

AUSTRALIA PILOT VOLUME III

East coast of Australia from North Head to Cape York

Great Barrier Reef, islands and reefs of Coral Sea

Great North East Channel

Torres Strait

South coast of Papua New Guinea between South Cape and the meridian of
141° 01' E.

TENTH EDITION
2005

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Area formerly covered by Australia Pilot:

Volume II	
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PREFACE

The Tenth Edition of Australia Pilot Volume III has been prepared by Mr D.H.Thomas. The United Kingdom Hydrographic Office has used all reasonable endeavours to ensure that this Pilot contains all the appropriate information obtained by and assessed by it at the date shown below. Information received or assessed after that date will be included in *Admiralty Notices to Mariners* where appropriate. If in doubt, see *The Mariner's Handbook* for details of what *Admiralty Notice to Mariners* are and how to use them.

This edition supersedes the Ninth Edition (2002), which is cancelled.

Information on climate and currents has been based on data provided by the Met Office, Exeter.

The following sources of information, other than UKHO Publications and Ministry of Defence papers, have been consulted:

Australian national charts and Notices to Mariners.
Fairplay Ports Guide 2005
Lloyds Ports of the World 2005.
The Ports of Australia and New Zealand, Sixteenth Edition 2003.
The Statesman's Yearbook 2005.
Whitaker's Almanac 2005.
Port Handbooks produced by Port Authorities

Dr D W Williams
United Kingdom National Hydrographer

The United Kingdom Hydrographic Office
Admiralty Way
Taunton
Somerset TA1 2DN
England
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PREFACE
to the Seventh Edition (1996)

The Seventh Edition of *Australia Pilot Volume III* has been compiled by Lieutenant Commander R. Jordan, Royal Navy, and contains the latest information received in the United Kingdom Hydrographic Office to the date given below.

This edition supersedes the Sixth Edition (1973) and Supplement No 11 (1994), which are cancelled.

Information on climate and currents has been based on data provided by the Meteorological Office, Bracknell.

The following sources of information, other than UK Hydrographic Office Publications and Ministry of Defence papers, have been consulted:

Australian Marine Information Manual.
Australian national charts and Notices to Mariners.
Fairplay Ports Guide 1996.
French Sailing Directions Volume K8.
Lloyds Maritime Guide 1995.
Lloyds Maritime Information Services.
Lloyds Ports of the World 1995.
Port Facilities Information System, Shell International Marine Ltd.
Sailing Directions, New South Wales Coast, Tenth Edition (1983).
The Ports of Australia and New Zealand, Fourteenth Edition.
The Statesman's Yearbook.
United States Publication 164—Sailing Directions New Guinea, Sixth Edition (1994).
Whitaker's Almanac.

J P Clarke CB LVO MBE
Rear Admiral
Hydrographer of the Navy

The UK Hydrographic Office
Admiralty Way
Taunton
Somerset
England
31st October 1996

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EXPLANATORY NOTES

Admiralty Sailing Directions are intended for use by vessels of 150 gt or more. They amplify charted detail and contain information needed for safe navigation which is not available from Admiralty charts, or other hydrographic publications. They are intended to be read in conjunction with the charts quoted in the text.

This volume of the Sailing Directions will be kept up-to-date by the issue of a new edition at intervals of approximately 3 years, without the use of supplements. In addition important amendments which cannot await the new edition are published in Section IV of the weekly editions of *Admiralty Notices to Mariners*. A list of such amendments and notices in force is published quarterly. Those still in force at the end of the year are reprinted in the *Annual Summary of Admiralty Notices to Mariners*.

This volume should not be used without reference to Section IV of the weekly editions of Admiralty Notices to Mariners.

CD-ROM

Status. A compact disc is provided at the back of this volume. The paper publication of Sailing Directions satisfies the requirements of Chapter V of the International Convention for the Safety of Life at Sea. The CD version does not satisfy these requirements and should only be used in conjunction with the paper publication and any amendments affecting the paper publication. Where any discrepancy exists between data on the CD and in the paper publication of Sailing Directions, the paper publication (inclusive of amendments) is to be relied upon.

Disclaimer. Whilst the UKHO has made all reasonable efforts to ensure that the data on the CD was accurate at the time of production, it has not verified the data for navigational purposes and the CD is not suitable, and is not to be relied upon, for navigation. The use of the CD for this purpose is at the user's own risk. The UKHO accepts no liability (except in the case of death or personal injury caused by the negligence of the UKHO) whether in contract, tort, under any statute or otherwise and whether or not arising out of any negligence on the part of the UKHO in respect of any inadequacy of any kind whatsoever in the data on the CD or in the means of distribution.

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References to hydrographic and other publications

The Mariner's Handbook gives general information affecting navigation and is complementary to this volume.

Ocean Passages for the World and *Routeing Charts* contain ocean routeing information and should be consulted for other than coastal passages.

Admiralty List of Lights should be consulted for details of lights, lanterns and fog signals, as these are not fully described in this volume.

Admiralty List of Radio Signals should be consulted for information relating to coast and port radio stations, radio details of pilotage services, radar beacons and radio direction finding stations, meteorological services, radio aids to navigation, Global Maritime Distress and Safety System (GMDSS) and Differential Global Positioning System (DGPS) stations, as these are only briefly referred to in this volume.

Admiralty Maritime Communications is a comprehensive guide on all aspects of maritime communications for the yachtman and small craft user. It provides general information on Global Maritime Distress and Safety System (GMDSS), the management of VHF, Maritime Safety Information, NAVTEX, Inmarsat and Radio Facsimile, and detailed information and procedures for marinas and harbours used by small craft.

Annual Summary of Admiralty Notices to Mariners contains in addition to the temporary and preliminary notices, and amendments and notices affecting Sailing Directions, a number of notices giving information of a permanent nature covering radio messages and navigational warnings, distress and rescue at sea and exercise areas.

The International Code of Signals should be consulted for details of distress and life-saving signals, international ice-breaker signals as well as international flag signals.

Remarks on subject matter

Buoys are generally described in detail only when they have special navigational significance, or where the scale of the chart is too small to show all the details clearly.

Chart index diagrams in this volume show only those Admiralty charts of a suitable scale to give good coverage of the area. Mariners should consult NP 131 *Catalogue of Admiralty Charts and Publications* for details of larger scale charts.

Chart references in the text normally refer to the largest scale Admiralty chart but occasionally a smaller scale chart may be quoted where its use is more appropriate.

Firing, practice and exercise areas. Submarine exercise areas are mentioned in Sailing Directions. Other firing, practice and exercise areas may be mentioned with limited details. Signals and buoys used in connection with these areas may be mentioned if significant for navigation. Attention is invited to the Annual Notice to Mariners on this subject.

Names have been taken from the most authoritative source. When an obsolete name still appears on the chart, it is given in brackets following the proper name at the principal description of the feature in the text and where the name is first mentioned.

Tidal information relating the daily vertical movements of the water is not given; for this *Admiralty Tide Tables* should be consulted. Changes in water level of an abnormal nature are mentioned.

Time difference used in the text when applied to the time of High Water found from the *Admiralty Tide Tables*, gives the time of the event being described in the Standard Time kept in the area of that event. Due allowance must be made for any seasonal daylight saving time which may be kept.

Wreck information is included where drying or below-water wrecks are relatively permanent features having significance for navigation or anchoring.

Units and terminology used in this volume

Latitude and Longitude given in brackets are approximate and are taken from the chart quoted.

Bearings and directions are referred to the true compass and when given in degrees are reckoned clockwise from 000° (North) to 359° Bearings used for positioning are given from the reference object.

Bearings of objects, alignments and light sectors are given as seen from the vessel.
Courses always refer to the course to be made good over the ground.

Winds are described by the direction from which they blow.

Tidal streams and currents are described by the direction towards which they flow.

Distances are expressed in sea miles of 60 to a degree of latitude and sub-divided into cables of one tenth of a sea mile.

Depths are given below chart datum, except where otherwise stated.

Heights of objects refer to the height of the object above the ground and are invariably expressed as "... m in height".

Elevations, as distinct from heights, are given above Mean High Water Springs or Mean Higher High Water whichever is quoted in *Admiralty Tide Tables*, and expressed as, "an elevation of ... m". However the elevation of natural features such as hills may alternatively be expressed as "... m high" since in this case there can be no confusion between elevation and height.

Metric units are used for all measurements of depths, heights and short distances, but where feet/fathoms charts are referred to, these latter units are given in brackets after the metric values for depths and heights shown on the chart.

Time is expressed in the four-figure notation beginning at midnight and is given in local time unless otherwise stated. Details of local time kept will be found in *Admiralty List of Radio Signals Volume 2*.

Bands is the word used to indicate horizontal marking.

Stripes is the word used to indicate markings which are vertical, unless stated to be diagonal.

Conspicuous objects are natural and artificial marks which are outstanding, easily identifiable and clearly visible to the mariner over a large area of sea in varying conditions of light. If the scale is large enough they will normally be shown on the chart in bold capitals and may be marked "conspic".

Prominent objects are those which are easily identifiable, but do not justify being classified as conspicuous.

ABBREVIATIONS

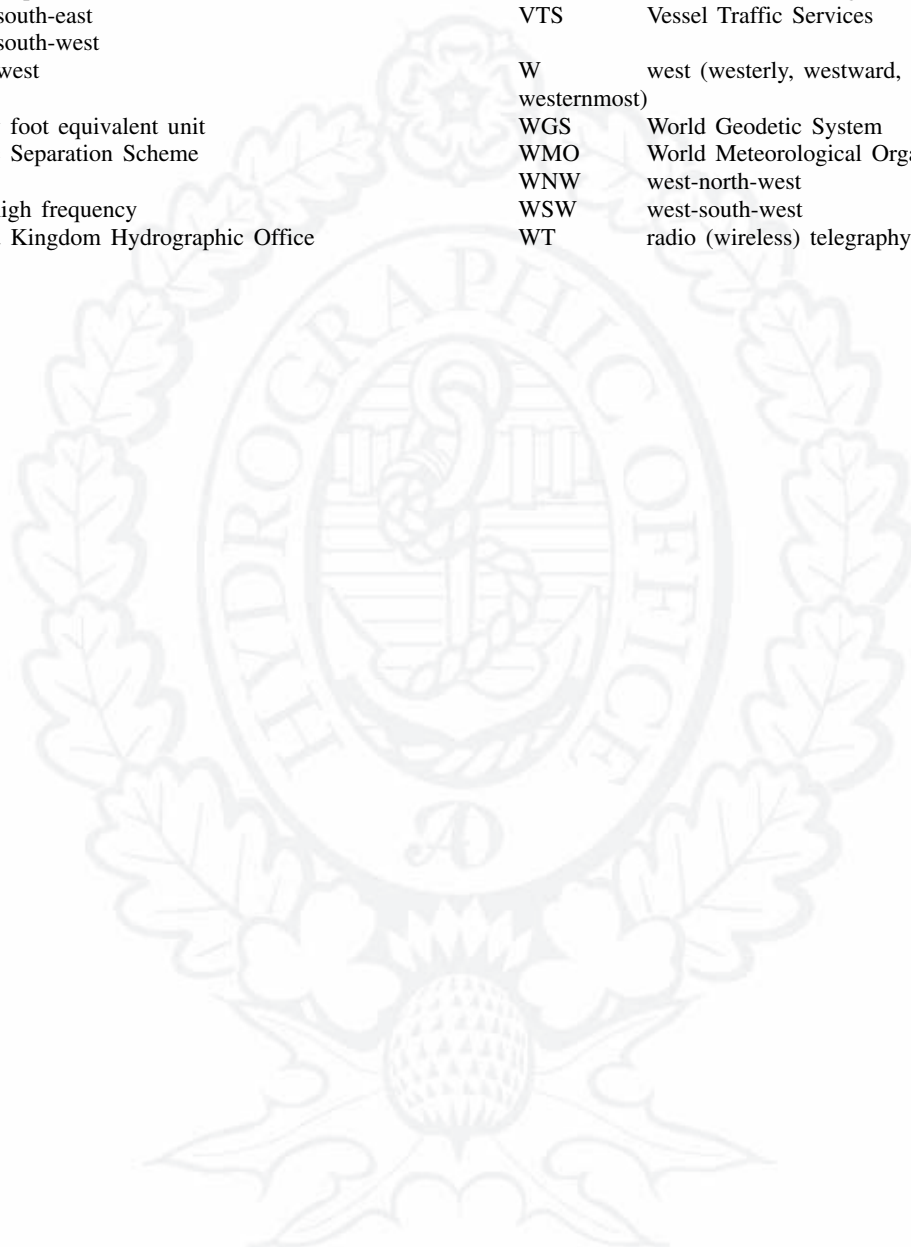
The following abbreviations are used in the text:

AIS	Automatic Identification System	kW	kilowatt(s)
ALC	Articulated loading column	Lanby	Large automatic navigation buoy
ALP	Articulated loading platform	LASH	Lighter Aboard Ship
AMVER	Automated Mutual Assistance Vessel Rescue System	LAT	Lowest Astronomical Tide
°C	degrees Celsius	LF	low frequency
CALM	Catenary anchor leg mooring	LHG	Liquefied Hazardous Gas
CBM	Conventional buoy mooring	LMT	Local Mean Time
CDC	Certain Dangerous Cargo	LNG	Liquefied Natural Gas
CVTS	Co-operative Vessel Traffic System	LOA	Length overall
		LPG	Liquefied Petroleum Gas
		LW	Low Water
DF	direction finding	m	metre(s)
DG	degaussing	mb	millibar(s)
DGPS	Differential Global Positioning System	MCTS	Marine Communications and Traffic Services Centres
DW	Deep Water	MF	medium frequency
DSC	Digital Selective Calling	MHz	megahertz
dwt	deadweight tonnage	MHHW	Mean Higher High Water
DZ	danger zone	MHLW	Mean Higher Low Water
		MHW	Mean High Water
E	east (easterly, eastward, eastern, easternmost)	MHWN	Mean High Water Neaps
EEZ	exclusive economic zone	MHWS	Mean High Water Springs
ELSBM	Exposed location single buoy mooring	MLHW	Mean Lower High Water
ENE	east-north-east	MLLW	Mean Lower Low Water
EPIRB	Emergency Position Indicating Radio Beacon	MLW	Mean Low Water
ESE	east-south-east	MLWN	Mean Low Water Neaps
ETA	estimated time of arrival	MLWS	Mean Low Water Springs
ETD	estimated time of departure	mm	millimetre(s)
EU	European Union	MMSI	Maritime Mobile Service Identity
feu	forty foot equivalent unit	MRCC	Maritime Rescue Co-ordination Centre
fm	fathom(s)	MRSC	Maritime Rescue Sub-Centre
FPSO	Floating production storage and offloading vessel	MSI	Marine Safety Information
FPU	Floating production unit	MSL	Mean Sea Level
FSO	Floating storage and offloading vessel	MV	Motor Vessel
ft	foot (feet)	MW	megawatt(s)
		MY	Motor Yacht
g/cm ³	gram per cubic centimetre	N	north (northerly, northward, northern, northernmost)
GMDSS	Global Maritime Distress and Safety System	NATO	North Atlantic Treaty Organization
GPS	Global Positioning System	Navtex	Navigational Telex System
GRP	glass reinforced plastic	NE	north-east
grt	gross register tonnage	NNE	north-north-east
gt	gross tonnage	NNW	north-north-west
HAT	Highest Astronomical Tide	No	number
HF	high frequency	nrt	nett register tonnage
HMS	Her (His) Majesty's Ship	NW	north-west
hp	horse power	ODAS	Ocean Data Acquisition System
hPa	hectopascal	PEL	Port Entry Light
HSC	High Speed Craft	PLEM	Pipe line end manifold
HW	High Water	POL	Petrol, Oil & Lubricants
		PSSA	Particularly Sensitive Sea Areas
IALA	International Association of Lighthouse Authorities	PWC	Personnel watercraft
IHO	International Hydrographic Organization	RCC	Rescue Co-ordination Centre
IMO	International Maritime Organization	RMS	Royal Mail Ship
ITCZ	Intertropical Convergence Zone	RN	Royal Navy
JRCC	Joint Rescue Co-ordination Centre	Ro-Ro	Roll-on, Roll-off
		RT	radio telephony
kHz	kilohertz		
km	kilometre(s)		
kn	knot(s)		

ABBREVIATIONS

S	south (southerly, southward, southern, southernmost)
SALM	Single anchor leg mooring system
SALS	Single anchored leg storage system
SAR	Search and Rescue
Satnav	Satellite navigation
SBM	Single buoy mooring
SE	south-east
SPM	Single point mooring
sq	square
SS	Steamship
SSE	south-south-east
SSW	south-south-west
SW	south-west
teu	twenty foot equivalent unit
TSS	Traffic Separation Scheme
UHF	ultra high frequency
UKHO	United Kingdom Hydrographic Office

ULCC	Ultra Large Crude Carrier
UN	United Nations
UT	Universal Time
UTC	Co-ordinated Universal Time
VDR	Voyage Data Recorder
VHF	very high frequency
VLCC	Very Large Crude Carrier
VMRS	Vessel Movement Reporting System
VTC	Vessel Traffic Centre
VTMS	Vessel Traffic Management System
VTs	Vessel Traffic Services
W	west (westerly, westward, western, westernmost)
WGS	World Geodetic System
WMO	World Meteorological Organization
WNW	west-north-west
WSW	west-south-west
WT	radio (wireless) telegraphy



GLOSSARY

The following words are occasionally found on charts and in Sailing Directions within the area covered by this volume.

FRENCH

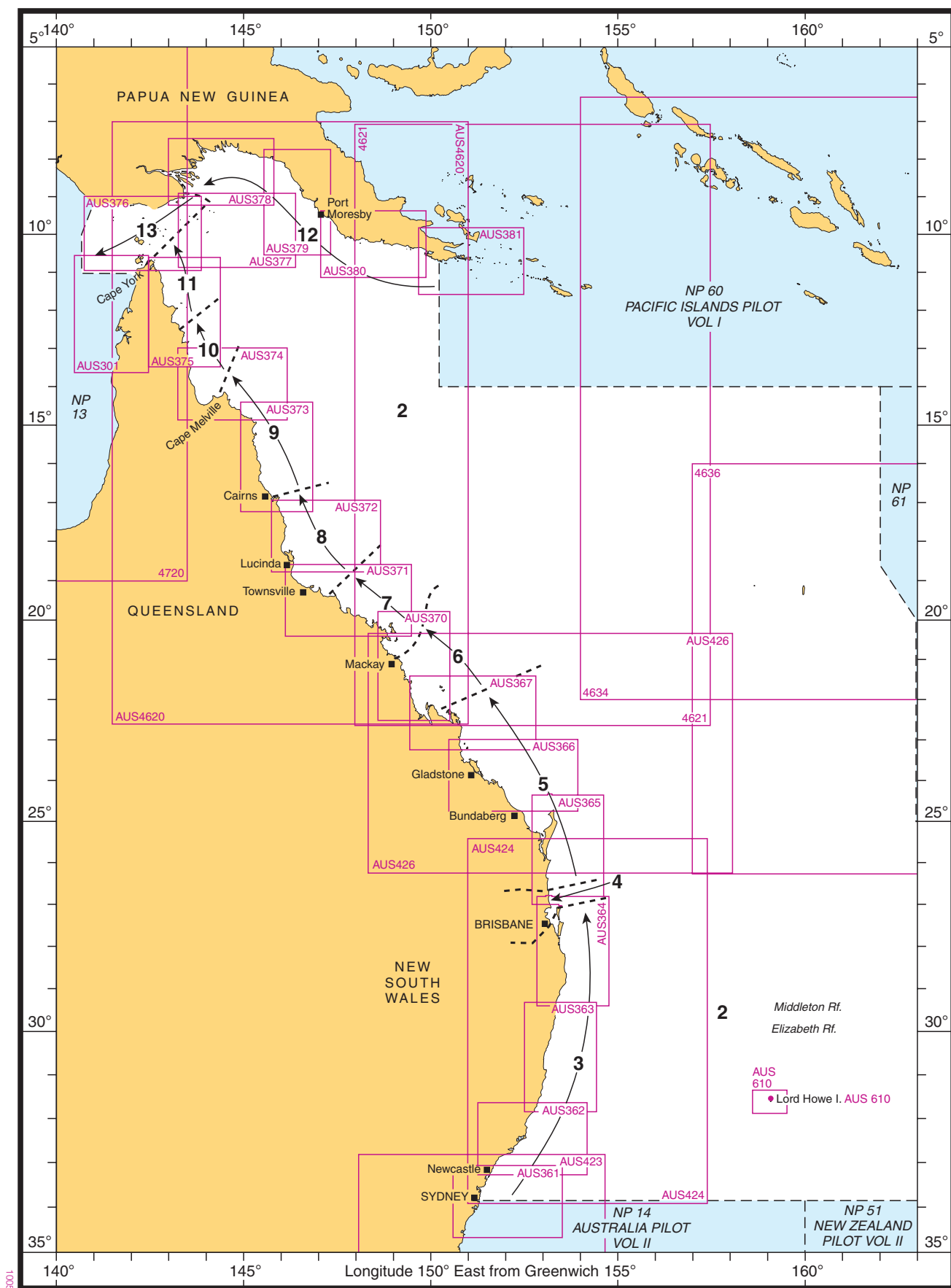
French English

banc	bank
caye	cay
grand	great
île	island, isle
îlot	islet
milieu	middle
mouillage	anchorage
nord	north
nord-est	north-east
nord-ouest	north-west

French English

nouvelle	new
observatoire	observatory
ouest	west
passage	passage
passe	pass, channel
plateau	table land, or flat below water
pointe	point
récif	reef
sud	south
sud-est	south-east

Chapter Index Diagram



NP 15

LAWS AND REGULATIONS APPERTAINING TO NAVIGATION

While, in the interests of safety of shipping, the United Kingdom Hydrographic Office makes every endeavour to include in its hydrographic publications details of the laws and regulations of all countries appertaining to navigation, it must be clearly understood:

- (a) that no liability whatever will be accepted for failure to publish details of any particular law or regulation, and
- (b) that publication of the details of a law or regulation is solely for the safety and convenience of shipping and implies no recognition of the international validity of the law or regulation.

AUSTRALIA PILOT

VOLUME III

CHAPTER 1

NAVIGATION AND REGULATIONS COUNTRIES AND PORTS NATURAL CONDITIONS

NAVIGATION AND REGULATIONS

LIMITS OF THE BOOK

Charts 4602, 4603, 4604

Area covered

1.1

- 1 This volume covers the E coast of Australia from Sydney to Cape York, Great Barrier Reef, Torres Strait, the major part of the S coast of Papua New Guinea and parts of Coral and Tasman Seas, all lying within the following limits:

	Lat S	Long E
From North Head, but excluding the limit of Port Jackson	33°49'	151°18'
N and NW along the coast of Australia to the W side of Cape York peninsula	11°00'	142°08'
Thence W to	11°00'	140°40'
Thence N to	10°00'	140°40'
Thence NNE to the coast of Papua New Guinea	9°08'	141°01'
Thence E along the S coast of Papua New Guinea to	10°30'	150°14'
Thence S to	14°00'	150°14'
Thence E to	14°00'	162°00'
Thence S to	18°30'	162°00'
Thence SE to	20°00'	163°00'
Thence S to	25°00'	163°00'
Thence E to	25°00'	170°00'

Lat S Long E

Thence S to 33°49' 170°00'

Thence W to North Head but excluding the limit of Port Jackson 33°49' 151°18'

NAVIGATIONAL DANGERS AND HAZARDS

Volcanic activity

1.2

- 1 See 1.143 and *The Mariner's Handbook*.

Navigation amongst coral

1.3

- 1 See information and recommendations in *The Mariner's Handbook* for navigation amongst coral generally.

Passage through the Inner Route of Great Barrier Reef involves navigating for a long period within the confined waters of these coral reefs, the section of the route N of latitude 16°40'S being particularly restricted and about 500 miles in length. A careful navigational plan, and a suitable ship's organisation to ensure its safe execution, is essential.

- 2 Moving discoloured patches may be seen whilst proceeding on the recommended tracks, preferred routes or within the two-way routes of the Inner Route. These patches are apparently due to surface plankton and should not require avoiding action if a vessel's position is not otherwise in doubt.

If any doubt should arise about a vessel's position whilst navigating the Inner Route, the safest immediate course of action may be to anchor.

Floating hazards

1.4

- 1 Large floating tree trunks and rafts of vegetation, washed down from the rivers of Gulf of Papua, are likely to be encountered within 100 miles of the coast of Papua New Guinea and are hazardous to shipping. Further information is given in relevant places in the text.

Former mined areas

1.5

- 1 Minefields laid in the waters of Australia and Papua New Guinea during the 1939–1945 war have been swept and have been used safely by shipping for many years. Due to the lapse of time, the risk from mines to navigation through the areas affected, whether swept or not, is now considered no greater than the ordinary risks of navigation. Even in swept waters there is however a remote risk that mines may still remain, having failed to respond to orthodox sweeping methods, and a danger still exists with regard to anchoring, fishing or any form of submarine or seabed activity.
- 2 Former mined areas exist in Moreton Bay (27°15'S 153°21'E), throughout an extensive length of Great Barrier Reef and in the approaches to Port Moresby (9°28'S 147°08'E). The areas are mentioned in the relevant geographical chapters, and listed in detail in Appendix II. Details are also given in *Annual Australian Notices to Mariners*.

Unexploded ordnance

1.6

- 1 A number of areas exist which are considered dangerous due to the presence of unexploded ordnance on the seabed. All such areas are listed in *Annual Australian Notices to Mariners* and those considered to be significant to normal surface navigation are charted.

TRAFFIC AND OPERATIONS

Routes

General information

1.7

- 1 **Preferred route.** In areas covered by this volume where preferred routes are shown on the charts, these routes have not been surveyed in accordance with IMO/IHO standards for a recommended track, but is the preferred route for vessels having regard to charted depths (see note on the charts).
- 2 **Two-way route.** In areas covered by this volume where two-way routes are shown on the charts, these routes are a ships routing measure and use is not mandatory. However, they do indicate the best and safest route for all vessels having regard to charted depths and dangers (see note on the charts).
- 3 **Recommended track.** In areas covered by this volume where recommended tracks are shown on the charts, these tracks are tracks which all or certain vessels are recommended to follow.

Further information concerning routes and tracks can be obtained in *The Mariners Handbook*, *Australian Seafarers Handbook* and *Annual Australian Notice to Mariners*.

Fishing

1.8

- 1 Inshore commercial and recreational fishing takes place off much of the E coast of Australia from vessels operating

from the ports and harbours of New South Wales and Queensland.

Significant levels of commercial lobster and cray fishing occur throughout the year between Newcastle (32°56'S 151°47'E) and Evans Head (29°08'S 153°27'E). Commercial prawn fishing occurs at a significant level in Torres Strait in the months from May to September. Further details are given in the relevant chapters.

Exercise areas

Military exercises

1.9

- 1 Military exercises are conducted in a number of areas off the E coast of Australia and the S coast of Papua New Guinea. In view of the responsibility of range authorities to avoid accidents, exercise areas are not generally shown on charts or described in the text of this volume.

General remarks about the existence of exercise areas are given in the relevant geographical chapters; full details are given in *Annual Australian Notices to Mariners*.

Submarine exercises

1.10

- 1 The Australian Exclusive Economic Zone (1.95) is a permanently established Australian submarine exercise area. Under certain circumstances warnings that submarines are exercising in specified areas may be broadcast by a coast radio station, or promulgated in printed navigational warnings.

Information concerning submarines is promulgated in *Admiralty* and *Annual Australian Notices to Mariners*.

Marine exploitation

Seismic surveys

1.11

- 1 Seismic survey vessels may be encountered within the continental shelf areas covered by this volume and should be given a wide berth; see *The Mariner's Handbook* for details of these operations.

Oil rigs and offshore structures

1.12

- 1 Kumul Marine Terminal (8°04'S 144°34'E) (12.228) lies in Gulf of Papua within the limits of this book. Two wells (see *The Mariner's Handbook*), lying 70 miles SSE of the terminal, are shown on charts Aus 377 and 378.

CHARTS

State of survey and charting

1.13

- 1 **North Head to Sandy Cape.** This part of the E coast of Australia is well surveyed, except for Great Sandy Strait (25°30'S 152°58'E), where the surveys are old and the channels are shallow and subject to change.

Inner Route. The Inner Route of Great Barrier Reef, from Sandy Cape to Cape York, has been well surveyed and is charted with recommended tracks, preferred routes or two-way routes throughout most of its length.

- 2 **Torres Strait.** The main approach channels to Torres Strait and the main channels through the strait are well surveyed and generally charted with recommended tracks, preferred routes or two-way routes. Large areas N and W of the main channels are either unsurveyed, or incompletely so.

Papua New Guinea. The S coast of Papua New Guinea is incompletely surveyed.

- 3 **Coral Sea.** A number of large scale plans of islands, reefs and islets in Coral Sea are based on recent surveys up to 1999, but many of the remainder are still from old surveys and dangers may have been only partially examined. Coral Sea as a whole is unsurveyed, and uncharted dangers may exist.

Reference charts

1.14

- 1 Most of the area covered by this volume lies within the Australian area of charting responsibility. Details of arrangements between United Kingdom and Australian Hydrographic Offices are given in *The Mariner's Handbook*.

France is the primary charting authority for waters extending W from Nouvelle-Calédonie to Plateau des Bellona and Récifs et Iles Chesterfield.

- 2 The reference charts quoted in the text of this volume are generally Australian charts incorporated in the Admiralty series (adopted charts). Admiralty charts of the area are now (2005) only small scale charts forming part of the International chart series.

The full range of Australian charts includes a number of medium and large scale unadopted charts which are not incorporated in the Admiralty series.

- 3 Australian Notices to Mariners, except for certain temporary and preliminary notices, are reprinted in Admiralty Notices to Mariners.

1.15

- 1 In certain areas where British Admiralty or adopted Australian charts show insufficient detail for navigation close to danger, these Sailing Directions have been written using larger scale charts which are either unadopted Australian, or French charts. These are not quoted as reference charts in the text, which has been written on the assumption that mariners wishing to navigate in these areas will have provided themselves with suitable charts on which to do so.

1.16

- 1 **Australian charts** may be obtained from the Australian Hydrographic Service, 8 Station Street, Wollongong, NSW 2500, and agencies.

French charts may be obtained from L'Etablissement Principal du Service Hydrographique et Océanographique de la Marine, 13 rue du Chatellier, BP426, 29275 BREST CEDEX, and agencies.

Datums

1.17

- 1 **Chart datum.** Datums throughout this volume are generally either the level of LAT or the approximate level of Indian Spring Low Water. The level in use is generally given on all medium and large scale charts. The relationship between these datums and those used in old surveys has not necessarily been determined.

Chart datums and their relationship with Admiralty tidal predictions are discussed in *The Mariner's Handbook*.

1.18

- 1 **Horizontal datum.** The datum formerly used on Australian charts was the Australian Geodetic Datum (1966). Older charts are based on local datums. Most modern Admiralty, Australian and International series charts of the area are now (2005) based on the World Geodetic System Datum (1984) (WGS 84), and this datum is being adopted on most new charts and new editions.

- 2 Most charts not based on WGS84 datum carry a caution on the shift to be applied to satellite-derived positions before they are plotted. In the absence of such a caution it should not be assumed that such a shift is negligible.

Differences in graduation may be apparent when transferring positions from one chart to another. When in doubt, it is advisable to transfer positions relative to common charted features rather than to geographical co-ordinates.

AIDS TO NAVIGATION

Lights

Responsible authorities

1.19

- 1 **Australia.** Lights are the responsibility of The Commonwealth, State or Harbour Authorities.

Papua New Guinea. Lights are the responsibility of the Papua New Guinea Harbours Board.

Landmarks

Caution

1.20

- 1 Caution is necessary when evaluating the descriptions given in this volume concerning landmarks, such as trees, and the colour and shape of buildings etc. New buildings may have been erected and old trees or houses destroyed, so that marks, which may at one time have been conspicuous on account of their isolation, shape or colour, may no longer exist or may now be difficult to identify.

Buoys

IALA Maritime Buoyage System

1.21

- 1 The IALA Maritime Buoyage System, Region A (Red to Port), is in use in the area covered by this volume.

For full details of the system see *The Mariner's Handbook* and *IALA Maritime Buoyage System*.

Direction of buoyage

1.22

- 1 General direction of buoyage in this volume:
East coast of Australia: N to S.
Torres Strait: W to E.
South coast of Papua New Guinea: E to W.

Special buoys

1.23

- 1 Oceanographic instruments, normally marked by light-buoys (special), are frequently positioned off the coasts of New South Wales and Queensland. Details are promulgated in *Australian Temporary Notices to Mariners*. Some buoys in more permanent locations are charted.

Caution

1.24

- 1 Buoys and beacons in exposed positions throughout the area covered by this volume are liable to be out of position or missing after bad weather. Marks established as temporary replacements may not have the same characteristics as the originals.

See also *Annual Australian Notices to Mariners* for caution with regard to the reliability of navigational buoys.

PILOTAGE

Port pilotage
1.25

- 1 **Australia.** Pilotage is compulsory at all Australian ports within the area covered by this volume where a pilotage service is provided, except where the master holds an exemption certificate. Vessels under 35 m LOA, and Commonwealth and Foreign naval, military and air force vessels, are also exempted.
- 2 **Papua New Guinea.** The Papua New Guinea Harbours Board at Port Moresby is the national pilotage authority and is responsible for the control of pilotage services at all declared ports. Pilotage at Port Moresby is compulsory; services at other ports may require 48 hours notice.

Coastal pilotage
1.26

- 1 **Great Barrier Reef.** Pilotage is compulsory for all vessels of 70 m LOA or more and all loaded oil tankers, chemical and liquefied gas carriers, regardless of length, except Defence Force vessels, passing through Hydrographers Passage or on passage through the Inner Route of Great Barrier Reef between the vicinity of Cairns Roads (16°40'S) and Cape York (10°41'S). It is also compulsory for such vessels in the Whitsunday and Lindeman Islands groups.
- 2 Additionally, the use of a licensed pilot by masters unfamiliar with other areas of the Inner Route, or with the entrances at Palm or Grafton Passages, is strongly recommended.

1.27

- 1 **Torres Strait and approaches.** Vessels of 70 m LOA or more and all loaded oil tankers, chemical and liquefied gas carriers, irrespective of size, are recommended to use a pilot when navigating Torres Strait and Great North East Channel.

For further information see *Australian Seafarers Handbook*.

Pilotage authorities
1.28

- 1 **New South Wales ports:** The Maritime Services Board of New South Wales, Circular Quay West, Sydney 2000.
Queensland ports: The Queensland Department of Transport, PO Box 2595, Brisbane 4001.
Inner Route, Great Barrier Reef, Torres Strait: The Australian Maritime Safety Authority, PO Box 1108, Belconnen ACT 2616.
Papua New Guinea: The Papua New Guinea Harbours Board, PO Box 384, Port Moresby, Papua New Guinea.

Pilot services and boarding places
1.29

- 1 The availability of port, coastal and reef pilots, and procedures and boarding places, are described in relevant parts of the text; further details may be found in *Admiralty List of Radio Signals Volume 6(4)*.
Guidance on the embarkation and landing of pilots by boat and by helicopter is given in *The Mariner's Handbook*. Information on any additional local requirements should be obtained beforehand.

RADIO FACILITIES

Electronic position fixing systems

Satellite navigation systems
1.30

- 1 **Global positioning system.** The Navstar Global Positioning System (GPS), a military satellite navigation system owned and operated by the United States Department of Defence, provides world wide position fixing.

The system is referenced to the WGS84 datum and therefore positions obtained must be adjusted, if necessary, to the datum of the chart being used.

- 2 **Global Navigation Satellite System.** The Russian Global Navigation Satellite System (GLONASS) is similar to GPS in that it is a space-based navigation system which provides world wide position fixing.

The system is referenced to the Soviet Geocentric Co-ordinate System 1990 (SGS-90) and as for GPS positions must be adjusted, if necessary, to the datum of the chart being used.

- 3 **DGPS.** Differential GPS compares the position of a fixed point, referred to as the reference station, with positions obtained from a GPS receiver at that point. The resulting differences are then broadcast as corrections to suitable receivers to overcome the inherent and imposed limitations of GPS.

DGPS corrections are transmitted from:

- Brisbane (27°04'S 153°03'E).
- 4 Cape Flattery (14°58'S 145°18'E).
- Gladstone (24°02'S 151°22'E).
- Glenfield (33°59'S 150°59'E) (*Australia Pilot Volume II*).
- Ingham (18°21'S 146°18'E).
- Mackay (21°06'S 149°13'E).
- Thursday Island airport, Horn Island (10°36'S 142°17'E).

- 5 **Caution.** Satellite navigation systems are under the control of the owning nation which can downgrade the accuracy to levels less than that available from terrestrial radio navigational systems. Therefore satellite based systems should only be utilised at the user's risk.

For full details of the above systems see *Admiralty List of Radio Signals Volume 2*.

Other radio aids to navigation

Radar beacons
1.31

- 1 **Racon**s are established at a number of suitable locations off the coasts of Australia and Papua New Guinea. Details are given in *Admiralty List of Radio Signals Volume 2*.

Radio stations

1.32

- 1 For full details on all radio stations which transmit in the area covered by this volume see *Admiralty List of Radio Signals Volumes 1(2) and 6(4)*.

Automatic Identification System

General
1.33

- 1 Automatic Identification System is designed to contribute to the safety of navigation, enhance protection of the marine environment and improve the monitoring of passing traffic by coastal states. A phased implementation

programme is underway (2004) on various classes of vessel and at certain establishments ashore. For further details see *The Mariners Handbook*.

Radio navigational warnings

Long range warnings

1.34

- 1 The area described in this volume lies within the coverage of Navarea X and Hydropac long range warnings.

Navarea X warnings. Australia is the area co-ordinator for Navarea X. Warnings are issued by the Rescue Coordination Centre Australia (RCC Australia), which is part of the Australian Maritime Safety Authority (AMSA), and are broadcast through:

- 2 National coast radio stations.
SafetyNET (Enhanced Group Calling International SafetyNET).

Hydropacs are issued by the United States National Imagery and Mapping Agency and broadcast through Guam and Honolulu coast radio stations.

- 3 Further details of the Navarea X and Hydropac warning services are given in *Admiralty List of Radio Signals Volumes 3(2) and 5*.

Coastal warnings

1.35

- 1 **Australia.** Coastal warnings are issued by RCC Australia as the AUSCOAST warnings series, Safety Messages (SSM series), or Weapon Practice Warnings (WP series). Warnings are broadcast through the coast radio stations listed at 1.34 for Navarea X warning broadcasts, and through SafetyNET.

1.36

- 1 **Papua New Guinea.** Urgent warnings for the area from the equator to 12°S between 141°E and 160°E are broadcast through Port Moresby coast radio station: see *Admiralty List of Radio Signals Volume 3(2)* for broadcast details.

Radio weather services

High seas warnings

1.37

- 1 The WMO has established a global service for the broadcast of high seas weather warnings and routine weather bulletins through the Enhanced Group Calling International SafetyNET service. Meteorological services areas (Metareas) are identical to the 16 Navareas within the world-wide navigational warning service. The area covered by this book lies within Metarea X, for which the responsible authority is the Australian Bureau of Meteorology. See *Admiralty List of Radio Signals Volume 3(2)* for broadcast details.

Coastal warnings

1.38

- 1 Forecasts and strong wind warnings for national coastal waters and adjacent high seas are regularly broadcast through coast radio stations in English from Australia, New Zealand and Papua New Guinea, and in French from Nouvelle-Calédonie. Weather warnings and routine bulletins for Australian coastal waters are also broadcast through the SafetyNET service.

For more information see *Admiralty List of Radio Signals Volume 3(2)*.

Meteorological broadcasts by radio–facsimile

1.39

- 1 The area covered by this volume lies within the broadcast coverage area of Australian coast radio–facsimile stations. For broadcast details see *Admiralty List of Radio Signals Volume 3(2)*.

Telephone/telefax weather information services

1.40

- 1 Weather information for the area covered by this volume is available through the telephone and telefax. For details see *Admiralty List of Radio Signals Volume 3(2)*.

Internet weather service

1.41

- 1 Weather information for the area covered by this volume is available through the Internet from the Australian Commonwealth Bureau of Meteorology. For details see *Admiralty List of Radio Signals Volume 3(2)*.

Radio medical advice

1.42

- 1 Mariners may obtain medical advice by radio through the International Radio Medical Centre (CIRM) in Rome. Advice is also available through RCC Australia (Canberra); Telemedical Advice Services Centre.

For further information and for details of the coast radio stations see *Admiralty List of Radio Signals Volume 1(2)*.

INTERNATIONAL REGULATIONS

Submarine cables and pipelines

1.43

- 1 Mariners are warned that every care should be taken to avoid anchoring or trawling in the vicinity of submarine cables or pipelines on account of the serious consequences which would result from fouling them. See *The Mariner's Handbook* for information on *The International Convention for the Protection of Submarine Cables*, together with advice on the action to be taken in the event of fouling a cable or pipeline.

- 2 In Australia, compensation for anchors or fishing gear which have been sacrificed outside territorial waters in order to avoid injuring a submarine cable may be claimed under *The Commonwealth Submarine Cables and Pipeline Protection Act of 1963*, see *Annual Australian Notices to Mariners*.

1.44

- 1 **Caution.** Mariners are advised not to anchor or trawl in the vicinity of pipelines. Gas from a damaged oil or gas pipeline could cause an explosion, loss of a vessel's buoyancy or other serious hazard. Pipelines are not always buried and may effectively reduce the charted depth by up to 2 m. They may also span seabed undulations and cause fishing gear to become irrecoverably snagged, putting a vessel in severe danger. See *Annual Australian Notice to Mariners No 14* and *The Mariner's Handbook*.

Pollution of the seas

1.45

- 1 *The International Convention for the Prevention of Pollution from Ships, 1973* was adopted by the International Conference on Marine Pollution convened by IMO in 1973. It was modified by the Protocol of 1978 relating thereto and adopted by the International Conference on Tanker Safety and Pollution Prevention convened by IMO in 1978. The Convention, as modified by the Protocol, is known as MARPOL 73/78.

2 The Convention consists of six Annexes. Annex I (Oil), Annex II (Noxious Liquid Substances in Bulk), Annex III (Harmful Substances carried at Sea in Packaged Form) and Annex V (Garbage from Ships) are mandatory; Annex IV (Sewage from Ships) and Annex VI (Air Pollution) are optional.

3 Particular Sensitive Sea Areas (PSSAs) are areas which need special protection through action by IMO because of their ecological, socio-economic or scientific significance, and which may be damaged by international maritime activities.

Particular Sensitive Sea Area covered by this volume is Great Barrier Reef.

MARPOL 73/78 and Annexes are described in detail in *The Mariner's Handbook*.

NATIONAL REGULATIONS: AUSTRALIA

Environment protection

Dumping waste at sea

1.46

1 The *Environment Protection (Sea Dumping) (Australia) Act 1981* applies to Australian flag vessels anywhere and to all vessels within Australian waters, including the Australian Economic Zone (1.95).

The Act regulates the loading and deliberate disposal of waste. Operational discharges and wastes arising from the "normal operations" of ships come under separate legislation.

See *Annual Australian Notices to Mariners* for further details.

Disposal of garbage at sea

1.47

1 The *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* implements MARPOL 73/78. Annex V of MARPOL 73/78 regulates the disposal of operational garbage from ships and applies to Australian flag vessels anywhere and to all vessels within Australian waters, including the Australian Economic Zone (1.95).

2 Great Barrier Reef region is designated "A Particularly Sensitive Sea Area" under MARPOL 73/78 and special protection measures apply. The outer edge of Great Barrier Reef is defined as "the nearest land" and the disposal of any garbage within the reef area is thereby prohibited.

3 Despite any discharges that may be permitted offshore, it is preferable that all waste is returned to disposal facilities ashore.

Further details are given in *The Mariner's Handbook* and in *Annual Australian Notices to Mariners*.

Oily waste disposal

1.48

1 The availability of shore reception facilities for oily waste is included in the information given on ports and harbours in the text of this volume.

Transfer operations at sea

1.49

1 The practice of transfers at sea is commonplace in some designated areas of the world, where special precautions are taken to counter the associated risks of collision and pollution. Except within established port limits, no areas have been designated off the Australian coast for such

purposes and the practice of using random locations to suit commercial requirements is viewed with concern.

2 The Australian Maritime Safety Authority, as the Commonwealth authority responsible for maritime safety and for the prevention of pollution from ship sources, is anxious to ensure that all necessary precautions are taken whenever a ship-to-ship transfer of persons, cargo or other goods is undertaken at sea in the vicinity of the Australian coast. To this end it is requested that early advice be forwarded to the Authority if such operations are intended.

3 Notifications for this purpose should be directed to the Australian Maritime Safety Authority, Canberra, or to any of the Authority's regional offices. Information provided should include the date and place of the proposed transfer, identity and full details of the ships to be involved, the purpose of the transfer, whether other craft (such as tugs) are to be in attendance and what equipment is to be provided to assist in manoeuvring and cargo transfer.

Pollution reports

1.50

1 Protocol I of Marpol 73/78 contains comprehensive requirements and recommendations for ship reporting of incidents involving harmful substances. Australian implementation of the protocol imposes obligations on all vessels navigating within Australian waters to report incidents involving the following:

2 A discharge or probable discharge of oil, or noxious liquid substances carried in bulk, resulting from damage to the ship or its equipment, or for the purpose of securing the safety of the ship or saving life at sea (Harmful Substances Report).

A discharge or probable discharge of harmful substances in packaged form, including those in freight containers, portable tanks, road and rail vehicles and ship-borne barges (Marine Pollutants Report).

3 Damage, failure or breakdown of a ship of 15 m in length or above which:

(i) affects the safety of the ship; including but not limited to collision, grounding, fire, explosion, structural failure, flooding, and cargo shifting; or
(ii) results in impairment of the safety of navigation; including but not limited to, failure or breakdown of steering gear, propulsion plant, electrical generating system, and essential ship-borne navigational aids; or

4 A discharge during the operation of the ship of oil or noxious liquid substances in excess of the quantity or instantaneous rate permitted under the present Convention.

1.51

1 Reports should be sent to the Manager, Marine Environment Protection Standards, in the Australian Maritime Safety Authority, Australian MRSC through the nearest coast radio station.

Detailed formats for pollution reports in Australian waters are given in *Admiralty List of Radio Signals Volume I(2)* and in *Annual Australian Notices to Mariners*.

Port entry

Port regulations

1.52

1 A copy of the port regulations should be obtained before or on arrival at any port.

Accident or damage**1.53**

- 1 The following extracts from *The Navigation Act (Australia), 1912–1958, Provision 268(1)* apply to any ship on passage to a port in Australia, or in Australian waters.

Where a ship to which provisions of the Act apply:

- Has sustained or caused an accident occasioning loss of life or serious injury to a person, or:
- 2 Has sustained an accident or has otherwise received damage, or a defect in the ship or its boilers, machinery or equipment has been discovered, and the accident, damage or defect has affected, or is likely to affect:
 - (i) the seaworthiness or safety of the ship, or:
 - 3 (ii) the efficient operation or the safety of the boilers, machinery or fixed equipment of the ship; or:
 - (iii) the efficiency or completeness of the life-saving appliances or other safety equipment of the ship; or:
- 4 Has been in a position of great peril, either from the action of some other ship or from danger of wreck or collision; or:
- Has been stranded or wrecked; or:
- 5 Has fouled or done any damage to a pipeline or submarine cable or to a lighthouse, lightship, beacon, buoy or other marine mark, not being a lighthouse, lightship, beacon, buoy or marine mark to which section 19B of the *Lighthouses Act 1911 – 1957* applies; or:
- 6 Having left a port in Australia, has put back to that port or another port in Australia.

Then the master of the ship shall, as soon as practicable, having regard to the means of communication available to him, report the happening to such person as is prescribed and shall, if so requested by or on behalf of that person, furnish a report in writing to that person in the prescribed form.

Smoking and the use of lights and fires in ships**1.54**

- 1 The attention of Masters and agents of ships visiting Australian ports is drawn to the *Navigation (Cargo — Hazards Prevention) Regulations, Statutory Rules 1959, No 97*, and amendments thereto, made under *The Commonwealth Navigation Act, 1912–58*. Copies of these regulations may be obtained from any Mercantile Marine Office in Australia.

Flammable cargo**1.55**

- 1 Special regulations are in force with regard to flammable cargo. These have been made under *The Commonwealth Navigation Act, 1912–58*, and are contained in the regulations quoted at 1.54.

Safety inspections are carried out on all tankers visiting Australian ports, prior to any transfer of cargo.

Signals to be shown by vessels with flammable liquids on board are given at 1.84.

Explosives**1.56**

- 1 Special regulations under the *Marine (Dangerous Goods) Regulations, 1990*, are in force in Australian ports regarding the loading, carriage and discharge of explosives.

All vessels having explosives onboard exceeding 15 kilograms in weight of gunpowder, or 3 kilograms in weight of any other explosive, shall on approaching a port hoist the appropriate signal from *The International Code of Signals*. This signal shall then continue to be shown until the explosives have been landed, or until the vessel has cleared the port or anchorage.

- 2 Details of designated explosive anchorages, explosives handling berths, and limits beyond which such vessels may not proceed, are given in the text for ports and harbours where these facilities exist.

Ports and navigable rivers: New South Wales**1.57**

- 1 **Speed limits** of between 4 and 8 kn are in force on many of the rivers and lakes of New South Wales.

1.58

- 1 **Conduct on passing certain vessels:**

- A vessel approaching a dredger, or other vessel employed on works in the river, is to reduce to a speed not exceeding 4 kn over the ground from at least 275 m before passing, to 45 m beyond the dredger or other vessel.
- 2 A red flag shown at the entrance to a dock indicates docking or undocking operations in progress. All vessels approaching must proceed at dead slow speed from at least 275 m before passing, to 45 m beyond.
- 3 A vessel approaching a river ferry crossing shall, when between 5 and 2½ cables from the ferry, sound a prolonged warning blast on her whistle or siren, and slow down. If the ferry is underway, the vessel should pass astern and, if practicable, stop engines while doing so. Ferries are forbidden to leave the shore after a vessel has sounded a prolonged warning blast, until that vessel has passed.

1.59

- 1 **Ferry navigation lights.** Ferries and other vessels working on wires or chains in ports or across navigable rivers exhibit at each end an all-round red light, not less than 3 m above the deck and visible at one mile, and a similar green light, not less than 1 m above the red light at the forward end of the vessel, to indicate the direction of travel.

Port regulations: Queensland**1.60**

- 1 **Speed.** Every power-driven vessel, when under way within the limits of any port in Queensland, shall be navigated at such reduced speed as shall not endanger the safety of any other vessel or vessels or moorings, or cause damage thereto, or to the banks of any river, or to any wharf, jetty, dredged channel, beacon, buoy or other harbour improvement.

Navigable rivers: Queensland**1.61**

- 1 **Sound signals.** The following sound signals are to be made when appropriate on the whistle or siren of all power-driven vessels in any river in Queensland:

Immediately before casting off from any wharf or jetty, a prolonged blast to signify the intention of so doing.

When proceeding up-river and approaching any bend, a short blast followed by a long blast.

- 2 When proceeding down-river and approaching any bend, a long blast followed by a short blast.

When about to turn round whilst underway, four short blasts followed after a short interval by one or two short blasts to indicate the intended direction of the turn. This signal is to be repeated as necessary during the turn to warn any approaching vessel. The latter vessel is required to keep clear.

1.62

- 1 **Ferry navigation lights.** Power-driven ferries operating across Queensland rivers exhibit a green all-round light at each end of the vessel.

In Brisbane River the same vessels, when underway, exhibit an additional red flashing all-round light from a position midway between the centre of the ferry and the forward green light.

Naval waters

1.63

- 1 Regulations applying to naval waters of the Commonwealth of Australia are embodied in the *Control of Naval Waters Regulations*; see Appendix I.

Quarantine

General information

1.64

- 1 The following extracts from the *Quarantine Act* of the Commonwealth of Australia are for the guidance of vessels arriving in Australian waters.

17. The following vessels shall be subject to quarantine:

- (a) Every overseas vessel until pratique has been granted or until she has been released from quarantine;
- 2 (b) Every vessel (whether an Australian vessel or an overseas vessel) on board which any quarantinable disease, or disease which there is reason to believe or suspect to be a quarantinable disease, has broken out or been discovered (notwithstanding that pratique has been granted or that she has been released from quarantine); and
- 3 (c) Every vessel which is ordered into quarantine by a quarantine officer.

20. The master of an overseas vessel arriving in Australia shall not, unless from stress of weather or other reasonable cause, suffer the vessel to enter any port other than a port declared to be a first port of entry.

1.65

- 1 First ports of entry within the area covered by this volume are listed at 1.131 and 1.132.

The following extract from *Statutory Rules No 85 of 1935*, made under the *Quarantine Act*, is inserted for the guidance of vessels arriving in Australian waters. The master of every vessel should take care to obtain a copy of these rules at the first port of call in Australia:

- 2 "... 6. The hours of clearance of vessels subject to quarantine shall be from sunrise to sunset. Provided that an authorised quarantine officer may, at any hour between 0500 and 2359, during the months from November to March (inclusive) and between 0600 and 2200 during the remaining months of the year, if so directed by the Chief

Quarantine Officer, inspect and clear any vessel. In certain cases these hours may be extended by special permission of the Chief Quarantine Officer."

Radio pratique

1.66

- 1 The Australian Quarantine and Inspection Service (AQIS) requires all vessels arriving in Australia from overseas, or which have been in contact with overseas vessels or sea installations, to submit a Quarantine Pre-Arrival Report for Vessels (Pratique) (QPAR) to AQIS.

The QPAR details the condition of the vessel, including human health, cargoes and ballast water management and must be submitted to AQIS by the vessel's Master or agent 12 to 48 hours prior to the vessel's arrival in Australia.

- 2 If this report is not submitted to AQIS, the vessel will be met by a quarantine officer on or shortly after arrival to complete quarantine formalities. This will cause delays to the vessel and will incur additional AQIS charges.

Vessels will require written permission to discharge any ballast water in Australian ports or waters.

Masters are also required to complete two other AQIS forms:

- 3 a) The AQIS Ballast Water Uptake/Discharge Log.
b) The AQIS Ballast Water Treatment/Exchange Log.

For further details of the above reports see *Admiralty List of Radio Signals Volume 1(2)*.

1.67

- 1 On receipt of satisfactory information in the request for radio pratique, the Quarantine Officer may grant pratique by radio. This may be followed by an inspection when the vessel arrives at the berth. The granting of pratique to a vessel does not release it from being subject to quarantine. Goods require separate clearance.

- 2 Should radio pratique not be granted, the vessel must remain outside the quarantine limit at the port of entry until boarded and cleared by the Quarantine Officer.

Refuse disposal

1.68

- 1 All animal waste, organic refuse, galley scraps and quarantinable waste arising whilst a vessel remains in or near a port must be made available for collection by an authorised collector. Arrangements should be made through ships' agents.

Importation of animals and plants

1.69

- 1 Strict prohibitions are in force against the import of certain animals, insects, plants and some animal products, e.g. hides, bristles, bone-meal etc., into Australia.

Animals may only be imported into Australia through certain ports; Brisbane and Thursday Island are the only such ports within the coverage of this volume.

Protection of historic features

Historic shipwrecks

1.70

- 1 Under the *Historic Shipwrecks Act 1976* certain historic shipwrecks may be protected. Except in accordance with a permit it is then prohibited to damage, destroy, interfere with or dispose of an historic shipwreck or historic relic, or

remove an historic shipwreck or historic relic from Australia, from Australian waters, or from the waters above the continental shelf of Australia.

- 2 Protected zones are also established around a number of declared historic wrecks. A permit is required for access to a protected zone for any purpose, whether related to the wreck or not.

Further details are published in *Australian Seafarers Handbook*.

Protected historic wrecks within the coverage of this volume are mentioned in the text.

Protected areas

Particularly Sensitive Sea Areas

1.71

- 1 These are areas which need special protection through action by IMO because of their ecological, socio-economic or scientific significance, and which may be damaged by international maritime activities. Great Barrier Reef is a designated PSSA. For further details see *Australian Seafarers Handbook*.

Marine Protected Areas

1.72

- 1 Australia has established a number of Marine Protected Areas (MPAs) which comprise any area of intertidal or subtidal terrain, together with its superjacent waters and associated flora and fauna, which have been reserved by legislation to protect part or all of the enclosed environment for conservation, scientific, educational or recreational purposes. Various restrictions, which include prohibition of general navigation, may apply within the protected areas.

- 2 Great Barrier Reef Marine Park is the most extensive of the protected areas. A number of offshore reefs and islands in Coral Sea are also protected.

Details of MPAs, prohibited activities and managing authorities are given in *Annual Australian Notices to Mariners*.

Great Barrier Reef Marine Park

1.73

- 1 Great Barrier Reef, which stretches from Lady Elliot Island (24°07'S 152°43'E) to Cape York (10°41'S 142°32'E), is the world's largest coral reef ecosystem and living structure. Great Barrier Reef Marine Park, which has been established for its protection, extends from the continental LW mark to beyond the E edge of the barrier reefs.

- 2 The Inner Route of Great Barrier Reef, which leads through the length of the marine park, is considered to be one of the trade highways of the world and requires sustained vigilance in navigating for a long period within confined waters. The most restricted part of the passage, for vessels W-bound through Torres Strait, occurs between Cairns (latitude 16°40'S) and Cape York and thence to Booby Island (10°36'S 141°55'E), and has a total length of about 500 miles.

- 3 Particular measures, such as Great Barrier Reef Marine Park Zoning Plan 2003, ship reporting systems and compulsory pilotage, are designed to avoid the potentially disastrous consequences of the passage of marine traffic

through these sensitive areas, are described in the relevant parts of the text.

Designated Shipping Area

1.74

- 1 Mariners are advised that Great Barrier Reef Marine Park Zoning Plan 2003 is in force and sets out the purposes for which each zone may be used or entered without permission, and the purposes for which a zone may be used or entered only with the written permission of Great Barrier Reef Marine Park Authority.

A Designated Shipping Area (DSA) is established through the Inner Route, recognised passages, and all port approaches in Great Barrier Reef Marine Park. The DSA will accommodate vessels using accepted or normally used routes.

- 2 Any vessel that is:
 - (a) 50 m or more in overall length; or
 - (b) an oil tanker (within the meaning given by the Protocol of 1978 relating to *The International Convention for the Prevention of Pollution from Ships, 1973*, regardless of its length; or
 - (c) a chemical carrier or liquefied gas carrier, regardless of its length; or
 - (d) a ship to which the INF Code applies, regardless of its length; or
- 3 (e) a vessel that is adapted to carry oil or chemicals in bulk in cargo spaces; or
- (f) a vessel engaged in towing or pushing another vessel or vessels, if any of the paragraphs (a) to (e) applies to the towed or pushed vessel, or the total length of the tow, from the stern of the towing vessel to the after end of the tow, is greater than 150 m;
- 4 but is not:
 - (g) a vessel of the Defence Force; or
 - (h) a vessel of the armed service of another country, if the vessel is in Australian waters with the consent of Australia; or
 - (i) a super-yacht (that is, a vessel more than 50 m in overall length used for private recreational activities).

is required to navigate within the limits of the Designated Shipping Area or the General Use Zones of the Great Barrier Reef Marine Park, except in the case of an emergency for any of the following purposes:

- 5 (i) to investigate and respond to an emergency alert;
- (ii) to save human life or avoid the risk of injury to a person;
- (iii) to locate or secure the safety of an aircraft, vessel or structure that is, or may be, endangered by stress of weather or by navigational or operational hazards;
- (iv) to carry out emergency repairs to a navigational aid;
- 6 (v) to deal with a threat of pollution to the marine environment under a Commonwealth law or a national emergency response arrangement in which the Great Barrier Reef Marine Park Authority participates;
- (vi) under Commonwealth law, to remove or salvage a vessel or an aircraft, or a section of a vessel or aircraft, or other wreck, that is wrecked, stranded, sunk or abandoned and poses a threat to the marine environment or safety.

- 7 Penalties apply to vessels which operate outside the DSA or General Use Zones without the written permission of the Great Barrier Reef Marine Park Authority, other than for the purposes mentioned in paragraphs (i) to (vi). Vessels wishing to deviate from the DSA or General use Zones, cruise ships for example, must seek permission from the Great Barrier Reef Marine Park Authority.

It is recommended that a copy of the Great Barrier Reef Marine Park Zoning Plan 2003, is obtained from the Great Barrier Reef Marine Park Authority before transiting this area.

NATIONAL REGULATIONS: PAPUA NEW GUINEA

Submarine pipelines

1.75

- 1 Papua New Guinea Petroleum Regulations prohibit anchoring or trawling within 10 miles of a submarine pipeline.

Quarantine

1.76

- 1 Radio pratique may be granted to vessels arriving from another port in Papua New Guinea, or from Australia or New Zealand. Pratique allows a vessel to enter port without further clearance. The port medical officer will otherwise board at the anchorage.

First ports of entry within the limits of this volume are listed at 1.131 and 1.132.

The procedure, and information required before arrival, is given in *Admiralty List of Radio Signals Volume 1(2)*.

SIGNALS

National signals: Australia

Uniform port signals

1.77

- 1 Uniform port signals, endorsed by The Association of Australian Ports and Marine Authorities, are for use by port authorities where provision is made for advising mariners of navigational information. The signals, if displayed, shall be shown from shore installations except that the Port Closed or Channel Blocked signal may be displayed also by a vessel blocking the channel.

- 2 These signals are not all in general use by port authorities, but where they are known to be in operation a statement referring to them is made in the text dealing with the port concerned.

1.78

- 1 **Port traffic signals.**

Day	Night	Meaning
		Port closed or channel blocked.
		
		

Port traffic signals (1.78)

1.79

- 1 **Storm signals.**

Day	Night	Meaning
		Winds of force 8 or greater may be expected.

The following Storm Signal is used in the State of Queensland; It is not used nationally.

Day	Night	Meaning
	 (Illuminated)	Tropical cyclone.

Storm signals (1.79)

1.80

- 1 **Tide signals.** To be shown from the masthead:

Day	Night	Meaning
		Flood
		Ebb
		Slack

QUARTER TIDE SIGNALS - When shown with other signals they will be shown on the mast below the crosstrees or the normal positions of crosstrees. Quarter tide signals are NOT exhibited with depth signals.

FLOOD TIDE

Day	Night	Meaning
		1st quarter
		2nd quarter
		
		3rd quarter
		
		4th quarter
		

EBB TIDE

Day	Night	Meaning
		1st quarter
		2nd quarter
		
		3rd quarter
		

Courtesy flag**1.85**

- 1 The correct courtesy flag to be flown in Australian ports is the Australian National Flag:



Courtesy flag (1.85)

DISTRESS AND RESCUE**Search and Rescue****Global Maritime Distress and Safety System****1.86**

- 1 The GMDSS enables SAR authorities on shore, in addition to shipping in the immediate vicinity of a vessel in distress, to be rapidly alerted to an incident so that assistance can be provided with the minimum of delay. The sea area covered by this volume lies variously within the SAR Regions of Australia, New Zealand, Nouvelle-Calédonie and Papua New Guinea.

Details of the GMDSS and the associated coast radio stations are given in *Admiralty List of Radio Signals Volume 5*.

General arrangements for Search and Rescue**1.87**

- 1 AusSAR is a discrete business unit of the Australian Maritime Safety Authority. It is located in Canberra and is responsible for both aviation and maritime search and rescue. When a ship or aircraft is in distress in the Australian Search and Rescue Region (SRR), assistance may be given by ships in the vicinity and/or the following authorities:
- 2 Australian Maritime Safety Authority (AMSA) through AusSAR, specifically the Rescue Co-ordination Centre Australia (RCC Australia) for merchant ships outside port limits and small craft beyond the capacity of local SAR resources. RCC Australia co-ordinates aircraft and surface vessels involved in SAR operations within the Australian SRR. RCC Australia is also the Australian Mission Control Centre (AUMCC) for the COSPAS/SARSAT. RCC Australia is manned continuously and may be contacted through any Australian Coastal Radio Station or INMARSAT.
- 3 Coastal Radio Stations (CRS), which keep watch on the International RTF distress frequencies. The Royal Australian Air Force is responsible for SAR operations involving Australian and foreign military land-based aircraft, but may provide assistance to other SAR authorities. The Royal Australian Navy is responsible for SAR in respect of naval ships and shipborne aircraft, but may provide assistance to other SAR authorities.
- 4 The New South Wales and Queensland State Police Forces are responsible for SAR operations involving fishing vessels and pleasure craft within the limitations of their SAR resources.

An Australian Government protocol is in place for commercial shipping rescuing persons at sea in or adjacent to the SRR; this includes guidance on the processes to be followed in landing people who have been rescued at sea.

Ship reporting systems**Australian Ship Reporting System (AUSREP)****1.88**

- 1 To facilitate SAR procedures for ships in distress, an Australian Ship Reporting System (AUSREP) is operated by the Australian Maritime Safety Authority through AusSAR, specifically the Rescue Co-ordination Centre (RCC) Australia, for all ships in waters adjacent to the Australian continent. The E limit of the AUSREP region is the meridian of 163°00'E. Participation in the system is mandatory for those vessels listed below:
- 2 All Australian registered ships engaged in trade or commerce interstate or overseas while in the AUSREP area.
- Ships not registered in Australia but engaged in the coasting trade between Australia and an external territory, or between external territories, while in the AUSREP area.
- 3 Ships not registered in Australia but demised under charter parties to charterers whose residences or principal places of business are in Australia while in the AUSREP area.
- Foreign ships, other than the above mentioned vessels, from their arrival at their first Australian port until their departure from their final Australian port; they are encouraged, however, to participate from their entry into the AUSREP area until their final departure from it.
- 4 Australian fishing vessels proceeding on overseas voyages while in the AUSREP area, but not including those vessels operating from Queensland ports, which may call at ports in Papua New Guinea as an incidental part of their fishing operations. The term "overseas voyage" is defined in Section 6(1) of *The Navigation Act (Australia) 1912*.
- 5 Suitably equipped small craft on passage of 200 miles or more between different ports.
- Small craft participation in AUSREP is dependant upon carriage of approved communications and safety equipment and on the prior registration of craft particulars with RCC Australia in Canberra.
- Full details of the AUSREP system are given in *Admiralty List of Radio Signals Volume 1(2)* and *Annual Australian Notices to Mariners*.

Torres Strait and Great Barrier Reef ship reporting system**1.89**

- 1 In order to minimise the risk of marine accident and consequent pollution and damage to the marine environment a ship reporting system (REEFREP) is in force for vessels navigating the Inner Route of Great Barrier Reef and Torres Strait.
- Great Barrier Reef and Torres Strait Vessel Traffic Service (REEFVTS) is in force as part of REEFREP, to enhance the level of navigational safety by interacting with vessels transiting the region by providing information on

potential traffic encounters and other navigational information.

Great Barrier Reef and Torres Strait Vessel Traffic Service also has AIS (1.33).

- 2 The system, which covers the Inner Route N of 22°00'S and the general area of Torres Strait between the meridians of 141°45'E and 144°00'E, extends from the Australian coast to the outer edge of Great Barrier Reef and includes Great North East Channel and Endeavour Strait.

Participation is mandatory for vessels in the following categories:

- 3 (a) All vessels of LOA 50 m or more.
(b) Oil tankers, liquefied gas carriers, chemical tankers and vessels covered by the Irradiated Nuclear Fuels Code; all regardless of length.
(c) Vessels engaged in towing or pushing a vessel within categories (a) or (b) above, or where the length of tow, measured from the stern of the

towing vessel to the after end of the tow, exceeds 150 m.

See *Admiralty List of Radio Signals Volume 6 (4)* and *Australian Seafarers Handbook* for further details.

AMVER

1.90

- 1 AMVER, operated by the United States Coast Guard, is an international maritime mutual assistance organisation which provides important aid to the development and co-ordination of search and rescue efforts in many offshore areas of the world. Participation in the system is voluntary and additional to participation in the Australian Ship Reporting System (AUSREP).

Details are given in *Admiralty List of Radio Signals Volume 1(2)*.



COUNTRIES AND PORTS

GENERAL INFORMATION

Jurisdiction

Chart 4060

1.91

- 1 Waters in the W and NW of the area covered by this volume lie variously within the jurisdiction of Australia, Papua New Guinea or Papua (formerly Irian Jaya). Some waters in the SE, E and NE parts of the coverage lie within the maritime jurisdictions of New Zealand, Nouvelle-Calédonie and Solomon Islands. Nouvelle-Calédonie is an overseas territory of France.

- 2 Australia has bi-lateral agreements with the governments of France, Papua New Guinea and Solomon Islands with respect to jurisdiction over waters of Coral Sea, and with Papua New Guinea with respect to Torres Strait.

Tasman Sea

1.92

- 1 Lord Howe Island is a dependency of New South Wales. Norfolk Island is an external territory of the Commonwealth of Australia.

Coral Sea

1.93

- 1 As a result of national claims to jurisdiction and bi-lateral agreements, France exercises control over Bancs Capel, Kelso, Argo and Nova, Récifs Bellona, Récifs et Iles Chesterfield, Récifs Bampton, and the reefs and banks farther E.

Papua New Guinea exercises control over Portlock Reefs and Eastern Fields.

- 2 The remaining reefs and banks, including Selfridge Bank but excluding Gifford Tablemount, fall within Australia's claim. Gifford Tablemount lies outside the claims of both France and Australia.

AUSTRALIA

General description

1.94

- 1 Australia, the official name of which is Commonwealth of Australia, is an independent country and the smallest continent in the world, situated entirely in the S hemisphere. It has a total land area of about 7 692 300 sq km and is divided into six states and two territories.

The country is bounded N by Timor and Arafura seas, NE by Coral Sea, E by the S Pacific Ocean, and S and W by the Indian Ocean. The capital city is Canberra which, in 2004, had an estimated population of about 323 100.

- 2 The Australian States and Territories included in this volume are:

Norfolk Island.

New South Wales.

Queensland.

Coral Sea Island Territory.

National limits

1.95

- 1 In general, Australia claims a territorial sea with an outer limit of 12 miles measured from the territorial sea baselines; a contiguous zone with an outer limit of 24 miles from the territorial sea baseline; an EEZ and fishing zone with an outer limit of 200 miles from the territorial sea

baseline. The fishing zone limits are similar but not identical to the limit of the EEZ.

- 2 Australia regulates fishing by vessels of all nationalities in the waters of the Australian Fishing Zone and the external territories, but excluding the Australian Antarctic Territory.

The EEZ applies around the Australian mainland and islands including all external territories.

- 3 For full details of Maritime Jurisdiction, copies of the *Commonwealth of Australia Gazette* and the relevant *Acts* should be consulted; copies may be purchased from Australian Government Publishing Service bookshops, or be examined at Australian diplomatic and consular offices. See also *Australian Seafarers Handbook* and *The Mariner's Handbook*.

History

Discovery and exploration

1.96

- 1 The true discoverers of Australia were the aborigines who reached the N coasts of the continent in two distinct races about 20 000 years ago. The first race to arrive may have been the Tasmanoids, coming from New Guinea or other islands in Melanesia. The second race, the Australoids, coming probably from S India, pushed the Tasmanoids before them into the SE part of the continent at a time when it was still connected to Tasmania or close enough for it to be reached by canoe. At any rate the Tasmanoids settled in Tasmania, where they remained isolated until the coming of the Europeans with whom they were unable to compete. By the end of the nineteenth century they had become extinct as a pure race; however half-caste descendants still live on the islands in Bass Strait.

- 2 Chinese junks may have visited N Australia in the thirteenth century or even earlier and there is ample evidence that Malay fisherman, from what is now Indonesia, were frequent visitors to obtain trepang, a form of edible sea slug, for some hundred years before the arrival of the first European. In addition Portuguese or even Arab seaman may have reached the coasts of Australia before 1600, but no written evidence has survived. The depiction of a continent named Java-la Grande (or variations of that spelling) to the S of Sumatra on sixteenth century maps of the Dieppe school of Hydrography have been cited as evidence for a Portuguese discovery of Australia.

1.97

- 1 However, it was the Dutch who were the first Europeans to sight and report the existence of Australia and to land on the continent. In 1606 Captain Jansz was sent from Java in the yacht *Duyfken* to explore the S coast of New Guinea. During this voyage Jansz sailed S to the W coast of what is now Cape York Peninsula and explored the E side of Gulf of Carpentaria as far S as Cape Keerweer, where some of the crew were attacked by aborigines. Jansz returned to Java reporting a barren and inhospitable land; he failed to discover Torres Strait.

- 2 Later in 1606 the Spanish explorer Torres, in the *San Pedrico* and *Los Tres Reyes*, successfully passed through the strait which now bears his name. Torres had accompanied Quiros on a voyage from Peru to Vanuatu (The New Hebrides) where they became separated. Torres then sailed W in compliance with the expedition's orders, thus discovering and passing through Torres Strait before

finally reaching Manila. His report lay hidden in Spanish archives for many years and though the strait began to appear on charts in the eighteenth century its existence remained in doubt until Lieutenant James Cook sailed through it in 1770. The exact route Torres took through the strait is still being debated.

1.98

- 1 It was also the Dutch who were the first Europeans to sight the coast of Western Australia, when in 1616 Dirk Hartog in the *Eendracht* of Amsterdam sighted and explored the W coast between 21°45'S and 28°00'S, including Shark Bay. The coast N of Shark Bay was named after his vessel and some of the islands in the bay itself after members of his crew.
- 2 In 1619, Houtman, who founded the Dutch East India Company, was nearly wrecked in the *Dordrecht* and *Amsterdam* on the islets and rocks, now known as Houtman Abrolhos. On this voyage the land S of Shark Bay was named Edel's Land after the ships' supercargo. In 1629 Houtman Abrolhos was the scene of the wreck of the Dutch East Indiaman *Batavia*, under the command of Captain Pelsaert. However, the first European ship identified as wrecked off the Australian coast was the British East Indiaman *Tryal*, which was lost on Tryal Rocks in the Monte Bello Islands in 1622.
- 3 Also in 1622 the Dutch ship *Leuwin* rounded the SW cape of Australia which was named Cape Leuwin in 1801 by Matthew Flinders during his survey. In 1624 the Dutch ship *Gulden Zeepaard* cruised the S coast of Australia as far as the head of Great Australian Bight; the lands sighted were named after Pieter Nuyts, an important Dutch official who was on board.
- 4 In 1642 Anthony Van Diemen, Governor of the Dutch East Indies, sent Abel Janszoon Tasman in the *Heemskerck* and *Zeehaen* on a voyage of exploration during which Tasman discovered Tasmania, which he named Van Diemen's Land, the name by which the island was known until the mid nineteenth century. Tasman then became the first European to visit New Zealand and Fiji before returning to Batavia N of New Guinea.
- 5 The golden age of Dutch exploration ended in 1697 when Swan River was entered by Vlaming in the *Geelvink*. By this time most of the S, W and N coasts of Australia had been explored and charted to a certain extent. New Holland, the Dutch name for the continent, had also become generally accepted.

1.99

- 1 The first Englishman to visit Australia was William Dampier who landed on its N coast in 1688 reporting that "The inhabitants of this country are the miserablest people in the world". Dampier returned again in 1699 in command of HMS *Roebuck* and explored part of the NW coast, giving his name to the land in the vicinity of King Sound, and naming Roebuck Bay after his ship.
- 2 In 1770, Lieutenant James Cook, returning to England in HMS *Endeavour* after observing the transit of Venus in Tahiti, made a landfall on the coast of Australia at Point Hicks, now in the state of Victoria, thereafter exploring and charting the whole of the E coast as far as Cape York. Cook hoisted the Union Flag in Botany Bay in April 1770, claiming possession for the British Crown of New South Wales, the name given by Cook to the coast he had explored.
- 3 Formal possession of New South Wales was eventually taken by the British in Botany Bay on 26th January 1788 by Captain Arthur Phillip. Phillip, on board HMS *Sirius*, was in command of a fleet of naval vessels and transports,

now known as "The First Fleet" which had been sent from England to Botany Bay to establish a convict settlement. This site proved unsuitable and instead, Phillip moved his fleet to Sydney Cove, Port Jackson, a few miles up the coast, where on 7th February 1788 the British colony was set up. A subsidiary settlement was set up shortly afterwards on Norfolk Island.

- 4 The settlement of Port Jackson stimulated further exploration and between 1795 and 1799 Mr George Bass, Surgeon RN, and Lieutenant Matthew Flinders, both of HMS *Reliance*, explored the coasts adjacent to Port Jackson. Bass Strait was discovered by and named after the former officer, and Tasmania circumnavigated by the latter. Flinders returned to Australia in 1801 in command of HMS *Investigator* and surveyed the S and E coasts of Australia and Gulf of Carpentaria.
- 5 On the S coast Flinders forestalled the French explorer Nicholas Baudin commanding the *Geographe*, *Naturaliste* and *Casuarina*, who explored parts of the S, W and N coasts of Australia between 1801 and 1803, one of several distinguished Frenchmen who made useful contributions to the charting of Australia. There was an unexpected meeting between Flinders and Baudin in what Flinders aptly named Encounter Bay, situated about 25 miles E of Backstairs Passage in S Australia.
- 6 Lieutenants James Grant and John Murray carried out some useful surveys in HMS *Lady Nelson* between 1800 and 1802. Under the command of the former officer the *Lady Nelson* was the first ship from Europe to sail through Bass Strait, and with Murray in command, Port Phillip was discovered in 1801 and named by Governor King after the first Governor. Earlier in 1791 Captain George Vancouver in HMS *Discovery* had discovered and named King George Sound in Western Australia.
- 7 Finally, between 1817 and 1822, Lieutenant Phillip Parker King in the colonial schooners *Mermaid* and *Bathurst* surveyed the NE, N and W coasts of Australia. It can be said on the completion of King's survey that the outline of Australia as shown on modern maps had been finally determined. The work of such surveyors as Wickham, Stokes, Blackwood, Stanley, Yule and Denham, who followed King, filled in the missing details.

Settlements

1.100

- 1 The first settlement in Western Australia was made in 1827 at Albany in King George Sound. The official claim of British Sovereignty over all Australia was made in the same year. A settlement on the banks of Swan River was founded in June 1829 by Captain Stirling; the first stone of Perth, the capital of Western Australia, was laid in the same year.
- 2 The first settlement in Tasmania, then administered as part of New South Wales, was made in 1803. Tasmania became a separate colony in 1825. Melbourne was founded in 1835, at the head of Port Phillip, and became the capital of Victoria in 1851 when that colony too became separated from New South Wales.
- 3 Queensland was first settled in 1824 at Redcliff Point, Moreton Bay, but this site was found to be unsuitable and the settlement was moved to near the present site of Brisbane. Queensland was separated from New South Wales in 1859 and proclaimed a separate colony. South Australia was founded in 1836.

Naming of the continent

1.101

- 1 At the time of the initial settlement of Australia in 1788, the name of New Holland continued to be used for the W part of the continent and New South Wales for the E part. However, in 1804 Flinders wrote to Sir Joseph Banks suggesting the name of Australia for the continent as a whole. This suggestion did not meet with Bank's approval at the time nor again in 1814 when Flinders repeated the suggestion in the printed account of his voyage, which therefore was published with the title *A Voyage to Terra Australis*. Flinder's charts also carried the name *Terra Australis*, though his small scale chart of the continent was titled *General Chart of Terra Australis or Australia*. The name *Australia* gradually became accepted and by the time King's charts were published in 1825 only this name was used in the titles. The names *Terra Australis* and *New Holland* persisted in legal documents for a few more years.

Government

Constitutional development

1.102

- 1 In 1901 the British colonies of New South Wales, Victoria, South Australia, Queensland, Western Australia and Tasmania were granted the status of self-governing states and federated to form the Commonwealth of Australia, the states retaining many of the features of their former constitutions. At the time of federation Northern Territory was a corporate part of South Australia, but in 1911 it formally passed under the control of the Commonwealth Government. In 1978 Northern Territory became a self-governing territory within the Commonwealth of Australia. In 1969 The Coral Sea Islands Territory was established under the control of the Commonwealth Government.

Federal capital

1.103

- 1 The Australian Capital Territory was set up in 1911 as an enclave within the territory of New South Wales, but it was not until 1927 that the federal capital of Canberra was completed and the seat of government transferred there.

System of government

1.104

- 1 The Federal Government of the Commonwealth of Australia is vested in the Federal Parliament, which consists of the Sovereign, represented by the Governor-General, a Senate and a House of Representatives. Senators and Members of the House of Representatives are elected by compulsory universal suffrage.
- 2 In each of the six States there is a State Government whose constitutional powers and laws continue, subject to changes embodied in the Australian Constitutions and subsequent alterations and agreements, as they were before federation. These Governments are similar to the Federal Government being lead by the Sovereign, represented by a Governor and an upper and lower house of Parliament (except in Queensland where the upper house was abolished in 1922).
- 3 The legislative powers of the Federal Government include taxation, finance, defence, external affairs, service and execution of the civil and criminal process. The State Governments deal with education, health, hospitals, law and order and public safety, and public undertakings such as railways, water, sewage.

Population

1.105

- 1 The estimated population of the country in 2004 was 20 275 700.

Language

1.106

- 1 English is the official language used throughout the Commonwealth of Australia.

Norfolk Island

General information

1.107

- 1 Norfolk Island (29°02'S 167°56'E) was discovered by Captain Cook in 1774 and first settled by Europeans in 1788. In 1856 the descendants of the mutineers in *HMS Bounty* were conveyed there from Pitcairn Island.
Norfolk Island and adjacent islands, which together form an external territory under the control of the Commonwealth of Australia, are described at 2.55.

New South Wales

General description

1.108

- 1 The State of New South Wales occupies the E coast of the Australian continent from Cape Howe (37°30'S 149°59'E) in the S to Danger Point (28°09'S 153°34'E) in the N. The S part of the state, and its coastline between Cape Howe and Port Jackson (33°50'S 151°17'E), is described in *Australia Pilot Volume II*.

Physical features

1.109

- 1 The State may be divided into five natural divisions. These are the coastal district, the tablelands, the W declivity, the inland river district and the W plains.
The coastal district is a comparatively narrow strip of fertile, well-watered, undulating land which extends about 30 miles inland to the tablelands of Great Dividing Range.
- 2 The tablelands consist of a high plateau which traverses the entire length of the state and is furrowed by precipitous valleys. In many places there are nearly perpendicular escarpments on the seaward side. The high plateau extends from about 30 to 200 miles from the coast, from whence there is a gradual fall to the great central plains on its W side.
- 3 The W declivity extends from the W edge of the tablelands to the head-waters of the inland rivers, and covers some 38 000 sq miles of broken uplands and lowland hills which are peculiarly adapted for the breeding of choice merino sheep. The best stud strains in the country come from this district.
The inland river district, the S part of which is known generally as the Riverina, consists of a well-watered expanse of downland and plains, the greater part of which is adapted to both sheep breeding and agriculture, particularly the growing of wheat.
- 4 The W plains are purely pastoral, except in specialised districts where vast mineral deposits have made the names of Broken Hill and Cobar famous as the sites of valuable mines of silver, lead, copper and gold.
- 1.110
1 Most of the rivers of the state have their sources in Great Dividing Range and flow thence to the sea by the E or W watersheds. The principal rivers of the E watershed flowing to sea within the limits of this volume are the Hawkesbury, Hunter, Manning, Macleay, Clarence and

Richmond Rivers. All these are partially navigable by light-draught vessels, but bars at their entrances may be significant or dangerous.

Flora and Fauna

1.111

- 1 **Flora.** Among the indigenous trees and shrubs of New South Wales are acacia, eucalyptus or gum tree, cedar, casuarina or she-oak, honeysuckle, fig tree, cabbage tree palm, salt bush and malee scrub. Ferns of large size are numerous. Wild flowers grow in profusion and of these the waratah or native tulip, the Christmas bush and varieties of rock lily are some of the most striking.

1.112

- 1 **Fauna.** Among the animals indigenous to New South Wales are kangaroo, wallaby, paddymelon, bandicoot, wombat, opossum, koala bear, feral cat, platypus and hedgehog.

Bats are numerous and vary in size from the flying mouse to the large sized flying fox.

- 2 Birds are well represented. In addition to over sixty species of parrot, there is the eagle, owl, great kingfisher or laughing jackass, magpie, pheasant, bush and wild turkey, emu and the lyre and bower bird.

Snakes are numerous, the death adder and the yellow snake being the most dangerous.

- 3 There are many types of lizard. An unusual long-necked tortoise is found in the swamps of some rivers.

Most creeks and lagoons abound with leeches and teem with insects.

Fish abound in the rivers and coastal waters of the state. Among them are bream, mullet, whiting, snapper, jewfish, flathead, garfish, murray cod and perch. Crustaceans abound; Sydney oysters are much prized.

Industry and trade

1.113

- 1 The most important products are the vast numbers of sheep and large numbers of cattle, horses, pigs and poultry which are bred throughout the state. Crops grown include wheat, maize, oats, rice, potatoes, tobacco, sugar cane, fruit and vegetables. Vineyards are numerous.

- 2 Large quantities of coal are mined from deposits which are among the most extensive in the world. Silver, iron, zinc, copper, tin and gold are also produced.

Factories for processing these and other products are numerous.

Trawler fleets operate off the whole of the New South Wales coast S of Port Stephens (32°42'S 152°10'E).

Queensland

General description

1.114

- 1 The State of Queensland occupies the NE part of the Australian continent and includes within its limits the islands of Great Barrier Reef and most of the islands in Torres Strait.

Just over half of Queensland lies within the tropics. Because of its physical, climatic and general living conditions, this vast area is however relatively immune from many of the diseases and disabilities encountered in other tropical areas.

- 2 The mainland coast of Queensland extends N from Danger Point (28°09'S 153°34'E) to Cape York (10°41'S 142°32'E), thence along the NW and W sides of Cape York Peninsula where it is fronted by Gulf of Carpentaria. The outer approaches to Torres Strait W of 140°40'E, and Gulf of Carpentaria, are described in *Australia Pilot Volume I*.

- 3 The E seaboard of Queensland, N of the approximate parallel of 22°30'S is protected by Great Barrier Reef which form a natural breakwater. The various openings through the barrier are described in relevant places in the text of this volume. The numerous islands of Great Barrier Reef included within the State of Queensland are enclosed by a line drawn from Sandy Cape (24°42'S 153°16'E) along the outside of Great Barrier Reef, enclosing Anchor Cay (9°22'S 144°07'E) in the N, then Bramble Cay (9°09'S 143°53'E). From Bramble Cay the line is drawn bearing 260° to enclose Warrior Reefs and Saibai and Dauan Islands; thence W to Deliverance Island (9°31'S 141°35'E); thence bearing 259° to the meridian of 138°E, which forms the continental border between Queensland and the Northern Territory.

Physical features

1.115

- 1 Queensland is essentially a land of great plains, the largest of which lies in the W part of the state in the region of Great Artesian Basin. Land on the E side of the basin rises towards Great Dividing Range and then falls to the coast in a tumble of mountainous ranges, usually separated by low land. This fall to the coast is gentle along the Tropic of Capricorn but elsewhere it is abrupt, with steep scarps on the E faces, which for some distance N of Cairns occur on the coast. Farther S the scarp is fronted by other ranges between which there are narrow corridors, where the soil is rich and rainfall high, giving magnificent scenery and good agricultural land. In some places this structure continues beyond the coast; numerous similarly mountainous islands, of which Curtis, Whitsunday and Hinchinbrook Islands are examples, being found offshore.

- 2 Apart from reefs and islands offshore, description of the mainland may be divided into three distinct areas.

The E coastal area lying between Great Dividing Range and the sea is formed mainly of plains which then rise again to coastal ranges containing the most striking mountains, including Bellenden Ker Range, the highest in the state. Great Dividing Range itself is not a noticeable feature of the landscape from seaward. The disposition of the high country in this E part of the state has caused unusual drainage patterns for the E-flowing rivers. Burnett, Fitzroy and Burdekin Rivers, with numerous tributaries, enter the sea in the S part of the state through gaps in the coastal ranges. These rivers, the longest in the state, are sluggish and of intermittent seasonal flow, with wide areas of alluvial plains within their basins. In the N part of the area the short rivers, rising on the plateau, descend to the coastal plains by cutting great gorges in the scarp.

- 3 To the W of Great Dividing Range, high country consisting of broken plateaux slopes to the plains of Great Artesian Basin, beneath which there are great reserves of water. The slope to Gulf of Carpentaria is very gentle and culminates in large tracts of salt flats, flooded each summer. The rivers flowing N and W have only slight gradients and periodic high river levels can cause widespread inundation.

- 4 In the far NW of the state a series of rugged ranges, in which most minerals are found, rise from the W side of the

artesian basin, giving way first to a broken plateau of limestone and then to rugged sandstone uplands. Behind these, the grassy plains of Barkly Tableland stretch NW into Northern Territory.

Flora

1.116

- 1 The native vegetation of Queensland may be classified broadly into seven main types:
Rain forests have mostly been cleared in former years for pasture and cultivation, but some areas remain on the E coast as National Parks and State Forests. Softwood scrub may also be known as monsoon forest, turkey scrub, bastard scrub and bottle tree scrub. It occurs in patches in the E part of the state.
- 2 Acacia scrub may be one of three main types: Brigalow scrub occurs on both sides of Great Dividing Range S of 21°S and Gidyea or Gidgee scrub occurs in the more W parts of the state in the less arid regions usually associated with open grassland. Both Brigalow and Gidyea have been extensively cleared for pasture. Mulga scrub ranges from dense scrub to open grassland and occurs in the S inland areas of the state. Mulga itself is a valuable food for sheep and cattle, particularly during times of drought.
- 3 Open forest occupies nearly half the total area of the state and is found in the semi-arid or so-called "desert" country of central Queensland. Vegetation consists of scattered trees, mainly eucalypts, and grassland. Poplar Box is the principal tree in the S. The growing season of open forest in the monsoon area is very short and intense, with long dry periods each year.
- 4 Open grassland occurs in semi-arid parts of the state, with few or no trees or scrub. The grasses may be Blue Grass or, in the more W parts, Mitchell Grass. This type of land supports most of the wool-growing sheep, and in more favourable parts is cultivated for grain crops.
Spinifex occupies large areas of open stony and sandy soils in the semi-arid regions, mainly in the W between open grassland and the desert. Spinifex grasses are low in nutriment but can support small numbers of sheep and cattle.
- 5 Channel country occupies the SW part of the state where Lake Eyre river system spreads out into vast flood plains of fertile alluvial soil. The coolabah tree is common along the main river channels, but the country is otherwise largely tree-less.

1.117

- 1 The predominant summer rainfall has largely determined the agriculture of the state. Sugar cane is the most important crop and is grown in the wettest parts of the E coast, chiefly in the general area between Hay Point and Cairns. Irrigation is used extensively in other areas where the rainfall is low.
Dairying, which depends largely on natural and cultivated grazing crops, is a primary industry in the plains of the E coastal area. The main dairying area stretches from Brisbane to Rockhampton.
- 2 Crops grown in the E coastal area in summer are maize, sorghum, lucerne, bananas, pineapple, cotton, citrus, pumpkin, potatoes, tomatoes, tobacco and peanuts. The chief winter crops are wheat, barley, oats, linseed, safflower and onions.

The main asset of interior Queensland is natural grass, which supports most of the sheep and a large proportion of the beef cattle. Stock holdings towards the W border, where rainfall is low, are much larger.

Fauna

1.118

- 1 The animal life of Queensland is abundant and varied.
Australia's two unique egg-laying mammals are both represented. The Spiny Anteater is widely distributed, but the less common Platypus is found only in some streams.
There are about fifty species of marsupial, ranging in size from the large grass-eating Red and Grey Kangaroos to tiny marsupial mice. Brown and Grey Cuscuses, Tree Kangaroos, Musk-rat Kangaroos and several distinctive Possums are restricted to the NE.
- 2 The Koala Bear is rigidly protected, as also is the Naked-nosed Wombat found in the S part of the state, and the Hairy-nosed Wombat found in a remote region in the central part.
Other native mammals are mostly rats and bats. The bats are insectivorous except for the large False Vampire Bat of the N areas, which eats other bats as well, and the Fruit Bat, or Flying Fox, which attacks fruit.
- 3 About 400 species of birds are known, ranging in size from the large flightless Cassowary of the N rain forests, and the Emu of the open country, to the tiny Weebills and Thornbills. Birds of Paradise, Cat-birds and Bower-birds are found in a part of the state. The Wedgetailed Eagle, one of the world's largest eagles, the Companion, the only native member of the crane family, and the Jabiru, the only native stork, are found on the plains and waterways. Brush Turkeys are found in the scrub and rain forests.
- 4 There are about a dozen species of dangerous snake, including the Taipan. The largest snake, the Scrub Python, which is found in the N parts of the state and may exceed 6 m in length, is harmless. The lizards are not venomous.
Freshwater fish-eating crocodiles, and the larger and dangerous estuarine crocodiles are widely distributed through the N part of the state. The Green Turtle of coastal waters is protected.

1.119

- 1 The waters of Queensland contain as many as 1600 species of fish, undoubtedly due to the wide range of coastline extending through nineteen degrees of latitude, and to the proximity of Great Barrier Reef.
The best known of the freshwater fish is the Queensland Lungfish, which occurs in Brisbane, Mary and Burnett Rivers. The Dawson River Salmon, or True Barramundi, is another representative of a fossil group of fish. Other freshwater fish include Bream, Catfish, Eel, Perch, Australian Bass, Archer-fish, Murray Cod, Bullrout, Grunter and Sleepy Cod.
- 2 Saltwater fish vary in size from the massive but harmless 14 m Whale Shark to the tiny Blenning. Sharks include the Hammerhead, Tiger and Whaler, all of which are killers, and the White Shark, which is the largest and most ferocious, reaching a length of 9 m or more. The Wobbegong is harmless and ornately marked; the Green Sawfish may exceed 6 m in length and has a toothed saw 2 m long. Among the rays are the beautifully marked Blue-spotted Ray of Great Barrier Reef, the leaping Eagle Ray and the huge but harmless Devil Ray.
- 3 The fish of coastal waters and those inhabiting the shoals and deeper waters of the reefs are too numerous to list.

Comparatively few of the fish in Queensland waters are poisonous. Those that are poisonous to eat are Toados, Box-fish, Chinaman-fish, Red Bass and Paddletail. Those with a poisonous sting are the Stingray, Spinefoot, Butterfly Cod, Bullrout, Scorpion and Stonefish. The last-named is the most poisonous.

Industry and trade

1.120

- 1 Mineral production, including gold, silver, copper, tin, lead, zinc, bauxite, coal, mineral sands, uranium and salt, continues in its importance to the economy of the state.

Oil and gas have been found at several places.

The agriculture of Queensland (1.117) differs from that of other states because of the large proportion of tropical crops and fruit.

- 2 More than half the total value of rural production comes from sheep, beef, dairy cattle and pigs. Wool is one of the state's most valuable products.

Timber is an important asset in a continent not well endowed with softwoods and the state possesses the largest area in the continent suitable for permanent forestry production. The principal trees grown are pines, mainly Hoop, Bunya, Kauri and Cypress, hardwoods and cabinet woods.

- 3 Industry tends to be concentrated in the S part of the state. The fishing industry contributes substantially to the economy.

Coral Sea Islands Territory

Boundaries

1.121

- 1 The Coral Sea Islands Territory comprises the islands within an area which starts at the E extremity of Great Barrier Reef in latitude 12°00'S. The boundary then runs E to 12°00'S 157°10'E; thence S to 24°00'S 157°10'E; thence W to 24°00'S 154°00'E; thence N to 22°00'S 154°00'E; thence W to the E extremity of Great Barrier Reef; thence NW along the E extremity of Great Barrier Reef to the starting point.

Description

1.122

- 1 The islands, reefs and banks within the territory are described in Chapter 2.

The territory is under the control of the Commonwealth of Australia.

PAPUA NEW GUINEA

General description

1.123

- 1 Papua New Guinea consists of the E half of the island of New Guinea and many offshore islands, including New Britain, New Ireland and Bougainville. The territory extends from 1°S to 12°S and from 141°E to 156°E. Only the S coast of the main island of Papua New Guinea is described in this volume.

History

1.124

- 1 New Guinea was sighted by Portuguese and Spanish navigators in the early sixteenth century but remained largely isolated from the rest of the world. In 1884 a British Protectorate was proclaimed over the S coast of New Guinea and the adjacent islands. British New Guinea, as the protectorate was called, was annexed outright in

1888 and, in 1906, was placed under the authority of the Commonwealth of Australia, being known thenceforth as the Territory of Papua.

- 2 The N part of New Guinea was a German colony until the First World War, becoming a League of Nations mandated territory in 1921, administered by Australia. This mandate was in force until the invasion by the Japanese in 1942, when the civil administration was suspended until the surrender of Japan in 1945.

In September 1975 the former Territories of New Guinea and Papua, having achieved self-government in December 1973, amalgamated to form the combined independent state of Papua New Guinea, within the British Commonwealth.

Government

1.125

- 1 Papua New Guinea is a constitutional monarchy within the British Commonwealth, with the British Sovereign as Head of State represented locally by the Governor General. The National Parliament is formed by 109 members from all parts of the state. General elections are held every 5 years.

Additionally there are 19 fully elected provincial governments formed to decentralise administration.

The seat of Government and capital of Papua New Guinea is at Port Moresby.

Population

1.126

- 1 The estimated population of Papua New Guinea in 2004 is 5 261 200.

Languages

1.127

- 1 English is the official language but a multiplicity of different local languages, totalling about 850, is to be found throughout the country. Pidgin English is probably in most common use.

Physical features

1.128

- 1 The interior of the main island of Papua New Guinea is formed by a central spine of mountain ranges which reaches from the SE extremity to about the mid-point of the W border with Papua. The mountain ranges are rugged and precipitous, with some peaks rising to nearly 4600 m and many of them visible at a distance of 90 miles in clear weather. The high rainfall of the interior results in many rivers and streams flowing to the coast. The most significant rivers within the coverage of this volume occur in the W part of Gulf of Papua, where Fly River is the largest of a number of large rivers which enter the gulf through immense deltas.

- 2 The N coast of the main island of Papua New Guinea is notable for a line of volcanoes (1.143) which then extends E through New Britain and Bougainville Island. In 1951 there was a serious eruption of Mount Lamington (8°56'S 148°11'E), which had previously been considered to be extinct.

Flora and fauna

1.129

- 1 Dense jungle is the striking feature of a large part of Papua New Guinea, with rain forests occurring in most areas from sea level to elevations of about 980 m.

The fauna is closely related to that in Australia, and marsupials predominate in the 100 or so species so far found. Birds of Paradise and Cassowary are amongst the many species of indigenous birds. Crocodiles are found in

the rivers and sea. Fish are plentiful and contribute largely to the diet of the local people.

Industry and trade

1.130

- ¹ Papua New Guinea's natural resources, which include gold, copper, hydrocarbons, timber, tree crops and fisheries, provide the country's main exports. There is little domestic industry.

PRINCIPAL PORTS, HARBOURS AND ANCHORAGES

1.131

¹ Place and position	Remarks
Australia	
New South Wales	
Newcastle (3.76) (32°56'S 151°47'E)	Major commercial river port; port of entry
Queensland	
Brisbane (4.61) (27°19'S 153°10'E)	Major commercial river port; naval base; port of entry
² Bundaberg (5.120) (24°46'S 152°23'E)	River port for bulk sugar exports; port of entry
Gladstone (5.149) (23°50'S 151°15'E)	Major commercial port in large natural harbour; bulk coal exports; port of entry
Port Alma (5.223) (23°35'S 150°52'E)	River port; bulk export of salt and meat; port of entry
³ Hay Point (6.149) (21°16'S 149°18'E)	Offshore bulk coal export terminal; port of entry
Mackay (6.176) (21°06'S 149°13'E)	Bulk sugar export and general cargo; port of entry
Abbot Point (7.155) (19°53'S 148°05'E)	Offshore coal export terminal; port of entry
⁴ Townsville (8.87) (19°15'S 146°50'E)	Large artificial harbour; bulk sugar and mineral exports and general cargo; port of entry
Lucinda (8.45) (18°32'S 146°20'E)	Offshore bulk sugar export terminal; port of entry
Mourilyan (8.146) (17°36'S 146°07'E)	River port for bulk sugar exports; port of entry
⁵ Cairns (9.46) (16°56'S 145°47'E)	Natural harbour; bulk sugar export, general cargo and cruise liner terminal; naval base; port of entry
Cape Flattery (9.114) (14°57'S 145°21'E)	Offshore export terminal for silica sand
⁶ Thursday Island (13.97) (10°35'S 142°13'E)	Natural harbour; trans-shipment port for Torres Strait islands and Gulf of Carpentaria; port of entry
Papua New Guinea	
Port Moresby (12.115) (9°28'S 147°08'E)	Large natural harbour and principal port of Papua New Guinea; naval base; port of entry

Place and position

Remarks

- ⁷ Kumul Marine Terminal (12.228)
(8°04'S 144°34'E)
Umuda Floating Terminal (12.245)
(8°29'S 143°54'E)
- Offshore platform terminal for export of crude oil
- Open anchorage; permanent storage vessel functions as terminal for bulk export of minerals

First ports of entry

1.132

- ¹ Ports of entry are indicated in the list of principal ports above (1.131). The following additional first ports of entry are also declared:

Australia

Lord Howe Island (31°32'S 159°05'E) (2.28).
Coffs Harbour (30°19'S 153°09'E) (3.199).
Yamba (29°26'S 153°22'E) (3.215).

Papua New Guinea

Daru (9°05'S 143°12'E) (13.34).

PORT SERVICES – SUMMARY

Docking facilities

Australia

1.133

- ¹ Newcastle. Floating dock, lift 15 000 tonnes; patent slip, lift 1250 tonnes (3.125).
Port Macquarie. Slip, lift 400 tonnes (3.179).
Yamba. Dry dock, length 61 m; slip, lift 700 tonnes (3.223).
Brisbane. Dry dock, maximum size 85 000 dwt; slip, lift 2500 tonnes (4.122).
² Mackay. Slip, lift 600 tonnes (6.205).
Townsville. Slip, lift 850 tonnes (8.127).
Innisfail. Slip, lift 250 tonnes (8.166).
Cairns. Dry dock, maximum size 2000 dwt; slip, lift 3000 tonnes; floating dock, lift 350 tonnes (9.73).
Thursday Island. Slip, lift 250 tonnes (13.137).

Papua New Guinea

1.134

- ¹ Port Moresby. Panamax dry dock, under construction (2001); slip, lift 1000 tonnes (12.150).

Other facilities

Salvage services

1.135

- ¹ Brisbane (4.123).

Compass adjustment

1.136

- ¹ Newcastle (3.126).
Yamba (3.223).
Cairns (9.73).

Deratting**1.137**

- / Deratting and exemption certificates:
Newcastle (3.126).
Brisbane (4.123).
Bundaberg (5.139).
Gladstone (5.200).
Rockhampton (5.242).
Hay Point (6.175).

Mackay (6.205).
Townsville (8.127).
Cairns (9.73).

Measured distances**1.138**

- / Gold Coast Seaway (3.263).
Maryborough (5.103).



NATURAL CONDITIONS

MARITIME TOPOGRAPHY

General remarks

Charts 4602, 4603, 4604

Sea Areas

1.139

- 1 The S part of the sea area covered by this book lies in the N of Tasman Sea, which extends between Australia and New Zealand and fronts the E coast of Australia as far as the parallel of 30°S. Remaining sea areas of the book lie in Coral Sea, which extends between Australia and Vanuatu and is bounded in the W by the coast of Australia N of 30°S, Torres Strait and the S coast of Papua New Guinea. A line on the W side of Torres Strait, between Slade Point (10°59'S 142°08'E) on Cape York peninsula and the entrance to Torassi River (9°08'S 141°01'E), forms the boundary between Coral and Arafura Seas.

Seabed

Continental shelf

1.140

- 1 From North Head (33°49'S 151°18'E) to Sandy Cape (24°42'S 153°16'E), the continental shelf off the E coast of Australia extends between 10 and 40 miles offshore. From Sandy Cape the edge of the shelf then crosses the entrance to Capricorn Channel to the SE end of Swain Reefs (22°20'S 152°45'E), from whence it follows the outer edge of Great Barrier Reef as far as the E approaches to Torres Strait and the S approaches to Gulf of Papua.
- 2 In the W and N parts of Gulf of Papua the edge of the continental shelf lies up to 80 miles offshore, before closing to between 6 and 13 miles of the E shore of the gulf. The edge of the shelf then follows the outer edge of Sunken Barrier Reef throughout the remaining length of the S coast of Papua New Guinea at distances of 1 to about 12 miles off the coast.
- 3 The vast shallow bank of Arafura Shelf which extends W from Torres Strait is described in *Australia Pilot Volume I*.
To seaward of the continental shelves of Australia and Papua New Guinea, the seabed structures of Tasman and Coral Seas give rise to widely varying features.

Seabed south of 20°S

1.141

- 1 Norfolk Ridge, which lies from New Zealand to Nouvelle-Calédonie and passes through the SE limits of this book, is separated throughout its length from Lord Howe Rise by New Caledonia Basin. A chain of islands, reefs and banks lying on the W side of Lord Howe Rise, extends N from Lord Howe Island (31°32'S 159°05'E) approximately along the meridian of 159°E to the large shoal area of Plateau des Bellona. Between Lord Howe chain and the mainland of Australia, 600 miles farther W, a remarkable chain of seamounts rises from Tasman Abyssal Plain in the S and extends N between the meridians 155° and 156°E to abreast Sandy Cape (24°42'S 153°16'E). Shoal depths rising to Cato Bank and Wreck, Kenn and Frederick Reefs extend about 220 miles N from the end of the seamount chain.

Seabed north of 20°S

1.142

- 1 The main features of the NW part of Coral Sea are the remarkable Great Barrier Reef, the large and detached Queensland Plateau and Coral Sea Basin. Mellish Reef (17°25'S 155°51'E) is the most significant of a number of features rising from the seabed on the SE side of the basin. The NW side of Coral Sea Basin is bounded by Papua Plateau.

Volcanic and seismic activity

1.143

- 1 Most of the area covered by this book is notable for its volcanic and seismic inactivity. The exception is on Norfolk Ridge between New Zealand and Nouvelle-Calédonie, where some submarine volcanic activity has occurred. This area forms part of a chain of quaternary volcanoes, some still active, which extends from the N coast of Papua through New Britain and Solomon Islands, and thence in an arc S through Vanuatu towards New Zealand, where movements occur between the earth's crustal plates. The plate structure in this area is very complex, and high seismic activity, which can trigger tsunamis, may occur at both shallow and medium depths. The region forms part of the circum-Pacific earthquake zone from where 80% of the world's tsunamis originate.
- 2 Further information on underwater volcanoes, earthquakes and tsunamis is given in *The Mariner's Handbook*.

CURRENTS, TIDAL STREAMS AND FLOW

Currents

General information

1.144

- 1 The currents over large areas of Coral and Tasman Seas have not been fully resolved due to the relatively small number of observations. In general, the flow of water is very dependant on both the meteorological and oceanographic conditions within and outside the area and, except for the coastal area of E Australia S of about 25°S and W of around 155°E, the constancy of the currents is low to moderate. The flow is mainly counter clockwise with the centre near 33°S 165°E in January and near 27°S 157°E in July.

Caution

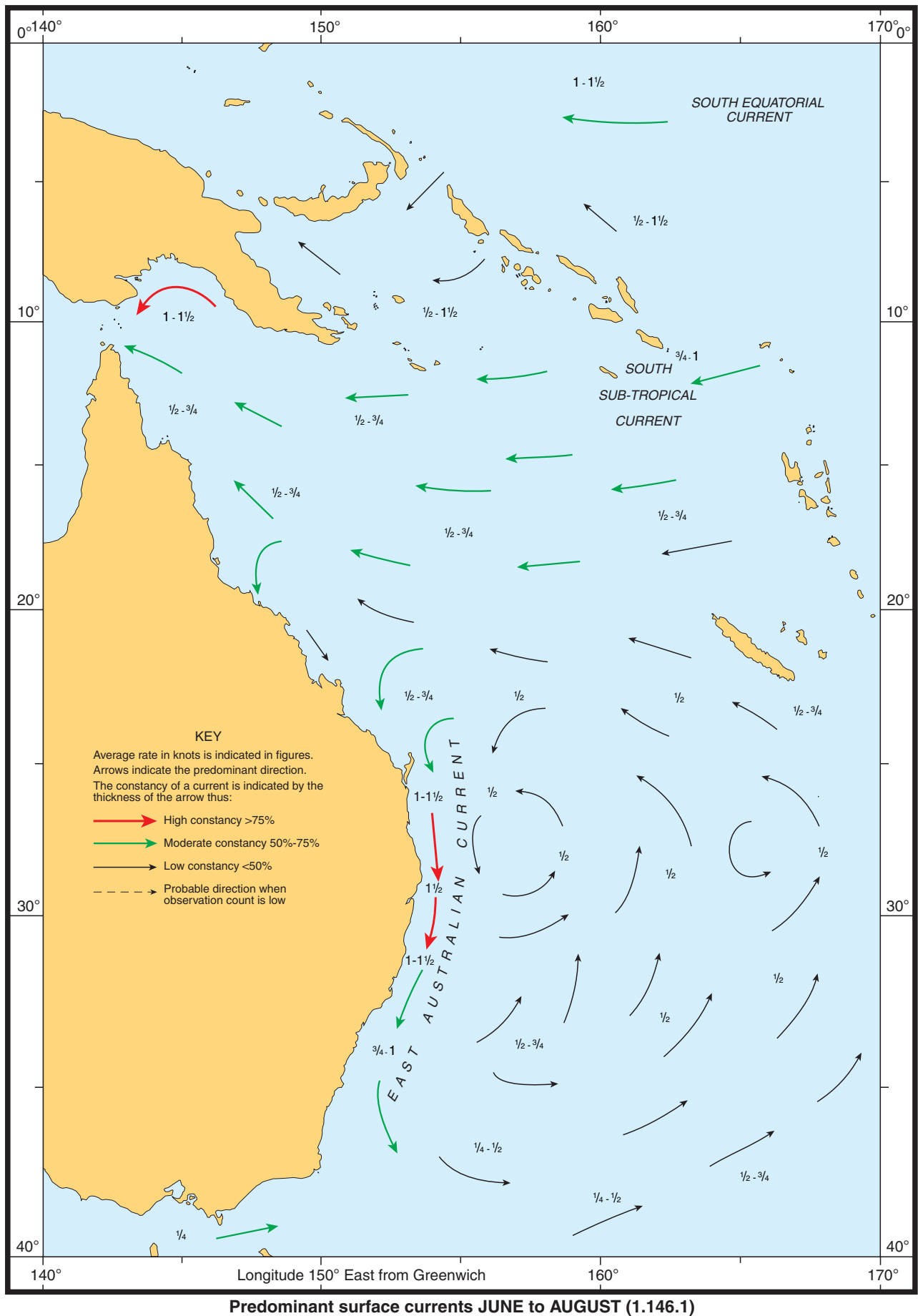
1.145

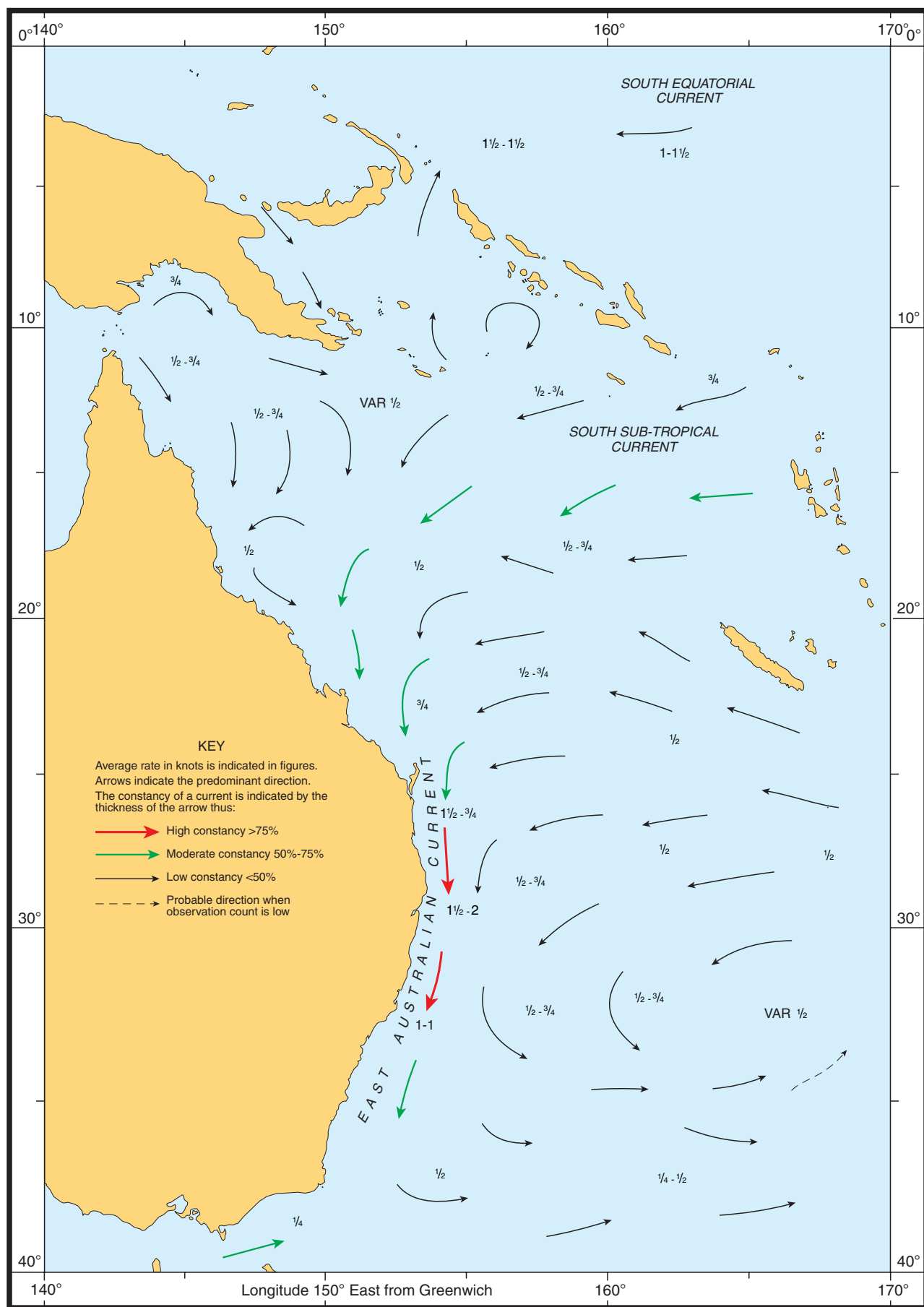
- 1 The islands and reefs of the area covered by this volume obstruct the flow of water. This flow, which may reach considerable depths, can be greatly distorted by these obstructions and usually results in an accelerated current rate around the obstruction. On occasions, an eddy is formed in the lee with associated back sets towards the obstruction.

Current Diagrams

1.146

- 1 In the current diagrams (1.146.1 and 1.146.2), arrows indicating the Predominant Direction, Average Rate and Constancy are shown, and defined as follows:
Predominant Direction. The mean direction within a continuous 90° sector containing the highest proportion of observations from all sectors.
- 2 **Average Rate.** This rate is the average of the highest 50% in the predominant sectors as indicated by the figures





Predominant surface currents DECEMBER to FEBRUARY (1.146.2)

in the diagram. It is emphasised that rates above and below those shown may be experienced.

Constancy is a measure of its persistence, eg Low constancy implies marked variability in rate and, particularly, direction.

Currents in the area north of 20°S, east of Great Barrier Reef

1.147

- 1 Surface water enters the area as the South Sub-tropical Current from South Pacific Ocean in a general W to SW direction past Vanuatu and Nouvelle-Calédonie into Coral Sea. Except for the period between about mid-December and early February, the current divides between 150° and 156°E with the N branch setting W then NW towards Torres Strait. The S branch gradually sets towards the S to the W of Récifs et Iles Chesterfield (159°E) although its N flank may reach Great Barrier Reef before eventually recurving towards the SSE. Between about mid-December and early February the W to SW set of the current becomes S near 153°E, where it is joined by a SSE flow from Torres Strait.
- 2 The constancy of the current is mainly low between December and February and low to moderate at other times of the year, and therefore the set of the current can be very variable from one occasion to the next over the whole of the area. The average rate of the predominant current is between $\frac{1}{2}$ and $\frac{3}{4}$ kn but with about 14% of observations reporting rates of between 1 and 2 kn and less than 2% with rates above 2 kn. An exceptional rate of $4\frac{1}{2}$ kn, setting SSE has been reported in the vicinity of Grafton Passage (16°39'S 146°15'E).
- 3 Within Torres Strait the predominant direction of the current generally conforms to the direction to which the wind is blowing. From December to March, the period of the NW monsoon, the set of the current is between E and SE with an average rate of between $\frac{1}{2}$ and $\frac{3}{4}$ kn, although the constancy is low. From April to November, the predominant direction is WNW with a moderate constancy.
- 4 In Gulf of Papua the non-tidal component of the flow of water follows the curvature of the coast, setting E during the period of the NW monsoon with an average rate of $\frac{3}{4}$ kn but with rates of between 1 and 2 kn being recorded on about 16% of occasions and over 2 kn on around 6% of occasions. Between May and November the current sets W with an average rate of between 1 and $1\frac{1}{2}$ kn but with about 10% reporting rates of between 2 and 3 kn and less than 1% with rates above 3 kn.

Currents within the area of Great Barrier Reef

1.148

- 1 The flow of water in this area follows the general pattern of that in adjacent areas of Coral Sea. In most months the current sets NW along the N part of the Queensland coast and SE along the S part. The latitude of this division varies throughout the year and is mainly determined by the prevailing monsoon or trade wind. In summer, during the NW monsoon, the division is near 15°S and with most of the water within Great Barrier Reef setting SE and only a small volume NW. In January a SE set predominates over the whole of the region, and in March and November, the transitional months, the set of the current is very variable. During the period of the South-east Trade Winds the division is around 18°S and the greater volume of water sets NW. Throughout the year

the set of the current S of about 21°S is SE and opposite in direction to which the prevailing wind is blowing.

- 2 On some occasions strong and persistent E winds, which can cause a considerable amount of water to enter the area and locally raise water levels, may completely alter the predominant direction of the current and significantly increases the flow rate. In settled conditions, the average rate of the current is generally between $\frac{1}{4}$ and $\frac{1}{2}$ kn but increases to $\frac{1}{2}$ to $\frac{3}{4}$ kn to the N of about 17°S during the winter months. A small percentage of observations have recorded rates of between 2 and 3 kn setting mainly parallel to the coast and usually in the direction of the prevailing wind.

Currents in the area south of 20°S and west of 160°E

1.149

- 1 At around 20°S in summer and 22°S in winter, the current sets S as a strong narrow stream which is known as the East Australian Current. The axis of the strongest flow of the East Australian Current follows the 200 m (or 100 fm) depth contours, and its width varies from about 20 to 60 miles. The W boundary lies close to the mainland but the E edge is ill-defined. The constancy of the current is high especially in the area between 26° and 31°S. On the E flank of the current the flow gradually sets towards the E at about 30°S in winter and around 35°S in summer, whilst the W flank of the current lies close inshore and throughout the year extends to the S of the area covered by this volume. On the W flank of the East Australian Current, clockwise eddies may, on occasions, form in the larger bays along the coast.
- 2 The average rate of the East Australian Current varies with latitude and season. The average rate, near 29°S is between $1\frac{1}{2}$ and 2 kn in summer and $1\frac{1}{2}$ kn in winter although rates below 1 kn are not uncommon. Rates of above 3 kn have been recorded on about 3% of occasions in summer and around 1% in winter.
- 3 Between the E flank of the East Australian Current and 160°E the constancy of the current is low. Between October and February the current mainly sets WSW in the N, and E to SE in the S. By July, the set of the current is between WNW and SW in the N and between E and NE in the S, and with the centre of the main circulation near 27°S 157°E. Throughout the year, other small counter-clockwise eddies may form which complicate the general flow of water in this area.
- 4 The average rate of the current to the E of the East Australian Current is between $\frac{1}{2}$ and $\frac{3}{4}$ kn in summer and about $\frac{1}{2}$ kn in winter. Rates of between 1 and 2 kn have been recorded on about 13% of occasions in summer and 8% in winter, and with less than 3% of occasions recording rates above 2 kn in both seasons.

Currents in the area south of 20°S and east of 160°E

1.150

- 1 The currents within this area also show considerable variability due largely to the proximity of the sub-tropical anticyclone (1.171) and to the counter-clockwise circulations of the current in the area, and therefore the constancy of the current, throughout the year, is low. The current mainly sets WNW to the N of 27°S in winter and between WSW and WNW, to the N of 31°S, in summer. To the S of 31°S, in summer, the current is very variable and, in winter, the current mainly sets to the NE.
- 2 The average rate is about $\frac{1}{2}$ kn throughout the year. Rates of between 1 and 2 kn have been recorded on about

10% of occasions in both winter and summer, and rates of over 2 kn on less than 2% of occasions.

Effects of strong winds

1.151

- 1 After prolonged periods of strong winds from a constant direction, a wind-drift current may be generated, the rate of which varies according to the wind speed and direction. These wind-drift currents may reduce or enhance the main underlying current. For further information on how currents are influenced by wind, tropical cyclones, pressure gradient and topography, see *The Mariner's Handbook*.

Slow-moving tropical cyclones can, on occasions, produce currents of 2 kn or more, particularly when such a storm approaches land, due to the raising of the water level between the storm centre and the coast.

Tidal streams and Flow

North Head to Sandy Cape

1.152

- 1 Tidal streams along the coast between North Head (33°49'S 151°18'E) and Sandy Cape (24°42'S 153°16'E) are not generally reckoned with when navigating off this part of the coast as the current is so much greater.

Great Barrier Reef

1.153

- 1 Throughout the length of Great Barrier Reef, tidal streams set through the openings in a W or SW direction from seaward on the rising tide and E or N on the falling tide. In the wider openings the streams are only slight, but in the narrower openings their rates may be as much as 2 to 3 kn. A rate of 6 kn has been experienced, but this is unusual.

Inner Route of Great Barrier Reef

1.154

- 1 Tidal streams along the Inner Route between Great Barrier Reef and the Queensland coast change in the vicinity of North Barnard Island (17°41'S 146°11'E), tending to set away from the island on the rising tide and towards it on the falling tide. This tendency persists throughout the length of the Inner Route and produces a general pattern of tidal streams which on the rising tide set S from North Barnard Island to Sandy Cape, and N or NW from North Barnard Island to Cape York (10°41'S 142°32'E). This pattern is only disturbed in the relatively limited areas of Broad Sound (22°15'S 149°45'E) and Princess Charlotte Bay (14°15'S 143°55'E).
- 2 The rate of the tidal stream increases noticeably as approach is made to the inner edge of Great Barrier Reef. The direction also changes so that the stream tends to set towards the nearest large opening on the falling tide, and away from it on the rising tide.
- 3 Over most of the area of the Inner Route, where the channels are not constricted by the coast, reefs or islands, the rate of the stream averages 1 kn in the S part and ½ kn in the N. Greater rates are found in the entrances to coastal inlets and where channels elsewhere are constricted. Notable examples of this are in Whitsunday Passage (20°20'S 148°54'E) and Adolphus Channel (10°42'S 142°38'E) where rates of 3 to 4 kn are found, and in the vicinity of Broad Sound where the tidal range is greatest. These and lesser local variations from the general pattern are described in their relevant places in the book.

1.155

- 1 **Flow.** During the South-east Trade Winds the tidal stream along the Inner Route is less than the current except in a comparatively small number of channels, the more important of which have been described in the preceding paragraph. During this season, and except in those channels described, an overall flow setting N will be experienced throughout. The rate of this flow will be greatest when current and tidal stream combine, and least when they are in opposition.

The relatively few areas where the tidal stream sets across the direction of the current are described in their relevant places in the book.

Torres Strait

1.156

- 1 The restricted channels of Torres Strait connect two areas in which the tides differ remarkably. The tides and tidal streams experienced are peculiar to the strait and its approaches and are described in detail in Chapter 13.

South coast of Papua New Guinea

1.157

- 1 Offshore tidal streams along the S coast of Papua New Guinea are generally imperfectly known and information given in relevant places in the text is often limited to reports of overall sets experienced.

The effects of tidal streams alone are only likely to be identifiable in harbour, reef and river entrances and their immediate approaches, and are given in the text where known. Times of slack water do not necessarily correspond with the times of local HW and LW.

Overall flow in Gulf of Papua is very complex and information on tidal streams and current given in the text should be treated with caution.

TIDES

General information

1.158

- 1 Along the E coast of Australia, and in Coral Sea, the tides are mainly semi-diurnal although there is a marked diurnal inequality. This inequality is particularly evident S of 30°S on the Australian coast, and between the parallels of 25° and 17°S in Coral Sea.

Tidal ranges

1.159

- 1 The greatest range throughout the area of this book occurs in Broad Sound (22°15'S 149°45'E) where the mean spring range is approximately 6.4 m. To the S the range decreases to about 1.8 m at Brisbane and 1.2 m at Sydney. To the N of Broad Sound the range decreases to about 2.3 m at Townsville, 2.4 m at Bramble Cay and 1.3 m at Port Moresby.

The range throughout the offshore islands and reefs of Coral Sea to seaward of Great Barrier Reef is nowhere more than 1.8 m.

SEA AND SWELL

General remarks

1.160

- 1 For general information on sea and swell see *The Mariner's Handbook*.

Sea conditions

1.161

- 1 Sea waves are generated locally by the wind and can be very variable in direction, especially when tropical cyclones affect the area covered by this volume.

Over the open sea the frequency of reported combined sea and swell waves of 3.5 m and over is around 5% to 10% of occasions but with a slightly lower frequency in the N. In the SE of the area, E of about 155°E, the frequency increases to around 20% from late April to early September, and near 30% in July.

Swell conditions

1.162

- 1 Diagrams 1.162.1 and 1.162.2 give swell roses for January and July. The roses show the percentage of observations recording swell from a number of directions and for various ranges of wave height.
- 2 In summer, to the N of about 25°S, the swell is predominantly from the SE, except for the region of Torres Strait where it is from NW. Between 25° and 30°S the swell is predominantly E and, in the S of the area, there is an increasing frequency of SW swells E of about 155°E. Swell heights of 2 m and over are reported on less than 15% of occasions in the NW of the area, 25% to 30% at 25°S and along the E Australian coast to 35°S, and about 40% in the SE.
- 3 In winter the swell is predominantly SE to the N of about 25°S. Along the E Australian coast, to the S of 25°S, the swell is mainly from between S and SE whilst farther E the direction is frequently SW. Swell heights of 2 m and over are reported on less than 15% of occasions near the coast of NE Australia but steadily increases to around 26% to 32% of occasions along the SE coast. Over the open sea the frequency increases from around 25% in the NW of the area to about 40% near 20°S 165°E, and 55% to 60% in the extreme SE.

Tropical cyclones: sea and swell waves

1.163

- 1 Mountainous and confused seas are raised by the violent winds associated with intense tropical cyclones. Near the centre of a tropical cyclone or storm, groups of large waves, moving in different directions, create very irregular wave heights and can combine together to give exceptionally high waves.
- 2 Waves travel radially outwards from the storm centre as swell waves, and with the highest swell moving ahead of the storm and roughly in the same direction as the storm. When a storm approaches a coastline high tides may arise, due to the addition of the heavy swell and, later, the very high seas, which may cause severe flooding in low-lying areas.

Long period swells usually indicated the approach of a tropical storm, and with increasing height as the storm nears the area.

SEA WATER CHARACTERISTICS

Density and salinity

1.164

- 1 The relationship between the density and salinity of sea water is discussed in *The Mariner's Handbook*. Properties of the surface water of Coral Sea are derived mainly from the circulation of the East Australian Current system, which is composed of warm, moderately saline equatorial water, and cooler, more saline sub-tropical water. Below this are layers of sub-tropical lower water and Antarctic intermediate water.
- 2 Salinity values between 34 in the NW of the area, and 35.5 in the SE, should generally be found throughout the year. Densities vary between summer and winter from

1021.5 to 1022.5 gm/cm³ respectively in the NW of the area, and from 1024.0 to 1025.5 gm/cm³ in the SE.

Salinity at Newcastle and Brisbane may be affected by the outflow of fresh water from Hunter and Brisbane Rivers. Similar effects are likely to occur at other ports lying adjacent to river entrances.

Sea surface temperature

1.165

- 1 The mean sea surface temperatures for February and August are shown in the diagrams 1.165.1 and 1.165.2. Sea surface temperatures are generally at their lowest in August and highest in February. The effect of the warm East Australian Current is well marked as it sets S along the Australian coast.
- 2 Mean sea surface temperatures, in summer, decrease from around 28.5°C in the N of the area to 21.5°C in the extreme SE, and in winter they range from around 25° in the extreme NW to about 16°C in the far SE. In general the sea surface temperature over the open sea is similar to that of the mean air temperature in both summer and winter, except for the extreme NW of the area in February where it is between ½° and 1°C higher than the air temperature.
- 3 **Variability.** In general, differences between the mean air and sea temperatures rarely differ by more than 1° or 2°C but larger differences are possible in shallow coastal waters.

CLIMATE AND WEATHER

General information

1.166

- 1 The information in this chapter on climate and weather should be read in conjunction with the information contained in *The Mariner's Handbook* which explains in more detail many aspects of meteorology and climatology of importance to the mariner.
Routine weather reports, forecasts and warnings of hazardous weather, that cover the area, are regularly broadcast; for details see 1.37 and *Admiralty List of Radio Signals Volume 3(2)*.

General conditions

1.167

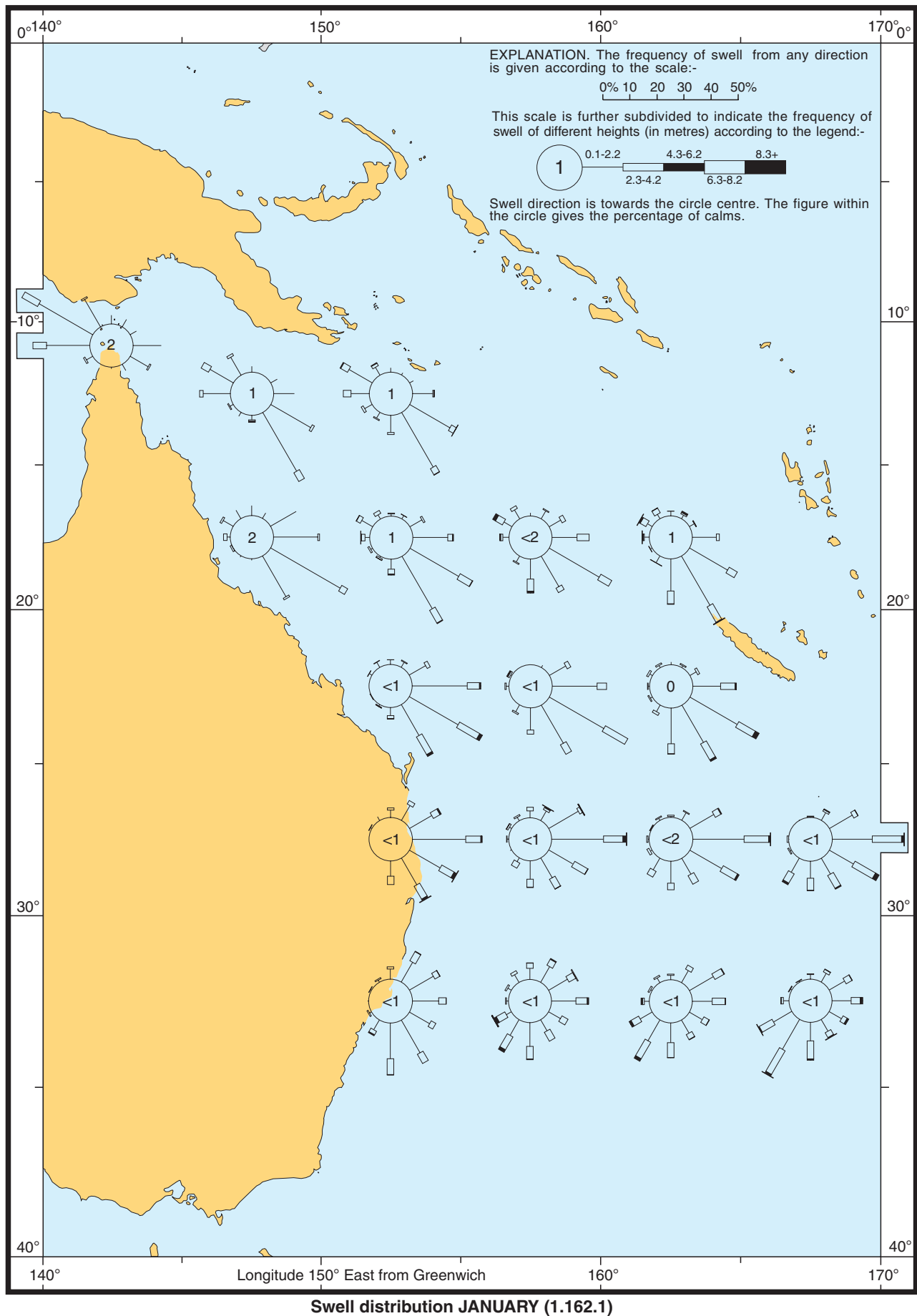
- 1 In the N half of the area a monsoon climate prevails with well marked wet and dry seasons. High temperatures and humidity, particularly in summer and autumn, can be relatively oppressive. To the S of about 25°S the climate is more favourable with only a moderate frequency of winter gales over the open sea. Visibility is generally good and fog is rare. The major hazard of the region is the tropical cyclone which, although infrequent, can give rise to hurricane force winds, mountainous seas, torrential rain and poor visibility.

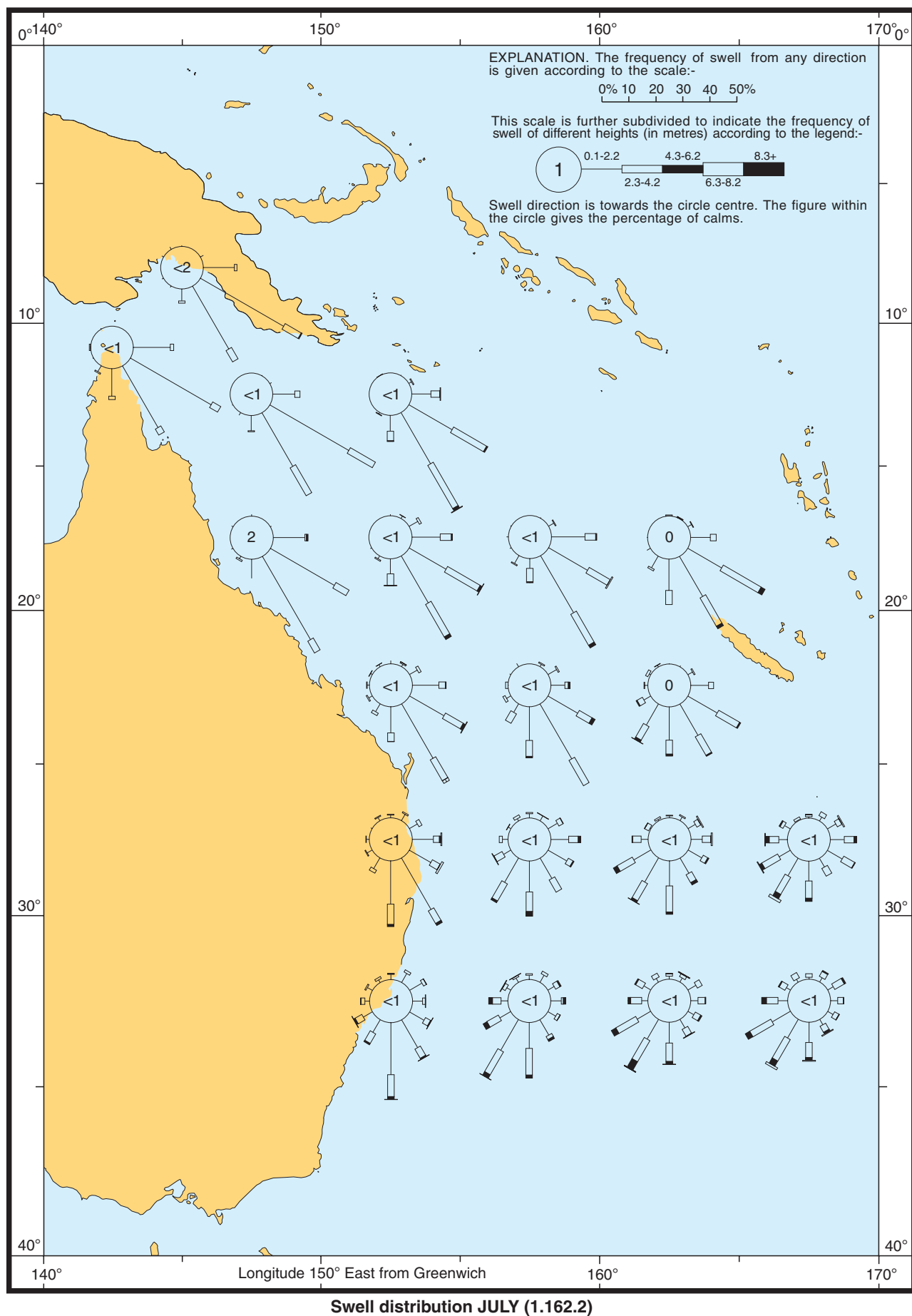
Pressure

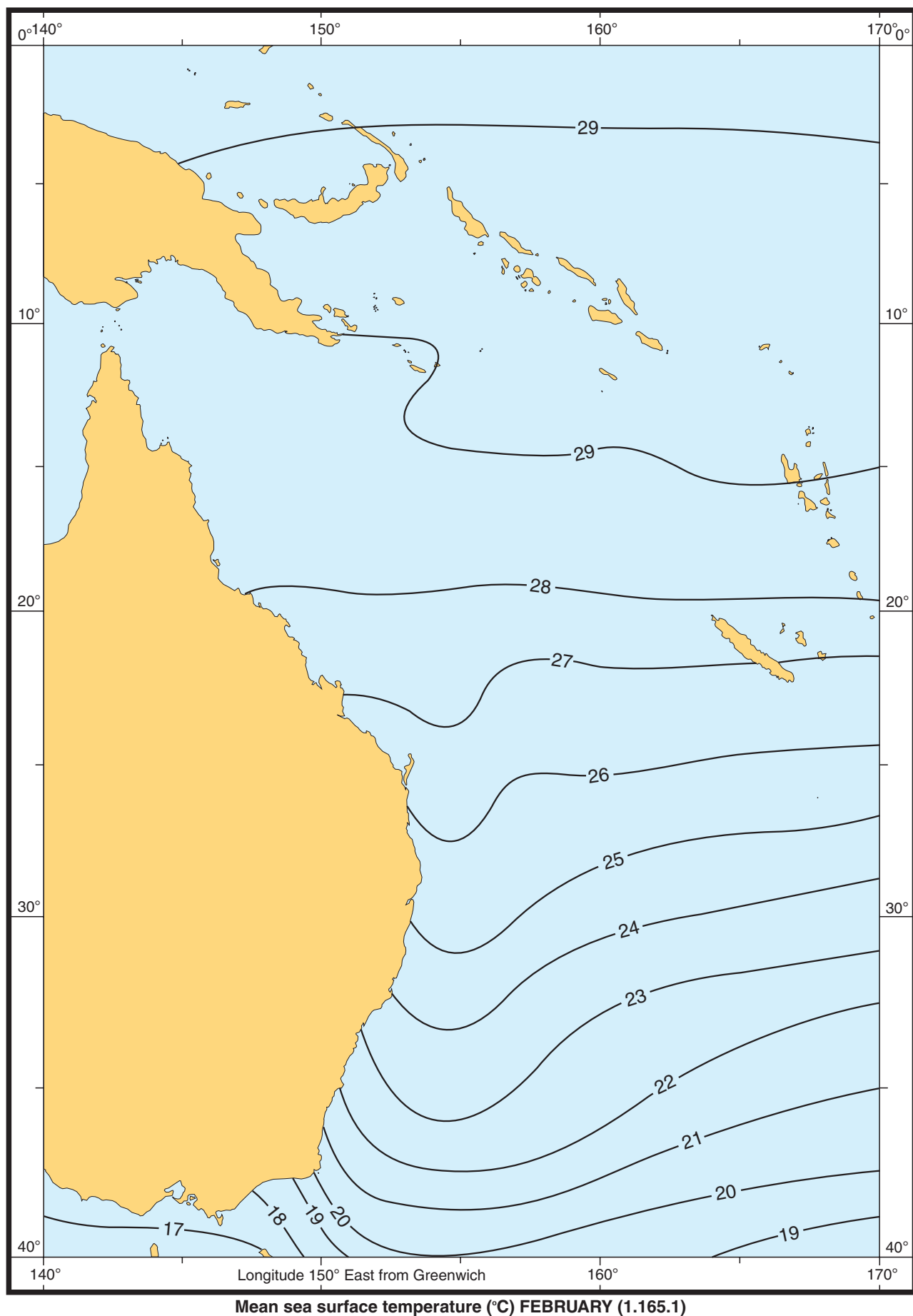
Average distribution

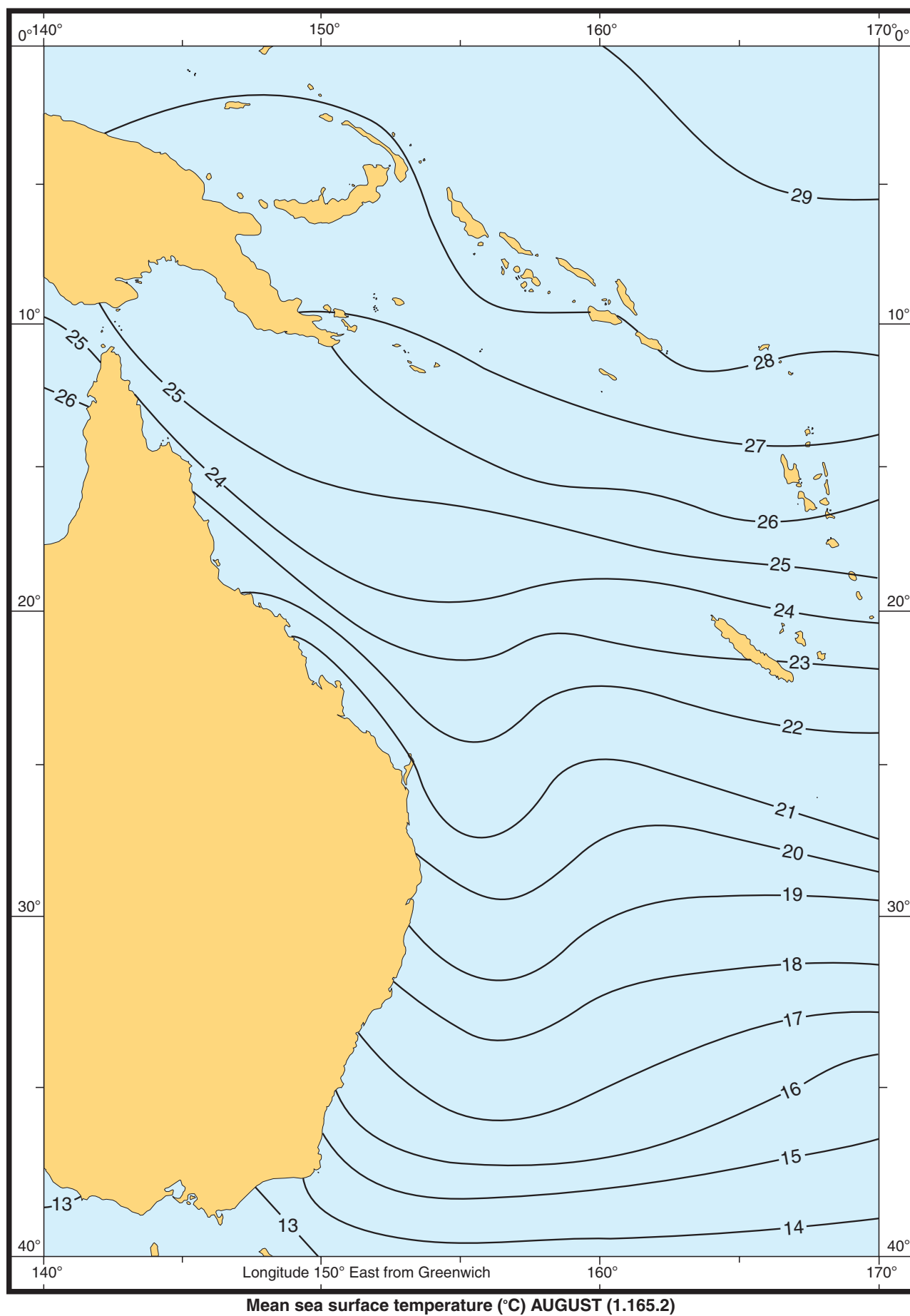
1.168

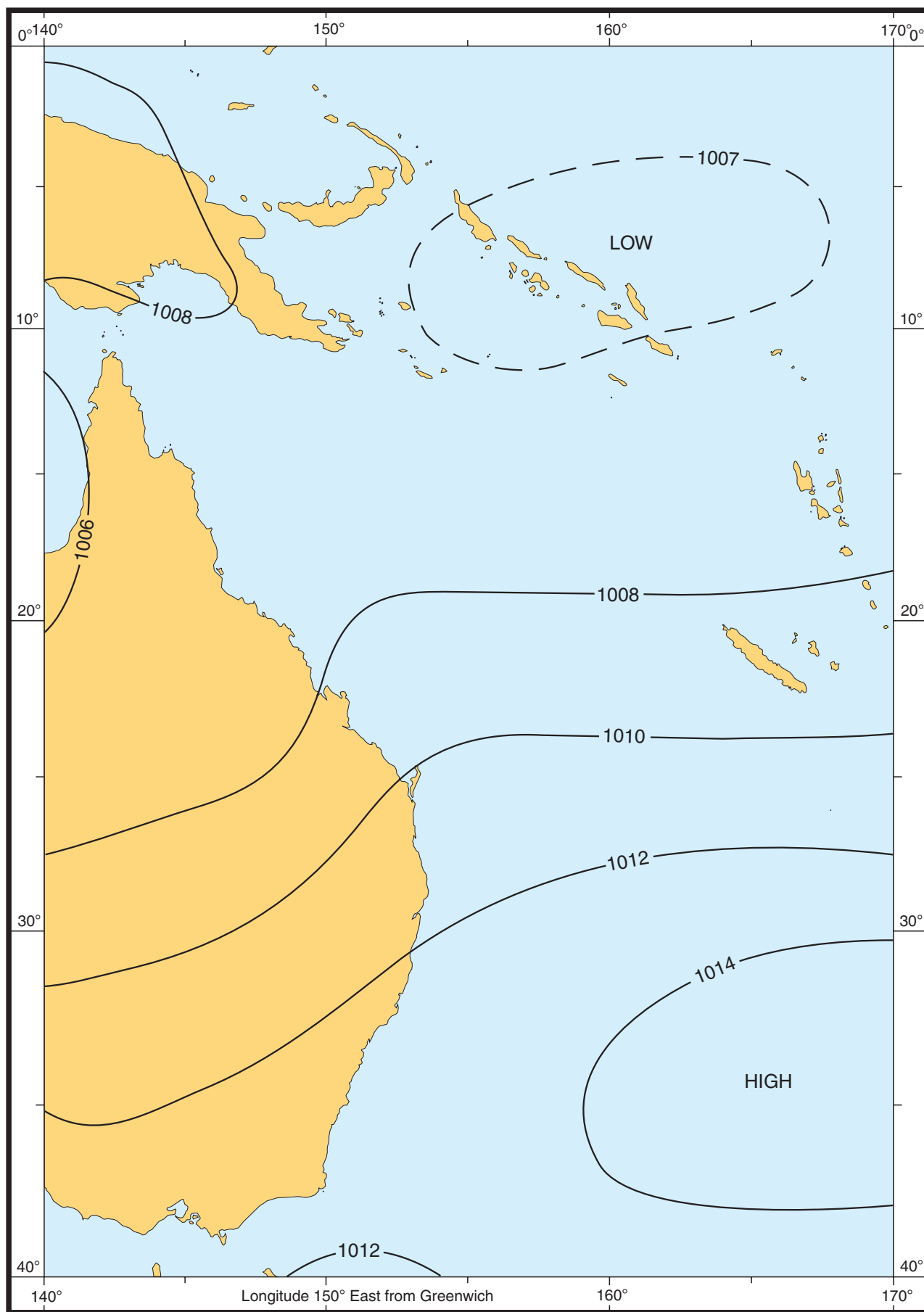
- 1 The average pressure distribution at mean sea level in January and July is shown in the accompanying diagrams 1.168.1 and 1.168.2. The dominant features of the pressure field are the tropical low pressure belt to the N of the area, the sub-tropical anticyclone centred over the SE of the area in January which then moves NW to central Australia and intensifies by July, and a low pressure belt situated to the S of the area covered by this volume.



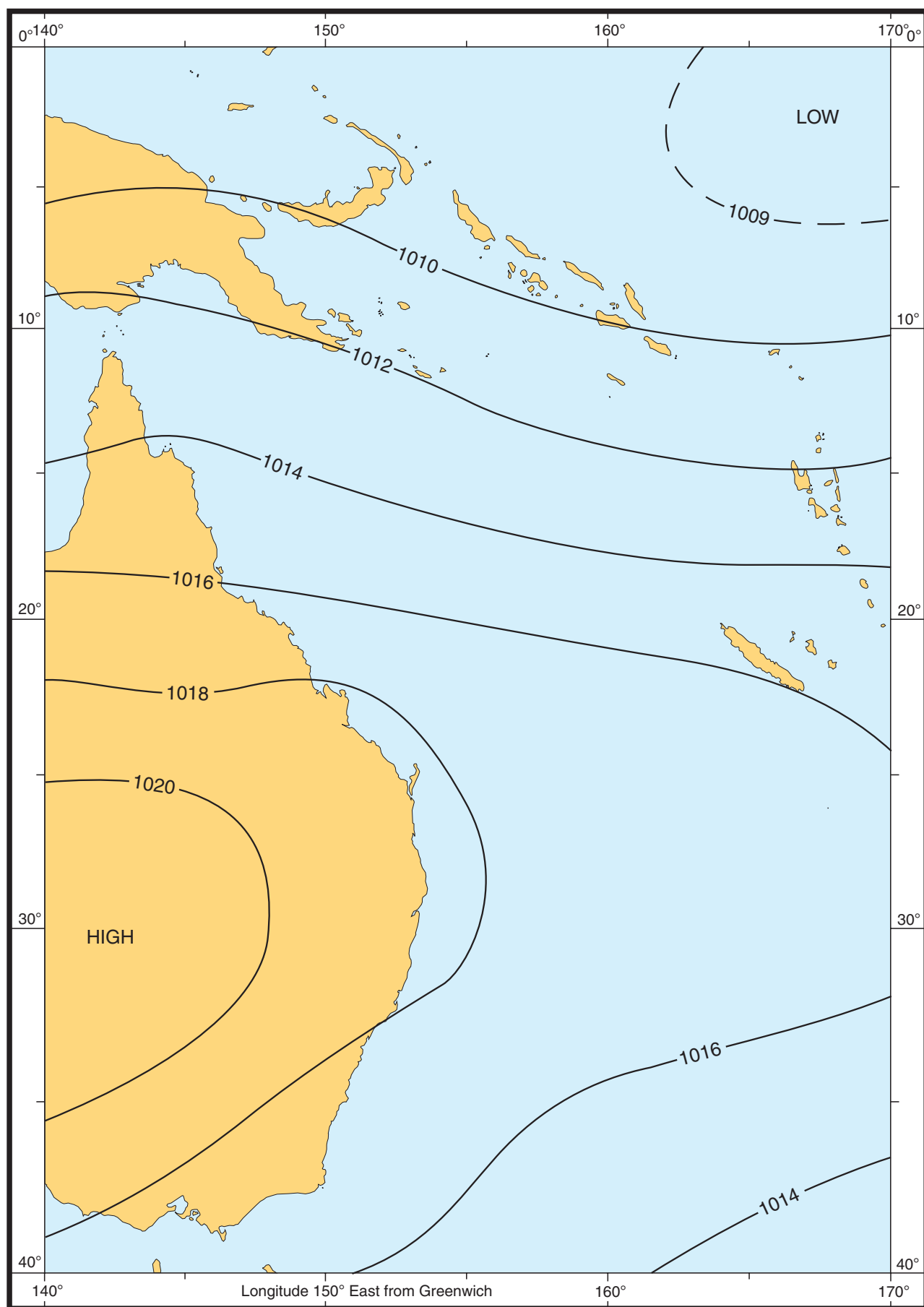








Average barometric pressure at mean sea level (hPa) JANUARY (1.168.1)



Variability

1.169

- 1 It is stressed that the diagrams depict the average pressure distribution and that the actual pressure pattern can be markedly different from the mean. These departures from the mean may be due to individual frontal troughs and high pressure cells transiting E over the S half of the area, especially in winter, or whenever the area is affected by a tropical cyclone.

Diurnal variation

1.170

- 1 Diurnal variation is about 3 hPa in the N and around 2.3 hPa in the S, with maxima at 1000 and 2000 and minima at 0400 and 1600 local time. The daily variation can be obscured in the S by the passage of a frontal trough or high pressure cell.

Anticyclones

Sub-tropical anticyclone

1.171

- 1 This semi-permanent anticyclone lies to the SE of the area in January with a central pressure of about 1015 hPa and is the result of a series of E-moving high pressure cells. Individual anticyclones tend to move E at about 15 to 20 kn every 5 to 7 days on average but on occasions an anticyclone may become slow-moving for several days over the S part of the area. By July the anticyclone has shifted NW and is centred over central Australia with a central pressure of about 1023 hPa.

Depressions

1.172

- 1 Frontal depressions frequently move E or SE across the Southern Ocean and in summer their tracks lie well to the S of Australia. As winter approaches their tracks move progressively farther N to affect the S part of the area. Other depressions form or intensify off the SE coast of Australia and can be slow-moving before moving off E or SE, and, on occasions, may give rise to some of the worst conditions that affect the coast of New South Wales.

Tropical cyclones

1.173

- 1 Tropical cyclones are infrequent but can develop in any month. However, they are most likely to form between November and April, and with the highest frequency occurring during the period January to March. Intense tropical cyclones can give rise to hurricane force winds, torrential rains, phenomenally high seas and tides of 4 m or more above normal.
- 2 The majority of cyclones develop between 8° and 18°S and of these about half move initially SW before recurving towards the SE, while an equal number track SE (diagram 1.173). The movement of individual tropical cyclones can however be extremely erratic, particularly if the storm is slow-moving. Tropical cyclones that cross or develop in Gulf of Carpentaria tend to move SE across Cape York peninsula to affect the NE coast. Other cyclones that form over Coral Sea may move SW and rapidly die on crossing the Queensland coast but on some occasions they have been known to parallel the coast before recurving SE as far S as 30°S.

- 3 A detailed description of tropical cyclones, signs of their approach and recommended evasive actions are given in *The Mariner's Handbook*.

Fronts

Warm and cold fronts

1.174



Southerly Buster (1.174)

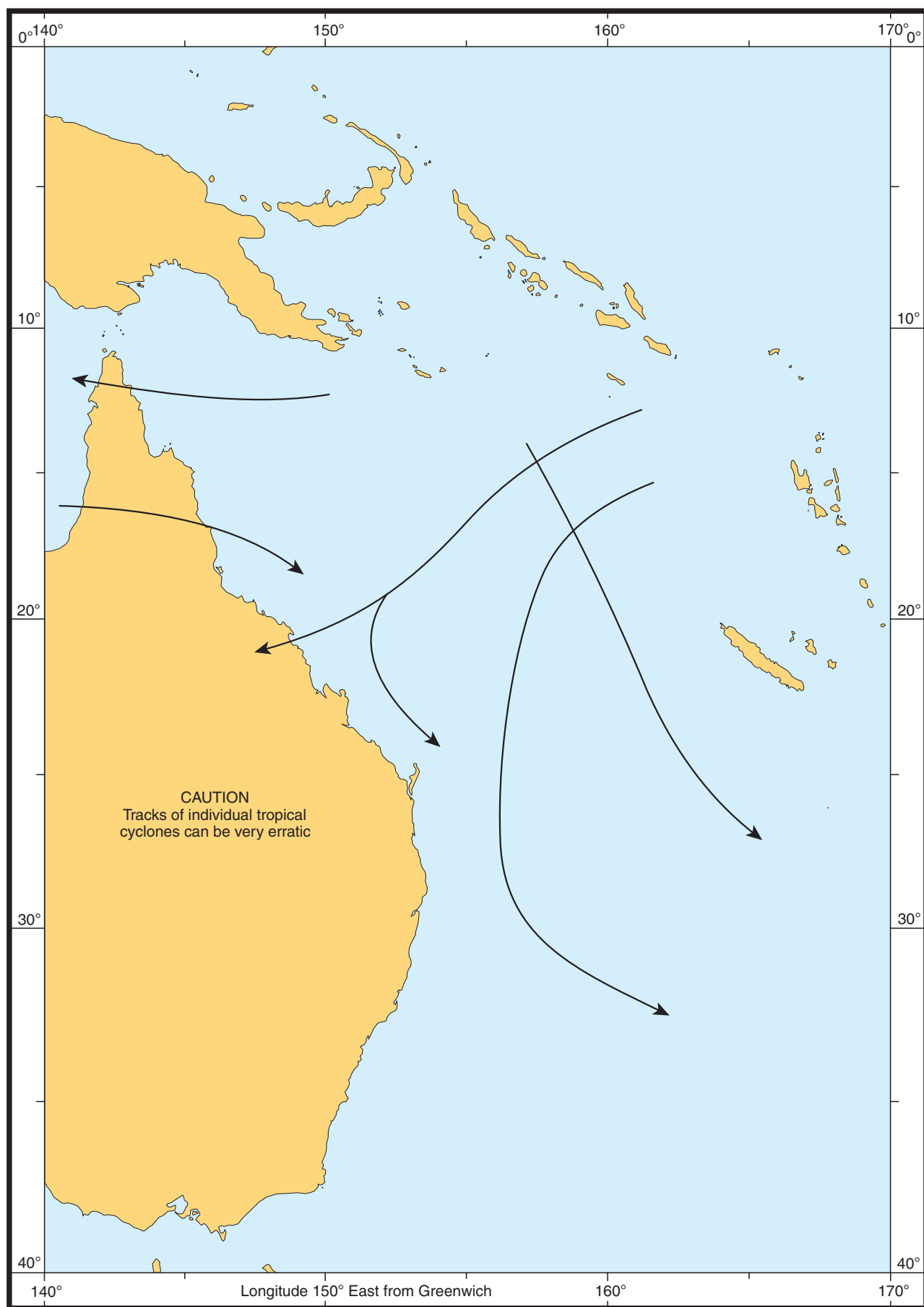
(Photograph – N. V. Villarin, Brussels)

- 1 The E-moving depressions, that mainly move well to the S of the area covered by this volume, have warm and cold fronts associated with them although the warm fronts are frequently weak (see *The Mariner's Handbook* for a detailed description of the weather patterns that are usually associated with warm and cold fronts). These fronts mainly affect the area to the S of 30°S, and with the cold front giving rise, on occasions, to a rapid and violent change in conditions. Southerly Buster is the name given to the S wind near a line squall which frequently follows just to the rear of a cold front near the SE coast of Australia. They mainly occur between spring and autumn and are most frequent in summer. Prior to the arrival of a Southerly Buster, N winds and high temperatures prevail, then a long roll of cumulus or cumulonimbus cloud develops to the S or SW, which may be 30 miles or more in length, and sometimes accompanied by thunder and lighting. As the roll cloud approaches (view 1.174) the winds drops to a calm and then becomes S, frequently increasing to gale force together with a rapid drop in temperature of 10°C or more. Southerly Buster is most likely to affect the area to the S of Tacking Point (31°29'S 152°56'E); on average there are around 30 each year with about 27 of these occurring between October and March.

Intertropical Convergence Zone

1.175

- 1 The ITCZ is the belt where the NW monsoon, originating in the N hemisphere, meets the South-east Trade Winds of the S hemisphere. Although not strictly a front, the ITCZ has some frontal characteristics but with frequently calm or light variable winds. On some occasions the ITCZ may be relatively inactive and difficult to locate, and at other times it may be characterized by heavy squally thundery showers.
- 2 During November and December the ITCZ moves S across Papua New Guinea towards Cape York and by February it is usually at its most S position, lying from W to E between 10° and 15°S. During April the ITCZ moves



Typical tropical cyclone tracks (1.173)

N across Papua New Guinea to lie to the N of the area until its return in November.

Winds

Average distribution

1.176

- 1 Wind roses showing the frequency of winds of various directions and speeds for January and July are given in diagrams 1.176.1 and 1.176.2.

Open sea

1.177

- 1 **Winds north of 15°S.** During the winter months the winds are predominantly SE force 4 to 5, and, in summer, they are mainly W to NW force 3 to 4 in the NW but more variable in the E.

Winds between 15° and 25°S. The predominant wind is SE throughout the year with an average strength of force 4 in the N in summer and force 4 to 6 in the S. In winter the mean strength is force 4 to 5 but with an increasing frequency of force 6 to 7 winds in the N.

- 2 **Winds south of 25°S.** Winds in this area can be very variable in both direction and strength, especially in winter when E-moving anticyclones and frontal troughs affect the S of the region. In summer, winds are predominantly ESE in the E of the area between 25° and 30°S and mainly between NNE and SSE elsewhere; in winter, there is an increasing frequency of SW winds in the S of the area.

Coastal waters

1.178

- 1 The climatic tables show the frequency of different wind directions at a number of coastal stations throughout the area. Topography has a major influence on the strength and direction of the wind especially in the vicinity of high ground and narrow inlets. See *The Mariner's Handbook* for further details on the modification of both wind speed and direction in coastal waters.

Land and sea breezes

1.179

- 1 Land and sea breezes affect most of the coastline. Depending on the prevailing wind, these breezes may reinforce or moderate the strength of the prevailing wind. Sea breezes normally set in by late morning and then die away by sunset. In areas where there is extensive low-lying land near the coast, the onshore sea breeze component of the wind can be substantial in summer. The land breeze is generally weaker and blows as a light offshore wind from around midnight to soon after dawn but, where there is high ground near the coast, katabatic offshore winds may, on occasions, reinforce the land breeze. This effect is most noticeable between North Head (33°49'S 151°18'E) and Cape Moreton (27°02'S 153°28'E) where sudden squalls may occur inshore.
- 2 On the S coast of Papua New Guinea severe squalls known as Gubas occur at times during the NW monsoon, and occasionally during the transition periods between monsoons. These squalls approach from NW bringing gusts from W or NW which may reach 50 to 70 kn. Gubas occur mostly at night and are reported to effect Port Moresby about five or six times per year.

Gales

1.180

- 1 Winds of gale force 8 to hurricane force 12 may occur within the circulations of tropical cyclones. These storms

can develop at any time but are most frequent between November and April, and with the highest frequency between January and March.

Winds of force 7 or more are relatively rare in summer and with the highest frequency of about 4% of occasions in the S of the area. The highest frequency of winds of force 7 or more occur in the autumn and winter in the S of the area (see accompanying diagrams 1.180.1 and 1.180.2).

Cloud

Open sea

1.181

- 1 To the N of about 17°S, the average cloud amount is between 4 and 6 oktas, and with the most extensive cloud near Torres Strait between December and May. The mean cloud amount, S of around 17°S, is around 4 to 5 oktas but decreases to around 3 to 4 oktas in the W of the area in winter. Cloud amounts on any particular day can be different from the mean, particularly in the S where E-moving anticyclones and frontal troughs cross the area.

Coastal waters

1.182

- 1 Average cloud amounts, at 0900 and 1500 local time, for each month of the year, are given in the Climatic Tables (1.192) for a number of coastal stations.

Precipitation

1.183

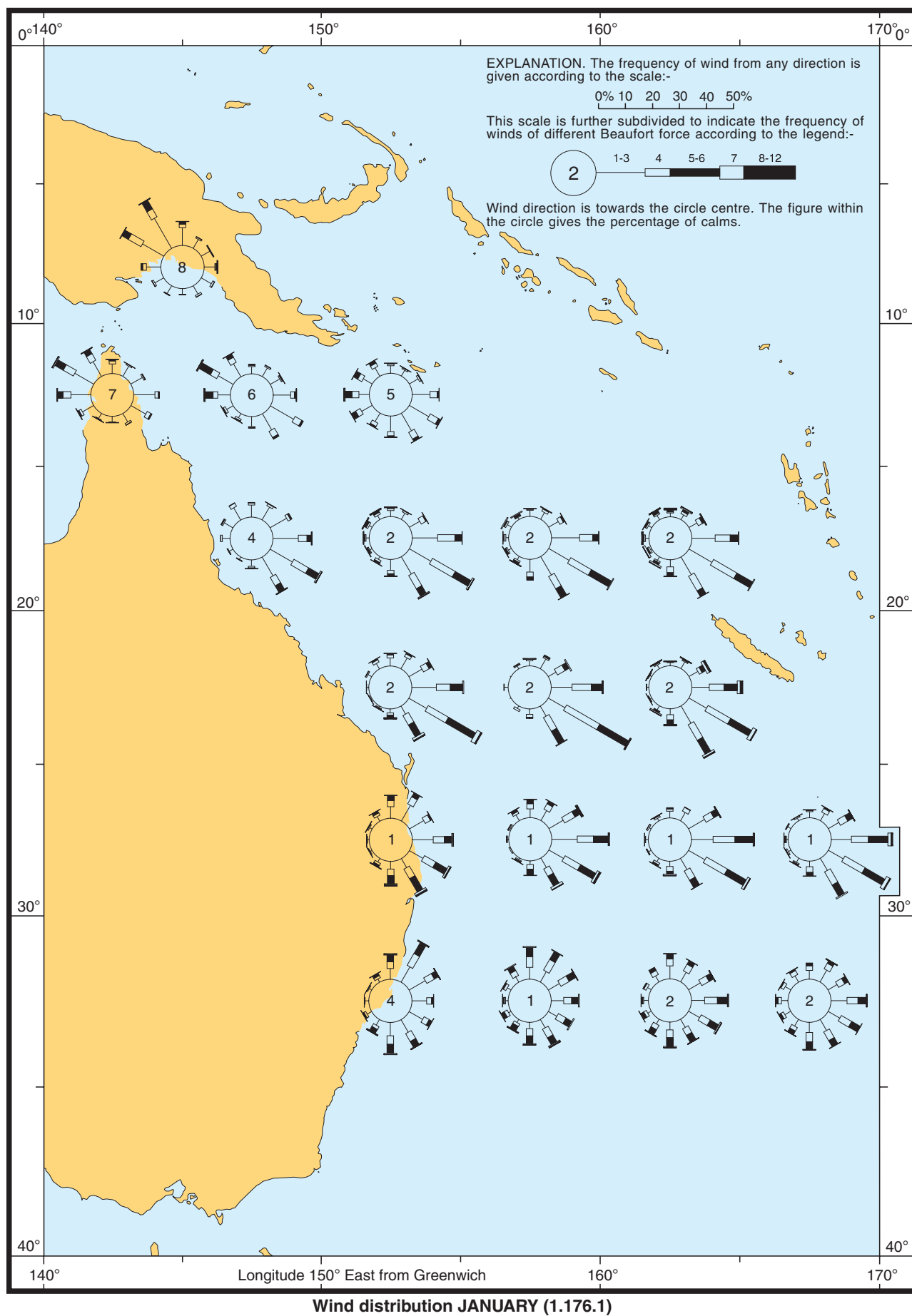
- 1 The seasonal distribution of precipitation changes markedly from N to S across the area covered by this volume, and to the N of about 23°S there are clearly marked wet and dry seasons. The wet season lasts from about December to April, reaching its peak between January and March, and the dry season from June to October. Typical of this tropical distribution is Thursday Island where the average monthly rainfall is in excess of 200 mm between December and April with a peak of around 420 mm in January, and decreases to less than 20 mm per month between June and October.
- 2 Between Cairns (16°55'S 145°47'E) and Innisfail, 40 miles farther SSE, the average annual rainfall can total around 4000 mm due to the forced ascent of the moist South-east Trade Winds over this mountainous stretch of coast. To the S of about 30°S the rainfall is more evenly distributed throughout the year and with the wettest period between January and July.
- 3 At Willis Islets the wettest months are generally between January and April, and at Norfolk and Lord Howe Islands the rainfall is more evenly spread throughout the year but with the highest monthly totals occurring during the autumn and winter.

Variations in both the monthly and annual rainfall can be large, and in Queensland the monthly values can vary from about 20 to 2000 mm. Heavy and persistent rain is common in the vicinity of tropical cyclones but to the S of Brisbane much of the rainfall is frontal.

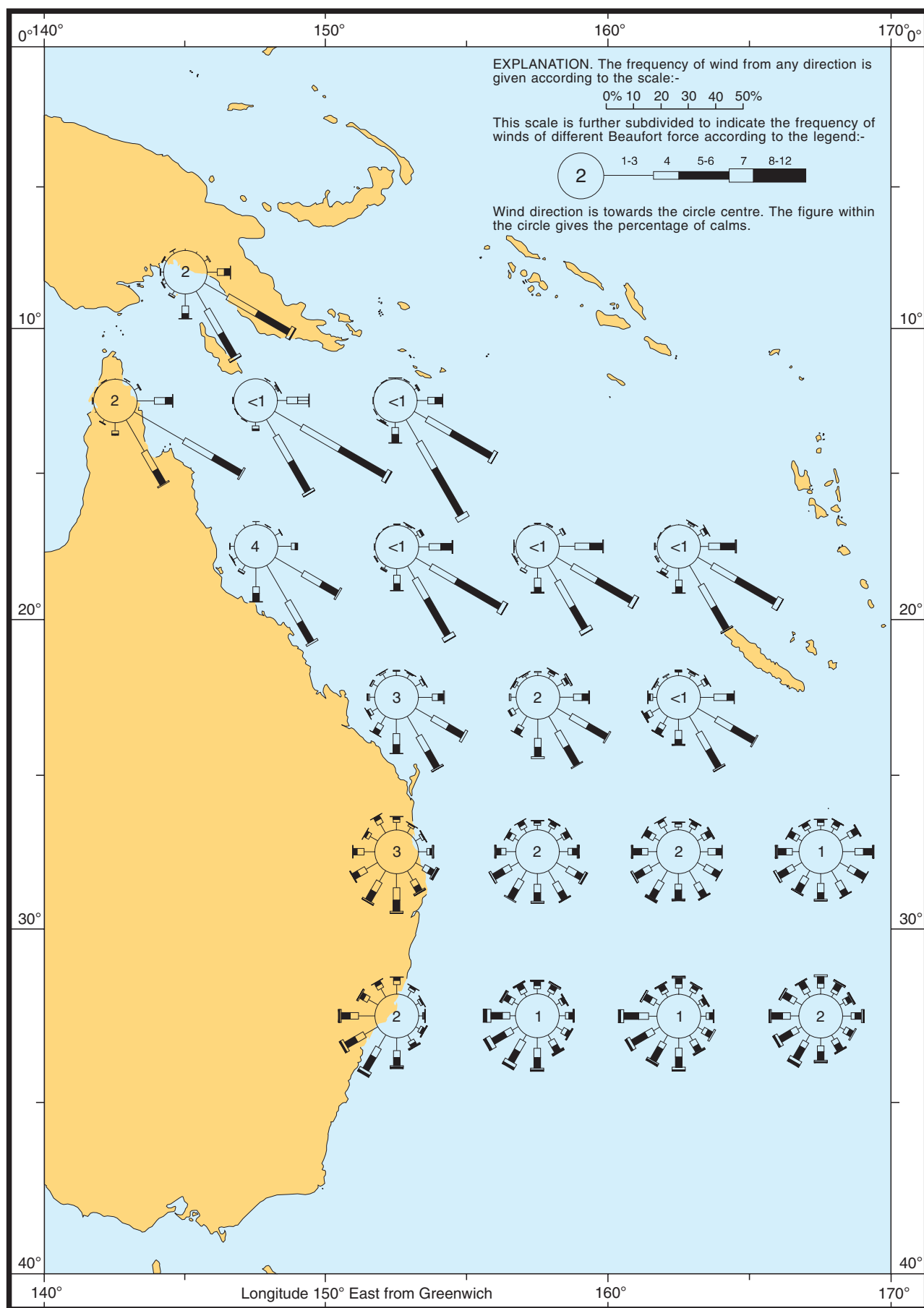
Thunderstorms

1.184

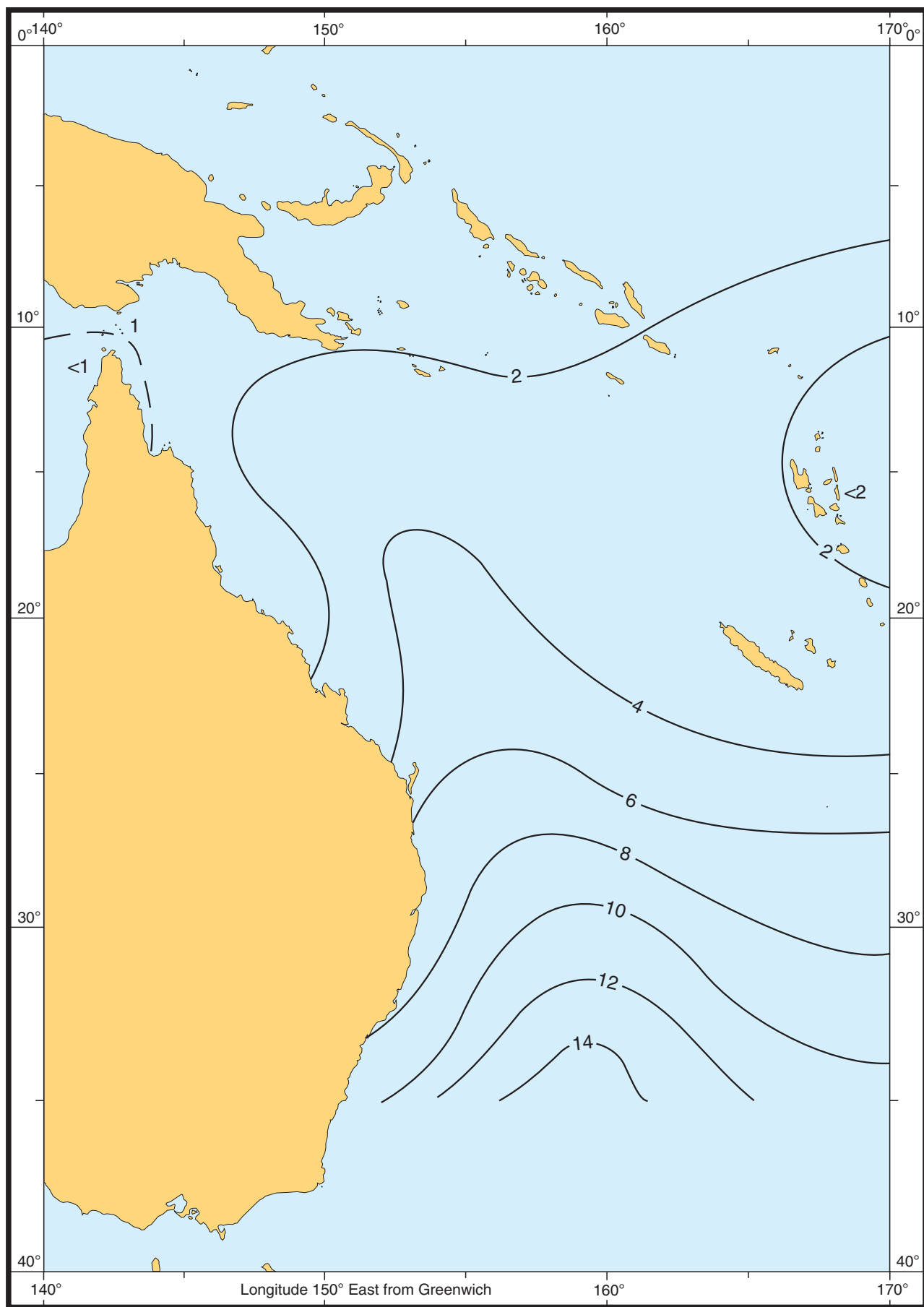
- 1 Thunderstorms are most frequent over Papua New Guinea, with an average of around 30 to 35 per year and mainly occurring between November and April during the wet season. Elsewhere the average number of thunderstorms is between 10 and 20 per year and with the highest frequency between November and March, although Lord Howe Island experiences between 27 and 31 thunderstorms per year.



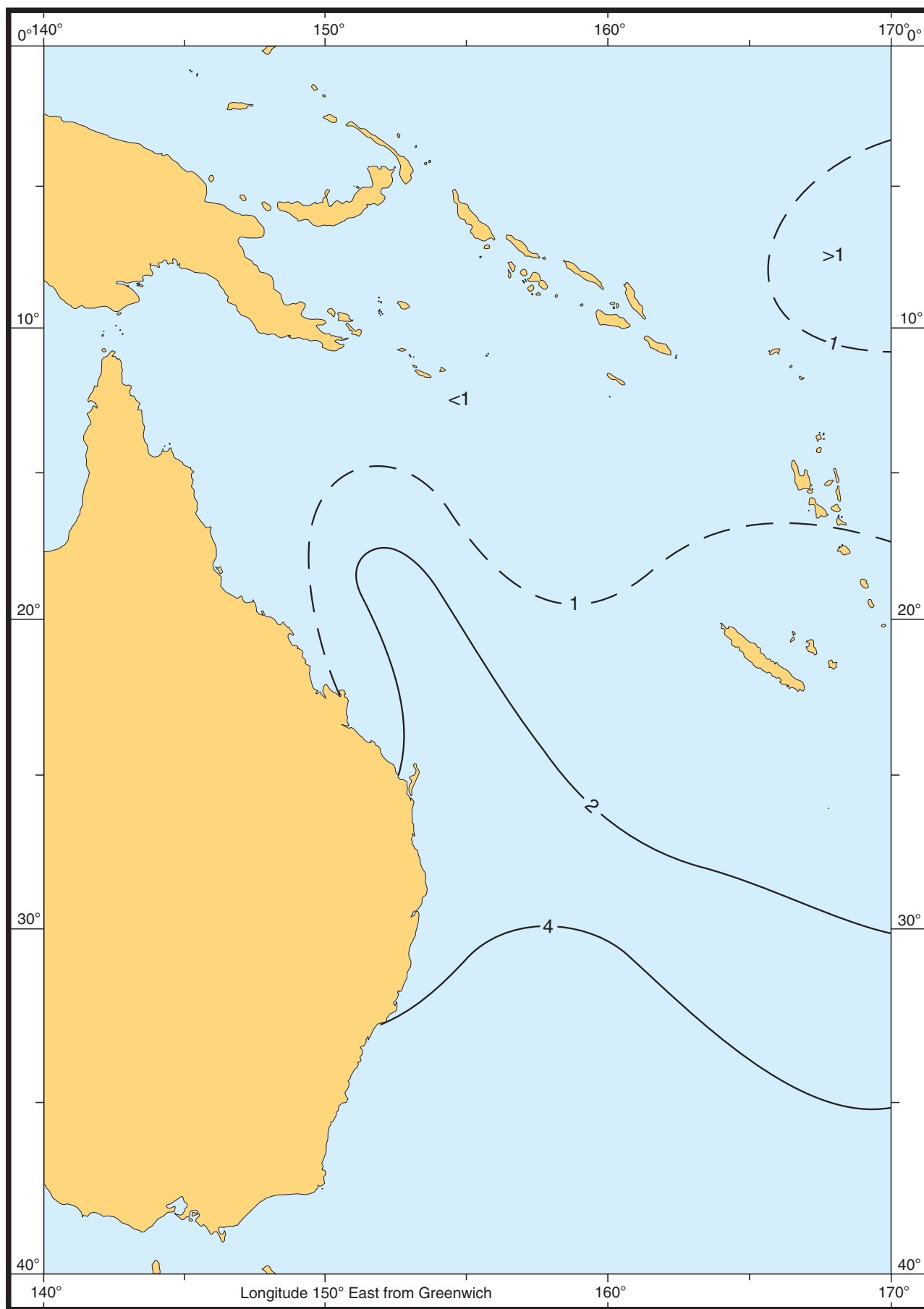
Wind distribution JANUARY (1.176.1)



Wind distribution JULY (1.176.2)



Percentage frequency of occasions with winds of Beaufort force 7 and over JUNE (1.180.1)



Percentage frequency of occasions with winds of Beaufort force 7 and over DECEMBER (1.180.2)

Fog and visibility

1.185

- 1 Visibility is generally good and fog is rare. Poor visibility is mainly associated with heavy rain and can, on occasions, fall to near fog limits of 1000 m. Over the open sea, fog is reported on less than 1% of occasions although mist and thick haze may reduce visibility to less than 5 miles in the N of the area with fresh to strong South-east Trade Winds.

- 2 Coastal fogs are uncommon except along the coast of Papua New Guinea, where they tend to form around dawn and disperse by mid-morning. During periods of drought, dust and smoke from bush fires may, on occasions, give rise to poor visibility in coastal waters.

Air temperature

General information

1.186

- 1 In general the coldest period is from June to August and the warmest December to February.

Open Sea

1.187

- 1 In February the mean air temperature is around 28°C in the N of the area and between 20° and 22°C in the S. By August the mean temperature decreases to about 25°C in the NW and to between 14° and 15°C in the extreme S. In general, the mean air temperature is similar to that of the mean sea surface temperature except in the extreme NW of the area, in February, where it tends to be between ½° and 1°C lower than the sea surface temperature.

Coastal waters

1.188

- 1 Air temperatures in the coastal waters covered by this volume, are much more variable than over the open sea. The temperature being greatly affected by sea breezes and to a lesser extent by land breezes. Maximum temperatures in summer, S of 25°S, frequently occur during the late morning before the onset of the sea breeze. The South-east Trade Winds tend to maintain a comfortable temperature during the day and impede night time cooling. The Climatic Tables (1.192) give mean temperatures for a number of coastal stations.

Relative humidity

General information

1.189

- 1 Humidity is closely related to air temperature and generally decreases as the temperature increases. During the

early morning, when the air temperature is normally at its lowest, the humidity is generally at its highest, and falls to a minimum in the afternoon. The high temperatures and humidity in the N of the area can have a considerable effect on personal comfort. The greatest discomfort may often be felt around sunset as the sea breeze fades.

Open sea

1.190

- 1 The mean humidity in summer is between 79% and 80% in the N of the area, 77% in the S but around 79% in central E areas. In winter, to the N of about 18°S, the mean humidity is around 78% and, to the S of about 18°S, between 69% and 70% in the W and between 72% and 74% in the E. Variations in the humidity tend to be greatest to the S of 25°S due to the more frequent changes in both wind direction and temperature.

Coastal waters

1.191

- 1 Average values of humidity are given in the Climatic Tables (1.192) for a number of coastal stations. Large changes from the mean in the N of the area are usually of a temporary nature, particularly during rainstorms when sudden marked decreases of temperature are possible. Of special note are the periods of very oppressive conditions in Torres Strait and Gulf of Papua during the wet season.

Climatic tables

1.192

- 1 The climatic tables (1.193 to 1.208) give long term data for several coastal stations (Diagram 1.192) which regularly undertake weather observations.

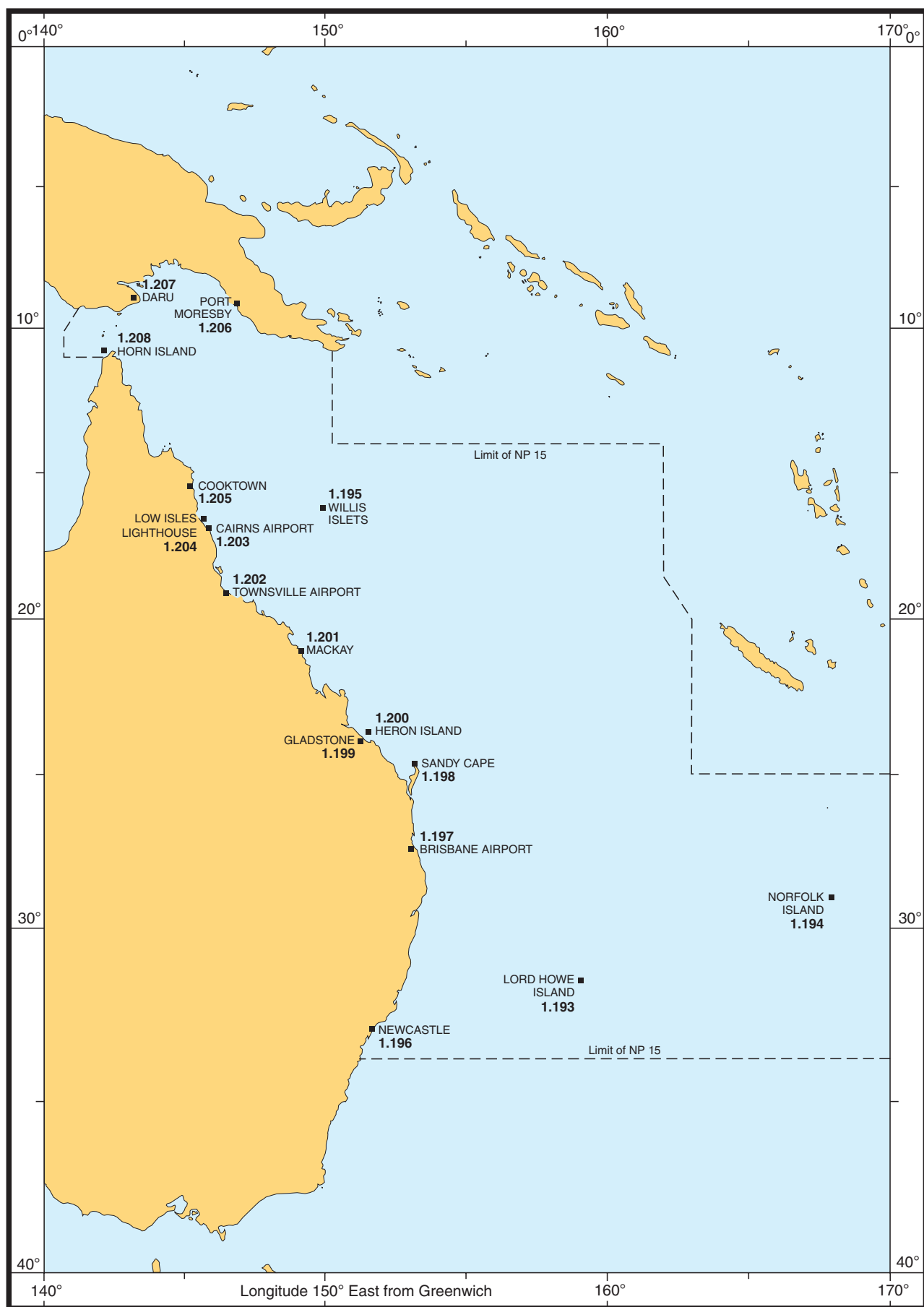
It is emphasised that these data are average conditions and refer to the specific location of the observing station and therefore may not be representative of the conditions over the open sea or in approaches to ports in their vicinity. The following comments briefly list some of the differences to be expected between conditions over open sea and those at the nearest reporting station (see *The Mariner's Handbook* for further details).

- 2 Wind speeds tend to be higher at sea with more frequent gales than on land, although funnelling in narrow inlets can result in an increase in wind strength.

Precipitation along mountainous wind facing coasts can be considerably higher than at sea to windward. Similarly, precipitation in the lee of high ground is generally less.

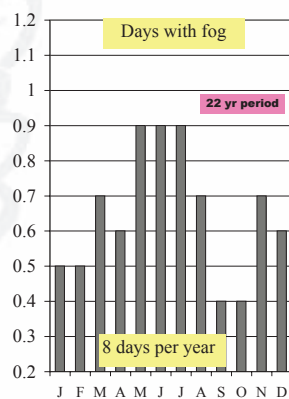
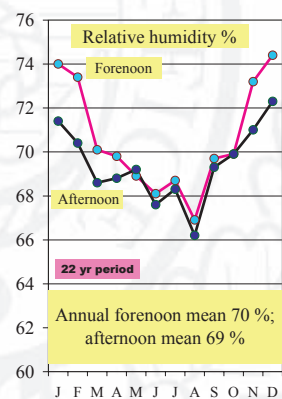
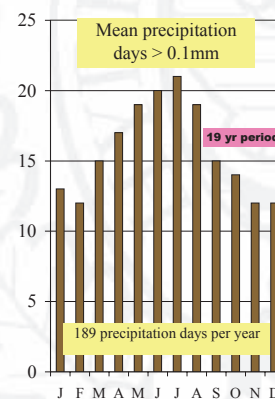
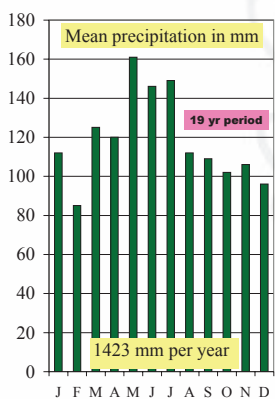
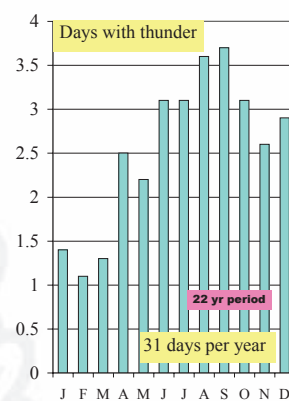
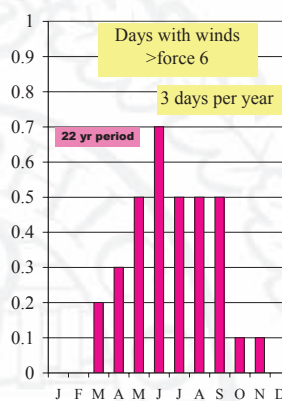
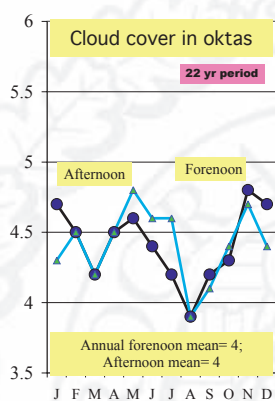
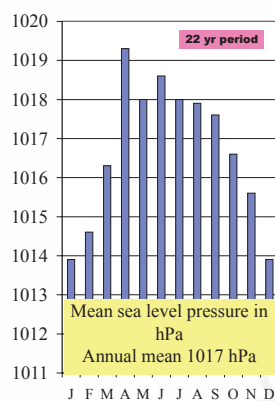
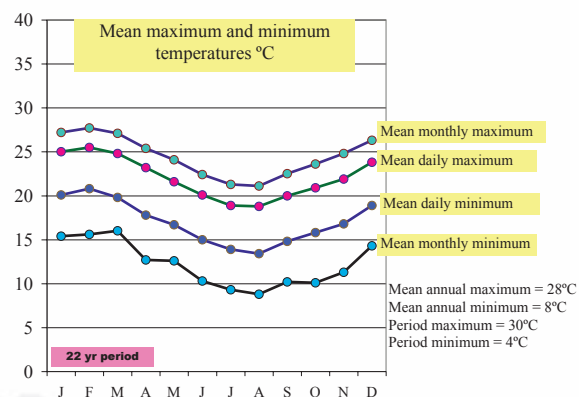
Air temperature over the sea is less variable than over the land.

Topography has a marked effect on local conditions.



Location of climatic stations (1.192)

31°32'S 159°04'E. Height above MSL - 7 m Climatic Information for period 1984 - 2005



Station Wind Distribution - 0900 local

NO WIND DATA AVAILABLE

January

March

May

July

September

November

The frequency of wind is given by scale:

0% 10 20 30 40 50%

Beaufort force is indicated by:



Wind flow is towards the circle. The figure in the circle gives the percentage of calms.

Station Wind Distribution - 1500 local

NO WIND DATA AVAILABLE

January

March

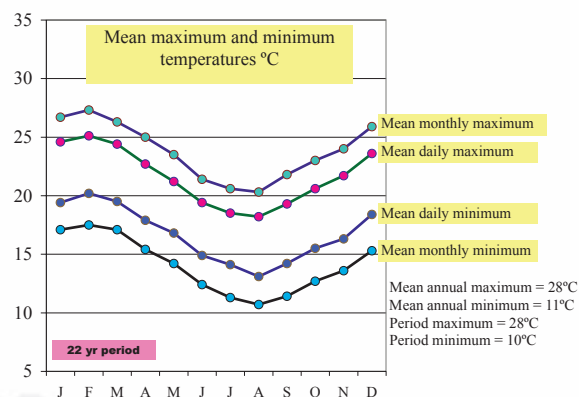
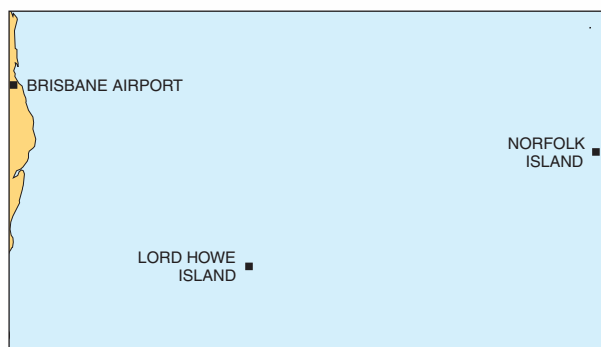
May

July

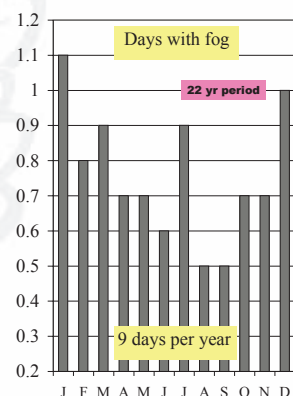
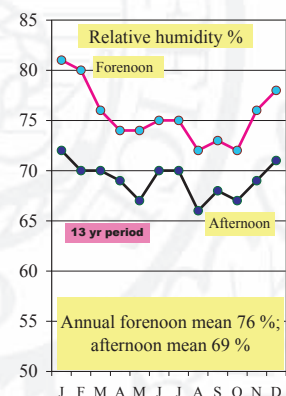
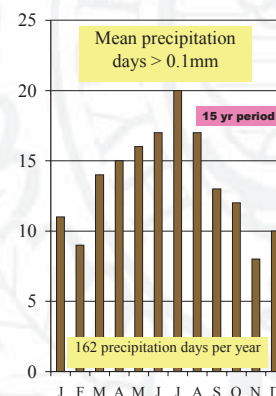
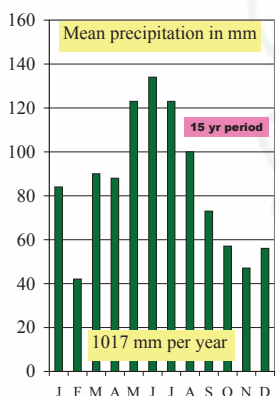
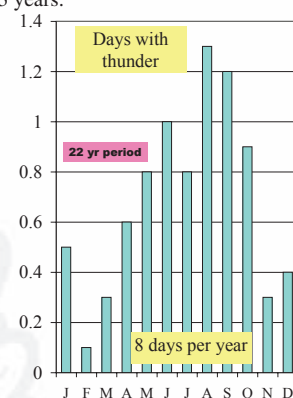
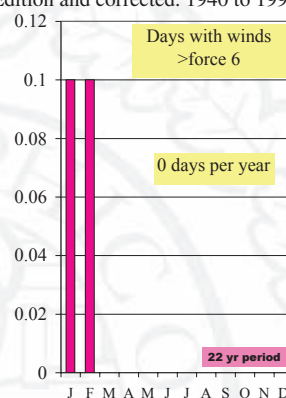
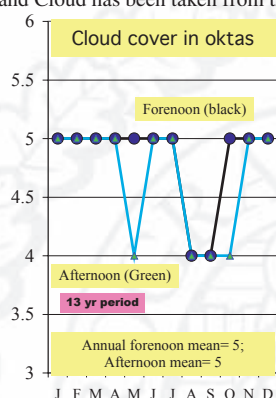
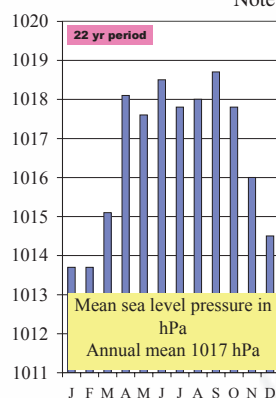
September

November

29°02'S 167°56'E. Height above MSL - 117 m Climatic Information for period 1984 - 2005



Note - Humidity and Cloud has been taken from the 9th Edition and corrected. 1940 to 1995, period 13 years.



Station Wind Distribution - 0900 local

NO WIND DATA AVAILABLE

January

March

May

July

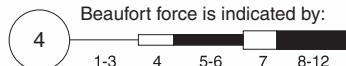
September

November

The frequency of wind is given by scale:

0% 10 20 30 40 50%

Beaufort force is indicated by:



Wind flow is towards the circle. The figure in the circle gives the percentage of calms.

Station Wind Distribution - 1500 local

NO WIND DATA AVAILABLE

January

March

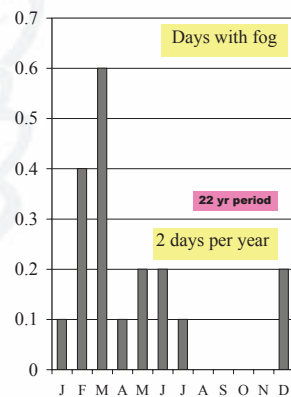
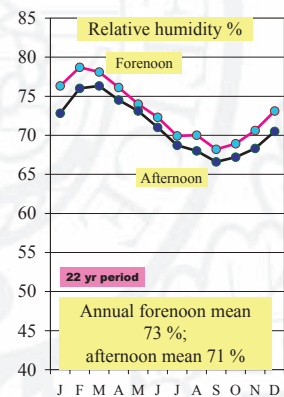
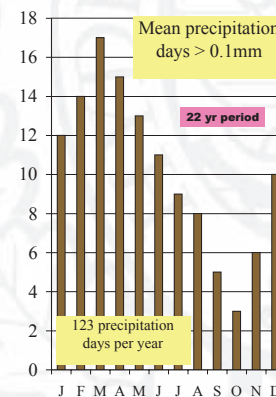
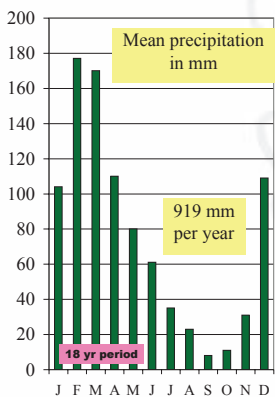
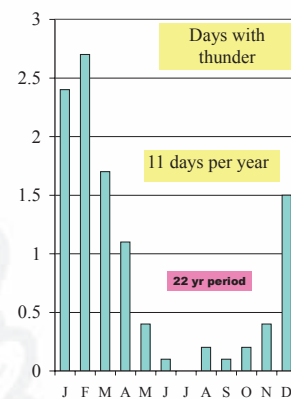
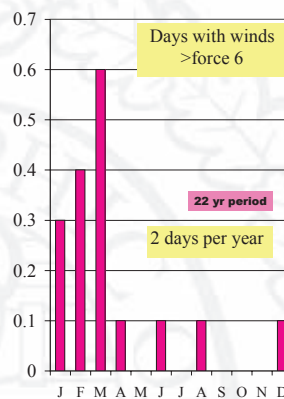
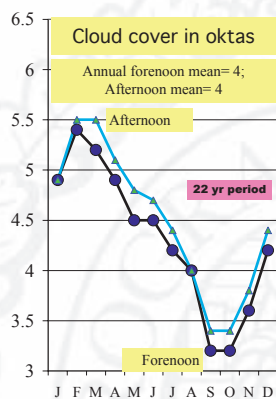
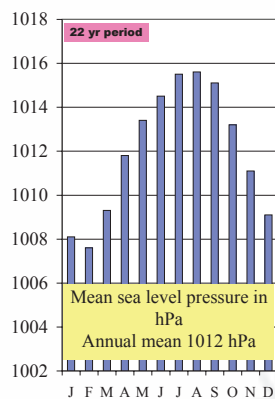
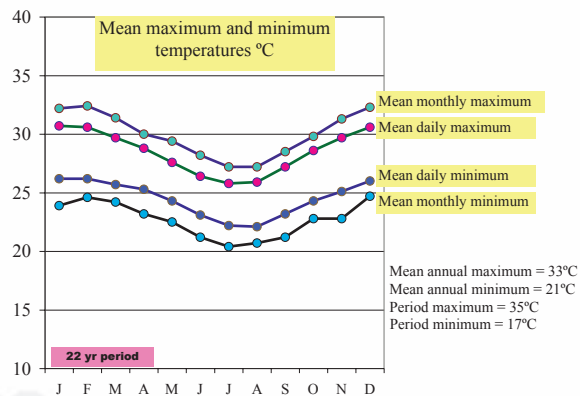
May

July

September

November

16°18'S 149°58'E. Height above MSL - 9 m Climatic Information for period 1984 - 2005



Station Wind Distribution - 0900 local

NO WIND DATA AVAILABLE

January

March

May

July

September

November

The frequency of wind is given by scale:

0% 10 20 30 40 50%



Beaufort force is indicated by:

1-3 4 5-6 7 8-12

Wind flow is towards the circle. The figure in the circle gives the percentage of calms.

Station Wind Distribution - 1500 local

NO WIND DATA AVAILABLE

January

March

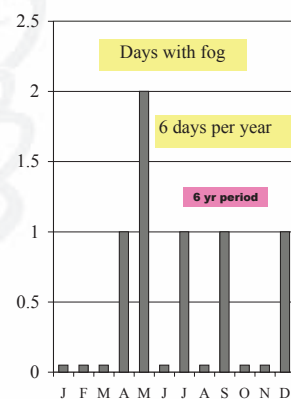
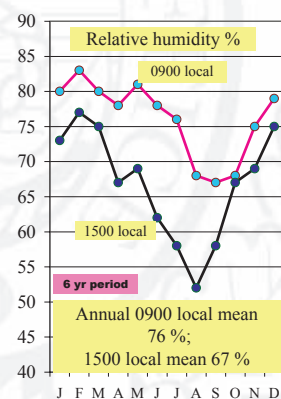
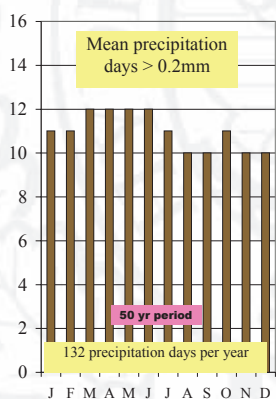
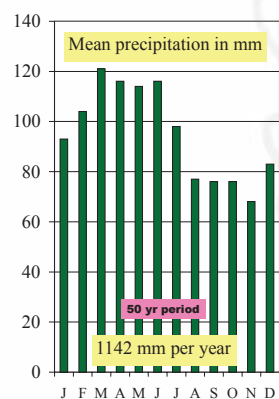
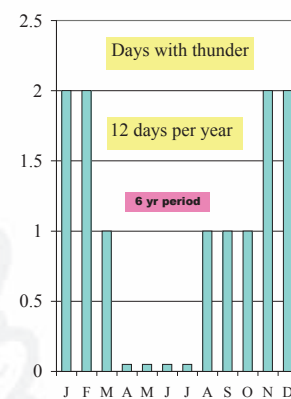
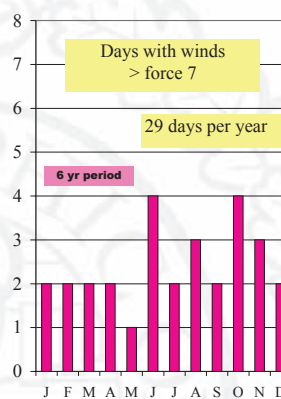
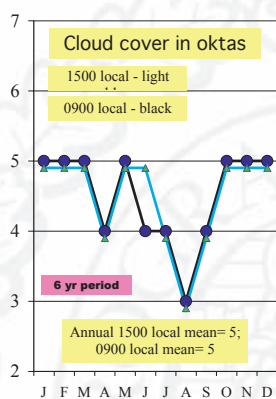
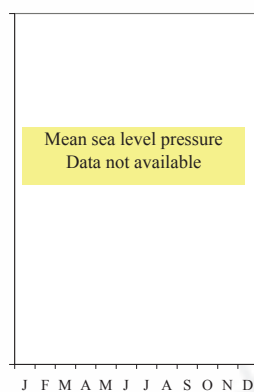
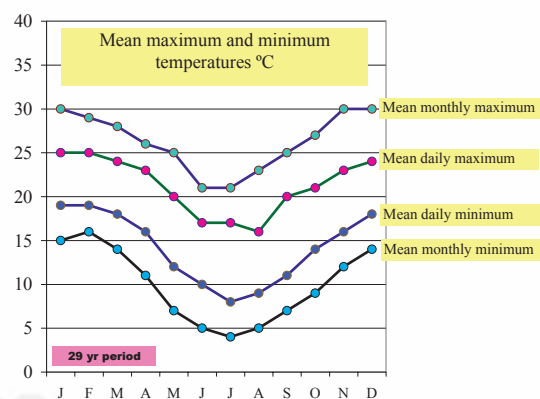
May

July

September

November

32°55'S 151°47'E. Height above MSL - 33 m Climatic Information for period 1940 - 1995



Station Wind Distribution - 0900 local

NO WIND DATA AVAILABLE

January

March

May

July

September

November

The frequency of wind is given by scale:

0% 10 20 30 40 50%



Beaufort force is indicated by:

1-3 4 5-6 7 8-12

Wind flow is towards the circle. The figure in the circle gives the percentage of calms.

Station Wind Distribution - 1500 local

NO WIND DATA AVAILABLE

January

March

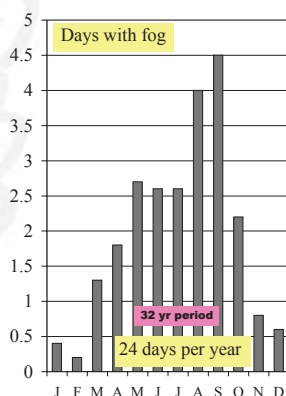
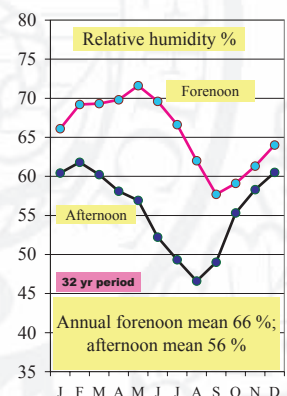
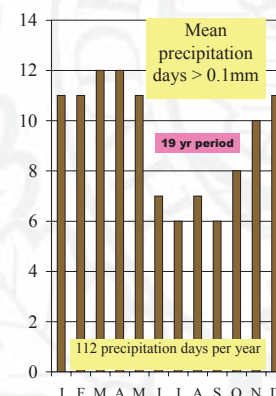
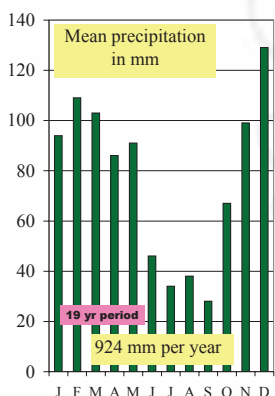
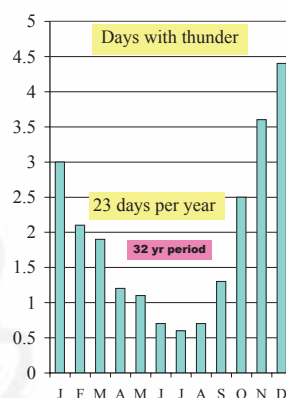
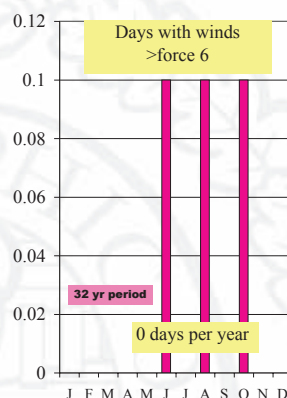
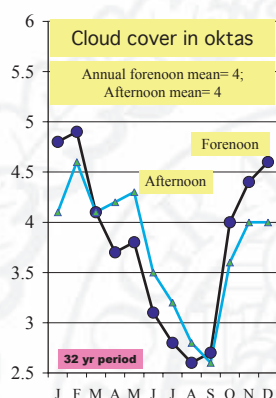
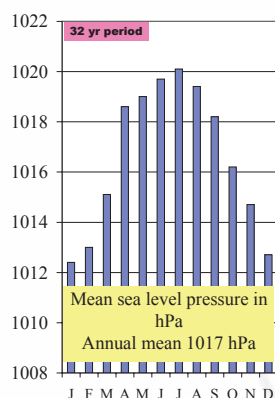
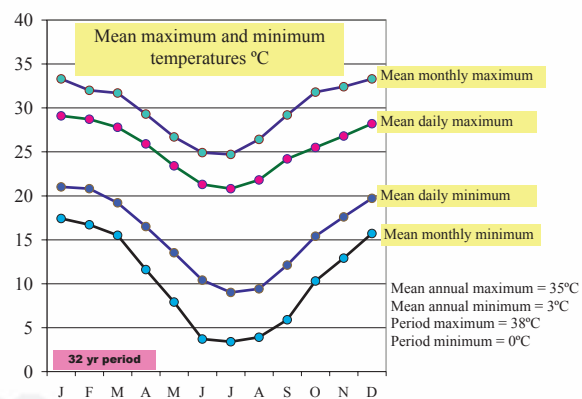
May

July

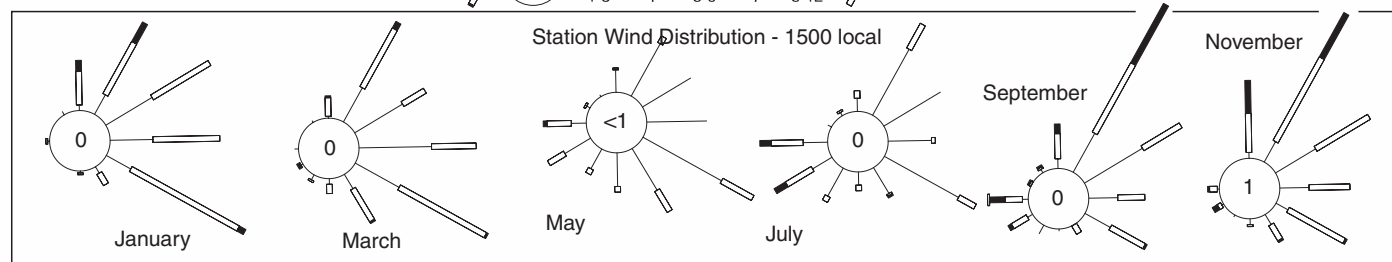
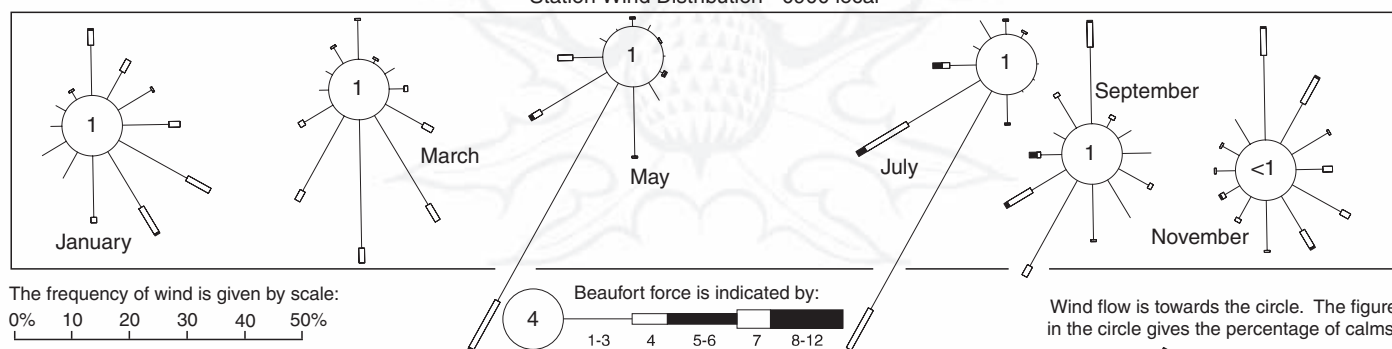
September

November

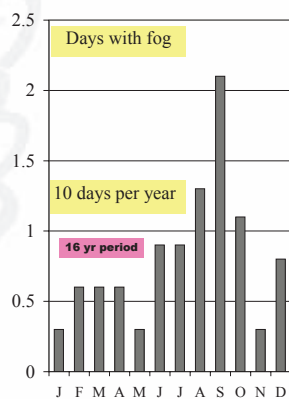
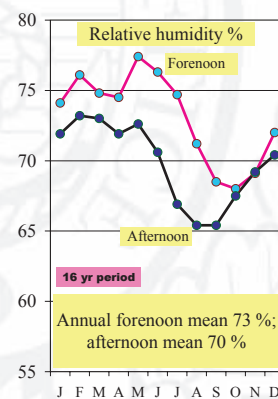
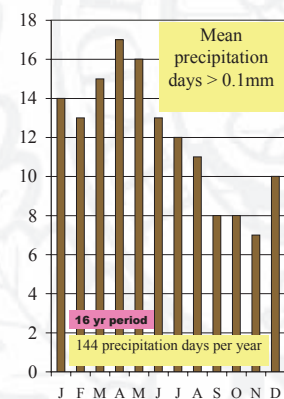
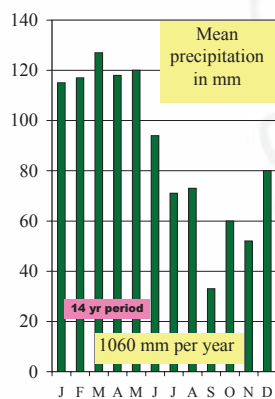
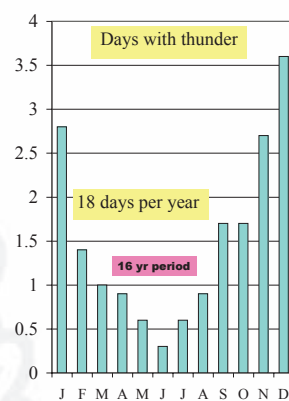
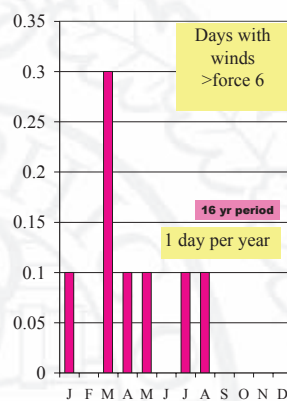
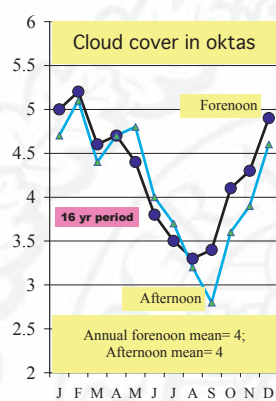
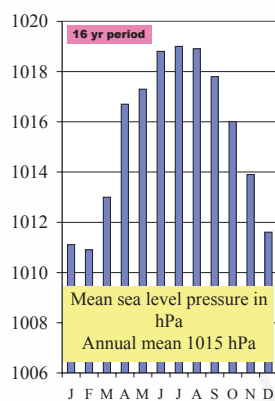
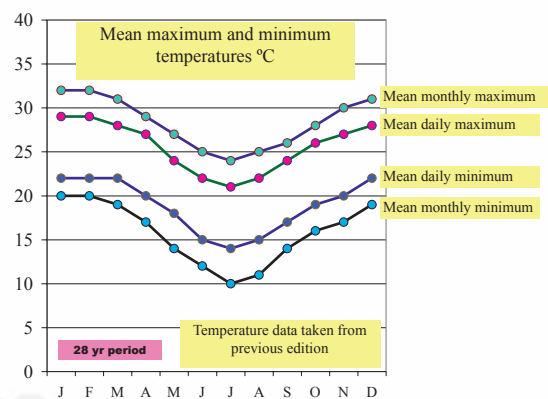
27°23'S 153°08'E. Height above MSL - 10 m Climatic Information for period 1974 - 2005



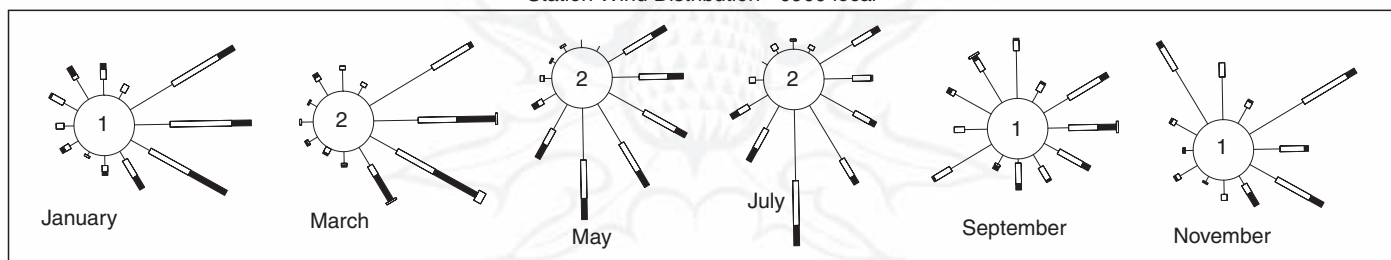
Station Wind Distribution - 0900 local



24°43'S 153°12'E. Height above MSL - 101 m Climatic Information for period 1990 - 2005



Station Wind Distribution - 0900 local



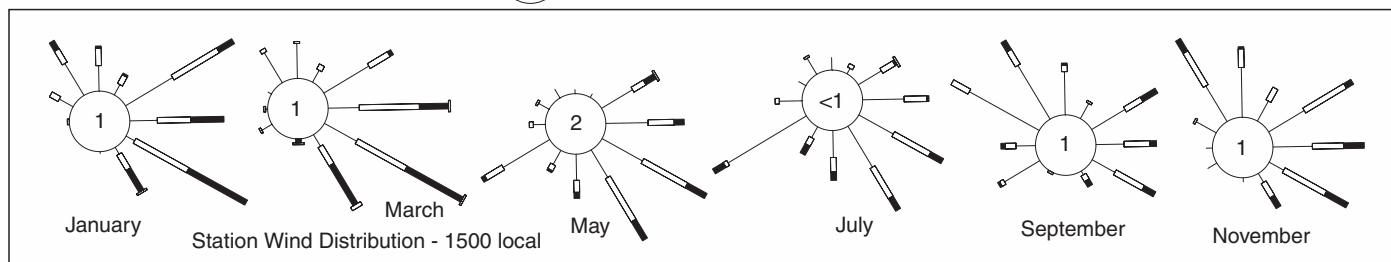
The frequency of wind is given by scale:

0% 10 20 30 40 50%

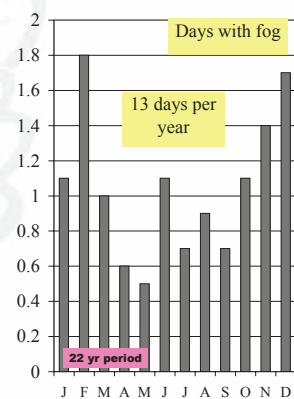
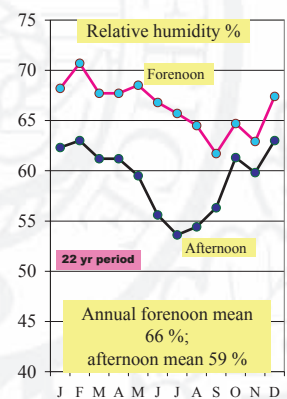
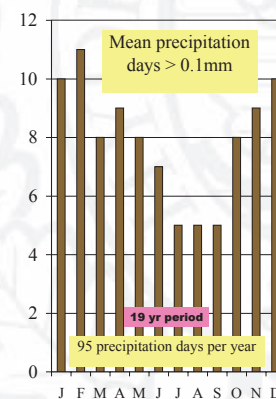
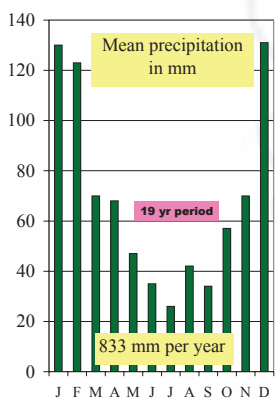
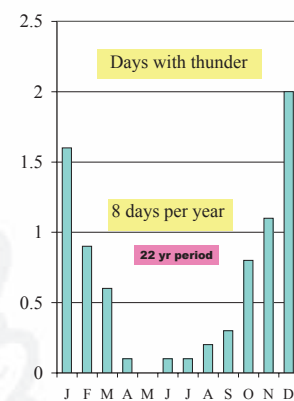
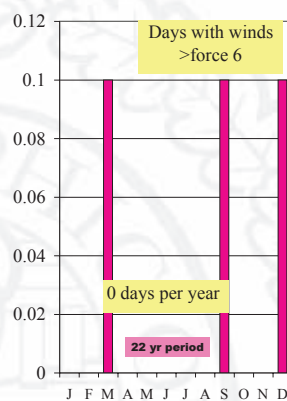
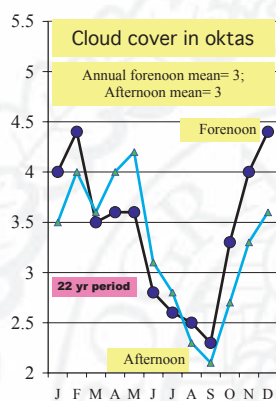
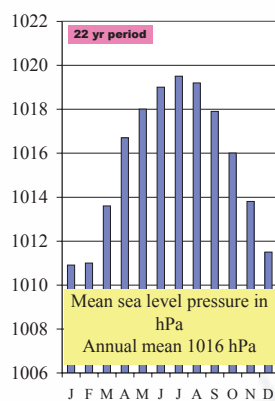
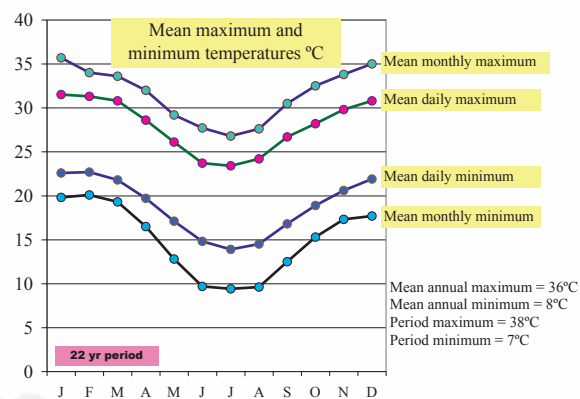
Beaufort force is indicated by:



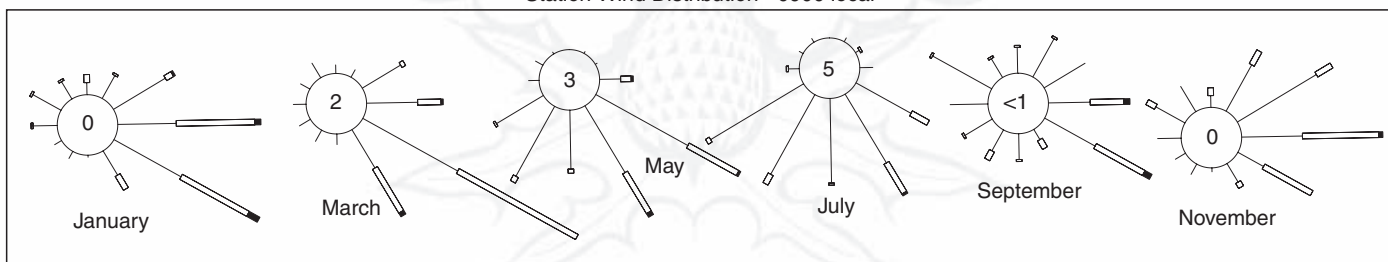
Wind flow is towards the circle. The figure in the circle gives the percentage of calms.



23°51'S 151°16'E. Height above MSL - 75 m Climatic Information for period 1984 - 2005



Station Wind Distribution - 0900 local



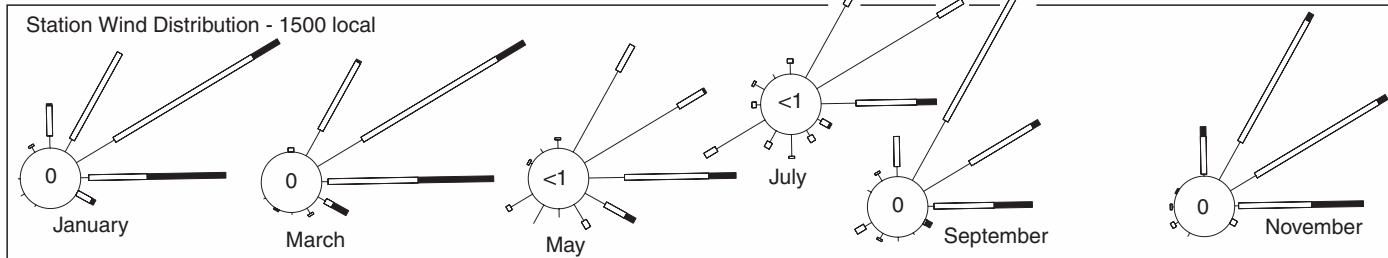
The frequency of wind is given by scale:

0% 10 20 30 40 50%

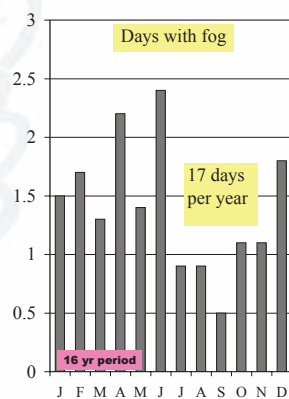
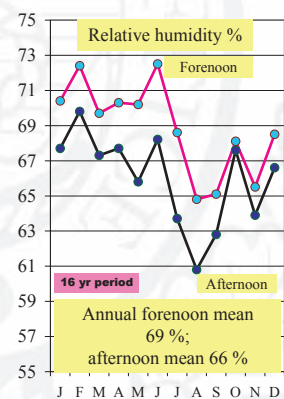
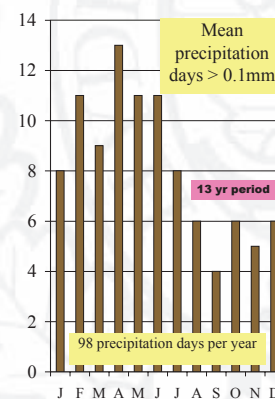
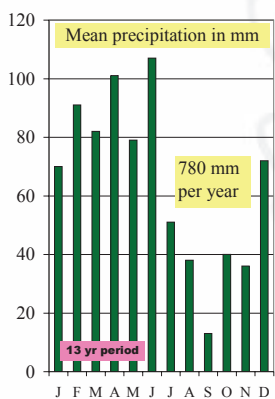
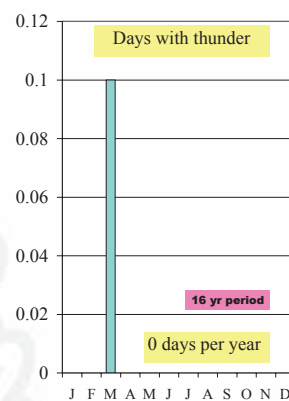
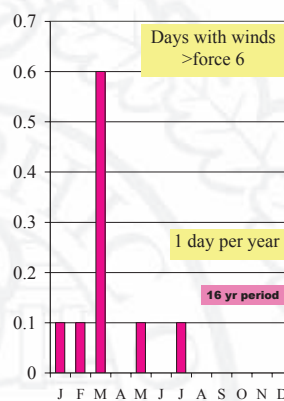
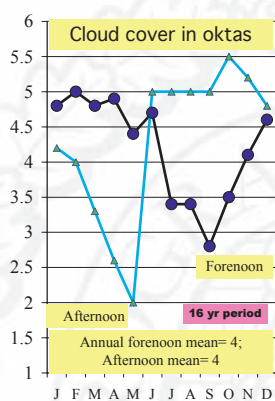
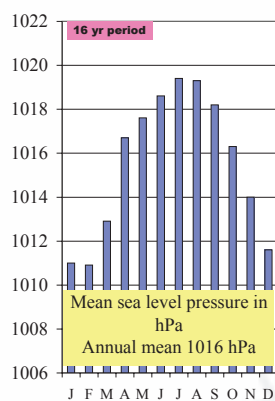
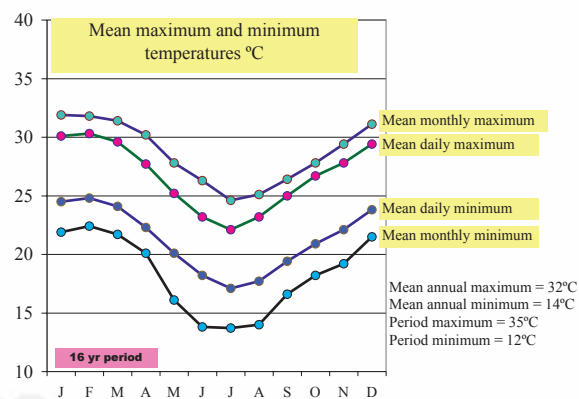
Beaufort force is indicated by:

4 1-3 4 5-6 7 8-12

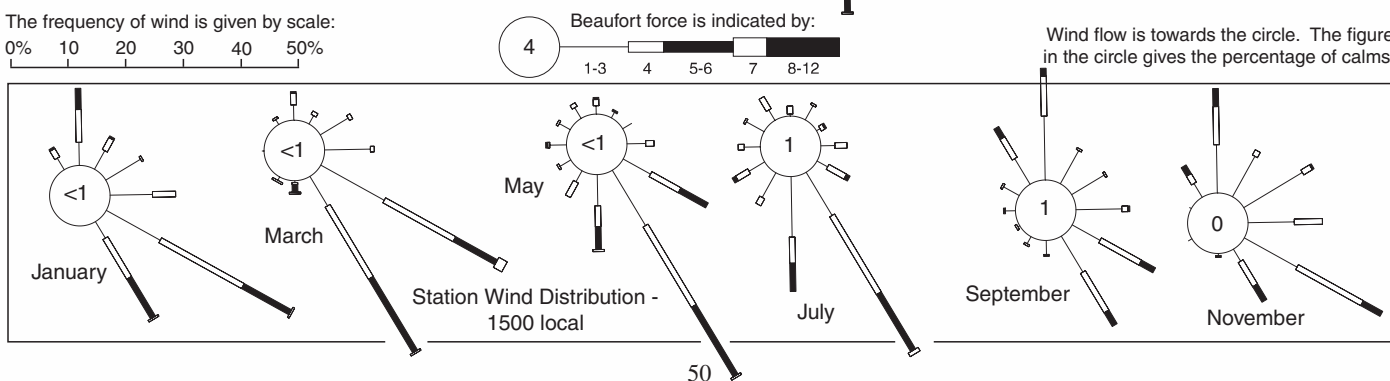
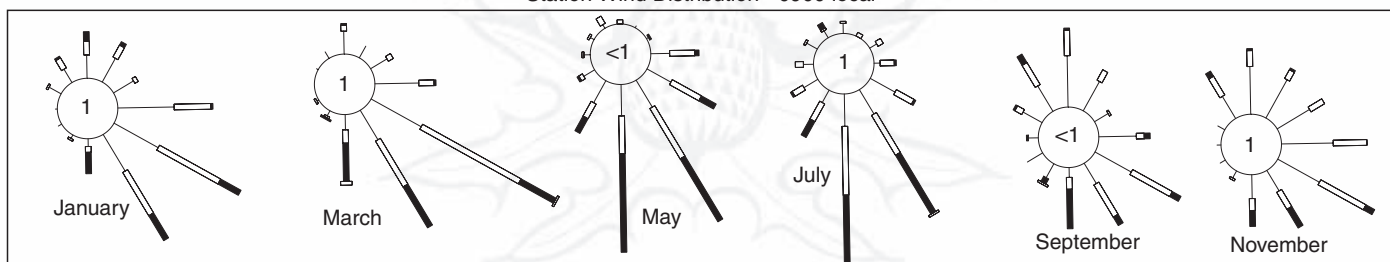
Wind flow is towards the circle. The figure in the circle gives the percentage of calms.



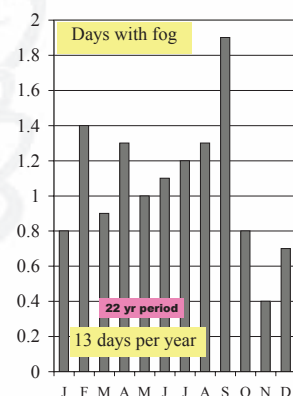
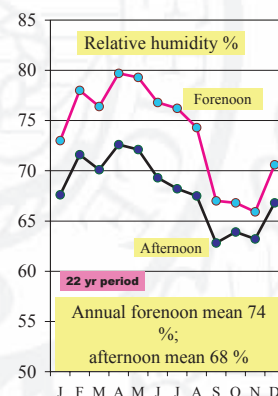
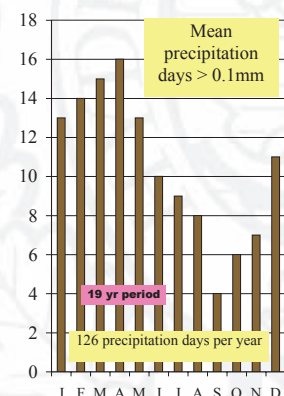
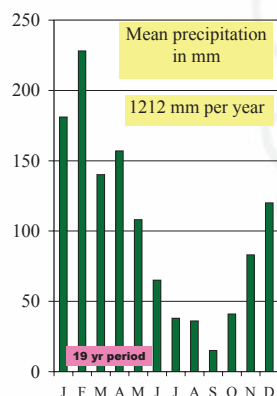
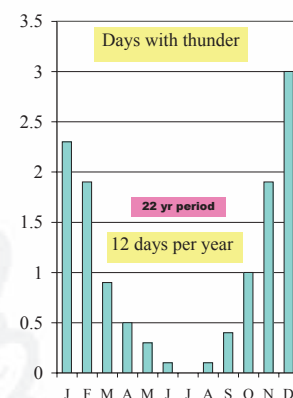
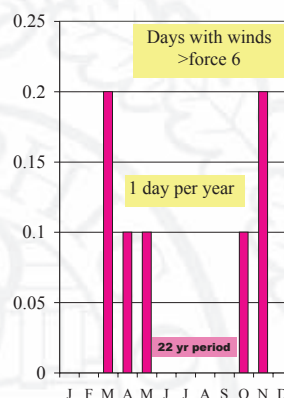
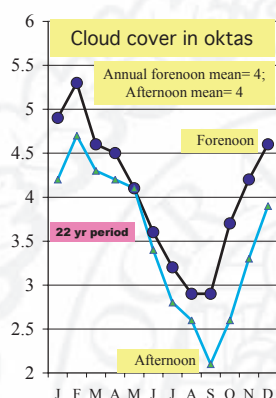
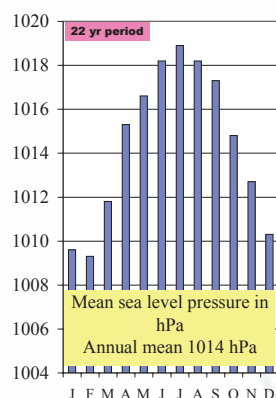
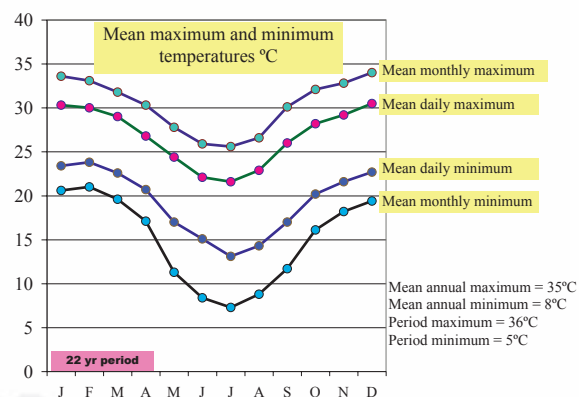
23°27'S 151°55'E. Height above MSL - 5 m Climatic Information for period 1990 - 2005



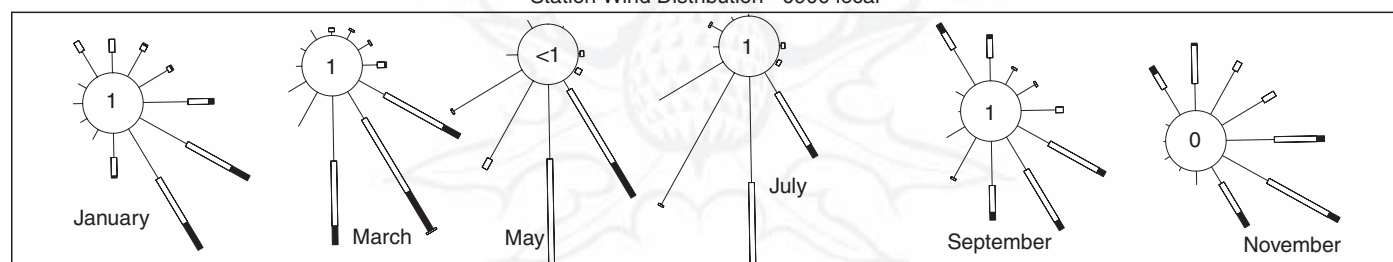
Station Wind Distribution - 0900 local



21°07'S 149°13'E. Height above MSL - 33 m Climatic Information for period 1984 - 2005



Station Wind Distribution - 0900 local



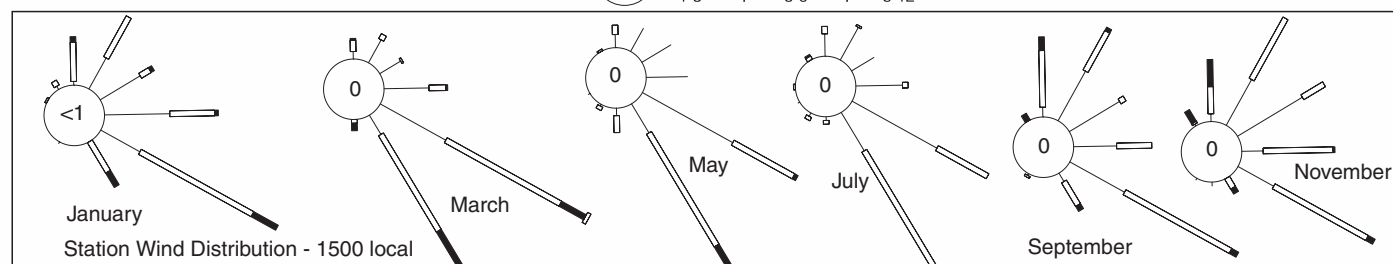
The frequency of wind is given by scale:

0% 10 20 30 40 50%

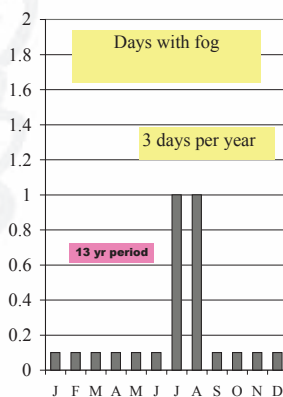
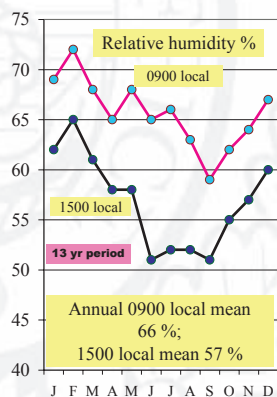
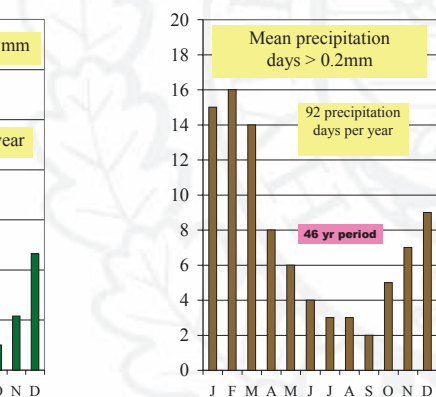
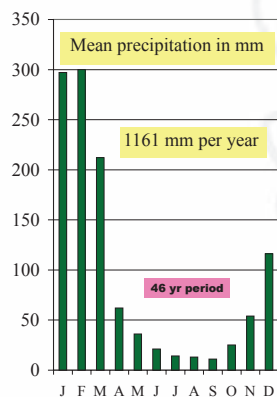
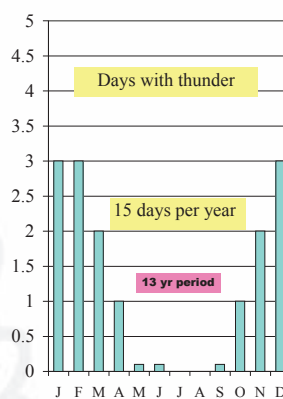
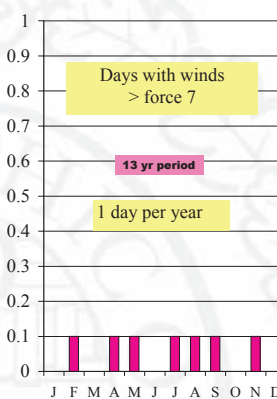
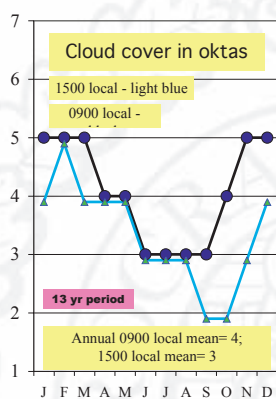
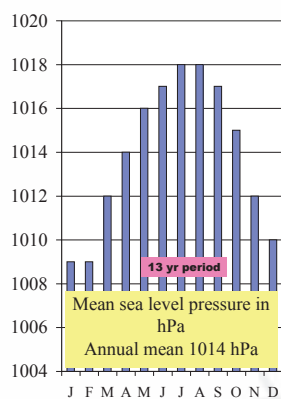
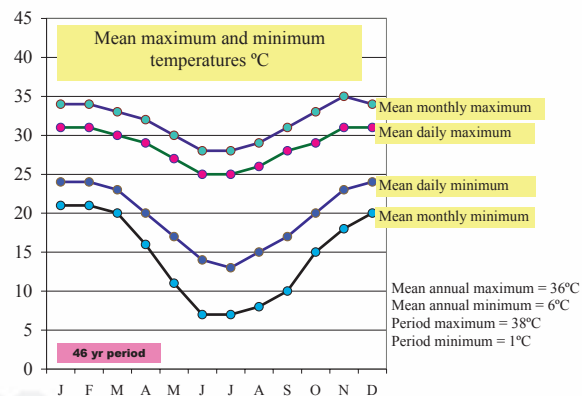
Beaufort force is indicated by:

1-3 4 5-6 7 8-12

Wind flow is towards the circle. The figure in the circle gives the percentage of calms.



19°15'S 146°46'E. Height above MSL - 9 m Climatic Information for period 1945 - 1995



Station Wind Distribution - 0900 local

NO WIND DATA AVAILABLE

January

March

May

July

September

November

The frequency of wind is given by scale:

0% 10 20 30 40 50%



Beaufort force is indicated by:

1-3 4 5-6 7 8-12

Wind flow is towards the circle. The figure in the circle gives the percentage of calms.

Station Wind Distribution - 1500 local

NO WIND DATA AVAILABLE

January

March

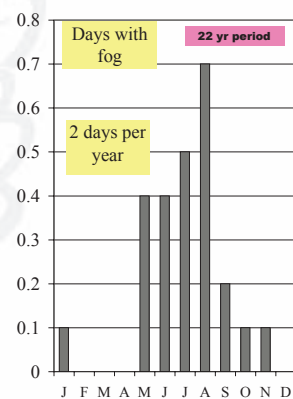
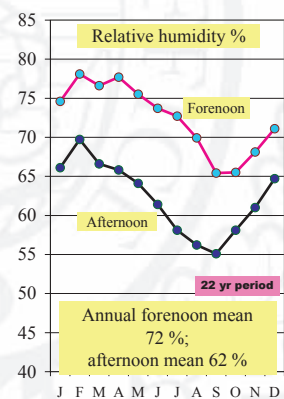
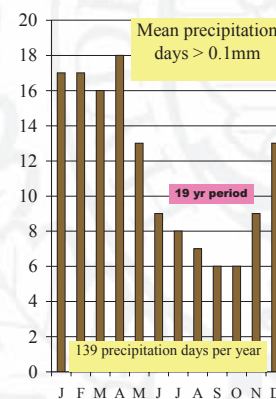
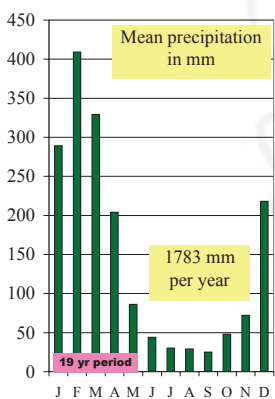
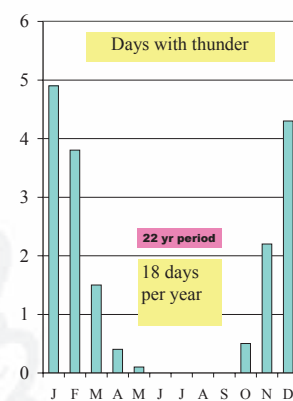
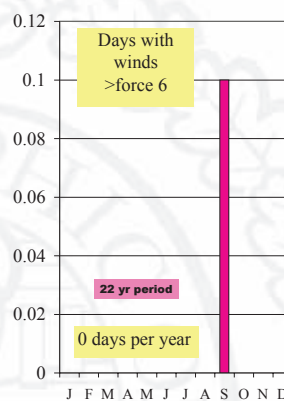
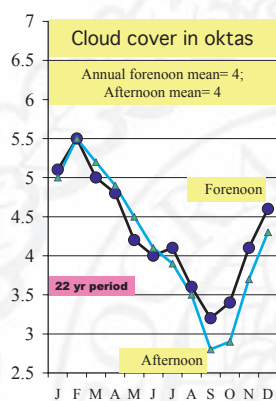
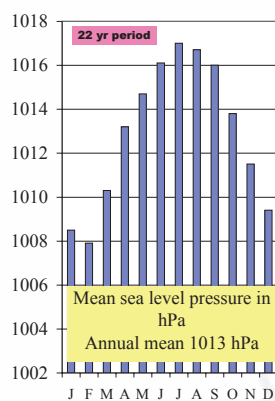
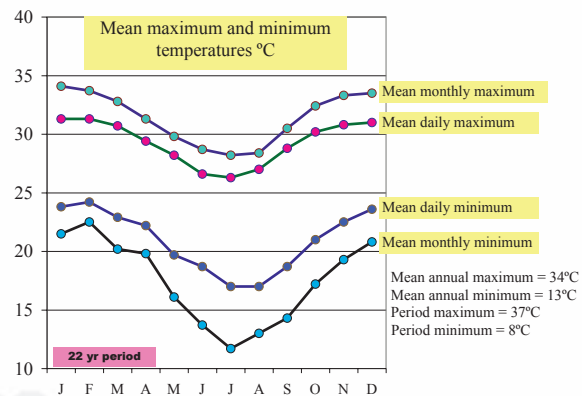
May

July

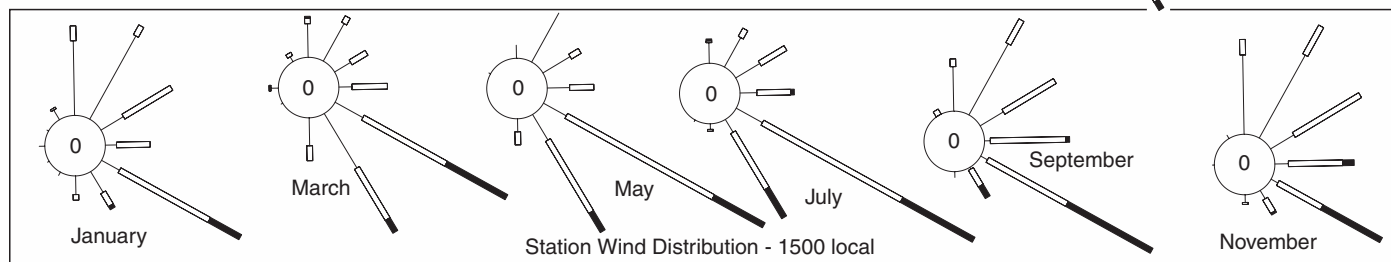
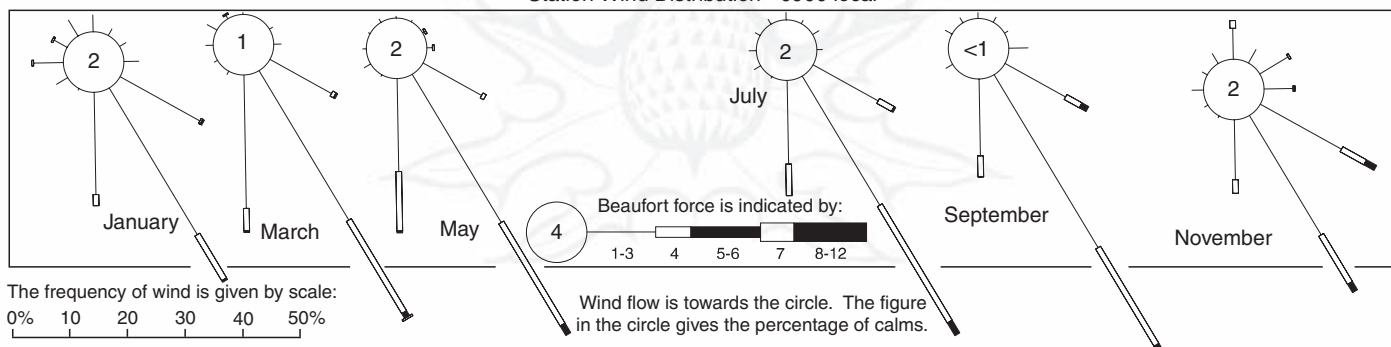
September

November

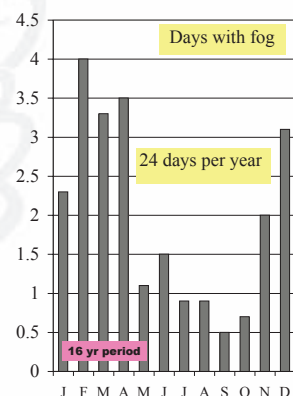
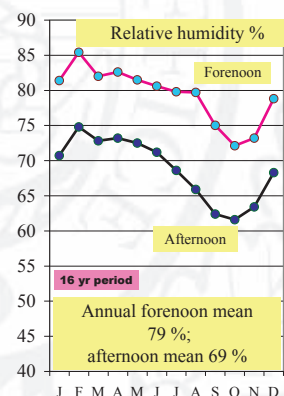
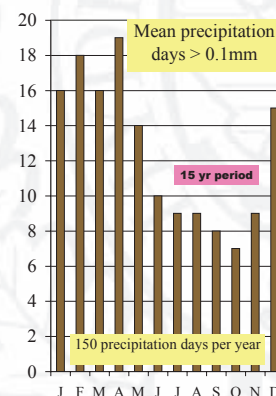
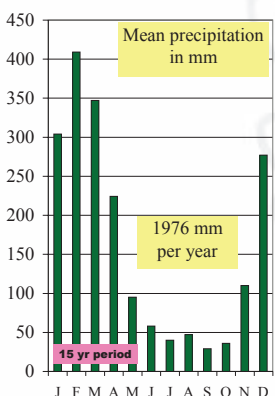
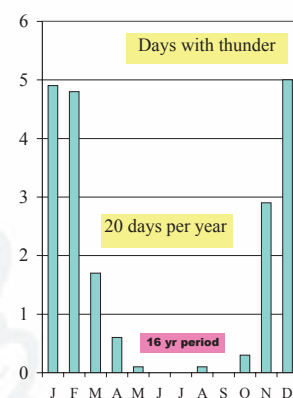
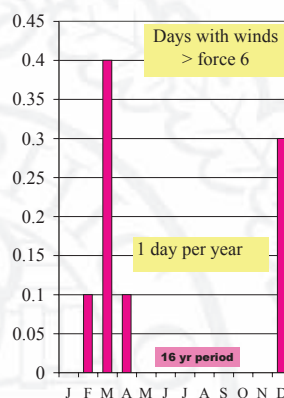
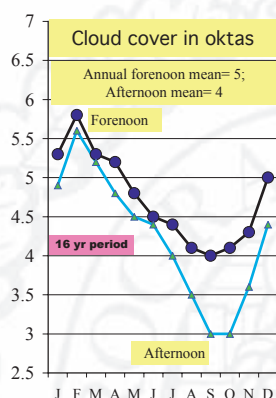
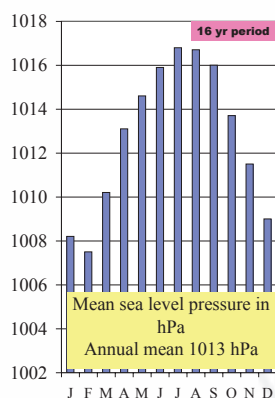
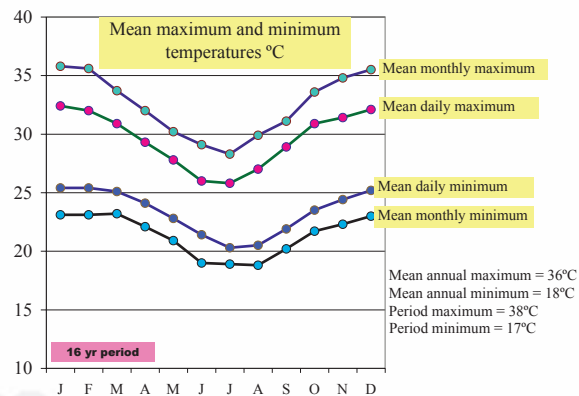
16°53'S 145°45'E. Height above MSL - 8 m Climatic Information for period 1984 - 2005



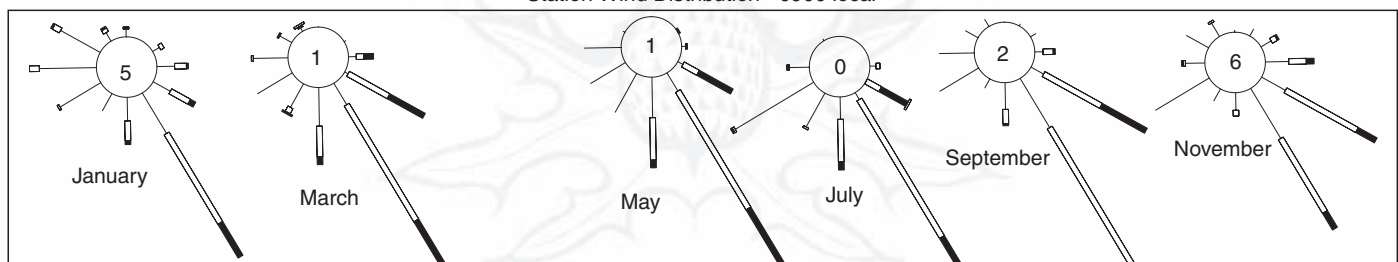
Station Wind Distribution - 0900 local



16°23'S 145°34'E. Height above MSL - 4 m Climatic Information for period 1990 - 2005



Station Wind Distribution - 0900 local



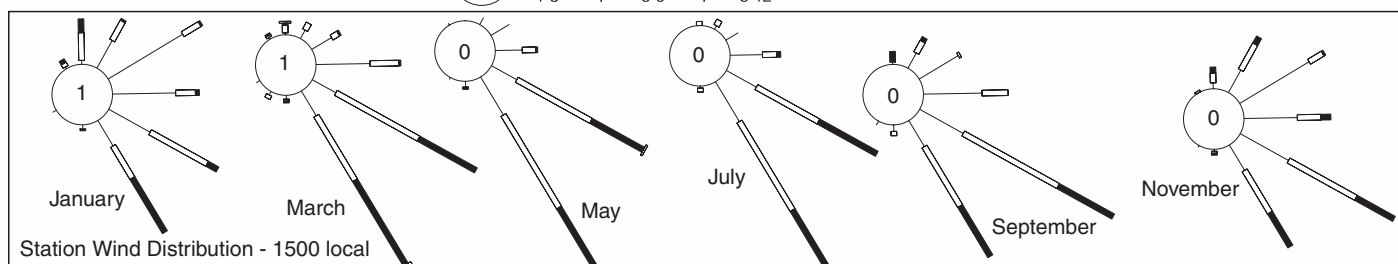
The frequency of wind is given by scale:

0% 10 20 30 40 50%

Beaufort force is indicated by:

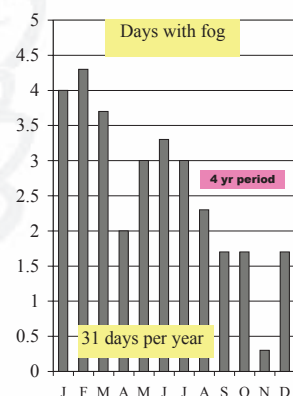
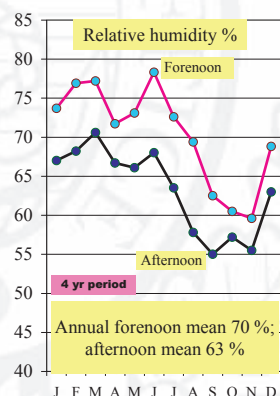
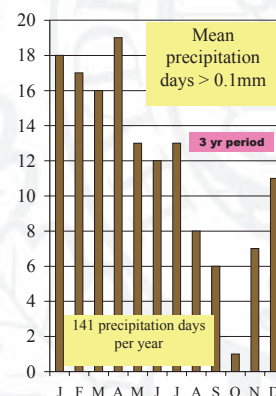
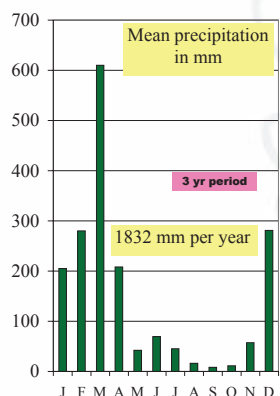
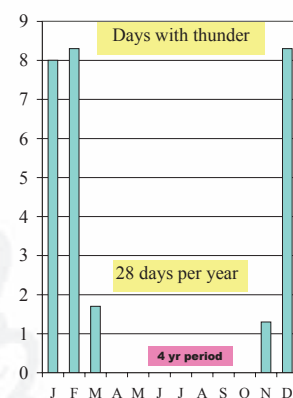
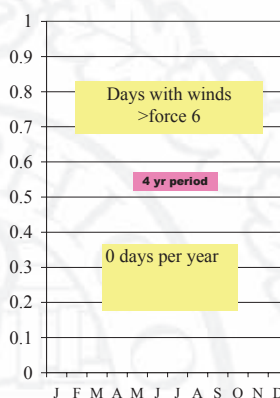
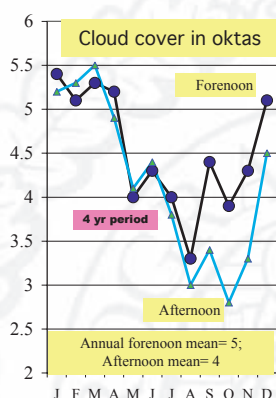
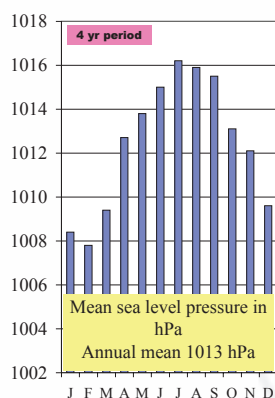
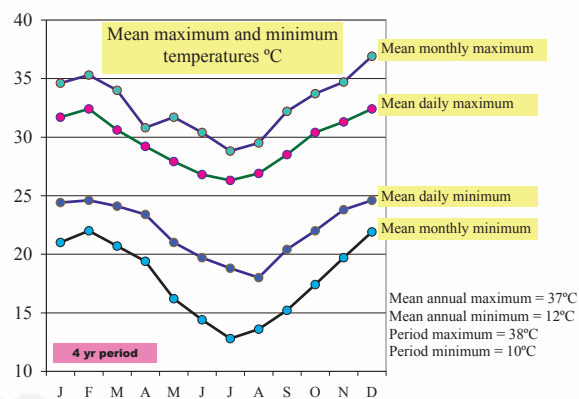
1-3 4 5-6 7 8-12

Wind flow is towards the circle. The figure in the circle gives the percentage of calms.

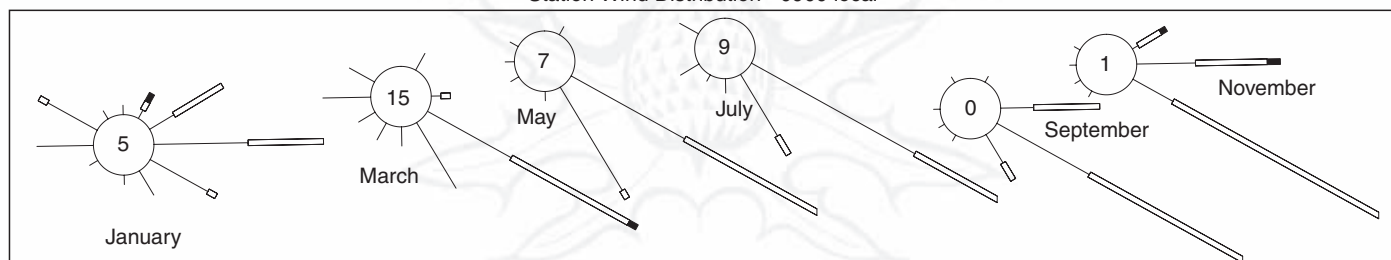


Station Wind Distribution - 1500 local

15°27'S 145°11'E. Height above MSL - 6 m Climatic Information for period 2002 - 2005



Station Wind Distribution - 0900 local



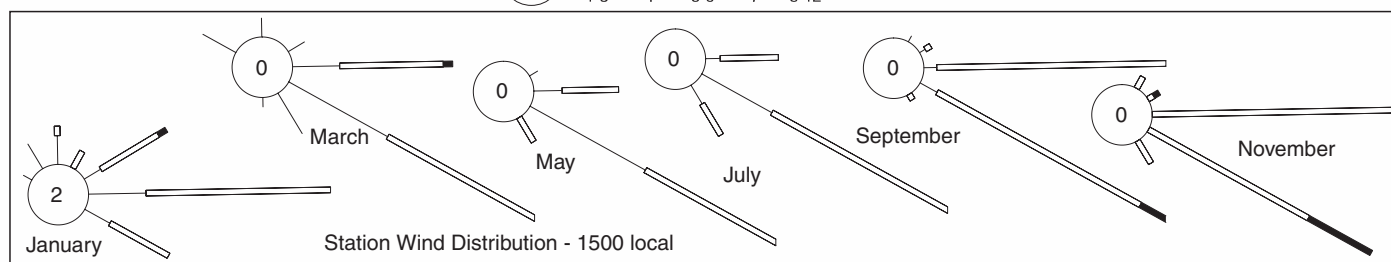
The frequency of wind is given by scale:

0% 10 20 30 40 50%

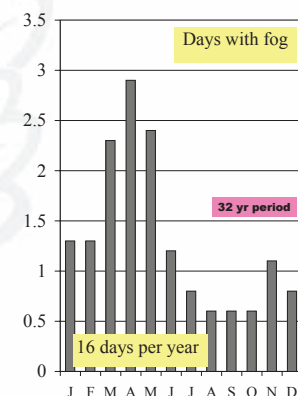
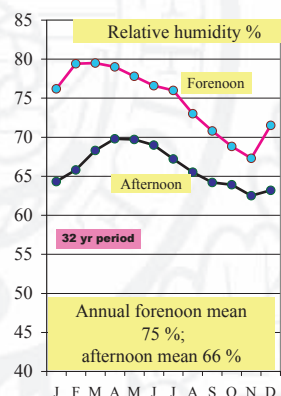
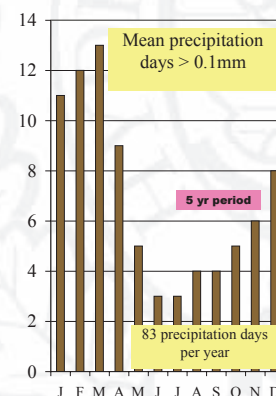
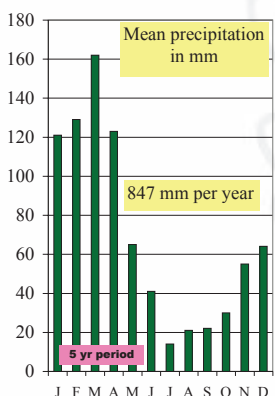
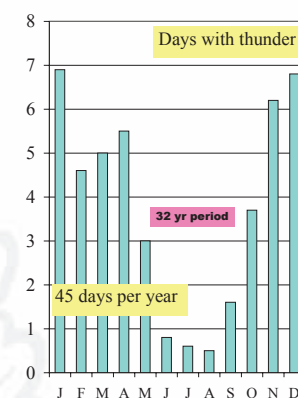
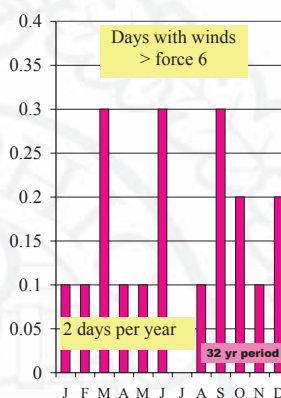
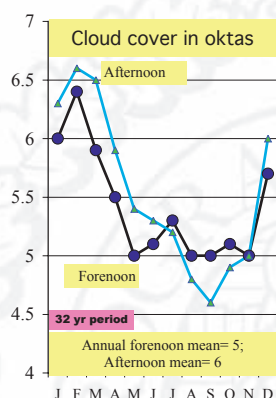
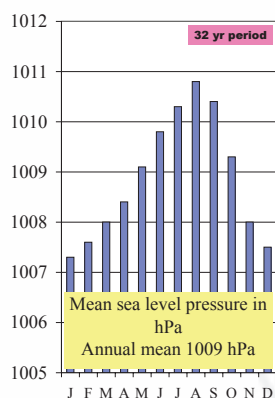
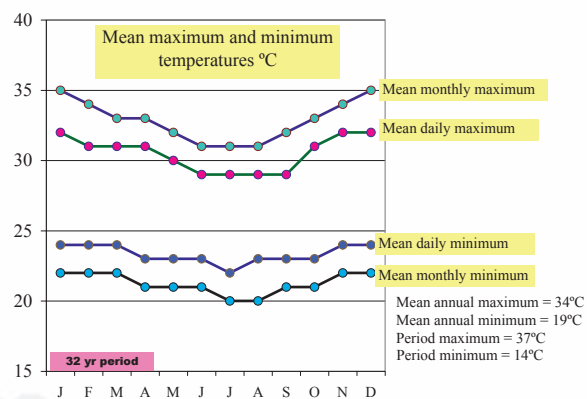
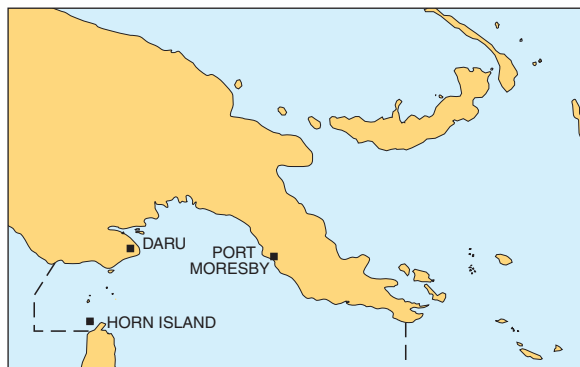
Beaufort force is indicated by:

4 1-3 4 5-6 7 8-12

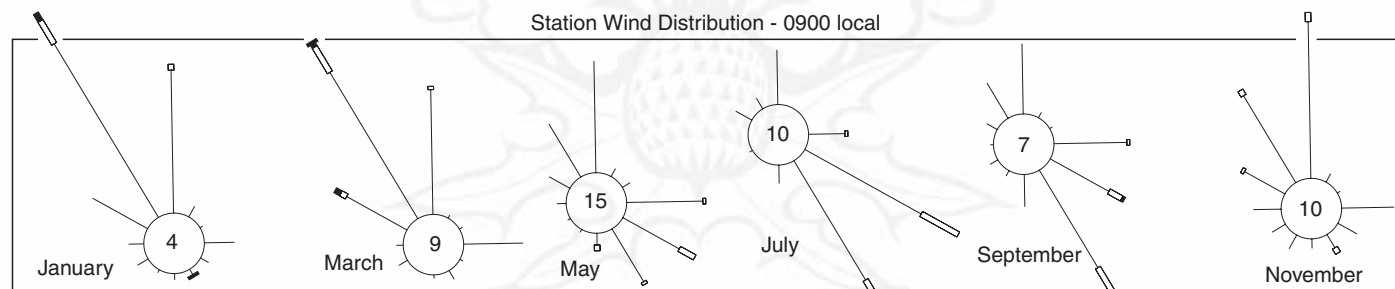
Wind flow is towards the circle. The figure in the circle gives the percentage of calms.



9°23'S 147°13'E. Height above MSL - 48 m Climatic Information for period 1975 - 2005



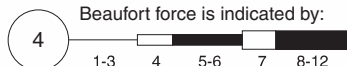
Station Wind Distribution - 0900 local



The frequency of wind is given by scale:

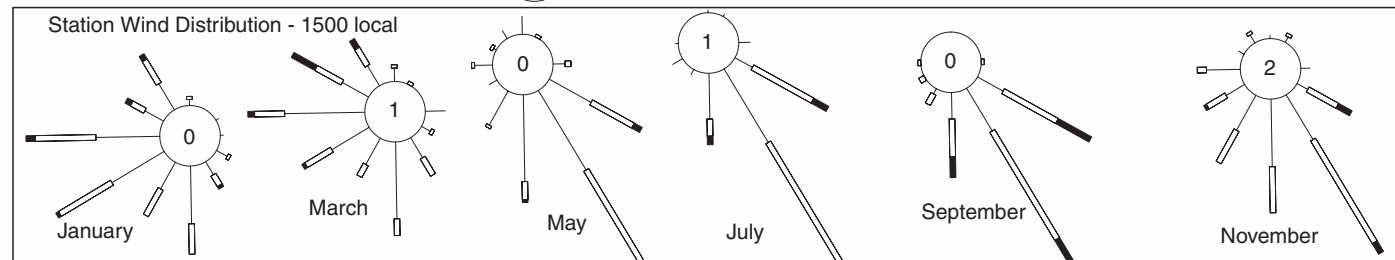
0% 10 20 30 40 50%

Beaufort force is indicated by:

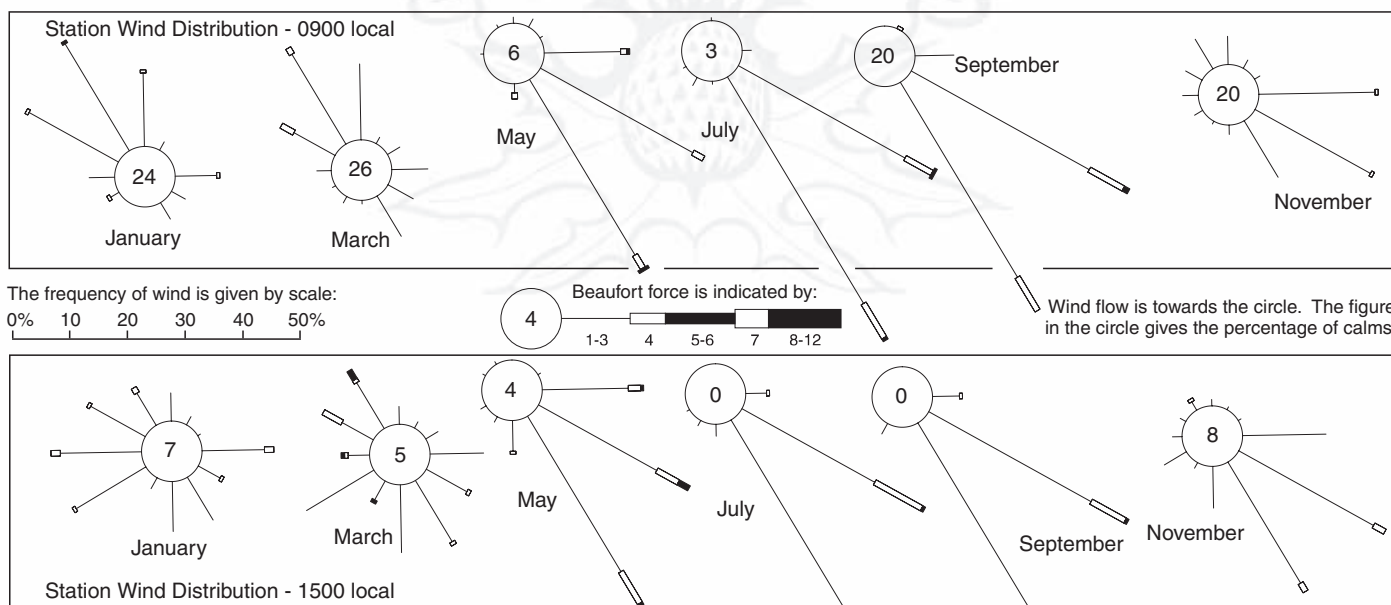
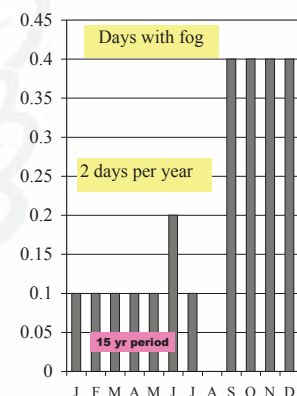
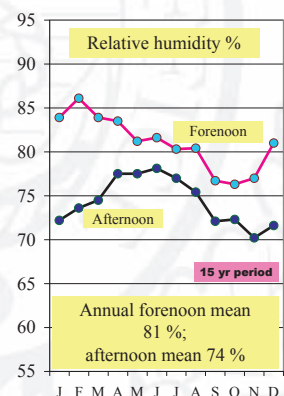
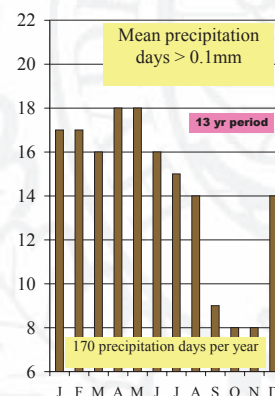
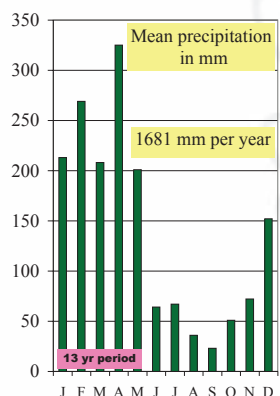
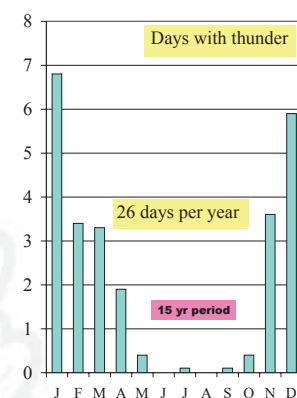
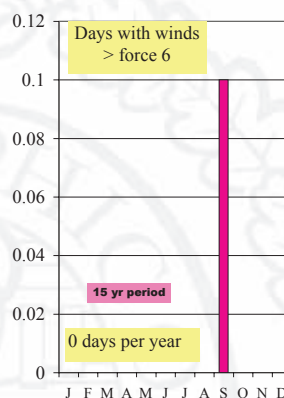
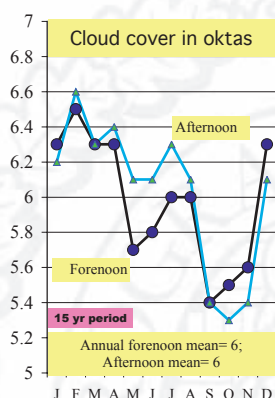
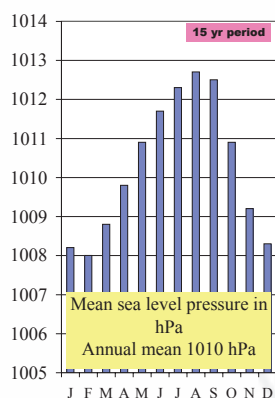
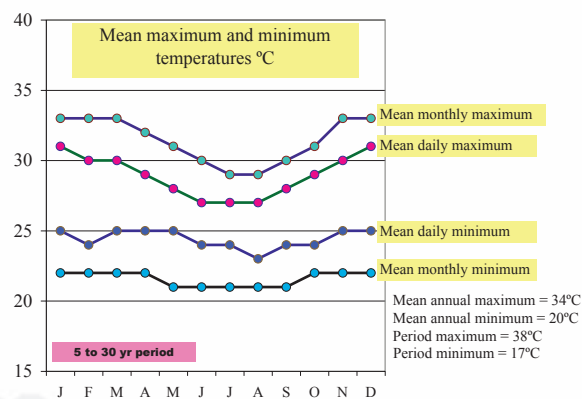
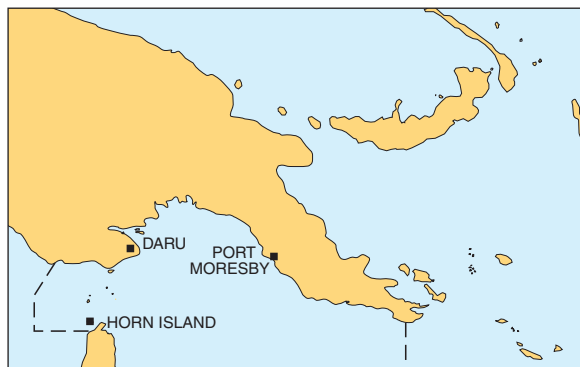


Wind flow is towards the circle. The figure in the circle gives the percentage of calms.

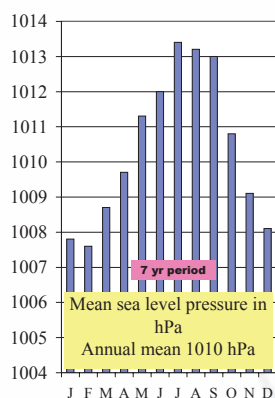
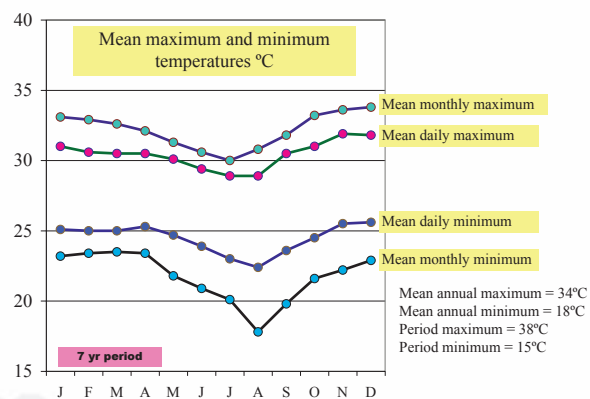
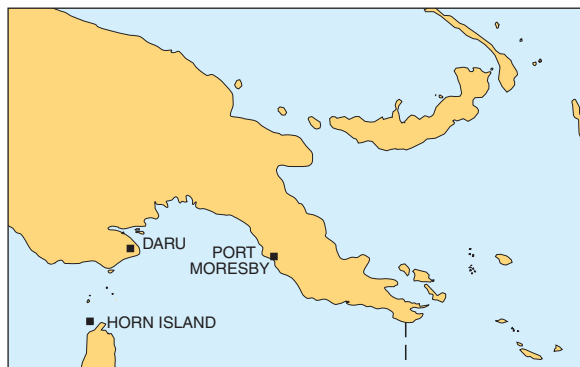
Station Wind Distribution - 1500 local



9°05'S 143°12'E. Height above MSL - 9 m Climatic Information for period 1991 - 2005



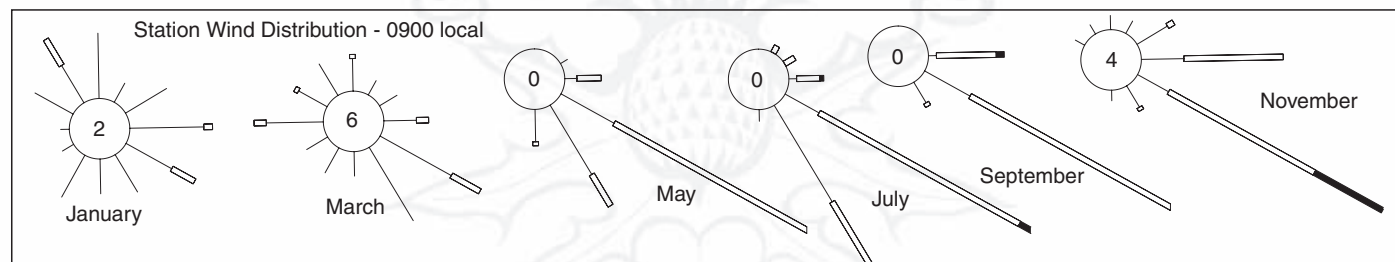
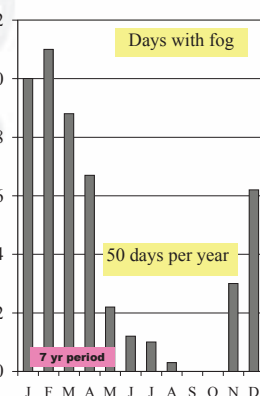
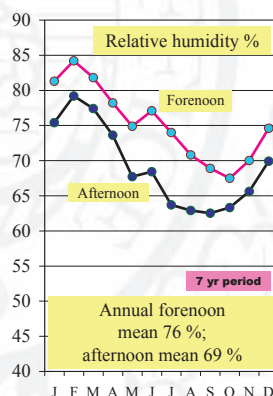
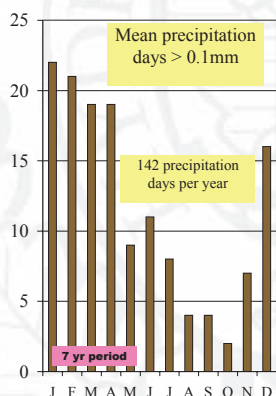
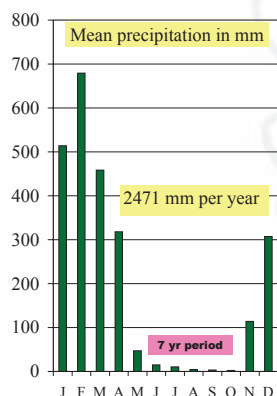
10°35'S 142°17'E. Height above MSL - 5 m Climatic Information for period 1999 - 2005



Cloud cover data
not available

Winds > force 6
data
not available

Thunder days data
not available



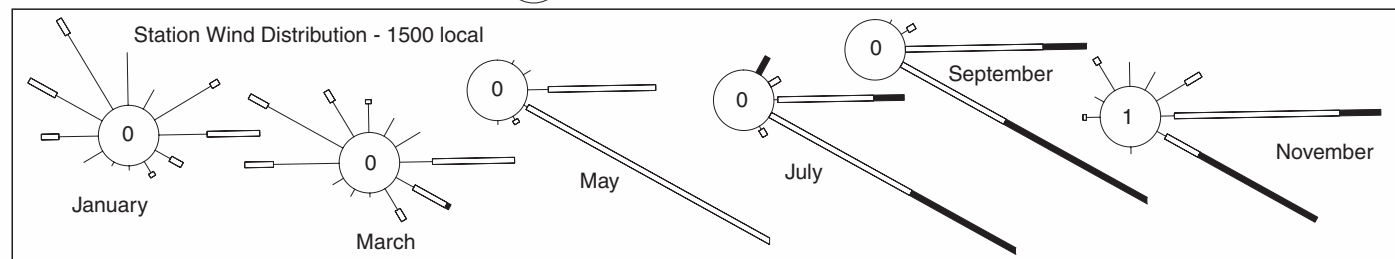
The frequency of wind is given by scale:

0% 10 20 30 40 50%

Beaufort force is indicated by:

4 1-3 4 5-6 7 8-12

Wind flow is towards the circle. The figure in the circle gives the percentage of calms.



1.209

METEOROLOGICAL CONVERSION TABLE AND SCALES

Fahrenheit to Celsius

°Fahrenheit

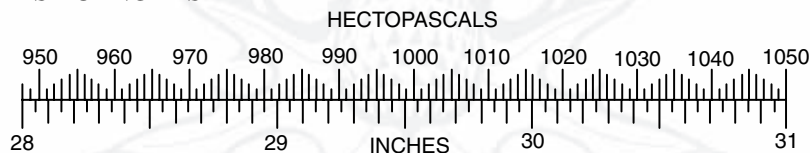
	0	1	2	3	4	5	6	7	8	9
°F	Degrees Celsius									
-100	-73.3	-73.9	-74.4	-75.0	-75.6	-76.1	-76.7	-77.2	-77.8	-78.3
-90	-67.8	-68.3	-68.9	-69.4	-70.0	-70.6	-71.1	-71.7	-72.2	-72.8
-80	-62.2	-62.8	-63.3	-63.9	-64.4	-65.0	-65.6	-66.1	-66.7	-67.2
-70	-56.7	-57.2	-57.8	-58.3	-58.9	-59.4	-60.0	-60.6	-61.1	-61.7
-60	-51.1	-51.7	-52.2	-52.8	-53.3	-53.9	-54.4	-55.0	-55.6	-56.1
-50	-45.6	-46.1	-46.7	-47.2	-47.8	-48.3	-48.9	-49.4	-50.0	-50.6
-40	-40.0	-40.6	-41.1	-41.7	-42.2	-42.8	-43.3	-43.9	-44.4	-45.0
-30	-34.4	-35.0	-35.6	-36.1	-36.7	-37.2	-37.8	-38.3	-38.9	-39.4
-20	-28.9	-29.4	-30.0	-30.6	-31.1	-31.7	-32.2	-32.8	-33.3	-33.9
-10	-23.3	-23.9	-24.4	-25.0	-25.6	-26.1	-26.7	-27.2	-27.8	-28.3
-0	-17.8	-18.3	-18.9	-19.4	-20.0	-20.6	-21.1	-21.7	-22.2	-22.8
+0	-17.8	-17.2	-16.7	-16.1	-15.6	-15.0	-14.4	-13.9	-13.3	-12.8
10	-12.2	-11.7	-11.1	-10.6	-10.0	-9.4	-8.9	-8.3	-7.8	-7.2
20	-6.7	-6.1	-5.6	-5.0	-4.4	-3.9	-3.3	-2.8	-2.2	-1.7
30	-1.1	-0.6	0	+0.6	+1.1	+1.7	+2.2	+2.8	+3.3	+3.9
40	+4.4	+5.0	+5.6	6.1	6.7	7.2	7.8	8.3	8.9	9.4
50	10.0	10.6	11.1	11.7	12.2	12.8	13.3	13.9	14.4	15.0
60	15.6	16.1	16.7	17.2	17.8	18.3	18.9	19.4	20.0	20.6
70	21.1	21.7	22.2	22.8	23.3	23.9	24.4	25.0	25.6	26.1
80	26.7	27.2	27.8	28.3	28.9	29.4	30.0	30.6	31.1	31.7
90	32.2	32.8	33.3	33.9	34.4	35.0	35.6	36.1	36.7	37.2
100	37.8	38.3	38.9	39.4	40.0	40.6	41.1	41.7	42.2	42.8
110	43.3	43.9	44.4	45.0	45.6	46.1	46.7	47.2	47.8	48.3
120	48.9	49.4	50.0	50.6	51.1	51.7	52.2	52.8	53.3	53.9

Celsius to Fahrenheit

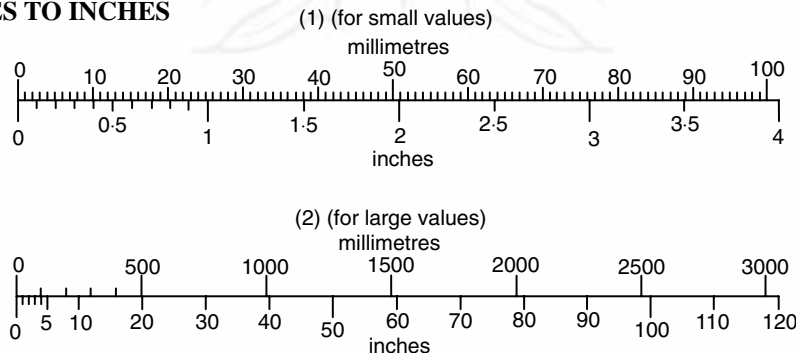
°Celsius

	0	1	2	3	4	5	6	7	8	9
°C	Degrees Fahrenheit									
-70	-94.0	-95.8	-97.6	-99.4	-101.2	-103.0	-104.8	-106.6	-108.4	-110.2
-60	-76.0	-77.8	-79.6	-81.4	-83.2	-85.0	-86.8	-88.6	-90.4	-92.2
-50	-58.0	-59.8	-61.6	-63.4	-65.2	-67.0	-68.8	-70.6	-72.4	-74.2
-40	-40.0	-41.8	-43.6	-45.4	-47.2	-49.0	-50.8	-52.6	-54.4	-56.2
-30	-22.0	-23.8	-25.6	-27.4	-29.2	-31.0	-32.8	-34.6	-36.4	-38.2
-20	-4.0	-5.8	-7.6	-9.4	-11.2	-13.0	-14.8	-16.6	-18.4	-20.2
-10	+14.0	+12.2	+10.4	+8.6	+6.8	+5.0	+3.2	+1.4	-0.4	-2.2
-0	32.0	30.2	28.4	26.6	24.8	23.0	21.2	19.4	+17.6	+15.8
+0	32.0	33.8	35.6	37.4	39.2	41.0	42.8	44.6	46.4	48.2
10	50.0	51.8	53.6	55.4	57.2	59.0	60.8	62.6	64.4	66.2
20	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2
30	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2
40	104.0	105.8	107.6	109.4	111.2	113.0	114.8	116.6	118.4	120.2
50	122.0	123.8	125.6	127.4	129.2	131.0	132.8	134.6	136.4	138.2

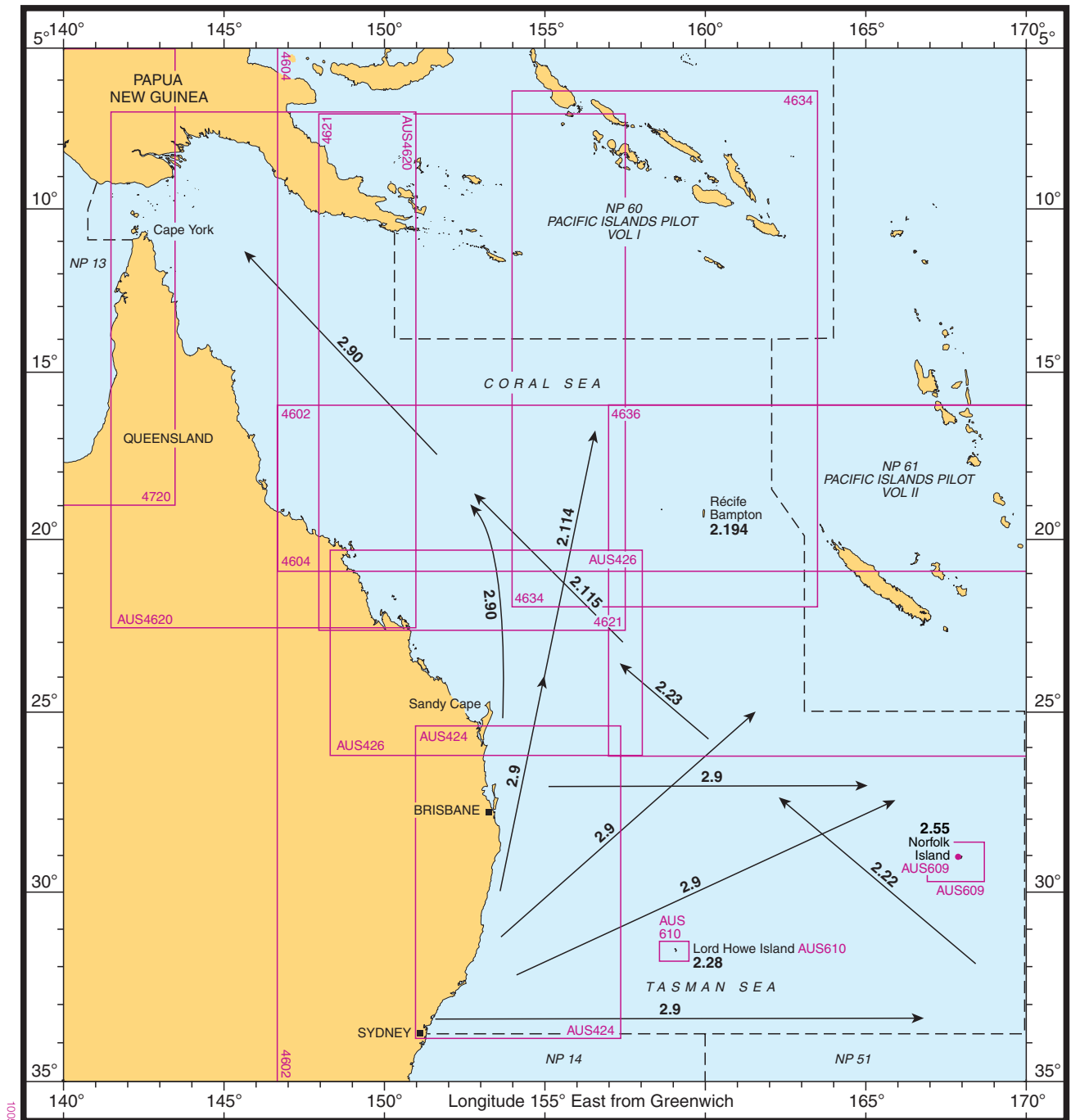
HECTOPASCALS TO INCHES



MILLIMETRES TO INCHES



Chapter 2 - Tasman and Coral Seas



CHAPTER 2

TASMAN AND CORAL SEAS

GENERAL INFORMATION

Chart 4060

Scope of chapter**2.1**

- 1 This chapter describes the offshore routes through those parts of Tasman and Coral Seas lying within the limits of the book, and the outlying islands, dangers and features which may affect those routes. Only Lord Howe and Norfolk Islands, in the S part of the area, are inhabited and able to offer limited port services; elsewhere there are no external resources available to the mariner offshore, and the only human habitation is on Willis Islets (16°17'S 149°58'E) (2.147).

Routes**2.2**

- 1 Routes described in this chapter are generally those listed in *Ocean Passages for the World*.

Topography of the seabed**2.3**

- 1 The general pattern of oceanic basins and plateaux in the whole area (1.140) is one of depths greater than 4000 m in many places in the basins, rising to below-water banks and drying reefs on the plateaux, where they may be of considerable significance to navigation. In the S part of the area, Lord Howe and Norfolk Islands rise from separate oceanic ridges.

A general feature of the whole area is that depth changes in the vicinity of dangers are likely to be rapid.

Navigation amongst coral**2.4**

- 1 See 1.3.

Local knowledge**2.5**

- 1 Throughout this chapter local knowledge is required for any passage that involves close proximity to outlying reefs or dangers for which the reference chart quoted is of too

small a scale for safe navigation. The requirement is repeated in appropriate places in the text.

Restricted area**2.6**

- 1 Trawling is prohibited in the following area:

A: 23°15'S 167°00'E.

B: 23°15'S 169°00'E.

C: 25°30'S 169°00'E.

D: 25°30'S 167°00'E.

Only the S part of this area is contained within this chapter and concerns only certain routes E-bound from Australian ports and through routes from New Zealand.

For further information see *Pacific Islands Pilot Volume II*.

Flow**2.7**

- 1 The general pattern of water movement throughout the area is described at 1.144. Local variations, where known, are described in the relevant parts of the text of this chapter.

Caution. No precaution should be omitted when navigating in the vicinity of reefs in Coral Sea. In the immediate vicinity of a reef the current may be deflected and is generally accelerated. The usual set is W, but this is probably much influenced by wind.

Coast radio stations**2.8**

- 1 Coast radio stations, which are situated in New South Wales, Queensland, Torres Strait and in Papua New Guinea, within the limits of this book, are mentioned in the relevant chapters. Other stations E and SE of the limits of the book are situated in Vanuatu (Port-Vila (17°44'S 168°33'E)), Nouvelle-Calédonie (Nouméa (22°16'S 168°28'E)) and New Zealand (Taupo (39°27'S 175°41'E)); see *Admiralty List of Radio Signals Volume 1(2)* for details.

TASMAN AND CORAL SEAS SOUTH OF SANDY CAPE AND RÉCIFS BELLONA

GENERAL INFORMATION

Chart 4602

Scope of section**2.9**

- 1 This section describes the routes through Tasman and Coral Seas S of Sandy Cape (24°42'S 153°16'E) and Plateau des Bellona (Récifs Bellona Sud (21°54'S 159°28'E)) which consist of the N-bound coastal route, routes leading between SE and NE from Australian mainland ports and through routes from the South Pacific Ocean NW to Solomon Sea or to Torres Strait.

Volcanic activity**2.10**

- 1 Some submarine volcanic activity occurs in the general area of Norfolk Ridge between Norfolk Island (29°02'S

167°56'E) and Nouvelle-Calédonie, 400 miles farther N, as shown on the chart.

In 1982 it was reported that the glow from the submarine volcano (27°45'S 169°09'E) was visible at a distance of 15 miles on a dark night.

A general description of volcanic activity throughout the whole area of this book is given at 1.143. Guidance on underwater volcanic activity is also given in *The Mariner's Handbook*.

Principal marks**2.11**

- 1 **Coastal landmarks.** The numerous landmarks available for the coastal passage N from the vicinity of Port Jackson (33°50'S 151°17'E) to Sandy Cape (24°42'S 153°16'E) are described in the text of Chapters 3, 4 and 5.

Outlying landmarks:

Mount Gower (31°35'S 159°05'E) (2.34) on Lord Howe Island.

2 Ball's Pyramid (31°45'S 159°15'E) (2.34).

Mount Pitt (29°01'S 167°56'E) (2.61) and Mount Bates, on Norfolk Island.

Phillip Island summit (29°07'S 167°57'E) (2.61).

Outlying major light:

Mount Pitt Aero Light (29°01'S 167°56'E) (2.61) on Norfolk Island.

North-bound coastal routes**General information****2.12**

1 The routes leading generally N up the E coast of Australia to Torres Strait or destinations in the NW Pacific Ocean pass the coasts of New South Wales and Queensland between Port Jackson (33°50'S 151°17'E) and Sandy Cape (24°42'S 153°16'E). These routes follow the general pattern of the coastal passage between those points, described section by section in Chapters 3 and 5.

(Directions follow for the Outer Route to Torres Strait at 2.96

and for routes to Solomon Sea at 2.112)

2.13

1 The route from the SE coast of Australia to Honolulu similarly follows the coast of New South Wales until abreast Sugarloaf Point (32°27'S 152°32'E), from whence it leads NNE and diverges slowly from the coast to pass 30 miles E of Cato Island (23°15'S 155°32'E) (2.180). The route passes Queensland, Brisbane, Moreton, Recorder and Fraser Seamounts, which lie near the meridian of 155°E between latitudes 27°50'S and 24°25'S.

(Directions from Cato Island onwards follow at 2.114)

East-bound routes from Australian ports**General information****2.14**

1 The relevant routes listed in *Ocean Passages for the World* are given from Sydney (Port Jackson (33°50'S 151°17'E)) and from Brisbane (Caloundra Head (26°48'S 153°08'E)). Port Jackson is described in *Australia Pilot Volume II*.

From Sydney**2.15**

1 **Routes leading east** to Auckland or Papeete pass:
S of Taupo Seamount (33°10'S 156°10'E), thence:
S of Wanganella Bank (32°31'S 167°24'E) (2.54).

2.16

1 **Routes leading north-east** to Nuku'alofa, Apia or Suva pass:

Barcoo Seamount (32°35'S 156°15'E), thence:

Clear of Lord Howe Island (31°32'S 159°05'E) (2.28) and clear of Ball's Pyramid, 13 miles farther SE; see description at 2.34 and Caution at 2.47. Thence:

2 SE of Elizabeth Reef (29°56'S 159°04'E) (2.49), thence:

NW of Norfolk Island (29°02'S 167°56'E) (2.55), thence:

Clear of areas of known or possible submarine volcanic activity (2.10) in the general area between Norfolk Island and Nouvelle-Calédonie, 400 miles farther N.

2.17

1 The route leading NE to Nouméa passes:
Derwent Hunter Seamount (30°50'S 156°15'E), thence:
NW of Middleton Reef (29°28'S 159°06'E) (2.52), thence:
SE of Gifford Tablemount (26°50'S 159°24'E).

From Brisbane**2.18**

1 **Routes leading south-east** to Bluff or Wellington, or to the Southern Route of the South Pacific Ocean via Cook Strait, pass:

Britannia Seamounts (28°15'S 155°35'E) and Stradbroke Seamount (29°04'S 155°46'E), thence:
SW of Elizabeth Reef (29°56'S 159°04'E) (2.49), thence:

Clear of Lord Howe Island (31°32'S 159°05'E) (2.28) and clear of Ball's Pyramid, 13 miles farther SE; see description at 2.34 and Caution at 2.47.

2.19

1 The route leading SE to Auckland passes:
Queensland Seamount (27°35'S 155°10'E), thence:
NE of Middleton Reef (29°28'S 159°06'E) (2.52), thence:
NE of Wanganella Bank (32°31'S 167°24'E) (2.54).

2.20

1 **Routes leading east** to Suva, Apia, Nuku'alofa, Papeete or Panama pass:

Brisbane Seamount (26°57'S 155°07'E), thence:
Gifford Tablemount (26°50'S 159°24'E), and:
S of Banc Capel (25°05'S 159°40'E) (2.79), thence:
Clear of areas of known or possible submarine volcanic activity (2.10) in the general area between Norfolk Island (29°02'S 167°56'E) and Nouvelle-Calédonie, 400 miles farther N.

2.21

1 The route leading ENE to Nouméa passes:
Moreton Seamount (26°01'S 154°56'E), thence:
Midway between Banc Capel (25°05'S 159°40'E) (2.79) and Banc Kelso (24°08'S 159°30'E) (2.80).

Through routes from south-east**To Nouvelle-Calédonie****2.22**

1 **From New Zealand.** Routes from Auckland or Wellington to Nouméa lead NNW through the E-most limits of this book, passing:

ENE of Norfolk Island (29°02'S 167°56'E) (2.55), thence:

Clear of areas of known or possible submarine volcanic activity (2.10) in the general area between Norfolk Island and Nouvelle-Calédonie, 400 miles farther N.

To the north-west Coral Sea**2.23**

1 Routes, described in the following paragraphs, from the South Pacific Ocean or from New Zealand all lead NW to the vicinity of 21°00'S 157°30'E.

2.24

1 **From the South Pacific Ocean** the route passes:
NE of Norfolk Island (29°02'S 167°56'E) (2.55), and:
Clear of areas of known or possible submarine volcanic activity (2.10) in the general area between Norfolk Island and Nouvelle-Calédonie, 400 miles farther N.

- 2 **From New Zealand.** Routes from Wellington or Auckland pass:
 Either side of Wanganella Bank (32°31'S 167°24'E) (2.54), thence:
 SW of Norfolk Island (29°02'S 167°56'E) (2.55).

Chart 4636

- 3 **Each of the above routes** then passes:
 NE of Banc Kelso (24°08'S 159°30'E) (2.80), thence:
 Either side of, or across, Banc Nova (22°34'S 159°14'E) (2.82), thence:
 SW of Récifs Bellona Sud (21°54'S 159°28'E) (2.84), thence:
 4 SW of Brisant Ouest (21°25'S 158°44'E) (2.87), thence:
 SW of Récif Booby (20°59'S 158°32'E) (2.88); Récif Bellona Nord-Ouest (2.89) lies 6 miles farther N.
(Directions continue, for the route to Torres Strait at 2.115 and for routes to Solomon Sea at 2.116)

Chart 4602

To the Inner Route of Great Barrier Reef 2.25

- 1 **From New Zealand.** Routes from Wellington or Auckland lead NW and WNW respectively, passing:
 Either side of Wanganella Bank (32°31'S 167°24'E) (2.54), thence:
 NE of Middleton Reef (29°28'S 159°06'E) (2.52), thence:
 SW of, or across, Gifford Tablemount (26°50'S 159°24'E), thence:

Chart Aus 426

- 2 Either side of, or across, Recorder Seamount (25°00'S 155°00'E), and:
 SW of Fraser Seamount (24°27'S 155°16'E), thence:
 NE of Sandy Cape (24°42'S 153°16'E) (5.41).
(Directions for Capricorn Channel and the Inner Route follow at 5.65, and for Curtis Channel at 5.80)

Anchorage

Coastal anchorages

2.26

- 1 The numerous coastal anchorages between Port Jackson (33°50'S 151°17'E) and Sandy Cape (24°42'S 153°16'E) are described in Chapters 3, 4 and 5.

Distant offshore anchorages

2.27

- 1 Lord Howe Island (31°32'S 159°05'E) (2.39).
 Ball's Pyramid (31°45'S 159°15'E) (2.47).
 Elizabeth Reef (29°56'S 159°04'E) (2.51).
 Middleton Reef (29°28'S 159°06'E) (2.53).
 Norfolk Island (29°02'S 167°57'E) (2.59).
 Récifs Bellona Sud (21°54'S 159°28'E) (2.84).
 Récif Bellona du Milieu (21°24'S 158°51'E) (2.87).
 Récif Booby (20°59'S 158°32'E) (2.88).
 2 **Caution.** The reef anchorages listed above may be more suited to vessels specifically working amongst the reefs,

than to those requiring shelter whilst on passage through Tasman and Coral Seas.

OUTLYING ISLANDS AND DANGERS

Lord Howe Island

Chart Aus 610

General information

2.28

- 1 **Position and function.** Lord Howe Island (31°32'S 159°05'E) and Ball's Pyramid 13 miles farther SE, both lying in a World Heritage Area, are the S-most of the outlying islands and reefs off the E coast of Australia. Lord Howe Island, which was discovered in 1788 and is a dependency of New South Wales, is a first port of entry, a customs port and a tourist centre. There is a resident population of 350 (2005), which may be increased by up to 400 visitors at any one time.

2.29

- 1 **Topography.** Lord Howe Island lies on a bank, within the charted 200 m depth contour, which extends between 3 and 9 miles offshore. The island is of volcanic origin and mountainous at its S and N ends, with luxuriant vegetation, the trees being mostly palms and banyans. The centre part of the island, where the airfield is sited, is formed of a narrow neck of sandhills about 12 m in height lying between Intermediate Hill (31°33'S 159°05'E) and Transit Hill, 1 mile farther NNW. To S of this low central part, the island rises to Mount Gower (31°35'S 159°04'E) (2.34). The population of the island is concentrated mainly on the N side of the central neck, where generally low land extends 1¼ miles NNW from Transit Hill before rising to the high cliffs of the N coast of the island between Malabar Hill (31°31'S 159°04'E) and Mount Eliza, 1 mile farther W. Fishy Point is the NW extremity of the island. The two mountainous areas and all offshore islands are Permanent Park Preserves.

- 2 The E coast of Lord Howe Island from King Point (31°36'S 159°04'E) to Mutton Bird Point, 3¼ miles NNE, is generally cliff-faced and indented with a number of bays, with points between them, as indicated on the chart. Wolf Rock (31°34'S 159°07'E) and Mutton Bird Island 1¼ miles farther NNW (2.38), with very foul ground between them, lie about 9 cables off this part of the coast.

- 3 From Mutton Bird Point to Soldiers Cap, an island 2¾ miles NW, the coast is formed by a number of bays. Of these, Blinkenthorpe Bay lies between Mutton Bird Point (31°33'S 159°06'E), which is cliff-faced on its N side and moderately steep-to, and Blinky Point 7½ cables NW. A sandy beach at the head of the bay is fronted by below-water rocks in its N part. The other bays are described at 2.42.

- 4 Admiralty Islands extend to 1½ miles NNE from Soldiers Cap.

A large part of the W coast of the island is fronted by coral reefs, on which there is heavy surf. The Lagoon, shallow and at LW only usable by small boats, lies between the reefs and the coast.

2.30

- 1 **Traffic.** Small supply vessels operate a regular fortnightly service from the Australian mainland; there are occasional calls by larger vessels.

Port Authority: Maritime Services Board of New South Wales, Circular Quay West, Sydney, New South Wales

2000, Australia. An officer of the Board acts as the local Maritime Area Superintendent.

Limiting conditions

2.31

- 1 **Tidal levels.** See information in *Admiralty Tide Tables*. Mean maximum range about 1.5 m; mean minimum range about 0.9 m.

Maximum size of vessel handled. Small vessels up to about 45 m LOA, 8 m beam and 2.5 m draught can negotiate North Passage (31°31'5S 159°02'7E) at HW and berth alongside the jetty close NW of Signal Point, 7 cables farther E. Such vessels will however take the ground alongside at LW.

Larger vessels must anchor off.

- 2 **Local weather.** Violent, shifting squalls may occur during strong winds. The area most affected is on the SE side of the island up to 1½ miles offshore between Gower Island (31°36'S 159°04'E), cliff-faced, and Red Point, 2 miles farther NE and steep-to, where squalls alternating with periods of dead calm may be experienced during offshore winds. Small craft should exercise caution as advised on the chart (plan of Lord Howe Island).

Passages into the lagoon are periodically closed due to weather conditions.

Arrival information

2.32

- 1 **Port radio.** Continuous listening watch is maintained on VHF Channel 16; see *Admiralty List of Radio Signals Volume 6(4)*.

Outer anchorages. Although there are moderate depths at convenient distances off the island, anchorage cannot be considered good owing to areas of foul ground and the effects of local weather.

- 2 Vessels will be directed by the Marine Superintendent to an anchorage as dictated by the weather. Anchorages used are North East Roadstead (2.42) on the E side of the island, South West Roadstead (2.43) and off North and Blackburn Island Passages on the W side, and off the N side of the island.

Prohibited anchorage exists within the lagoon.

- 3 **Local knowledge** is required for passages through the reef and navigation within the lagoon.

Quarantine. See 1.64 for extracts from the Quarantine Act. Pratique is given for the island only.

Harbour

2.33

- 1 **Visual signals.** The following signals may be displayed from the flagstaff at Signal Point (31°31'5S 159°03'5E) to indicate the anchorage to be used.

Signal	Meaning
	South-west Roadstead.
	North-east Roadstead.
	No landing on either side.

Lord Howe Island – anchorage signals (2.33)

Tidal streams set generally N and S around the island following the trend of the coast, as indicated on the chart. The N-going stream commences at local LW and the S-going stream at HW. On the W side of the island the N-going stream floods through the passages and across the fringing reef into the lagoon; the reverse occurs on the falling tide.

- 2 The stream attains a rate of 1 kn in South West Roadstead and 1½ kn in North East Roadstead, as shown on the chart. Through Sugarloaf Passage the stream is strong and variable in both directions and particular care should be exercised.

Climate. Subtropical maritime in nature. Rainfall is abundant due to the mountainous nature of the island, and is generally in the form of heavy showers.

Climatic table see 1.192 and 1.193.

2.34

- 1 **Landmarks:**

Mount Gower (31°35'S 159°04'E), the highest summit of Lord Howe Island, rising very steeply from King Point at the S extremity, Mount Lidgbird, standing 1½ miles farther NNE, is separated from Mount Gower by The Big Saddle, a ridge about 360 m in height. These mountains are often shrouded in cloud.

Ball's Pyramid (31°45'S 159°15'E), a rocky cliff-faced islet rising abruptly from the sea to a remarkable peak.

Directions for Signal Point jetty

2.35

- 1 **North Passage** is the best channel through the reef and may be used by small vessels of a suitable size and draught (2.31), subject to local knowledge and the tide.

Leading beacons. From a position SW of Dawson's Point (31°31'4S 159°03'1E) which is cliffy, the alignment (054°) of a pair of beacons (white triangle, point up), standing on the cliff close NW of the point, leads NE through North Passage, passing (positions from Dawson's Point):

- 2 SE of North Head (7 cables W); The Bombora, a below-water reef which dries occasionally (charted as drying 2.3 m), lies 1 cable SSE of the head. And:
NW of Yellow Rock (depth 1.7 m) (4½ cables SW), thence:
- 3 Between the reefs (awash) (3 cables WSW) fringing the inner end of the passage; a stranded wreck lies on each side of the inner end.

When clear of North Passage the track leads generally E to the berth (3½ cables E) as guided by local knowledge, passing S of Dawson's Point, and S of the drying reef extending S from Hunter Bay. No more detailed directions are available.

Other reef entrances

2.36

- 1 **Man of War Passage** (31°33'4S 159°04'2E) is the S-most entrance to the lagoon. A rock (awash) lies nearly in mid-channel within the entrance. No directions are available.

Erscofts Passage (31°33'1S 159°04'0E) is separated from Man of War Passage by a drying reef. The alignment (060°) of two lone pine trees leads through the passage.

Blackburn Island Passage is entered 3½ cables SW of Blackburn Island (31°32'1S 159°03'4E).

Sugarloaf Passage

2.37

- 1 The passage lies between Soldiers Cap (31°30'5'S 159°03'8'E) and the nearest of Admiralty Islands, 3 cables farther NE. See 2.33 for remarks on the attention required to tidal streams in the passage.

2.38

- 1 **Directions.** From a position in open waters NW of Sugarloaf Passage, the line of bearing 134° of Mutton Bird Island (31°32'S 159°07'E) leads SE in mid-channel through the passage. Mutton Bird Island is cliff-faced; Sail Rock, above water, with a below-water rock close S of it, lies close NW of the island. The track passes (positions from Soldiers Cap):
- 2 SW of Noddy Island (4 cables N); a rock lies between the island and Roach Island, the largest of Admiralty Islands, 1½ cables farther NE. All Admiralty Islands are cliff-faced. Thence:
SW of Sugarloaf Island, also known as The Sugarloaf, (3 cables NE); a small drying reef lies ½ cable farther N. And:
- 3 NE of Soldiers Cap, which is cliff-faced; a spit of foul ground extending 1 cable NNE from the island is the outer danger; Mokambo Rock, which dries 1.3 m, lies on the spit. The channel between Soldiers Cap and Lord Howe Island, 1½ cables S is foul. Thence:
- 4 NE of a 3.9 m patch known locally as Malaita Rock (1½ cables ESE), thence:
NE of Stevens Point (7½ cables SE) or as otherwise required.

Anchorage

2.39

- 1 There are six designated anchorages off Lord Howe Island, numbered LH1 to LH6 respectively, as shown on the chart.

Caution. Main engines should be kept at short notice when anchoring during the winter months.

2.40

- 1 **North Passage.** LH1 anchorage lies 6 cables WSW of Dawsons Point (31°31'S 159°03'E).

In 1985 HMAS *Supply* (11 200 grt) obtained anchorage to seaward of North Passage in winds from NNE at 25 kn with Signal Point flagstaff (31°31'4S 159°04'0E) (not charted) bearing 077° distant 1.28 miles. A heavy swell in the berth made boatwork difficult.

2.41

- 1 **North coast of Lord Howe Island.** LH2 anchorage lies off the N side of Lord Howe Island 3 cables ENE of Curio Point (31°31'S 159°03'E) in a charted depth of about 15 m.

2.42

- 1 **North East Roadstead.** LH3 anchorage lies 4 cables NNW of Stevens Point (31°31'S 159°04'E) in a charted depth of about 15 m. This is a suitable anchorage when no swell is running through Sugarloaf Passage, but the bottom is foul in places. In W winds landing can be effected on Ned's Beach, a sandy beach at the head of the bay.

- 2 LH4 anchorage lies 4 cables SE of Stevens Point, in charted depths of 10 to 15 m. In 1992 HMAS *Gawler* (LOA 42 m, draught 1.8 m) anchored farther offshore off Middle Beach in a depth of 17 m with Brodie's Point, (31°32'S 159°05'E) bearing 165°. In winds force 7 to gale 8 from between W and SW, the ship rode head to wind with a 0.5 to 1 m swell generally abeam. The bottom is sand with occasional rocky outcrops. The bay between Brodie's Point and Stevens Point, 7 cables NW (2.38), is generally

foul but a good landing, recommended for daylight use only, is available on Middle Beach.

2.43

- 1 **South West Roadstead.** LH5 anchorage lies 5 cables WSW of the entrance to Erscofts Passage (31°33'1S 159°04'0E), in depths of 16 to 23 m. Strong squalls may be experienced in the area. Care must be taken to avoid the charted shoal areas N and S of the berth.

2.44

- 1 **Blackburn Island Passage.** LH6 anchorage lies 7 cables WSW of Blackburn Island (31°32'1S 159°3'4E) in depths of 16 to 20 m.

Berth

2.45

- 1 Signal Point jetty (31°31'4S 159°03'5E) is of solid construction, 64 m in length, 6 m wide and 2.1 m in height above MHWS at its outer end. Depths of 0.9 to 1.5 m are available alongside.

Port services

2.46

- 1 **Repairs:** mobile crane.
Other facilities: small hospital; emergency cases can be airlifted to the Australian mainland.
Supplies: provisions in limited quantities from several small retail stores; fresh water at the jetty; diesel and petrol in drums, or in larger amounts by prior arrangement.
Communication. There is regular communication by air and sea with the Australian mainland.

Ball's Pyramid

2.47

- 1 **General information.** Ball's Pyramid (31°45'S 159°15'E) (2.34), with Ball's Islet and other islets and rocks in the vicinity, lies 13 miles SE of Lord Howe Island on a separate bank, within the charted 200 m depth contour, which extends between 2 and 7 miles from the pyramid.

Landing can occasionally be effected at a point on the NE side of Ball's Pyramid.

- 2 **Caution.** The area 5 miles S of Ball's Pyramid, where heavy breakers have been reported during SW gales, should be avoided. Patches of 8.8 and 16.4 m, lying about 1½ miles SSE of South East Rock (31°47'S 159°17'E), which is steep-to, are the only known shoal depths in the vicinity.

- 3 **Anchorage** may be obtained in a depth of 18 m, sand, WSW of Ball's Pyramid and 3 cables E of Wheatsheaf Islet, but there is very little shelter. An above-water rock lies close E of Wheatsheaf Islet and another lies close NE of Observatory Rock, 3 cables farther N.

Elizabeth and Middleton Reefs

Chart 4602 (see 1.15)

Currents

2.48

- 1 Currents in the vicinities of the two reefs are very variable in direction and rate. Sets E and NE, or in a W direction, are probably more frequent than any other. A rate of 2 kn has been observed. Local counter-currents may be expected within 1 mile of the edges of the reefs.

Elizabeth Reef

2.49

- 1 **General information.** Elizabeth Reef (29°56'S 159°04'E) is a coral reef the edge of which, except for a few rocks, covers at HW. The reef encloses a lagoon, studded with coral patches which either dry or have depths less than 2 m over them.

To seaward of the outer edge of the reef depths increase fairly quickly except off the NW side where depths less than 50 m extend up to 1¼ miles from the reef.

2.50

- 1 **Directions for approach.** A depth of 46 m (chart 4602) lies 3 miles from the reef in the approach from SE.

Under favourable conditions the reef might be seen from aloft from a distance of about 5 miles. At HW, in E or SE winds, seas are unlikely to break over the W and NW sides of the reef and great care is then necessary in the approach from W, especially in the forenoon with the sun ahead, when breakers on the E side of the reef may not be seen until too close to avoid the nearer danger.

- 2 **Useful mark:**

Wreck (29°56'0S 159°01'6E), stranded prior to 1978 on the W extremity of the reef. Reported (1983) to give a good response on radar.

2.51

- 1 **Anchorage.** Fair anchorage, with shelter from the prevailing E and SE winds, may be obtained in a depth of 18 m off the NW side of the reef. A drying sand cay lies 5 cables ESE of the anchorage. Boats are reported to be able to cross the reef on either side of the position of the sand cay at half tide in E winds.

- 2 Small vessels of appropriate size and draught might also obtain anchorage within the entrance in the NE side of the reef in depths of 5 to 7 m, broken coral. The entrance, which is 1 cable in width, is difficult and dangerous in E winds, but the berth within is sheltered from all but NE winds.

Middleton Reef

2.52

- 1 **General information.** Middleton Reef (29°28'S 159°06'E) lies on a bank on which depths less than 200 m extend between 7½ cables and 1¼ miles from the outer edge of the reef. Practically the whole of the outer edge dries. The bottom is coral grit.

The lagoon within the reef is studded with drying coral patches and otherwise has general depths of 0.3 to 1.8 m.

- 2 **Useful mark for approach:**

Wreck of SS *Runic* (29°27'0S 159°03'3E), stranded in 1961; broken into several sections and visible at 15 miles (1976); reported (1998) still to give a good response on radar. Three other stranded wrecks lie on the reef.

2.53

- 1 **Anchorage** may be obtained in The Sound midway between North West Horn (29°27'S 159°04'E) and North East Horn 1½ miles farther NE, in depths of 12 to 26 m. False Bight, lying 2¼ miles ENE of North West Horn, is a narrow, rapidly shoaling indentation in the drying reef, and should be avoided.

Small vessels of a suitable size and draught may also obtain anchorage in Herald Haven, 1½ cables S of the point of North West Horn, in depths of 9 to 11 m. The berth is well sheltered by the reefs.

Wanganella Bank

Chart 4602

General information

2.54

- 1 Wanganella Bank (32°31'S 167°24'E), with depths less than 100 m over it, lies on West Norfolk Ridge between New Zealand and Norfolk Island. There is a least known

depth of 82 m. Two shoals of 119 m and 138 m lie 13 miles NNE of the bank, which is mostly unexamined.

Remarks on the general nature of the seabed throughout the area are at 2.3.

Norfolk and Phillip Islands

Chart Aus 609 and plan of Norfolk and Phillip Islands

General information

2.55

- 1 **Position and function.** Norfolk Island (29°02'S 167°57'E), discovered by Captain Cook in 1774, was first settled by Europeans in 1788. Together with the adjacent Phillip and Nepean Islands the island is an External Territory of the Commonwealth of Australia, with its own administration. The resident population of about 1800 is usually increased by up to 600 temporary residents and a further 2000 visitors at any one time. The town of Kingston lies on the S side of the island.

- 2 The island is not self-supporting and relies on imports of food, manufactured goods and fuel to augment its own resources. The main source of income is derived from the tourist industry. Tourists arrive by sea and air and number over 27 000 annually.

2.56

- 1 **Topography.** The islands stand on a bank, with depths less than 100 m over it, which extends about 34 miles S and 17 miles N from Norfolk Island. A remarkable shoal (depth 112 m), which lies 36 miles S of Norfolk Island at the S end of the bank, is flat-topped with a diameter of 1.2 miles and rises abruptly from depths greater than 500 m.

The islands are of volcanic formation.

- 2 The coast of Norfolk Island is generally high and precipitous, with almost inaccessible cliffs 60 to 90 m in height, fringed by a narrow coastal reef. Off-lying rocks, some of which may break in bad weather, and foul ground extend up to 4 cables offshore in places, as shown on the chart; large sections of the inshore waters are unsurveyed. Inland the island rises to its two highest peaks, Mounts Pitt and Bates (29°01'S 167°56'E) in the NW part, but is otherwise moderately flat, being broken by gullies and covered with grass, pines and white oak. The soil is rich and fertile. In the gullies, and on the slopes of Mount Pitt, there are thick growths of sub-tropical vegetation.

- 3 Two radio masts (framework masts, about 30 m in height) standing about 250 m apart on Anson Point (29°01'S 167°55'E) are prominent when viewed from SW and NNW; in line they bear 066¼°.

Captain Cook Monument (brown obelisk, 3 m in height), which stands in a grassy patch inland from a cliffy headland at the SE end of Duncombe Bay and 1 mile ESE of Point Howe (29°00'S 167°56'E), is a prominent mark for vessels passing that part of the coast.

- 4 Phillip Island (29°07'S 167°57'E), a red volcanic mass, rises to a remarkable peak (2.61) near the S end. The island is everywhere precipitous, with deep gullies, and almost bare except in the gullies and watercourses where some bushes and stunted trees grow.

- 5 Phillip Island is mostly fringed by a narrow reef. With the exception of the N side, the island is largely inaccessible due to the steep cliffs or to the many off-lying rocks. Caves exist in the cliffs and are particularly numerous in Dar Tomato Bay on the SW side of the island. South Rock and Hard Balli Stone, above-water, are the outer known dangers respectively S and N of Phillip Island.

2.57

- 1 **Traffic.** Infrequent visits are made by vessels to Norfolk Island to discharge fuel, LPG and dry cargo, with occasional visits by cruise liners and naval vessels.

Port Authority. Office of the Administrator, Kingston, Norfolk Island.

Limiting conditions**2.58**

- 1 **Tidal levels.** See information in *Admiralty Tide Tables*. Mean spring range about 1.4 m; mean neap range about 0.8 m.

Maximum size of vessel handled. The recognised anchorages are used regularly by cargo vessels of about 172 m LOA and 9 m draught.

Arrival information**2.59**

- 1 **Port radio.** A port operations and shipping movement service is operated when required; see *Admiralty List of Radio Signals Volume 6(4)*. Watch on VHF Channel 16 is usually maintained during working hours by customs, police and other organisations ashore.

Pilotage: not available or required.

Anchorage and mooring areas. Anchorage may be obtained off Kingston (29°04'S 167°57'E), on the S coast of Norfolk Island, or in Cascade Bay 3 miles farther NNE. There are facilities in Ball Bay (29°03'S 167°59'E) for oil and LPG tankers to discharge.

2.60

- 1 **Tidal streams.** The general pattern of the tidal stream in open waters clear of the islands is to set SW on the rising tide for 5 hours and NE on the falling tide for 7 hours. Rates of 1½ to 3 kn are attained in each direction. Close to the islands these streams are deflected around the coastlines, as indicated in places on the chart. The NE-going stream setting towards Norfolk Island is split at Rocky Point (29°03'S 167°55'E) and sets very strongly over the rocky ledge extending from the point.
- 2 Outside Sydney Bay, in a position 1½ miles SSW of Kingston jetty (29°04'S 167°57'E), the stream sets WNW on the rise, and ESE on the fall of the tide, at rates of 1 to 2 kn.

Off Cascade Bay, on the NE side of the island, the streams set in similar directions on the rise and fall of the tide, but with a spring rate of 1 kn. There may be a set W into the bay on the rising tide.

Climate: mild, sub-tropical oceanic. See climatic table at 1.192 and 1.194.

2.61

- 1 **Landmarks:**

Mount Pitt summit (29°01'S 167°56'E); an aero light, see below, is displayed from the summit.

Mount Bates summit (3 cables NNE of Mount Pitt). Phillip Island summit, known locally as Jacky Jacky (29°07'S 167°57'E).

Major light:

Mount Pitt Aero Light (29°01'S 167°56'E). This may only be displayed when aircraft are expected.

Anchorage**2.62**

- 1 **General information.** Anchorages are allocated by the Port Authority.

Caution. None of the anchorages are sheltered. Masters are advised to get underway if a strong onshore breeze develops.

Chart Aus 609 plan of Norfolk and Phillip Islands, plan of Sydney Bay

Kingston anchorage**2.63**

- 1 **General information.** Anchorage during the summer months may normally be obtained in Sydney Bay, which lies to seaward of the town of Kingston and between Nepean Island (29°04'S 167°58'E) and Point Ross, 1½ miles farther WNW. Heavy breakers usually occur outside the almost continuous detached reef which fronts Kingston.

- 2 The bottom is sand. Holding ground is reported to be poor, with a likelihood of dragging when the wind is athwart the tidal stream, or above 25 kn.

The combination of strong SW winds, low barometric pressure and spring tides causes high seas off Kingston, but this does not occur more frequently than once every 6 months. Rapid changes in sea and swell conditions are however frequently experienced in the bay.

Passengers and cargo may be landed by boat or lighter at Kingston Jetty (29°03'·5S 167°57'·2E) (2.73).

2.64

- 1 **Directions.** From a position in open waters between Point Hunter (29°03'·7S 167°57'·7E) and Phillip Island 3 miles farther S the track leads NNE into Sydney Bay.

Leading beacons:

- Front beacon (white triangle, point up) (29°03'·4S 167°57'·3E) standing near the root of Kingston jetty; a yellow building stands E of the beacon.
- 2 Rear beacon (similar mark) (70 m farther NNE), standing at an elevation of about 20 m on the sloping ridge of a hill. The beacon is obscured from W by vegetation; a house with a green roof, standing farther inland on the same alignment, and higher, assists identification of the beacon.

The alignment (016°) of the above beacons leads towards the anchorages, passing (positions from Point Hunter):

- 3 WNW of Nepean Island (5 cables SSE), formed of coral sandstone and sparsely covered with grass and scrub. An isolated patch (depth 4.3 m) 2½ cables SE of the island, is the outer known danger SE; depths less than 10 m extend 1½ cables W from the island. The channel between Nepean Island and Point Hunter is obstructed with many dangers, as indicated on the chart, and should be used only by small craft, and with much caution. Dangerous seas build in this channel in weather from S or SW, particularly with the tidal stream in opposition to sea or swell. And:
- 4 ESE of Bumboras Rock (9½ cables W), lying near the outer edge of a reef of above and below-water rocks extending up to 5 cables E and ESE from Point Ross. The term bumbora, or bombora, is used in Australian waters to describe large and dangerous rollers which break heavily over a shoal depth, even in otherwise smooth seas.

2.65

- 1 **Useful marks:**

Pine tree (29°03'·7S 167°57'·7E) standing on Point Hunter.

Chimney (29°03'·60S 167°57'·7E), square, stone and 4 m in height, standing in the ruins of a former salt house on the NNW entrance point to Emily Bay.

- 2 Flagstaff (29°03'·4S 167°57'·2E), standing on Flagstaff Hill, the site of a former signal station.

This flagstaff is obscured from W by vegetation and requires careful identification as there are others in the vicinity.

2.66

- 1 **Anchorage** may be obtained on or near the alignment of the leading beacons (29°03'4S 167°57'3E) (2.64).

The most convenient anchorage, regularly used by vessels drawing 9 m, is found 5 cables WSW of Point Hunter (29°03'7S 167°57'7E) with the outer end of Kingston Jetty distant 4 cables, in depths of 18 to 22 m. The NE edge of Nepean Island is reported (1993) to bear 118° from the berth.

- 2 In 1974 HM Yacht *Britannia* (LOA 126 m, draught 5.2 m) found comfortable anchorage in a strong E wind in a depth of 29 m on the alignment (009°) of the head of Kingston Jetty with the flagstaff (2.65) 1¼ cables farther N, and the NE edge of Nepean Island bearing 104°. A white tide gauge stands at the head of the jetty.

An outer anchorage, 1 mile SW of Point Hunter in a depth of 33 m, has also been used.

Chart Aus 609 plan of Norfolk and Phillip Islands, plan of Cascade Bay

Cascade Bay anchorage

2.67

- 1 **General information.** Cascade Bay, which is entered between Steeles Point (29°02'S 168°00'E) (2.70) and Bird Rock 2½ miles NW, is the preferred anchorage and landing during the winter months. The bay is moderately secure and comfortable, even in strong SW winds; the holding ground is good. In summer the bay is exposed to the prevailing swell from E or SE.

Passengers and cargo may be landed by boat or lighter at a small jetty (2.75) situated 1¼ miles WNW of Steeles Point.

2.68

- 1 **Leading beacons.** A pair of leading beacons (white triangle, point up) stand on a hillside 1½ cables WSW of Cascade Jetty (29°01'3S 167°58'4E).

Directions. From a position NE of the head of the bay, the approach to the anchorage area and the jetty leads SW, being guided by the alignment of the above leading beacons.

Useful mark:

Bird Rock (29°00'3S 167°57'5E).

2.69

- 1 **Anchorage** may be obtained in a depth of 25 m, sand, 5 cables NE of Cascade Jetty, as shown on the chart.

Another anchorage, used regularly by MV *Capitaine Wallis*, draught 9 m and LOA 172 m (1993), may be obtained closer inshore, but local knowledge is required.

An outer anchorage, 1.1 miles N of the jetty, is shown on the chart.

Chart Aus 609 plan of Norfolk and Phillip Islands, plan of Ball Bay

Ball Bay

2.70

- 1 **General information.** Tankers discharging fuel and LPG in Ball Bay (29°03'S 167°59'E) anchor bows to seaward and secure with stern lines to bollards positioned about 150 m apart on the foreshore. Ships hoses are required to connect to pipelines ashore.

- 2 A rocky ledge extends to seaward of Point Blackbourne (29°03'S 168°00'E) at the NE entrance point to the bay, as shown on the chart. The same coastal ledge extends 1 mile farther N to Steeles Point, where foul ground extends to

3½ cables offshore. A fringing reef and foul ground also extend 2 cables to seaward of Collins Head, the SW entrance point to the bay, 6½ cables SW of Point Blackbourne. Between the two entrance points, depths within Ball Bay decrease almost uniformly towards a rocky shore.

- 3 Ball Bay is exposed to weather and swell from SE, which may cause dangerous surf off the two entrance points and on the rocky beach at the head of the bay.

Useful marks:

Two white cylindrical gas cylinders (29°03'S 167°59'E).

Port services

2.71

- 1 **Repairs:** none available.
Other facilities: three lighters and two launches for cargo handling; dry cargo can be worked at about 250 tonnes per day; customs; hospital; dentist.
- 2 **Supplies:** fuel and fresh water not normally supplied due to lighterage difficulties; fresh and dry provisions sufficient to meet requirements of a small vessel subject to adequate notice.

Communications: frequent air services carrying passengers and freight; regular cargo services by sea; both services primarily with Australia and New Zealand.

Chart Aus 609, plans of Norfolk and Phillip Islands, Sydney Bay, Cascade Bay

Harbours and landings

2.72

- 1 **General information.** There are no permanent moorings in Sydney Bay or elsewhere. Local boats and lighters are launched and recovered by crane at Kingston and Cascade Bay Jetties.

2.73

- 1 **Kingston.** There is a boat harbour on the NW side of Kingston Jetty (29°03'5S 167°57'2E) at the W end of the town. The jetty is 150 m in length, with a depth of about 0.3 m alongside, and is equipped with one or more cranes. Except in the calmest of conditions a swell of up to 2 m is usually found close to seaward of the off-lying coastal reef; a surge of 0.5 m is also experienced alongside at HW. Approach involves rounding the W end of the coastal reef and is particularly dangerous with sea or swell from SW, when breakers may extend across the width of the entrance.

- 2 Local knowledge is required for the boat harbour and for Emily Bay, below.

A narrow boat passage close W of Point Hunter (29°04'S 167°58'E) leading to Emily Bay, crosses the E end of the off-lying coastal reef in a least depth of 0.6 m. The approach is foul and tortuous and should only be attempted at HW.

2.74

- 1 **Nepean Island.** In favourable conditions landing can be effected over a sandy beach in a small cove on the SW side of the island (29°04'S 167°58'E) (2.64).

2.75

- 1 **Cascade Bay.** The jetty (29°01'3S 167°58'4E) in Cascade Bay is 25 m in length with a depth alongside of 1 m and is serviced by a mobile crane; it can be used at all states of the tide. Boats working cargo have priority over other users.

Some surging will be experienced alongside even in the best conditions. Use of the jetty in heavy weather from N and NW is extremely difficult due to waves breaking on the adjacent rocks.

2.76

- 1 **Headstone Point landing.** There is a landing place on a rocky ledge in a cove close SE of Headstone Point (29°03'S 167°55'E). The cove may be identified by a white, low headstone and monument, which lie inland on the side of an open, grassy hill, and are prominent from the offing to at least 5 miles.

The landing is approached through unsurveyed water and is very dangerous. It should only be attempted in an emergency, in the calmest conditions, and when a landing cannot be made at either Kingston or Cascade Bay.

2.77

- 1 **Phillip Island.** Landing can be made over the beach in Dar Stool Inlet, which lies 1 cable S of White Stone Outside Dar Stool on the N side of Phillip Island (29°07'S 167°57'E) (2.56). Landing is also sometimes possible in the next bay E, lying close SE of Red Stone. Both bays are fronted by drying rock ledges; the beaches are formed of rock, stone and shingle.

A prominent pine tree stands on the N slope of Phillip Island, 3 cables SSW of Red Stone.

Bancs Capel, Kelso, Argo and Nova

Chart 4636

General information

2.78

- 1 The waters between latitudes 26° and 22°S and the meridians of 159° and 160°E, in which the above banks are situated, are traversed by a number of regularly used routes described in *Ocean Passages for the World*. Suitable precautions are recommended when navigating in the vicinity of these banks, as their general nature suggests that other shoal depths may exist.

Fish caught on Bancs Capel and Kelso have been reported to be poisonous.

Banc Capel

2.79

- 1 **General information.** Banc Capel (Capel Bank) (25°05'S 159°40'E) has depths less than 100 m over it, coral and sand, but has not been examined, nor its limits defined. On the bank there is a least known depth of 10 m (25°09'3S 159°45'4E). General unexamined depths less than 300 m, and reported depths of 56 and 85 m, lie within 20 miles of the bank.

Banc Kelso

2.80

- 1 **General information.** Banc Kelso (Kelso Bank) (24°08'S 159°30'E), with a least known depth of 15 m over its S end, has been defined but not examined. The bank is sometimes marked by tide-rips.

Banc Argo

2.81

- 1 **General information.** Banc Argo (Argo Bank) (23°10'S 159°35'E) has a least known depth of 274 m over it.

Banc Nova

2.82

- 1 **General information.** Banc Nova (Nova Bank) (22°34'S 159°14'E), which has a least known depth of 22 m over it, lies on a seamount ridge with a bottom of fine white sand. Depths between 277 and 335 m occur in a number of positions within 30 miles of the least known depth over the bank.

Récifs Bellona

Charts 4634, 4636

General information

2.83

- 1 **Plateau des Bellona,** which lies between latitudes 21°55'S and 20°28'S and the meridians of 158°25'E and 159°35'E, has depths of 21 to 70 m over it and is bordered by numerous banks and reefs, as indicated on the charts. Récif Olry (21°25'S 159°33'E), and Récif Desmazures 10 miles WNW, are two of the known dangers on the SE side of the plateau.

- 2 Banc Noël (20°34'S 158°34'E) is the outer known danger at the NW end of the plateau but is not marked by breakers. Bancs de la Seudre, a series of below-water reefs and banks, extend for 35 miles along the NE edge of the plateau.

Local knowledge is required for any passage over the plateau.

Récifs Bellona Sud

2.84

- 1 **General information.** Récifs Bellona Sud (South Bellona Reefs) (21°54'S 159°28'E), at the S end of the plateau, consist of two large reefs, which both dry about 1 m and together extend 9½ miles ENE/WSW. The N extremity of the E reef is marked by Nigger Head Rock (0.6 m in height), an unusually large black coral rock, which is readily identifiable. A smaller detached circular reef, awash and lying 1½ miles N of the rock, is also part of the group.

- 2 Lagoons enclosed by the two larger reefs have no apparent entrances and both retain impounded water at LW. The small detached reef has a boat entrance on its W side.

In 1984 a beacon, 8 m in height, was reported to stand on the W reef.

2.85

- 1 **Approaches.** The channel between Nigger Head Rock and the small reef, 1½ miles farther N, is reported to be strewn with shoals (not shown on the reference charts), and to have irregular depths of 5 to 24 m. This channel should not be attempted except with proper precautions and in good visibility.

- 2 The channel between the two large reefs is 5 cables in width and has a least depth of 12.8 m on a single line of soundings through it, but is reported to be foul. Similar caution is recommended.

An approach from W to an anchorage off the N side of the W reef is reported to present no difficulty.

2.86

- 1 **Directions.** From a position W of West Point (21°52'S 159°25'E), the W extremity of the W reef, the track leads E on 080° to an anchorage off the N side of the W reef, passing (positions from West Point):

S of a ridge of foul ground with a depth of 15 m over it (3½ miles NW), marked by overfalls; Bancs du Francis Garnier (depth 11 m) lie 6½ miles farther NW. Thence:

- 2 N of West Point distant 5 cables, crossing a patch, with a depth of 17 m over it, which lies 4 cables from the NW point of the reef. Below-water rocks lie off the point.

Anchorage, with shelter from S and SE winds, may be obtained off the N sides of the reefs where there are regular depths of 37 to 51 m, coral sand.

Récif Bellona du Milieu**2.87**

- 1 **General information.** Récif Bellona du Milieu (21°27'S 159°00'E) is the E of three reefs which together extend 16 miles E/W and have navigable passages between them. The reef dries 0.9 m and encloses a lagoon to which there is no entrance. Some boulders lie on the SW end of this reef and a below-water rock lies 2 miles SE of it.
- 2 The middle of the three reefs, 6 miles WNW of Récif Bellona du Milieu, dries 0.9 m and encloses a lagoon which has a boat entrance on its N side. The sea always breaks over the reef. Caye de l'Observatoire (Observatory Cay) (2.1 m in height), a bright coral sand cay which is the resort of great numbers of birds and some turtle, lies within the lagoon.
- 3 Brisant Ouest (Western Breaker), which lies 5 miles W of Caye de l'Observatoire, consists of a group of steep-to below-water rocks over which the sea breaks, but only at long intervals. Brisant Ouest is dangerous as it lies in the direction of the shipping routes and is far removed from the main reefs.
- 4 **Tidal streams** off these reefs set SW at rates up to 1 kn and NE at $\frac{3}{4}$ kn.

Anchorage may be obtained in a depth of 20 m, coral sand and coral rock, 5 cables N of Caye de l'Observatoire.

Récif Booby**2.88**

- 1 **General information.** Récif Booby (Booby Reef) (20°59'S 158°33'E) is steep-to on its W side and breaks at all times. Some black coral rocks, 1.2 to 1.8 m in height, lie on the S part of the reef which dries 0.9 m. The N end of the reef only partially uncovers at LW and is not easily seen. Below-water patches lie off the SE end, and a below-water rock lies 1 mile N of the NW end of the reef.
- 2 **Tidal streams** off the reef set SW and NE at rates up to $1\frac{1}{2}$ or 2 kn.

Anchorage may be obtained $2\frac{1}{2}$ cables off the NW end of the reef, in a depth of 8 m, keeping clear of the rock 1 mile N.

Récif Bellona Nord-Ouest**2.89**

- 1 **General information.** Récif Bellona Nord-Ouest, which lies 6 miles N of Récif Booby (20°59'S 158°33'E) (2.88), dries 0.9 m and is similarly steep-to on its W side. Some black coral rocks lie on the reef. A large patch, over which the sea breaks, lies $2\frac{1}{2}$ miles N of the reef.

CORAL SEA NORTH OF SANDY CAPE AND RÉCIFS BELLONA**GENERAL INFORMATION**

Charts 4602, 4603, 4604

Scope of section**2.90**

- 1 This section describes routes where, from a position off Sandy Cape (24°42'S 153°16'E), vessels bound N and W through Torres Strait may take either the Inner Route, entering through Capricorn Channel (5.57) or Curtis Channel (5.72), or the Outer Route (2.92) continuing through Coral Sea. Mainland ports on the Inner Route may also be approached through Great Barrier Reef entrances from Coral Sea. Other routes from abreast Sandy Cape lead N to Solomon Sea, or NE to destinations in the North Pacific Ocean.
- Through routes from SE lead either to Torres Strait or to Solomon Sea.

Local magnetic anomaly**2.91**

- 1 Local deflection of the compass has been observed in the vicinity of 19°52'S 157°31'E, W of Récife et Iles Chesterfield.

Outer Route from Sandy Cape to Torres Strait

Charts 4621, Aus 426, Aus 4620

General information**2.92**

- 1 The Outer Route to Torres Strait, which has been designated a recommended two-way Deep Water Route, provides a considerably more open, but longer, alternative to the Inner Route of Great Barrier Reef. See 2.7 for caution on passages in the vicinity of reefs in Coral Sea.

Principal marks**2.93****Landmarks:**

- 1 Stranded wreck (21°54'S 153°39'E) on Saumarez Reefs, conspicuous visually (1992) and on radar to 18 miles.
- Frederick Reefs Light (round stainless steel tower, 34 m in height; two galleries; concrete base) (20°56'S 154°24'E). The structure is reported to give a good radar response and to resemble a rocket in appearance.
- 2 Radio tower (automatic weather station) (17°07'S 152°00'E), white hut and tower, 14 m in height and conspicuous on radar, standing on Turtle Islet, Lihou Reef.

2.94**Major light:**

- 1 Lihou Reef Light (red GRP tower on stainless steel framework tower on 4 piles, 34 m in height) (17°08'S 152°09'E).

Other aids to navigation**2.95****Racons:**

- 1 Saumarez Reefs Light (21°40'S 153°46'E) (2.118).
 - Frederick Reefs Light (20°56'S 154°24'E) (2.93).
 - Lihou Reef Light (17°08'S 152°09'E) (2.94).
 - East Diamond Islet Light (17°27'S 151°04'E) (2.102).
- For details, see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 2.12)

2.96

- 1 From a position approximately 60 miles NE of Sandy Cape (24°42'S 153°16'E) (5.41) the track leads N, passing: E of the edge of Saumarez Reefs (2.118), which extends from South East Elbow (21°55'S 153°37'E) to North East Cay, 20 miles farther

NNE. The reefs should be given a berth of at least 2 miles.

The track then leads NNW, passing:

- 2 WSW of Frederick Reefs (20°58'S 154°22'E) (2.122).
WSW of Calder Bank (Reef) (20°42'S 154°11'E);
another bank, detached and with a least known
depth of 494 m over it, lies 6 miles S of Calder
Bank. Thence:
- 3 ENE of Marion Reef (19°07'S 152°17'E) (2.124),
thence:
ENE of Lihou Reef Light (17°08'S 152°09'E) (2.94)
at the NE extremity of Lihou Reef.

Charts 4621, Aus 377, Aus 4620

The track then leads NW towards Gulf of Papua,
passing:

- 4 SW of the SW extremity (10°11'S 145°33'E) of Eastern
Fields (2.174), thence:
Through Pandora Passage (2.98) passing between Boot
Reef and Portlock Reefs, thence NW and W towards Bligh
Entrance (9°13'S 143°58'E) (13.27). The track passes:
N of East Cay (9°24'S 144°13'E) and off-lying
dangers (11.78), thence:
N of Anchor Cay (9°22'S 144°07'E) (11.79).
(*Directions for Bligh Entrance and
Great North East Channel continue at 13.27*)

Side channels

Chart Aus 426

Saumarez Reefs 2.97

- 1 There is a channel 35 miles in width between Saumarez
Reefs (21°48'S 153°39'E) and the E edge of Swain Reefs
(5.24), 42 miles farther W. The channel is less frequently
used than that which passes between Saumarez and
Frederick Reefs.

Chart Aus 377

Pandora Passage 2.98

- 1 **General information.** Pandora Passage (9°51'S
144°46'E) lies between Boot Reef (10°00'S 144°41'E)
(2.177) and the S-most of the Portlock Reefs, 13½ miles
farther NNE (2.178). The passage has been incompletely
surveyed (1992) but is clear of known dangers. Charted
soundings suggest irregular depths through the passage; an
isolated shoal (depth 55 m, sounding doubtful), lying nearly
in mid-channel, rises sharply from surrounding depths.

Approaches to Great Barrier Reef entrances

Charts 4621, Aus 4620

General information 2.99

- 1 Approaches from NE to Hydrographers, Palm and
Grafton Passages, being the principal Great Barrier Reef
entrances, cross Coral Sea from Solomon Sea using the
passages E of Rossel Spit (11°27'S 154°24'E), or Jomard
Entrance (11°15'S 152°08'E).
Mariners approaching either the principal entrances
through Great Barrier Reef, or the numerous minor
entrances, from elsewhere in Coral Sea should be guided
by the charts and by the information on outlying reefs and
dangers given from 2.118 onwards.
- 2 Great Barrier Reef entrances are within the limits of the
Great Barrier Reef Marine Park which is an approved
Particularly Sensitive Sea Area (PSSA) (1.71). Areas which

are Designated Shipping Areas (1.74) are contained within
this PSSA. For further details of both, see the relevant
chart and *Australian Seafarers Handbook*.

Approaches to Hydrographers Passage

2.100

- 1 **General information.** Hydrographers Passage (19°48'S
150°22'E) may be approached from NE passing either E or
W of Lihou Reef (17°20'S 151°45'E). The passage W of
Lihou Reef, which leads through Diamond Passage and is
marked by a light, allows a saving of 24 miles in distance
from Jomard Entrance, and of 9 miles from Rossel Spit.

2.101

- 1 **Surveys.** Only reconnaissance surveys (1985–1989) have
been carried out over that part of Queensland Plateau
(2.129) lying within the 1000 m depth contour up to
90 miles N and NNE from Diamond Passage.

2.102

- 1 **Major light:**

East Diamond Islet Light (white GRP hut on
framework tower; 23 m in height) (17°26'S
151°05'E).

2.103

- 1 **Directions for passage east of Lihou Reef.** From
Solomon Sea the track leads SSW or S as required,
passing:

E of Lihou Reef Light (17°08'S 152°09'E) (2.94) at
the NE extremity of Lihou Reef.

The track then leads SW directly to the seaward
entrance (19°48'S 150°22'E) to Hydrographers Passage
(6.24), passing:

SE of Lihou Reef, thence:

NW of Marion Reef (19°07'S 152°17'E) (2.124).

Chart 4621 (see 1.15)

2.104

- 1 **Directions for approach through Diamond Passage.**
From Solomon Sea the track leads SSW or S as required to
Diamond Passage (17°29'S 151°14'E). The track then leads
SSW in mid-channel through the passage, which has a
least width of 10½ miles between the 500 m depth contours
on each side of the channel, outside which depths shoal
rapidly to Lihou Reef on the E side and to Diamond Islets
bank on the W. The track passes:

- 2 ESE of East Diamond Islet (17°26'S 151°05'E), 8 m
in height, thickly covered with bushes and grass
and reef-fringed out to 1½ miles except on its NW
side. A light (2.102) stands on the islet. And:
- 3 WNW of Lihou Reef (17½ miles farther ESE)
(2.130); the W edge of the reef rises to a ridge,
with depths of 15 to 40 m over it. The ridge gives
no visual indication of reefs, or discoloured water,
for a distance of 17 miles NNE from its SW
extremity (17°39'S 151°21'E). South West Cay
(2.136) lies 3½ miles E of the same extremity.

- 4 The track then continues SSW for about 145 miles to a
convenient position to seaward of the entrance (19°48'S
150°22'E) to Hydrographers Passage (6.24).

(*Directions continue at 6.36*)

Charts 4621, Aus 4620, Aus 372

Approach to Palm Passage (18°17'S 147°07'E)

2.105

- 1 **Landmark:**

Radio tower (16°28'S 147°52'E), 9 m in height,
standing near the middle of the W of the Holmes
Reefs (2.167); an automatic weather station, with
an array of instruments and aerials on an

aluminium framework tower, 10 m in height, on a concrete base, stands 30 m S of the tower. The tower can be detected on radar at a distance of 12 miles.

2.106

- 1 **Directions.** From Solomon Sea the track leads SW or WSW as required, keeping in depths greater than 1000 m and passing:

NW of a sand cay (15°42'S 149°37'E) at the NW end of Diane Bank (2.155); Queensland Plateau (2.129), with depths less than 1000 m over it, extends up to 45 miles WNW from the sand cay. Thence:

NW of Moore Reefs (15°56'S 149°14'E) (2.156), thence:

NW of Holmes Reefs (16°29'S 147°57'E) (2.167).

- 2 The track then leads generally S continuing in depths greater than 1000 m until making the final approach to Palm Passage. The track passes:

Clear of an isolated shoal (depth 40 m) (16°31'S 147°09'E), which rises sharply to a peak, thence:

W of Flora Reef (16°45'S 147°44'E) (2.166), thence:

W of McDermott Bank (17°14'S 147°51'E) (2.165).

(Directions continue at 8.19)

Charts 4621, Aus 4620

Approach to Grafton Passage

2.107

- 1 **Directions.** From Solomon Sea the track leads SW or WSW as required directly to Grafton Passage (16°39'S 146°15'E), keeping NW of the 1000 m depth contour of Queensland Plateau (2.129) between Diane Bank (16°00'S 149°40'E) and Holmes Reefs (16°29'S 147°57'E) as described at 2.106. The track then continues directly towards Grafton Passage, passing:

- 2 SE of Bougainville Reef (15°30'S 147°07'E), which dries at half tide and is difficult to see in calm weather when covered. Bougainville Reef Light (white GRP hut on stainless steel framework tower on concrete piles; 14 m in height) stands on the reef. Two wrecks stranded prior to 1962 lie on the reef. The older wreck, 8½ cables SE of the light, lies with its bow half on the reef; the sea breaks over the stern part, which is below-water. The other stranded wreck lies 1½ miles SSE of the light. In 1962 both wrecks gave better radar echoes than the light, out to a distance of 14 miles. Thence:

NW of the isolated shoal (16°31'S 147°09'E) (2.106).

(Directions continue at 9.23)

Charts 4621, Aus 426, Aus 4620

Alternative approaches from south-east

2.108

- 1 **General information.** From N of Saumarez Reefs (21°48'S 153°40'E) a safe route exists which passes to seaward of Great Barrier Reef and leads generally NW as far as One and a Half Mile Opening (14°25'S 145°27'E). The route gives access to the reef entrances at Palm Passage (18°17'S 147°07'E) (8.18) and Grafton Passage (16°39'S 146°15'E) (9.22), or as otherwise required.

2.109

- 1 **Outer edge of Great Barrier Reef.** Between its SE extremity and One and a Half Mile Opening about 640 miles farther NW, the outer edge of the reef is

described in the relevant parts of Chapters 5 to 9 in whatever detail may be available. The descriptions in those chapters are intended either to assist in identification of the various openings, or to emphasise the importance of keeping a safe distance to seaward of the reef. The route described here assumes that a safe distance from Great Barrier Reef will be maintained throughout, having due regard to the circumstances and conditions prevailing.

2.110

- 1 **Landmarks:**

Mount Pieter Botte (16°04'S 145°25'E) (chart Aus 373) (9.78).

Lizard Island (14°40'S 145°28'E) (9.146).

Major light:

White Tip Reef Rear Main Light (19°56'S 150°16'E) (6.33).

2.111

- 1 **Directions.** From a position N of Saumarez Reefs (21°48'S 153°40'E) (2.118) the track leads WNW, passing:
 - NNE of Elusive Reef (21°07'S 152°46'E) (5.28), thence:
 - NNE and well clear of the outer edge of Great Barrier Reef throughout, and:
- 2 SSW of Marion Reef (19°07'S 152°17'E) (2.124), thence:
 - SSW of the 1000 m depth contour of Queensland Plateau (2.129); Abington Reef (18°05'S 149°37'E) (2.139), Malay Reef (17°57'S 149°20'E) (2.139) and Flinders Reefs (17°38'S 148°26'E) (2.157) are the outer known dangers on this side of the plateau.
- 3 When abreast Palm Passage (18°17'S 147°07'E), the track leads generally NNW until abreast One and a Half Mile Opening (14°25'S 145°27'E), keeping in depths greater than 1000 m and passing:
 - WSW of McDermott Bank (17°14'S 147°51'E) (2.165), thence:
 - WSW of Flora Reef (16°45'S 147°44'E) (2.166), thence:
- 4 Clear of the isolated shoal (16°31'S 147°09'E) (2.106), thence:
 - WSW of Bougainville Reef (15°30'S 147°07'E) (2.107), thence:
 - WSW of Shark Reef (14°09'S 146°49'E) (2.172) and Osprey Reef (2.172), 9 miles farther NW.

Routes from Sandy Cape

(continued from 2.12)

Chart Aus 426

To Solomon Sea

2.112

- 1 **Directions.** From abreast Sandy Cape (24°42'S 153°16'E) the track leads N to a position 20 miles E of Frederick Reefs (20°58'S 154°22'E), passing:
 - W of Cato Bank (23°12'S 155°32'E) (2.180), thence:
 - W of West Islet (22°12'S 155°10'E) (2.183) lying near the W end of Wreck Reefs, thence:
- 2 W of Kenn Reefs (21°12'S 155°47'E) (2.185), thence:
 - E of Frederick Reefs (2.122).

Chart 4604

Tracks then lead N or NNW as required for entrances to Solomon Sea, passing:

W of Mellish Reef (17°25'S 155°52'E) (2.188).

(Directions continue in Pacific Islands Pilot Volume I)

Charts Aus 426, 4602, 4604

To Honolulu

2.113

- 1 **Directions from Brisbane.** The track from Brisbane to Honolulu leads NNE to position 21°30'S 156°05'E, passing: ESE of Sandy Cape (24°42'S 153°16'E), thence: WNW of Cato Bank (23°12'S 155°32'E) (2.180), thence: ESE of Bird Islet (22°10'S 155°28'E) (2.183), lying near the E end of Wreck Reefs, thence:
- 2 WNW of an area of shoal depths (21°48'S 156°37'E), centred about 55 miles SE of Kenn Reefs; a number of shoal depths between 18.3 and 104 m (60 ft and 57 fm) have been reported within 18 miles of this position, as shown on the chart. And:
- 3 ESE of Kenn Reefs (21°12'S 155°46'E) (2.185). The track then continues NNE to a position 30 miles NW of the N extremity (19°01'S 158°26'E) of Grand Récif Bampton, passing: WNW of Selfridge Bank (20°56'S 157°05'E) (2.187), thence:
- 4 WNW of Ilots Avon (19°32'S 158°14'E) (2.193), thence: WNW of Grand Récif Bampton (2.195).

The track then leads NE as described in *Ocean Passages for the World*, passing NW of Récifs Bampton.

2.114

- 1 **Directions from south-east Australia** (*continued from 2.13*). The track from the SE coast of Australia to Honolulu passes E of Cato Island (23°15'S 155°32'E) (2.180), continuing NNE to join the track from Brisbane (2.113) WNW of Récifs Bampton, keeping clear of the shoals and banks (2.113) which lie between Cato Island and Récifs Bampton.

Through routes from south-east

Charts 4602, 4621, Aus 4620

To Torres Strait

2.115

- 1 **Directions** (*continued from 2.24*). From (21°00'S 157°30'E) (2.23) the route from South Pacific Ocean or New Zealand to Torres Strait continues leading NW, passing: NE of Selfridge Bank (20°56'S 157°05'E) (2.187), thence: NE of Lihou Reef Light (17°08'S 152°09'E) (2.94) at the NE extremity of Lihou Reef. The Outer Route to Torres Strait may then be joined and Directions at 2.96 followed.

Charts 4602, 4604, 4621

To Solomon Sea

2.116

- 1 **Directions** (*continued from 2.24*). From (21°00'S 157°30'E) (2.23) routes from New Zealand to entrances to Solomon Sea lead N or NNW as required, passing: ENE of Selfridge Bank (20°56'S 157°05'E) (2.187), thence: Clear of Mellish Reef (17°25'S 155°52'E) (2.188). (*Directions for entry to the Solomon Sea continue in Pacific Islands Pilot Volume I*)

Anchorage

Charts 4602, 4603, 4604

2.117

- 1 Offshore anchorage may be obtained off many of the reefs in the NW part of Coral Sea: Saumarez Reefs (21°48'S 153°38'E) (2.121). Frederick Reefs (20°58'S 154°22'E) (2.122). Marion Reef (19°07'S 152°17'E) (2.128). Lihou Reef (17°22'S 151°45'E) (2.136). East Diamond Islet (17°26'S 151°05'E) (2.138). Coringa Islets (16°56'S 150°00'E) (2.144). Magdelaine Cays (16°36'S 150°20'E) (2.142).
- 2 Herald Cays (16°59'S 149°08'E) (2.146). Willis Islets (16°17'S 149°58'E) (2.154). Diane Bank, NW end (15°42'S 149°37'E) (2.155). South Flinders Reefs (17°50'S 148°28'E) (2.159). North Flinders Reefs (17°34'S 148°27'E) (2.161). Holmes Reefs (16°29'S 147°57'E) (2.170). Osprey Reef (13°53'S 146°33'E) (2.172). Ashmore Reef (10°08'S 144°27'E) (2.176). Cato Island (23°15'S 155°32'E) (2.181).
- 3 Wreck Reefs (22°10'S 155°28'E) (2.184). Kenn Reefs (21°17'S 155°43'E) (2.186). Mellish Reef (17°25'S 155°51'E) (2.189). Récifs et Iles Chesterfield (19°52'S 158°19'E) (2.192). Récifs Bampton (19°05'S 158°38'E) (2.198).

Caution. Many of the anchorages listed above may be more suitable to vessels specifically working amongst the reefs, than to those requiring shelter whilst on passage.

OUTLYING REEFS AND DANGERS

Saumarez and Frederick Reefs

Chart Aus 426 (*see 1.15*)

Saumarez Reefs

2.118

- 1 **General information.** Saumarez Reefs lie on a bank within the 200 m (100 fm) depth contour on the Australian continental shelf. South East Elbow (21°55'S 153°37'E) is the SW end of the largest of the reefs. Surveys of the bank are incomplete and its N and W sides are not fully defined. Reconnaissance soundings (1992) indicate the bank to be about 17 miles across from SE to NW, with general depths of 35 to 50 m (19 to 27 fm) over most of it. Isolated coral heads rise sharply to depths of 25 m or less in some places on the bank.
- 2 Small commercial fishing vessels regularly operate on the bank and use anchorages in the lee of the reefs. **Local knowledge**, or the large scale national chart, is required for a close approach.
- 3 The SE and windward reefs form a barrier, drying about 1 m (3 ft) with a number of above-water boulders on it, which extends 19 miles NE from South East Elbow. Only the N-most of three openings in this barrier has been surveyed. Dangerous below-water coral reefs extend up to 1½ miles SE from the outer edge of the barrier, and from South East Elbow; a berth of at least 2 miles is recommended for the whole of this edge. The inner edge of the barrier is fronted by a coral flat, up to 2 miles in width and with below-water patches on it, which extends 10 miles NE from South East Elbow without any apparent opening in it.

4 North East Cay (21°40'S 153°46'E) is 2.4 m in height, about 1 cable long (1997) and bare. The cay is enclosed by a steep-to coral reef, with an opening on its SW side, and is the N-most feature of the reefs. Saumarez Reefs Light (red GRP hut on stainless steel framework tower; 18 m in height; red daymark), which is readily identifiable but not conspicuous, stands on the cay. There is a clear channel, 1¼ miles in width, between the cay and the N-most reef of the barrier extending NE from South East Elbow.

5 The S side of Saumarez Reefs is formed by three reefs lying between 6 cables and 4½ miles WNW from South East Elbow. The openings between these reefs are unsurveyed. In 1992 HMAS *Flinders* (LOA 49 m, draught 3.7 m) passed through the opening immediately W of South East Elbow on a course of 000° and reported a least depth of 27 m midway between the reefs. The two openings next W appeared to be deep and clear, but were not attempted.

6 South West Cay, lying 6 miles NW of South East Elbow, is 2.4 m in height, bare and enclosed by a reef. Landing can be effected on the N side of the cay within 2 hours either side of LW by walking across the reef. At all other states of tide seas break across the reef and onto the cay from all directions. Zenobia Rock, 6½ miles farther N, which consists of a number of below-water heads, is steep-to and nearly always breaks; below-water coral heads extend up to 5 cables from the reef.

2.119

1 **Flow.** Observations in October/November 1992 showed the flow throughout a 24 day period to set almost continuously NE. The greatest rates were obtained during the falling tide.

Tidal streams off the reefs have been found to set SW at rates up to 1 kn on the rising tide, and NE at up to 1½ kn on the falling tide.

2 **Tide-rips** occur in the channels between the reefs. In the above period (1992) and with strong E or SE winds on the falling tide, these rips occurred up to 1½ miles E of the channels. In similar wind conditions on the rising tide the rips consist of steep standing waves, which form about 3 cables E of the reefs and are dangerous to small craft.

2.120

1 **Landmark:**

Stranded wreck (21°54'S 153°39'E) (2.93).

Other aid to navigation:

Racon. Saumarez Reefs Light (21°40'S 153°46'E) (2.118).

2.121

1 **Anchorages.** There are regular depths of 37 to 44 m, coral sand, between the S part of the barrier reefs and South West Cay, where anchorage may be obtained, sheltered from E. Recommended berths are 1¾ miles NW of South East Elbow in a depth of 40 m and 2 miles E, 6 cables N and 7 cables W of South West Cay in depths of 37 to 49 m.

Anchorage may also be obtained 8 cables N of North East Cay in depths of 31 to 59 m.

2 Vessels servicing Saumarez Reefs Light normally anchor on the W side of North East Cay, with the light bearing between 065° and 090°, distant 4 to 5 cables, in depths of 20 to 30 m, coral. In 1992 HMAS *Flinders* approached from WSW and anchored in a depth of 34 m, sand and broken shell, with the light bearing 075° distant 6 cables. The nearest danger was the edge of the fringing reef on the W side of the cay, distant 4 cables.

3 Landing on North East Cay can be effected in small boats in fine weather through the reef opening on its SW side, which is easily identified at LW. In moderate to poor

weather a landing at HW is extremely dangerous as seas break over the reef and beach. Landing at LW may then be safer, but great care must be taken in negotiating the reef opening.

Frederick Reefs

2.122

1 **General information.** Frederick Reefs (20°58'S 154°22'E) consists of reefs and connecting ridges fringing the S part of an isolated bank, which rises from oceanic depths to those generally less than 60 m on the bank. Anchorage Sound is a spacious and secure roadstead within the bight of the reef.

Local knowledge, or the large scale national chart, is required for a close approach.

2 Observatory Cay, 1.8 m in height (21°02'S 154°23'E), is one of a number of changeable sand cays lying along the S part of the S reef. In 1990 there were five such cays; in 1992 all were observed to cover at HW. A narrow boat channel leads through the reef from NE to Observatory Cay. A solitary, remarkable, leaning rock, 1.2 m (4 ft) in height, stands at the W extremity of the S reef, 1½ miles WNW of the same cay.

3 In 1992 depths greater than 400 m were found 5 cables off the SE and E edges of the S reef. It had previously been reported that the bottom could be seen distinctly at a distance of 1 mile SE of the reef, but no soundings had then been obtained. The inner edge of the S reef is always covered and has a number of below-water coral heads within 5 cables of it.

4 Danger Ridge extends 2¼ miles N from the NW extremity of the S reef and terminates at Ridge Rock, which always breaks. Danger Ridge is narrow and obstructed by below-water rocks on its S and central parts; depths greater than 500 m occur within 5 cables of its W side. Passage across the ridge should not be attempted.

5 A bare and changeable sand cay, 1 m in height (1992), lies near the centre of the N reef (20°56'S 154°24'E). Frederick Reefs Light (2.93) stands on this reef and a mast, 11 m in height, stands at the SW end of the cay and about ½ cable S of the light.

6 There is a safe passage with a width of 1½ miles between the S and N reefs but tide-rips occur on the E side of the passage. In 1992 a transit of this passage was made in HMAS *Flinders* (LOA 49 m, draught 3.7 m), passing 8 cables N of the S reef on a track leading E on 090°; a least depth of 9.7 m (32 ft) was obtained.

2.123

1 **Current** between the S and N reefs has been observed to set W at rates up to 1½ kn.

Anchorages. There are regular depths of 13 to 31 m, coral sand, in Anchorage Sound, which affords shelter from E and SE with no known dangers more than 5 cables distant from the inner edge of the bight of the S reef. Recommended berths in an area 2¼ miles SE of Ridge Rock (20°59'S 154°21'E), in depths of 13 to 24 m, are indicated on the reference chart.

2 Anchorage has also been obtained W of the N reef with the light bearing between 080° and 085°, distant 4½ to 6 cables, in depths of 27 to 32 m, sand. These berths provide little shelter from the swell in moderate or heavy weather from the E quadrant.

3 Landing on the cay on the N reef can be effected by boat through an opening on the W side of the reef. During construction of the lighthouse a landing on the SE side of the cay was used at all states of tide. Shelter afforded by the reef makes landing easiest at LW.

Marion Reef

Chart 4621 (see 1.15)

2.124

- 1 **General information.** Marion Reef (19°07'S 152°17'E) is an atoll, its lagoon within the reef has general depths of 30 to 65 m, but is obstructed with numerous dangerous coral heads. Approach and entry requires care and good light conditions.

Tidal levels. Mean maximum range about 2.0 m, mean minimum range about 0.3 m; for further information see *Admiralty Tide Tables*.

Local knowledge, or the large scale national chart, is required.

- 2 The S, E and N sides of the atoll are formed by a series of five extensive drying reefs. Long Reef, which is crescent-shaped, extends a total of 19 miles ENE then N from its SW end (19°18'S 152°14'E). Paget Cay (19°15'S 152°21'E), 1.5 m in height, and Carola Cay, 3.7 m in height, 10 miles farther NNE, lie on the reef. The N—most of the openings between Long Reef and the four remaining reefs on the E and N sides of the atoll has a depth of 24.9 m in it. The middle opening has depth of 18.4 m but is foul on the approach from seaward; the S opening has depths of less than 5 m.

- 3 The SW side is formed by the two Wansfell Reefs which lie 5 miles apart, with a least charted depth of 14.5 m in the opening between them, with overfalls to seaward. The NW Wansfell Reef breaks; Brodie Cay (19°17'S 152°13'E), 3 m in height, lies on the SE reef. An entrance to the lagoon, has depths of 15 to 30 m in the fairway, lies between Brodie Cay and the SW end of Long Reef, 1¼ miles farther ESE. There are tide-rips close off this entrance.

Two small isolated reefs, which break, lie on the open W side of the atoll, 7 miles NNE and 10 miles N of Wansfell Reefs.

2.125

- 1 **Current.** In 1961 HMAS *Gascoyne* experienced a S set attaining a rate of 2 kn off the E side of the reef.

Landmark:

Radio tower (automatic weather station) (19°06'S 152°24'E), white in colour and conspicuous on radar, standing on Carola Cay.

2.126

- 1 **Directions from south.** From a position SW of Brodie Cay (19°17'S 152°13'E) (2.124) the track into the S part of the lagoon leads on a bearing of 040°, passing (positions from Brodie Cay):

SE of Brodie Cay distant 1 mile. Foul ground extends 7 cables ESE from the cay. Thence:

NW of Long Reef (1¼ miles ESE); the W end of the reef is steep-to.

2.127

- 1 **Directions from north-west.** In 1985 HMAS *Flinders* (LOA 49 m, draught 3.7 m) entered the lagoon from NW on the line of bearing 127° of the radio tower (19°06'S 152°24'E) (2.125).

When the tower was distant 4 miles ahead the track then led bearing 160°.

The line of bearing 100° of the tower, then led to the anchorage used (2.128).

2.128

- 1 **Anchorage.** In 1985 HMAS *Flinders* obtained anchorage in a depth of 30 m with Carola Cay bearing 100°, distant 1 mile.

In 1984 HMAS *Dubbo* (LOA 42 m, draught 1.8 m) anchored about 8 cables WNW of Paget Cay (19°15'S 152°21'E) in a depth of 20 m, sand and broken coral.

Anchorage can also be found 2½ cables E of Brodie Cay (19°17'S 152°13'E) in a depth of 8 m, sand.

Queensland Plateau

Charts 4621, Aus 4620

General information

2.129

- 1 Queensland Plateau occupies much of the SW side of Coral Sea to seaward of Great Barrier Reef, from which it is separated by a trough with depths greater than 1000 m. The largest shoal part of the plateau lies on its S side where the 1000 m depth contour encloses numerous reefs and shoal patches between the latitudes of 18°12'S and 15°19'S and the meridians of 147°40'E and 152°17'E.

- 2 Osprey Reef (13°54'S 146°38'E) (2.172) lies near the NW end of the plateau.

Local knowledge is required in the above area within the 1000 m depth contour on the S side of the plateau which, with the exception of Diamond Passage (17°30'S 151°15'E) (2.104) and its approaches, is not recommended for general passage navigation.

Chart 4621 (see 1.15)

Lihou Reef

2.130

- 1 **General information.** Lihou Reef is an atoll which extends 56 miles WSW from its NE extremity (17°08'S 152°09'E). The W edge (2.104) of the reef borders Diamond Passage and has been surveyed, as has a corridor about 2 miles in width, which crosses the E part of Lihou Reef on the meridian of 152°00'E. The rest of the atoll has been incompletely surveyed, although the outer edge has been fully delineated. The outer edge is steep-to, with depths greater than 500 m within 1 mile, except off the SW end. The sea breaks on the edge of the atoll and on many of the coral heads and detached reefs within the lagoon, where there are otherwise general depths greater than 50 m. Lihou Reef is a Marine Protected Area (see 1.72).

Caution. A survey has revealed numerous coral pinnacles, with depths less than 5 m, between the charted reefs and the 50 m depth contour. Along the sunken barrier reef between 17°30'S 151°22'E and 17°40'S 151°18'E shoals with depths of 10 to 15 m exist.

- 2 **Local knowledge** and good light conditions are required for entry to the lagoon and any passage within. No attempt should be made to enter any of the numerous, small, undocumented and unsurveyed openings which exist between the SW end (17°39'S 151°21'E) of Lihou Reef and Herald Passage, 40 miles farther ENE. Navigable openings are described at 2.132 and 2.133.

2.131

- 1 **Tidal streams** have been observed to set through openings into the lagoon on the rising tide at rates up to 2 kn. The furrowed appearance of some of the passages on the S side of the reef suggests that stronger streams may be experienced.

Landmark:

Radio tower (17°07'S 152°00'E) (2.93) on Turtle Islet.

Major light:

Lihou Reef Light (17°08'S 152°09'E) (2.94).

2.132

- 1 **Entry at 17°37'S 151°29'E** may be obtained through a navigable passage which lies 4½ miles ENE of South West

Cay (2.136) and has a width of 1 mile and depths of 25 to 30 m. A cay, 3 m in height, lies on the drying reef on the NE side of the passage.

2.133

- 1 **Entry west of Hermit Crab Islet.** In 1985 HMAS *Flinders* (LOA 49 m, draught 3.7 m) found a least depth of 5.9 m when entering the lagoon through a narrow passage close W of Hermit Crab Islet (17°25'S 151°52'E). The islet is 2.4 m in height, covered with vegetation and frequented by large numbers of seabirds.

2.134

- 1 **Entry through Herald Passage.** The passage (17°24'S 151°58'E) is 1½ miles in width between two drying reefs and leads across a ridge with depths of 4.2 to 5.7 m over it. The deeper water is found W of mid-channel.

A boulder, 2 m in height, lies 4 miles ENE of the passage on the inner edge of the reef.

2.135

- 1 **Directions for entry west of Turtle Islet.** From N of Turtle Islet (17°07'S 152°00'E), the track leads S bearing 180° in mid-channel through a clear passage which has depths greater than 30 m over a width of 3 cables. The track passes:

- 2 W of Turtle Islet, distant 5 cables. The islet is 4.9 m in height, covered with vegetation and frequented by large numbers of seabirds; depths less than 10 m extend 2 cables NW from the fringing reef. A radio tower (2.93) stands on the islet. Landing can be effected on the W side.

- 3 When 1¼ miles S of the entrance the track leads into depths greater than 50 m.

A number of isolated and widely spaced coral heads, with known depths from 9.8 to 49 m over them, lie between Turtle Islet and Herald Passage (2.134), 16½ miles farther S; other dangers may exist.

2.136

- 1 **Anchorage.** In 1859 HMS *Herald* obtained anchorage within the SW end of Lihou Reef, where there are depths of 15 to 51 m, and also in the entrance to Herald Passage (17°24'S 151°58'E) in a depth of 8 m.

- 2 In 1985 HMAS *Flinders* anchored 5 cables NW of South West Cay (17°39'S 151°25'E) in a depth of 52 m. The cay is 5 m in height, covered in vegetation and is frequented by large numbers of seabirds; it is reported to give a response on radar at 11 miles. An entrance to the lagoon, with a depth of 30 m in it, lies 8 cables W of the cay and 2 cables from the fringing reef.

- 3 Anchorage, with shelter from the swell, may also be obtained 7½ cables S of Observatory Cay (17°07'S 152°05'E) in a depth of 28 m. The S-going tidal stream attains a rate of 1½ kn at the anchorage. Landing can be effected on the W side of the cay, which is 1.8 m in height.

In 1985 HMAS *Flinders* anchored 6½ cables SSW of Turtle Islet (17°07'S 152°00'E) (2.135) in a depth of 40 m.

Diamond Islets and Tregosse Reefs

2.137

- 1 **General information.** East Diamond Islet (17°26'S 151°05'E) (2.104) is the E of a group of four Diamond Islets lying near the E end of a bank, with known depths of 9 to 62 m over it, which extends up to 57 miles farther WSW. The E end of the bank, bordering Diamond Passage, has been surveyed but the remainder has been only partially examined.

Tidal levels: mean maximum range about 1.7 m, mean minimum range about 0.1 m; for further information see *Admiralty Tide Tables*.

Local knowledge, or the large scale national chart, is required for a close approach.

- 2 The three N islets lie close within the N edge of the bank, which is steep-to and marked by discoloured water, particularly between East and Central Islets. South Diamond Islet (17°40'S 150°50'E), 21 m in height at its SW end, lies close within the SE edge of the bank; the only landing place on this islet is on a small spit extending from the NW end. All the islets are fringed by reefs and thickly covered with bushes and grass (1990); they can be held on radar at ranges of 10 miles.

- 3 Central Diamond Islet (17°27'S 150°56'E) is 8 m in height; landing can be effected at the W end of a beach on the N side. West Diamond Islet, 8 miles farther WNW, is 6 m in height.

Tregosse Reefs consist of two small drying reefs which lie 7 and 14 miles SW of South Diamond Islet, close within the SE edge of the same bank. Below-water rocky patches lie 4 miles WNW and 7 miles W of the SW of Tregosse Reefs (17°47'S 150°38'E).

2.138

- 1 **Anchorage.** In 1990 HMAS *Flinders* (LOA 49 m, draught 3.7 m) found good anchorage WNW of East Diamond Islet (2.104), sheltered from SE and E, in a depth of 30 m with the light bearing 120° distant 6.4 cables; the berth was approached on the same bearing from a distance of 2 miles. An isolated coral head, with a depth of 5.3 m over it, lies 1½ cables N of the berth. There are numerous scattered coral heads farther inshore but small craft can make a closer approach with caution.

Landing can be effected at the N end of the islet. Lice and ticks are prevalent.

Charts 4621, Aus 4620

Abington and Malay Reefs

2.139

- 1 **Abington Reef** (18°05'S 149°37'E), reported by the SS *Abington* in 1855, is nearly awash. In 1961 the reef was reported to be steep-to all round at a distance of 1 mile.

- 2 **Malay Reef** (17°57'S 149°20'E) was discovered by the barque *Malay* in 1876. In 1961 it was reported that the reef was not easy to see, not clearly defined and not steep-to. There is no marked discolouration of the water, nor is there a line of breakers, which is typical of the reefs in the area. From a distance of over 2 miles the appearance is of broken water being thrown up at irregular heights and irregular intervals. The 200 m depth contour probably exists at a distance of over 2 miles from the reef, with irregular depths within it.

Caution. Malay Reef should be given a wide berth, even in daylight.

Charts 4621, Aus 4620 (see 1.15)

Magdelaine Cays and Coringa Islets

2.140

- 1 **General information.** South Magdelaine Cay (16°36'S 150°20'E) and the two Coringa Islets, consisting of Chilcott Islet (16°56'S 150°00'E) and South West Islet 6 miles farther WSW, lie on a bank, with known depths between 6 and 60 m over it which extends up to 50 miles SW from Magdelaine Cays. The 200 m depth contour around the bank has not been fully defined (1999). North Magdelaine Cay (16°32'S 150°17'E) is a detached feature off the N end of the bank. Magdelaine Cays and Coringa Islets, together with their adjacent waters, are a Marine Protected Area; see 1.72.

- 2 **Local knowledge** is required.

Currents. In 1960 W-going currents were reported which attained rates of 1 kn in the vicinity of Coringa Islets, and 1½ kn between the same islets and Magdelaine Cays.

2.141

- 1 **Magdelaine Cays.** The two cays lie 6 miles apart on separate drying reefs. An islet on South Cay (16°36'S 150°20'E) has established vegetation on it to a height of 9 m and a clump of trees at its centre. Birdlife is plentiful.

North Cay is reported to be 3 m in height (1992), but is not permanent. The surrounding reef and coral heads extend up to 1 mile from the cay; depths greater than 200 m are then found within 4 cables of the reef edge.

In 1990 the group was detected on radar at 11 miles and sighted at 8 miles.

2.142

- 1 **Magdelaine Cays anchorages.** Anchorage for a small vessel is reported (1984) to be obtainable NW of South Magdelaine Cay, 2 cables off the beach in a depth of 20 m. Landing is possible on the NW side of the cay.

- 2 A very restricted anchorage in a break in the reef W of North Magdelaine Cay was used by HMAS *Dubbo* (LOA 42 m, draught 1.8 m) in 1984 in a depth of 16 m with the S edge of the cay bearing 097° distant 7 cables. Depths decrease sharply from 500 m as the anchorage is approached on the same bearing. Landing is possible on the W side of the cay, which may be approached through breaks in the reef, but care is required to avoid numerous coral heads.

2.143

- 1 **Coringa Islets** lie close within the edge of a bight on the NW side of the extensive bank described at 2.140. Both islets lie on drying reefs, with foul ground extending 6 cables from their N sides.

Chilcott Islet (16°56'S 150°00'E), 8 m in height, is surrounded by a high bank of sand (1992). The islet is detectable on radar at 16 miles.

- 2 South West Islet is 13.5 m in height, with some sparse vegetation which reaches an additional 0.5 m in height.

A shoal (depth 8.4 m), coral and sand, lies 7½ miles WSW of South West Islet. The bottom is clearly visible over this shoal, which lies closely within the charted 100 m depth contour.

2.144

- 1 **Coringa Islets anchorages.** Temporary anchorage may be obtained W and NW of Chilcott Islet and NW of South West Islet, at a distance of 3 cables off the foul ground extending from each islet. Depths increase rapidly outside the anchorages and there is little shelter from SE swell. Landing by boat may be effected on the nearest sides of the islets but care must be exercised to avoid coral heads in the approaches. The landing beaches on both islets are steep-to and are hazardous in bad weather, due to breakers.

- 2 In 1992 HMAS *Flinders* (LOA 49 m, draught 3.7 m) approached Chilcott Islet from deep water on the line of bearing 130° of the NE edge, and anchored in a depth of 25 m, sand and coral, with the islet distant 7 cables. An approach on the line of bearing 135° to an anchorage in the same depth, distant 6¾ cables from the islet has also been used.

Herald Cays

2.145

- 1 **General information.** Herald Cays consist of South West Cay (16°59'S 149°08'E), 7 m in height, and North East Cay a larger cay, 5 m in height, 4 miles farther NE. The cays, which are covered with grass and dense

vegetation and support an abundance of bird life, may be detected on radar at a distance of about 15 miles, and sighted at 6 to 7 miles. A drying reef extends 2½ miles SSE and 1 mile N and NW from the South West Cay and another extends up to 1 mile from the North East Cay, except on its NW side. Both reefs break in weather from SE. A bank with depths less than 50 m over it, which surrounds the two reefs, extends 2 miles NW and NNW from the NE cay.

Herald Cays lie in a Marine Protected Area; see 1.72.

- 2 **Local knowledge,** or the large scale national chart, is required for a close approach.

Current. A W-going current, with rates up to 1 kn, has been reported in the vicinity of the cays.

2.146

- 1 **Anchorage,** with protection from SE weather, may be obtained in a depth of 35 m, sand, 9½ cables WNW of North East Cay, clear of discoloured water and coral heads which extend up to 8 cables W from the cay. The line of bearing 117° of the NNE edge of the cay leads to the anchorage. Coral heads lying 3 cables NE and 3 cables S from the berth are the nearest dangers.

- 2 Anchorage W of the South West Cay is unsafe for vessels with a draught of 2 m or more, due to depth of water and the numerous coral heads.

Landing may be effected by boat on the NW sides of both cays, through breaks in the reefs, but care must be taken to avoid the numerous coral heads in the approaches.

Willis Islets

2.147

- 1 **General information.** Willis Islets consist of South Islet (16°17'S 149°58'E), Mid Islet and North Cay. These lie on separate drying reefs on the E and N edges of an irregularly shaped bank, with general depths of 45 to 55 m over it, which extends 18 miles SW, 11 miles WNW and 11 miles N from South Islet. There are numerous coral heads on the bank, many of which rise 20 m above the surrounding seabed. Depths of 16.7 and 11.9 m occur over a submerged coral reef on the SE part of the bank, as shown on the chart, and Eliza Mary Shoal (16°30'S 149°45'E) with a depth of 16 m (reported 1887) lies near the S extremity of the bank.

- 2 There is a manned meteorological station on South Islet, which is supplied regularly by sea.

Radio. A listening watch on VHF is maintained at the meteorological station.

2.148

- 1 **Topography.** South Islet, 6 m in height and covered with grass, lies on the N part of a reef which dries 1 m and extends 1 mile farther S. The radar domes (2.151), buildings and three radio masts of the meteorological station, surrounded by palm trees, stand near the centre. An aero obstruction light (occasional) is displayed from one of the radio masts. The appearance of South Islet contrasts sharply with the wide belt of coral sand which surrounds it. Foul ground extends 7 cables W from the head of the bight of the reef. The islet is detectable on radar at a distance of 16 miles.

- 2 Mid Islet, 4½ miles NNE of South Islet, is 6 m in height, smaller than South Islet and covered with a light growth of vegetation; it lies on the W side of a reef, which dries 1 m. Foul ground, with deep water between the patches, extends up to 1 mile S, W and N of the islet.

- 3 North Cay, 9½ miles N of South Islet, is a narrow sand cay on the W part of a reef which dries 1 m, and on which the sea always breaks. The inner edge of North Cay reef is

fronted by foul ground which extends up to 1¼ miles from its S end.

2.149

- 1 **Tidal levels.** Mean maximum range about 1.7 m, for further information see *Admiralty Tide Tables*.

2.150

- 1 **Natural conditions.**

Tidal streams set N with the rise of the tide and S with the fall. Overfalls occur up to 2 miles S of South Islet and also in South Passage; the latter occur on the rising tide and appear dangerous.

Climatic table: see 1.192 and 1.195.

2.151

- 1 **Landmarks:**

Radar dome (white dome at the top of a framework tower, 20 m in height) (16°17'S 149°58'E) on South Islet; a second, larger, radar dome and four white dome-shaped water tanks stand at ground level 200 m farther N. The two radar domes are conspicuous from E.

2.152

- 1 **South Passage** lies between South Islet (16°17'S 149°58'E) and Mid Islet, 4 miles farther NNE. There is a least known depth of 7 m in the channel, which may be used with a good lookout.

2.153

- 1 **North Passage** lies between Mid Islet and a small drying reef, 2 miles farther NNE, near which there are a number of shoals, some of which are awash and break. The passage has a width of 1¼ miles with least charted depths of 5 and 5.7 m. Irregular depths occur W of the entrance. A rock (awash), with a 12 m patch 9 cables N of it, lies 3¾ miles NW of Mid Islet; foul ground is considered to extend some distance E from these dangers.

- 2 The channel between the above drying reef and the foul ground off North Cay reef is 6 cables wide. A single line of soundings runs NE across the fairway, but the channel has not been surveyed.

2.154

- 1 **Anchorage** may be obtained W of South Islet (16°17'S 149°58'E) but some swell, which rounds the S tip of the reef, may be felt. A good lookout for coral heads is recommended for any approach within 6 cables of the shore.

The outer anchorage lies 1 mile W of South Islet in a depth of 50 m, sand.

- 2 The inner anchorage lies 4 cables WSW of the islet. In 1992 HMAS *Flinders* (LOA 49 m, draught 3.7 m) approached this anchorage from WSW, on the line of bearing 060° of the aero obstruction light, and anchored in a depth of 25 m, sand, with the nearest point of land distant 4½ cables. The nearest coral heads were 2 cables SSW and 3 cables S of this position.

- 3 The inner anchorage has also been approached from S on a track passing 2 miles W of South Islet. The track then leads ENE to the anchorage on the line of bearing 073° of the aero obstruction light, crossing a 10.6 m patch 1¼ miles WSW of the light.

Leading light-beacons are situated close WSW of South Islet aero obstruction light. The alignment (044¾°) of the beacons indicates an approach channel, suitable for boats of dinghy size only, to a landing on the islet.

- 4 **Clearing marks.** The alignment of the above light-beacons also marks the safe SE limit of an area within which vessels of a suitable size and draught may obtain anchorage closer inshore. Waters SE of the alignment are foul with coral heads.

Anchorage may also be obtained 7½ cables WNW of Mid Islet in a depth of 46 m, coral.

- 5 **Local knowledge** is required for an inshore anchorage within the bight of deeper water on the NW side of Mid Islet. The approach track leads SE bearing 140°, passing NE of a coral head which lies 5 cables WNW from the islet.

Diane Bank

2.155

- 1 **General information.** Diane Bank is centred at 16°00'S 149°40'E, from where it extends about 20 miles S and N, with a width of up to 10 miles and general depths of 20 to 50 m. Sand Cay (15°43'S 149°37'E), 3 m in height, lies on a coral reef close inside the NW end of the bank. Depths less than 10 m extend up to 1½ miles SE of the cay.

- 2 **Local knowledge** is recommended for navigation in the vicinity of the bank.

Anchorage. In 1981 MV *Cape Pillar*, draught 4.6 m, approached from NW on the line of bearing 140° of the cay, crossing the edge of the bank when the cay was distant 2½ cables and anchoring in a depth of 14 m with the cay distant 2 cables. The distance from the reef edge to the cay was 1 cable.

Charts 4621, Aus 4620

Moore Reefs

2.156

- 1 **General information.** Moore Reefs (15°56'S 149°14'E) consist of three detached coral reefs grouped together within the space of 15 miles. Each is awash and steep-to. Numerous sharks have been seen in the vicinity of the SE reef; an unexamined shoal (depth 3 m) (reported 1981) lies 3 miles farther WNW. In 1961 two sand cays were reported to lie on the NW reef; one was then 2.5 m in height, and the other dried 1 m.

Chart Aus 372 (see 1.15)

Flinders Reefs

2.157

- 1 **General information.** Flinders Reefs, which extend 35 miles N and NNW from their S extremity (17°53'S 148°30'E), consist of four groups of reefs lying on separate banks with deep water between them. South Flinders Reefs, North Flinders Reefs, Dart Reef and Herald's Surprise make up the four groups. Some areas of the reefs have only been partially examined.

Local knowledge, or the large scale national chart, is required for navigation within the reefs.

- 2 **Traffic.** The reefs are visited by numerous recreational diving vessels from Townsville and Cairns.

Tidal levels. See information in *Admiralty Tide Tables*. Mean spring range about 1.6 m; mean neap range about 0.4 m.

Current. In 1961 a NW-going current was reported S and E of Flinders Reefs. The current N of the reefs was reported to turn W with a rate of 1½ kn.

- 3 **Landmark:**

Radio tower (aluminium tower on concrete foundation; 9 m in height) (17°43'S 148°27'E), which carries the instruments and aials of an automatic weather station on Main Cay Reef; a separate radio mast, about 15 m in height, stands on the NW side of the cay and 42 m from the tower. The tower is detectable on radar at 22 miles and may be sighted at 11 miles; under some conditions it appears white in colour due to guano.

2.158

1 **South Flinders Reefs** (17°50'S 148°28'E) enclose Horseshoe Lagoon which has general depths of 30 to 57 m and may be entered near its NW end. The SE end of the lagoon is formed by Horseshoe Reef which dries in places and lies open to NW. A submerged ridge with irregular depths over it, some of which are less than 5 m, forms the SW side of the lagoon and extends 4 miles NW to Entrance Reef (17°50'S 148°25'E), which dries.

2 The preferred entrance to Horseshoe Lagoon lies between Entrance Reef and a reef, with a number of drying heads on it, which lies 1 mile farther NNW at the W extremity of the group. A patch with a least known depth of 10.4 m, with deeper water each side of it, lies midway between the two reefs.

3 The N end of the group is formed by Channel Reef (17°47'S 148°25'E), which dries; a small reef awash, lies 7 cables SE of the E extremity of Channel Reef. Between this small reef and Horseshoe Reef, 4½ miles farther ESE, the NE side of the lagoon is formed by a submerged ridge, over which depths are mostly less than 10 m.

2.159

1 **Anchorage within South Flinders Reefs** may be obtained 1 mile from the head of the inner side of Horseshoe Reef in a depth of 30 m, as shown on the chart, but great caution is necessary. Drying and below-water rocks, and a number of shoal patches with a least depth of 3 m over them, lie within 6 cables of the inner edge of the reef.

2.160

1 **North Flinders Reefs** (17°34'S 148°27'E) lie on the rim of a bank and partially enclose a large lagoon which has not been fully examined and is strewn with coral heads, many of them dangerous. These dangers are most numerous in the S part of the lagoon, and particularly in the SE part, in the bight of East Ribbon Reef. Navigation within the lagoon requires great reliance upon a visual lookout.

2 The SE part of the bank is formed by East Ribbon Reef (17°40'S 148°35'E), a narrow curving reef 12 miles in length. Toe Reef, lying 8 cables W of the SW end of East Ribbon Reef, is effectively joined to it by foul ground. Main Cay Reef (17°43'S 148°27'E) lies midway along the S side of the bank and has some clear water on each side of it. A radio tower (2.157) stands on Main Cay Reef.

3 The opening between Toe and Main Cay Reefs has not been fully examined but is 1¼ miles in width and is shoal and dangerous in its E part. The W side, where there are depths greater than 10 m over a width of 6 cables, should be favoured if forced by circumstances to enter the lagoon by this passage.

4 A bight of deep water lies between Main Cay Reef and Cod Reef, which is awash, 2 miles farther WNW, but foul ground at the head of the bight is steep-to. Entry to the lagoon has been made on the E side of the opening; see anchorage approach at 2.161. Tidal streams set ENE and WSW through this opening on the rise and fall of the tide respectively.

5 South West Reef (17°43'S 148°21'E), which is the SW-most danger of the North Flinders group, is awash and clearly visible; it is separated from Cod Reef by a passage 1 mile in width which is fouled by a number of coral heads. A boulder, 1 m in height, lies on the W edge of South West Reef; breakers over the reef have been seen at a distance of 3 miles.

6 From South West Reef the W side of the bank extends 6½ miles N to Mid Reef (17°35'S 148°20'E), awash, thence

about 3½ miles NNW to North West Reef, also awash. There are a number of unexamined shoal patches, with depths of 2.9 to 12.2 m over them, between South West and Mid Reefs. An unexamined reef, with a below-water rock 2½ cables SW of it, lies about 6 cables SE of North West Reef.

7 North Reef (17°26'S 148°20'E), which dries 1 m, lies midway along the NW edge of the North Flinders bank. There are no known dangers on this side of the bank within 4 miles SW and NE of North Reef. When approaching these passages from NW, depths decrease rapidly from 400 m to less than 60 m, then increase very slightly when the rim of the bank is crossed.

8 The N-most feature of the North Flinders group is a bank, with a least known depth of 14.2 m over it (17°24'S 148°25'E). The waters between this bank and the N extremity of East Ribbon Reef, 11½ miles farther SE, have not been fully examined but appear clear of danger; there are depths less than 30 m within 5½ miles NW of the N end of East Ribbon Reef.

2.161

1 **Anchorage within North Flinders Reefs.** In 1992 sheltered but confined anchorage was obtained by HMAS *Flinders* (LOA 49 m, draught 3.7 m) NW of Main Cay Reef (17°43'S 148°27'E) (2.160) in a depth of 44 m, sand, with the radio tower (2.157) bearing 150° distant 8.3 cables. A 15.9 m patch lies close S of the berth and coral heads, awash, lie E and S distant 3 cables. Landing on the N side of the cay can be effected through a well-defined passage leading between S and SSW through the inner part of the reef.

2 The approach to the above anchorage from deep water leads NE bearing 045°, passing 1 mile NW of the radio tower and midway between the extremity of foul ground extending WNW from the cay and a 5.2 m patch 4 cables farther NW. The line of bearing 150° of the radio tower then leads SSE to the anchorage, passing S of a 3 m patch lying 1.1 miles NNW from the tower.

3 In weather from NW an alternative anchorage was obtained ESE of Main Cay Reef in a depth of 35 m on an uneven bottom, with the radio tower bearing 285° distant 1.2 miles. The approach was made from a distance of 2 miles on the same bearing. The outer edge of the reef SE of the cay is always covered and, being 1.2 cables farther inshore, was the closest danger. A boat landing can be effected across this side of the reef in weather from NW.

4 In 1983 HMAS *Barbette* (LOA 33 m, draught 2.1 m) obtained anchorage 9 cables N of South West Reef (17°43'S 148°21'E) (2.160) in a depth of 45 m on a foul bottom, but protected from SE.

Anchorage may also be obtained 1 mile SW of the N end (17°32'S 148°33'E) of East Ribbon Reef (2.160) in depths of 42 to 48 m. A good lookout is essential. A small reef which dries 0.6 m lies 1 mile SSE, and a below-water coral head lies 9 cables S of this anchorage.

5 Anchorage has also been obtained 5 cables W of North Reef (17°26'S 148°20'E) (2.160) in a depth of 46 m but the bottom is foul and the berth is only suitable for use in calm sea conditions. Small craft can anchor closer to the W extremity of the reef where there are depths of 10 m at a distance of less than 1 cable from the reef.

2.162

1 **Dart Reef** (17°24'S 148°11'E), which covers at HW, is not always visible in calm weather. There are depths greater than 400 m within 4 cables of the reef edge. The outer edge on the NE side of the reef is always covered.

2.163

- 1 **Herald's Surprise** (17°19'S 148°28'E) was discovered by HMS *Herald* in 1860 when she narrowly escaped being wrecked on it. The reef, over which the sea breaks, dries and is steep-to. Some above-water rocks lie near the NW edge; the outer edges on the S and W sides are always covered.

Charts 4621, Aus 4620

2.164

- 1 **Outlying danger.** An unexamined shoal with a least known depth of 4.9 m over it (17°24'S 148°54'E) lies about 20 miles E of Flinders Reefs. The shoal was reported in 1981 and extends 3 miles NE/SW with a width of 1 mile.

Chart Aus 372

McDermott Bank**2.165**

- 1 **General information.** McDermott Bank (17°14'S 147°51'E) is an extensive bank about 5 miles across, with general depths of 40 m (22 fm) over it and a least depth of 21.3 m (12 fm). The seabed on the bank is sand, live coral and rock.

Charts 4621, Aus 4620 (see 1.15)

Flora Reef**2.166**

- 1 **General information.** The NE and SW sides of Flora Reef (16°45'S 147°44'E) appear to be continuous, forming a horseshoe which encloses a lagoon. The NW side is open with a least depth of 0.6 m, immediately to seaward the depths increase rapidly; the lagoon within has depths of between 2 to 12.4 m and appears clear of dangers. There are general depths greater than 30 m to within 200 m of the outer edges of the reef. Breakers on the S side of the reef in calm weather have been sighted at a distance of 5 miles.

Local knowledge is required for a close approach.

Holmes Reefs**2.167**

- 1 **General information.** Holmes Reefs (16°29'S 147°57'E) consists of the W crescent-shaped group and the E U-shaped reef separated by a deep passage which is 4 miles wide and appears clear of danger. The reefs and approaches have not been fully examined.

Local knowledge is required.

- 2 **Tides** are reported to occur up to 30 minutes before those at Townsville, with a range that is 0.3 m less.

Tidal streams set N and S on the rise and fall of the tide, respectively.

Landmark:

Radio tower (16°28'S 147°52'E) (2.105).

2.168

- 1 **The east reef of Holmes Reefs** is a U-shaped reef open to the W which encloses a lagoon with general depths of 20 to 40 m; a rock (16°27'0S 148°01'7E) which dries is the only charted danger within the central part of the lagoon. Entry to the lagoon can be made through the open W side of the reef, for which the largest scale national chart is the best guide.

Local knowledge is required.

2.169

- 1 **The west group of Holmes Reefs** consist of three main reefs, which dry in places. The S and central reefs are separated by a ridge over which there is a clear passage, with a width of 3 cables and a depth of 74 m. Depths greater than 50 m are found to within 1 cable of the edge of the S reef. The stranded wreck of an offshore fishing

vessel, lying in two parts on the SE side of the S reef, is visible at about 5 miles (1991).

- 2 Two sand cays normally lie on the S and N parts of the central reef, but both cays are unstable and their positions must not be relied upon. The radio tower (9 m in height) (16°28'S 147°52'E) (2.105) and automatic weather station are established on a former site of the N cay. The cays are frequented by migratory sea birds.

- 3 The opening between the central reef and the N reef, 4 miles farther N, is foul. Generally, depths of 50 m are found to within 1 cable of the outer edges of the group, except off the W side of the central reef where depths of 50 m are found 7 cables off the edge of the reef.

2.170

- 1 **Anchorage** off the E reef (16°28'S 148°02'E) may be obtained 1 mile N of the SW end of the reef in a depth of 44 m, sand, but the berth is only 3 cables NW of a detached drying patch. Anchorage may also be obtained close off the NW extremity of the same reef in depths of 27 to 70 m. In 1990 HMAS *Flinders* (LOA 49 m, draught 3.7 m) obtained anchorage 1 mile off the dangers at the mouth of the lagoon, in a depth of 33 m with the radio tower (16°28'S 147°52'E) (2.105) bearing about 259°. The berth was not sheltered from S weather.

Anchorage off the W group of reefs may be obtained close off the N side of the S reef (16°32'S 147°50'E), but depths increase very rapidly to N.

- 2 Anchorage may also be obtained between W and WSW from the radio tower (16°28'S 147°52'E) (2.105) on the central reef of the W group. In 1990 HMAS *Flinders* anchored in a depth of 36 m with the radio tower bearing 076° distant 1.12 miles; depths decreased rapidly from 700 m to 40 m as this position was approached. In 1992 the same vessel anchored in a depth of 36 m, weed and sand, with the radio tower bearing 083° distant 9 cables; HMAS *Dubbo* (LOA 42 m, draught 1.8 m) had previously anchored in a depth of 23 m with the tower bearing 085° distant 7½ cables. These anchorages are protected from a SE swell but caution is required. Discoloured water in the vicinity of an unexamined coral head with a depth of 7.9 m over it, bearing 265° distant 1.05 miles from the radio tower, suggests the existence of similar features in the area. Landing can be effected on the W sides of the cay or cays, taking care to avoid coral heads in the approaches.

Charts 4621, Aus 4620 (see 1.15)

Bougainville Reef**2.171**

- 1 Bougainville Reef (15°30'S 147°07'E) (2.107) lies adjacent to the NE approach to Grafton Passage.

Osprey, Shark and Vema Reefs**2.172**

- 1 **General information.** Osprey Reef extends from Rapid Horn (14°01'S 146°41'E), its S extremity, to North Horn 15 miles NNW, and encloses a lagoon which has an entrance near the middle of the W side. In most places the reef is steep-to. In strong SE winds seas break heavily on the SE side of the reef and moderately on the NE side, but not on the W side.

- 2 Shark Reef, with a least known depth of 8.1 m over it, lies at the NW end of a bank, 8 miles SE of Rapid Horn. The reef is a narrow ridge of coral, 1 mile in length, and is not easily seen from any distance. The bank has general depths less than 20 m over it and is steep-to.

Vema Reef, with a least known depth of 11.5 m over it, lies on a separate bank 7 miles farther SE.

2.173

- 1 **Osprey Reef lagoon.** The entrance (13°52'9S 146°33'5E), about 3 cables in width, is reported to be clearly identifiable from seaward. From within the N part of the entrance a narrow channel, about $\frac{3}{4}$ cable in width and with depths of 20 to 35 m, leads SE into the lagoon. Shoals and drying coral outcrops lie NE of this channel; SW of the channel there are depths of 10 to 15 m but further shoals and pinnacles exist, including an isolated 0.7 m pinnacle (13°53'3S 146°33'9E) and a 1.1 m pinnacle $9\frac{1}{2}$ cables farther SE.

- 2 Within the lagoon there are general depths of 10 to 30 m in the central part. A group of pinnacles, with depths from 5.3 to 6.5 m, is centred on 13°53'9S 146°36'9S; pinnacles with depths over them of 5.2 m and 6.8 m lie, respectively, $1\frac{1}{4}$ miles WSW and $1\frac{1}{4}$ miles NNW of this group.

- 3 **Local knowledge,** or the large scale national chart, is required for entry into the lagoon. It is recommended that the entrance should only be attempted in good visibility and under a high sun.

Anchorage has been obtained in a depth of 11 m just inside the entrance to Osprey Reef lagoon. Depths to seaward of the entrance increase very rapidly.

Eastern Fields

Chart Aus 377

2.174

- 1 **General description.** Eastern Fields (10°07'S 145°40'E) is an extensive reef enclosing a lagoon and lying well offshore in the SE approaches to Great North East Channel. A number of dangers extend up to 9 miles from the reef and the whole area has been incompletely surveyed. Eastern Fields were discovered in 1802 by Captain Flinders. No attempt should be made to pass through this reef.

- 2 From the SE extremity (10°11'S 145°44'E) of Eastern Fields, the S, W and NW sides are formed mainly by drying reefs. A wreck, stranded in 1971, lies nearly midway along the S side; a detached drying reef (10°17'S 145°39'E) is the outer known danger on the same side. Overfalls occur off the SW extremity of Eastern Fields.

- 3 The opening in the middle of the W side of Eastern Fields is obstructed by below-water rocks; the W edges of detached below-water reefs lying $1\frac{1}{4}$ and 5 miles farther W have not been defined.

Below-water reefs lying 9 miles W and WNW from the NW extremity (10°03'S 145°33'E) of Eastern Fields are the outer known dangers W. The outer limits of these reefs have not been defined.

- 4 From the NW extremity of Eastern Fields, the drying reef extends $7\frac{1}{2}$ miles ENE to the W point of a large bight in the N side of the reef. From thence the outer edge of Eastern Fields is formed by a chain of below-water and drying reefs which extend firstly to the NE extremity, then SSW to the SE extremity.

A large area of overfalls lies 9 miles N of Eastern Fields; the cause of these has not been identified.

Ashmore, Boot and Portlock Reefs**General description****2.175**

- 1 Ashmore Reef, with its S extremity at 10°28'S 144°26'E, lies at the S end of a chain of reefs which extends through Boot and Portlock Reefs to Lagoon Reef, 67 miles farther NNE. The chain lies nearly parallel with Great Barrier

Reef, leaving clear water 19 to 28 miles wide between the two.

The area has been incompletely surveyed.

Ashmore Reef**2.176**

- 1 **General information.** Ashmore Reef dries in places and extends 24 miles NNE from its S extremity (10°28'S 144°26'E) to enclose a large lagoon. It is reported (2002) that portions of the reef lie up to 1 mile E of charted positions, particularly on the E and SW sides.

- 2 **Anchorage.** In 2003, MV *Clipper Odyssey* (LOA 103 m, draught 4.5 m) entered the lagoon through a passage on its W side. From a position of 10°10'5S 144°23'0E the passage was approached on a track of 105°, passing 2 cables abeam of the reef on the S side of the passage and obtaining a minimum sounding of 18 m at 10°11.0S 144°24'8E. After crossing the bar, water depth increased considerably and a course of 175° was steered to a position of 10°11'7S 144°24'9E where anchorage was obtained in a depth of 45 m.

- 3 In 1981 HMAS Flinders reported the N part of the lagoon to be apparently clear of dangers, with general depths of 50 m apart from some shoal patches, which can be seen.

Caution. Entry should only be attempted in ideal conditions of light and sea state, and when a vessel's position relative to the reef has been fixed with certainty.

Boot Reef**2.177**

- 1 **General information.** Boot Reef (10°00'S 144°41'E) extends 7 miles NNE/SSW and dries. A detached reef, 3 miles S of the S extremity of Boot Reef, is about $7\frac{1}{2}$ cables in extent and dries 1.9 m; the existence of this reef, over which the sea breaks, was first reported in 1985. A detached drying rock lies $2\frac{1}{4}$ miles farther S; in 1989 a steep 5 m swell was reported to be running over this rock, although the sea at the time was generally calm.

Portlock Reefs**2.178**

- 1 **General information.** From the S extremity (9°45'S 144°48'E), the main, ribbon-like part of Portlock Reefs extends $18\frac{1}{2}$ miles NNE to Lagoon Reef. Scattered outer parts of the reefs lie 4 miles ENE, 10 miles NNW and $15\frac{1}{2}$ miles N of the S extremity, as shown on the chart. Many of the reefs dry, and the sea breaks over all of them. The S-most reef encloses a lagoon.

2.179

- 1 **Lagoon Reef** (9°27'S 144°54'E), which dries, is the N-most danger of Portlock Reefs and of the chain extending NNE from Ashmore Reef. There is a below-water rock between Lagoon Reef and the next reef $4\frac{1}{2}$ miles farther SW.

Cato Bank, Wreck Reef, Kenn Reef, and Selfridge Bank

Chart Aus 426 (see 1.15)

Cato Bank**2.180**

- 1 **General information.** Cato Bank (23°12'S 155°32'E), of coral grit, lies within the charted 200 m (100 fm) depth contour, outside which it is steep-to. Known dangers are confined to the S and SE sides of the bank.

- 2 Cato Island (23°15'S 155°32'E), an oval-shaped island formed of coral grit, lies at the W end of a lagoon within Cato Reef on the S side of the bank. The island is

surrounded at LW by a belt of white sand; above this it is covered with grass and low vegetation which provides shelter for numerous birds. A cloud of birds over the island may occasionally indicate its position below the horizon. An automatic weather station, with two radio masts 9.1 m in height and a silver-painted hut, stands at the NE end of the island.

- 3 Cato Reef dries, the sea breaks over it in all conditions of weather and tide. The S side of the reef lies within 5 cables of the edge of Cato Bank.

Ledges, with depths less than 30 m (16 fm) over them, extend 4 miles NE and 4½ miles W from Cato Reef. Reflections from the white coral grit and black coral rock can be seen distinctly over both ledges.

- 4 Hutchison Rock (23°15'S 155°36'E), which lies on the E ledge, is the outer danger on the SE side of Cato Bank. Danger Patch, formed by blocks of coral with depths less than 14.5 m over them, lies 1½ miles farther NNE.

Flow is influenced more by wind current than by tidal forces. In SE winds rates of 1 to 3½ kn may be expected. There is a tidal race between Cato Reef and Hutchison Rock.

2.181

- 1 **Anchorage.** The best anchorage, least exposed to sea and current and convenient for landing on Cato Island, is found 6 cables NE of the island, in a depth of 29 m, coral grit. Temporary anchorage may also be obtained on the W ledge, where a suitable anchor should be used as it will inevitably foul the coral rock.

Anchorage on the E ledge should be avoided on account of Hutchison Rock and the tidal race. There is in any case little shelter to be had on this ledge from prevailing winds.

- 2 **Landing.** There are three boat entrances on the N side of Cato Reef. The lagoon within the reef has depths of 0.9 to 3.7 m but contains numerous coral heads and has not been fully examined. The centre entrance is the best, but is only suitable for very small boats. In 1989 this entrance was reported to lie approximately 180 m W of its charted position and to be marked by the alignment (154½°) of leading beacons. The front beacon stands on the reef about 300 m NNE of the weather station hut.

Wreck Reefs

2.182

- 1 **General information.** Wreck Reefs consist of a chain of ten drying reefs which extends about 19 miles E/W. Bird Islet (22°10'S 155°28'E) lies on the E-most reef and West Islet, 16 miles farther W, lies near the W end of the chain. There are several sand cays on the reefs, over which the sea always breaks. Satellite imagery suggests that the reefs lie on three separate banks; depths greater than 200 m (100 fm) occur about 5 cables S of the reefs.

- 2 **Caution.** Depths on the N side of the reefs between the E and W extremities of the chain are known to be irregular. Areas of small breakers were reported in 1960 to lie 1 mile N of the reefs, but were not observed in moderate seas in 1992. It is considered that the breakers reported were probably tide-rips, but the area has not been examined and should either be avoided, or approached only with care.

Tidal streams off Wreck Reefs set SW and NE, attaining rates of 1 kn.

2.183

- 1 **Bird Islet** (22°10'S 155°28'E), 3.7 m in height, lies at the W end of the E-most of the E group of drying reefs. The S side of the islet is formed of coral sandstone; the centre part is flat and bare but fringed with grasses and

low vegetation. The islet is frequented by large numbers of birds. Two smaller drying reefs lie between Bird Islet and Porpoise Cay, 5 miles farther W.

Porpoise Cay, 2.7 m in height, covered with sparse vegetation and frequented by large numbers of birds, lies 6 miles W of Bird Islet in the centre of the W-most reef of the E group.

- 2 The only drying reef on the centre bank of Wreck Reefs lies 3 miles W of Porpoise Cay.

West Islet (22°12'S 155°10'E), which is bare, lies near the middle of the SE of three detached drying reefs at the W end of Wreck Reefs. There is a least known depth of 7.3 m in the sparsely sounded water between the reef surrounding West Islet and a below-water reef 5 cables farther SE.

- 3 Another drying reef, in the middle of which lies Hope Cay, a bare sand cay 2.5 m in height, lies 4 miles ESE of West Islet. There is no passage through this reef and care must be taken if any approach to it is made. The E drying reef of the W group lies 1 mile ENE of Hope Cay.

2.184

- 1 **Anchorage.** Anchorage may be obtained 8½ cables WNW of Bird Islet, in depths of 26 to 31 m, and also N of the islet. The passage between Bird Islet and the next reef, 2½ miles farther WSW, has depths in it of 12.7 to 28 m. The only boat passage to the islet is through the W end of the reef, which partly uncovers at LW. In 1983 the fringing reef had been reported to extend 8 cables NW from the islet. In 1992 HMAS *Flinders* (LOA 49 m, draught 3.7 m) approached from NW with the NE extremity of Bird Islet on the line of bearing 130°, coming to anchor in a depth of 17 m, sand and coral, with the islet distant 7 cables. The nearest danger was the fringing reef at 3 cables distance. The anchorage provided little shelter from the SE swell.

- 2 Anchorage may be obtained off the N side of the chain of Wreck Reefs in depths of 18 to 37 m, but see Caution at 2.182. In 1967 HMAS *Teal* (425 tonnes) obtained anchorage off the N side of Porpoise Cay.

Anchorage may also be obtained 1¼ miles NW of West Islet and 3 cables off the N side of the W-most reef, in depths of 39 to 48 m. Landing can be effected on the NW end of West Islet. It should be approached from NW, following the shortest route across the reef and taking care to avoid coral heads.

- 3 There is a sheltered haven for small vessels of suitable size and draught in depths of 5 to 13 m in the channels immediately NE and NW of West Islet. The channel leading from S to N between these three W-most reefs is clear, but there is a rocky bar, with depths of 5.5 m over it, across the SE end of the channel on the NE side of West Islet.

- 4 **Prohibited anchorage** exists on the sites of three historic wrecks (1.70). HMS *Porpoise* and the transport vessel *Cato*, both lost in August 1803, and one other wreck lie within protected areas in the central part of the chain.

Kenn Reefs

2.185

- 1 **General information.** Kenn Reefs consist of four separate reefs which lie within 6 miles ENE and 11 miles NNE from the SW reef (21°17'S 155°43'E). The reefs lie along the S and E sides of a bank bounded by the 200 m (100 fm) depth contour, as shown on chart Aus 426. There are general depths of 22 to 68 m (12 to 37 fm), coral, sand and rock, over the bank except at the head of the bight formed by the W side of Kenn Reefs, which is obstructed by foul ground, shoal patches and below-water rocks

extending to about 2½ miles W. All the reefs dry at half tide; the sea breaks over all except the SW reef.

- 2 The SW reef, with South Western Extreme at its W end, is steep—except on its N side, where it is fringed by below-water rocks. Landing can be effected on the NE side in the vicinity of the conspicuous boulder (see below). The stranded wreck of a fishing vessel (250 tonnes) lies on the reef.

- 3 The passage between the SW reef and the largest of the four reefs, 1¼ miles farther ENE, is unsafe other than for small vessels due to foul ground, with depths of 7 to 9 m in the middle of the fairway.

The largest reef is L-shaped, with its elbow at Eastern Projection (21°15'S 155°49'E) where there is a sand cay and some boulders. Observatory Cay and another sand cay lie on the SW arm of the reef.

- 4 The next reef, to N of the largest, encloses a shallow lagoon studded with below-water rocks, with an opening on its W side. The opening between this reef and the largest is 2 cables wide, but is foul and unsafe even for boats. Tide-rips occur across this opening and also 3½ miles farther W.

- 5 The N reef encloses a shallow lagoon, which has an opening near the S end of its W side. Some boulders (high reef stones) lie on the N part of the reef, close inside North Western Extreme.

There is a safe channel, 2½ miles wide, with depths of 18 to 86 m between the two N reefs.

- 6 **Current** between the two N reefs has been observed to set WSW at a rate of ½ kn.

Landmark:

Boulder (1.8 m in height) (21°17'S 155°43'E), lying on the NE side of the SW reef. From a distance the boulder appears as part of a wreck.

2.186

- 1 **Anchorage** may be obtained 1¼ miles WNW of Observatory Cay (21°16'S 155°47'E) in a depth of 24 m (13 fm), but care must be taken to avoid below-water rocks in the vicinity. A landing on Observatory Cay can be effected through an opening in the reef on its N side.

Anchorage may also be obtained 5 cables SSW of North Western Extreme (21°06'S 155°45'E), in depths of 37 to 44 m, coral sand.

Charts Aus 426, 4634, 4636

Selfridge Bank

2.187

- 1 Selfridge Bank (20°56'S 157°05'E) has a least depth of 44 m (24 fm) over it, coral, coarse sand and shell.

A sounding of 32 m (17 fm), charted 52 miles farther NE, is doubtful.

Mellish Reef

Chart 4634 (see 1.15)

2.188

- 1 **General information.** Mellish Reef, which dries about 1 m and encloses a lagoon, is 6 miles in length N/S and narrow. Herald Beacon Islet (1.5 m in height) (17°25'S 155°52'E), a grass-covered sand cay, lies within the lagoon and 2¼ miles NNE of the S end of the reef. Another sand cay, 0.6 m in height, lies 2¾ miles NNW of Herald Beacon Islet.

- 2 A few above-water rocks lie on the reef. The remains of stranded wrecks lie 2½ and 3 miles NNW and 1¼ miles SSW of Herald Beacon Islet. Seas break heavily over the E side of the reef, but only slightly over other parts.

The lagoon, which has been inadequately surveyed, is only accessible to small boats. There are shoal patches and below-water rocks within the lagoon, but depths, although irregular, are otherwise generally between 1.8 and 14.6 m. The deeper part lies N of Herald Beacon Islet.

2.189

- 1 **Anchorage** for small vessels, in emergency, may be obtained 7½ cables WSW of Herald Beacon Islet in the bight on the W side of the reef, in a depth of about 47 m. The anchorage should be approached from WSW with the centre of the islet bearing 065°. Caution is required as the numerous below-water rocks and shallow patches, which occur in the bight up to 5 cables from the reef, are not easily seen and depths are irregular and decrease rapidly towards the reef. Discoloured water has been seen close to the anchorage. In 1987 HMAS *Fremantle* anchored in a depth of 4 m, good holding ground, close NE of the anchorage described above.

- 2 The best landing place for small boats is on the W side of the islet. The landing may be approached through a break in the reef 2 cables W of the islet. The lagoon may also be entered through a passage 2½ cables SW of the islet.

Récifs et Iles Chesterfield

Charts 4634, 4636 (see 1.15)

General information

2.190

- 1 Récifs et Iles Chesterfield (Chesterfield Reefs) consist of three narrow reefs extending 9 miles NNW and 27 miles NW from Pointe Sud (20°00'S 158°29'E), which lies at the S extremity of the group. The reefs lie on the W side of an extensive, but incompletely surveyed, bank which extends from Grand Passage des Chesterfield (20°21'S 158°50'E), which separates the bank from Plateau des Bellona (2.83), to the N edge of Récifs Bampton (Bampton Reefs), 180 miles farther NNW.

- 2 **Local knowledge** is required for any approach to the reefs, other than from W.

Outlying dangers. Below-water rocks lie on Banc de la Boussole, a bank 5 miles wide which extends from 5 to 15 miles SE of Pointe Sud; Banc du Vauban lies 4 miles SSE of this bank.

- 3 Banc du Dumont d'Urville, an extensive bank, lies 6 miles NE of Banc de la Boussole. A below-water reef, with a least charted depth of 7.3 m over it, lies on the N and E edges of the bank; an isolated 9 m shoal is reported to exist 7 miles S of this reef.

Topography

2.191

- 1 The SE reef extends NNW and WNW in a V-shape from Pointe Sud, which may be identified by Ilot Loop (19°59'S 158°28'E), lying just inside the reef. The islet, which is flat and tufted and has an automatic weather station on it, can be detected on radar at a distance of 12 miles and is visible at about 8 miles.

- 2 Ilots du Mouillage, so-named from the sheltered and secure anchorage W of them, are a group of islets lying on the inner edge of the reef, 5 miles N of Ilot Loop. The third islet from N is the highest. The islets and drying sand cays on the reef form a natural breakwater providing shelter from E. The remains of a number of wrecks lie on the islets.

- 3 The W arm of the SE reef extends 7¼ miles WNW from Pointe Sud. Ilot du Passage lies near the outer end of this arm, 2½ cables SE of the narrow passage from which

it takes its name. There are several sand cays on the reef SE of the islet.

- 4 The next reef, which extends 4½ miles NW from the above passage, is marked close within its NW end by Ile Longue (19°52'S 158°19'E). Three small, low islets lie on the reef between the passage and the island. Ile Longue, the largest island on Récifs et Iles Chesterfield, is covered with grass and fringed by a steep beach of white coral grit; a monument and two palm trees, all visible from E (1995), stand near the middle of the NE side of the island.
- 5 Ile Longue is separated from Grand Récif Chesterfield, the NW reef of the Chesterfield group, by Passe de l'Ile Longue, which is 2½ miles wide. A 15 m patch lies nearly in mid-channel and at the outer end of a spit which extends 1½ miles SSE from Grand Récif Chesterfield. Passage across the spit is not recommended due to reported dangers (1980). There are depths of 11 to 40 m on the S side of the passage between Ile Longue and the mid-channel patch.
- 6 Grand Récif Chesterfield extends about 14 miles NNW to the extremity (19°38'S 158°11'E) of Récifs et Iles Chesterfield; this reef is steep-to on its W side. A lagoon lies between the S end of the reef and Ilot du Sable, a sand cay 2 miles N. Farther N on the reef there are some small sand cays and boulders, mostly awash.

Anchorage

2.192

- 1 **General information.** Although there are dangers in the waters within the SE part of Récifs et Iles Chesterfield, this large area offers good anchorage in generally regular depths of 37 to 53 m and the possibility of finding shelter from all directions except NW.
- 2 A below-water reef, 3½ miles E of Ile Longue (19°52'S 158°19'E), dark in colour and difficult to identify, is dangerous, even for boats, and should be given a wide berth. The chief precaution required when anchoring is the selection of a clear sandy area with adequate swinging room between below-water coral patches. Particular anchorages are described below.
- 3 **Ilots du Mouillage.** The best berth, between 5 and 7 cables W of the highest islet, was formerly much used by whalers who, during the slack season off New Zealand, came here to fish inside the reefs. A good lookout is essential as the inner edge of this arm of the reef is bordered by numerous below-water patches, some of which are steep-to.
- 4 **Ilot Loop.** Anchorage for small vessels may be obtained in a depth of 20 m, good holding ground, with the NW extremity of Ilot Loop (19°59'S 158°28'E) bearing 163° distant 1.1 miles. A rock (awash) lies about 3 cables WSW from the berth and another lies midway between the berth and the islet. It is reported that yachts and other small craft may obtain anchorage closer to the islet in depths from 3 m to 7.6 m, sand and coral. Ilot Loop is surrounded by reef, but landing is possible in good weather on a beach on the NW point of the islet.
- 5 **Ilot du Passage.** Anchorage may also be obtained 2½ cables NE of the reefs on either side of the passage close NW of Ilot du Passage. The passage is 2½ cables wide and depths in the approach from SSW decrease rapidly to 14 m in the centre of the fairway. The passage is very short, and the change from conditions in the open sea to smooth waters inside the reef occurs quickly. Anchorage may then be obtained either SE or NW of the inner end of the passage.

Tidal streams, which set N and S through the passage at up to 3 kn, may cause a confused sea.

- 6 **Ile Longue** (19°52'S 158°19'E). Anchorage may be obtained 6 cables NE of the monument, in a depth of 27 m, clear of the shoals which lie 1½ cables off the reef on that side of the island. Anchorage may also be obtained 7 cables NNE of the same monument, in a depth of 25 m. The holding ground is good but the berths are exposed to sea and swell from SE. Landing from boats can be effected, with caution and in good visibility, by passing either side of a tongue of drying reef which extends 3 cables NE from the monument. The NW side is the better.
- 7 The approach track from W through Passe de l'Ile Longue leads ENE on 060° through the S part of the passage, in a least known depth of 29 m, passing 9 cables NNW of the NW extremity of Ile Longue.

Tidal streams in mid-channel set SW and NE on the rise and fall of the tide at rates of 2 to 3 kn.

Ilots Avon

2.193

- 1 **General information.** Ilots Avon (Avon Isles) consist of two islets lying between the NW extremity of Récifs et Iles Chesterfield and the S end of Récifs Bampton, 9 miles farther NNE. The islets, which lie on separate reefs 4¾ and 7 miles NNE of the NW point (19°38'S 158°11'E) of Grand Récif Chesterfield, are 5 m in height and formed of white sand, densely covered with stunted trees, low vegetation and grass. The N islet, on which stands a monument 4 m in height, is the larger.
 - 2 The opening between Grand Récif Chesterfield and the reef fringing the S islet is 4 miles wide and has depths of 7 to 31 m. The abrupt rise from deep water to this opening causes a remarkable tide-rip.
 - 3 The opening between the two Ilots Avon is 1 mile wide between the reefs and has depths of 16 to 24 m; that between the N islet and the S end (19°28'S 158°15'E) of Récifs Bampton is 1¼ miles wide, with a depth of 7.3 m. There is foul ground 1¾ miles ENE of the N islet.
- Local knowledge** is required for any close approach.
- Tidal streams** in mid-channel between the two Ilots Avon set SW and NE at rates of 2 to 3 kn.

Récifs Bampton

Charts 4634, 4635

General information

2.194

- 1 Récifs Bampton (Bampton Reefs) (19°05'S 158°38'E) lie on the W, N and E edges of an extensive bank lying generally NNE of Récifs et Iles Chesterfield. The bank and reefs are the N-most of the known dangers which extend between N and NNW for 180 miles from Récifs Bellona Sud (21°54'S 159°28'E). Récifs Bampton and the large area of water within them have been only partially examined.
 - 2 **Caution.** The positions quoted for Récifs Bampton are intended to enable the various features to be identified on the reference charts. Because of the scale of the charts and incompleteness of the surveys, these positions must generally be regarded only as approximations.
- Local knowledge** is required for any close approach to Récifs Bampton.

Topography

2.195

- 1 **Grand Récif Bampton** lies on the W edge of the bank and extends from 19°29'S 158°15'E to its N extremity, 30 miles farther NNE. The reef consists of a low, narrow

barrier, with groups of boulders and some rocks, 1·8 m in height, which when seen on the horizon have the appearance of lugsail boats. At a distance of 6 to 8 miles these rocks serve as beacons on the barrier which, if there is no swell breaking over it, might not otherwise be seen until dangerously close.

- 2 A below-water rock lying about 3 miles W of the N extremity of the reef (19°01'S 158°26'E) is the outer known danger NW of Récifs Bampton.

2.196

- 1 **Récif Bampton Nord** extends from 3 miles SW of Ilot Bampton (19°08'S 158°36'E) to about 12 miles E of the islet. An opening between Ilot Bampton and a sand cay on the E edge of La Vasque, a drying reef 2 miles farther W, has depths in it of 31 to 73 m, which then increase suddenly when N of the islet; another opening W of the sand cay has depths in it of 5·5 to 9 m, and is moderately clear of patches. Patches with depths of 12·8 and 9·1 m over them lie 4½ and 10 miles SW of Ilot Bampton.

- 2 Ilot Bampton is 5 m in height and reef-fringed. General depths of 47 m, over a bottom of coral grit, extend from the S edge of the reef to 2 miles S of the islet, but the area is unsurveyed.

- 3 A sand cay (19°04'S 158°50'E), at the E end of Récif Bampton Nord, has a passage close E of it which is 2 miles wide and has depths in it less than 12·8 m. The E side of this passage is formed by a drying reef which extends 7½ miles N in broken patches to Caye du Nord-Est (18°56'S 158°54'E), the N extremity of Récifs Bampton. La Palette, detached horseshoe-shaped reef (19°04'S 158°59'E), lies about 9 miles SE of that N extremity.

2.197

- 1 **Récif Bampton Nord-Est** lies with its NW end 1 mile SE of La Palette (19°04'S 158°59'E); it extends 2¾ miles SE to a sharp elbow, thence the same distance SW. Three small cays lie on the N part of the reef, and another on the elbow.

- 2 **Ilot Reynard** (19°13'S 158°56'E), which lies between Récifs Bampton Nord-Est and Sud-Est, is 6 m in height, bush-covered and fringed by reef, except on its W side. A rocky ledge, which extends about 1 mile W from the islet, has depths less than 3 m over it but is easily seen from aloft.

- 3 **Récif Bampton Sud-Est** lies with its N end 3½ miles SSE of Ilot Reynard, and extends 10 miles S. There are drying sand cays on the reef. Caye Skeleton (19°27'S 158°54'E), which lies off the S extremity of Récif Bampton Sud-Est, is a coral patch with a sand cay at its centre. Breakers do not readily occur over the patch and the cay is difficult to identify.

Below-water reefs, over which the sea breaks, lie 5 miles SW of Caye Skeleton.

Anchorage

2.198

- 1 **Ilot Bampton.** Anchorage may be obtained SW of Ilot Bampton (19°08'S 158°36'E) (2.196), in depths of 11 to 18 m, with the centre of the islet bearing 054° distant 1 mile. A strong current setting W has been observed in the vicinity of the islet.

- 2 **Récif Bampton Nord-Est.** Fair anchorage has been obtained W of Récif Bampton Nord-Est (19°07'S

159°02'E) (2.197) in a depth of 25 m, coral, with the sand cay on the elbow bearing 088° distant 2·3 miles. Foul ground extends 1½ miles W from the elbow.

Ilot Reynard. Anchorage, with shelter from SE winds, may be obtained off the NW or W sides of Ilot Reynard (19°13'S 158°56'E) (2.197) in depths of 16 to 25 m, taking care to avoid the rocky ledge extending W from the islet.

Banks east of Récifs Bellona and Récifs et Iles Chesterfield

Charts 4634, 4636

General information

2.199

- 1 An extensive area of shoals and irregular depths lies midway between Plateau des Bellona (21°05'S 158°55'E) (2.83) and Nouvelle-Calédonie, 250 miles farther ENE, as shown on the chart. The area, which is triangular in shape, has been incompletely surveyed and many of the reported shoal depths have not been examined.

Outer banks on the south side

2.200

- 1 Patches with depths of 43 to 80 m over them, lying within 12 miles of 21°08'S 162°11'E, form an outer group of known shoals at the SE end of the area. In 1911 breakers were reported E of where the above patches are now charted.

A further group of shoal patches, with depths of 48 to 100 m over them, lie within 12 miles of 21°16'S 160°44'E at the SW end of the area.

Récif Fairway

2.201

- 1 Récif Fairway (Fairway Reef) (21°00'S 161°46'E), is about 2½ miles in diameter, lies near the SE end of a bank bounded by the 100 m depth contour as shown on the charts. Reported 12 m and 15 m patches lying at the W end of the same bank are unexamined.

Banc du Lansdowne

2.202

- 1 Banc du Lansdowne (Lansdowne Bank) (20°30'S 161°00'E), which appears to consist of a group of banks and shoal patches lying within the 100 m depth contour as shown on the chart, is largely unsurveyed and less water than charted may exist. There is (1996) a least reported depth of 29 m over the bank, and two isolated 38 m patches are reported to lie 8 miles SW and 10 miles S respectively, of the 29 m shoal.

Récif Nereus

2.203

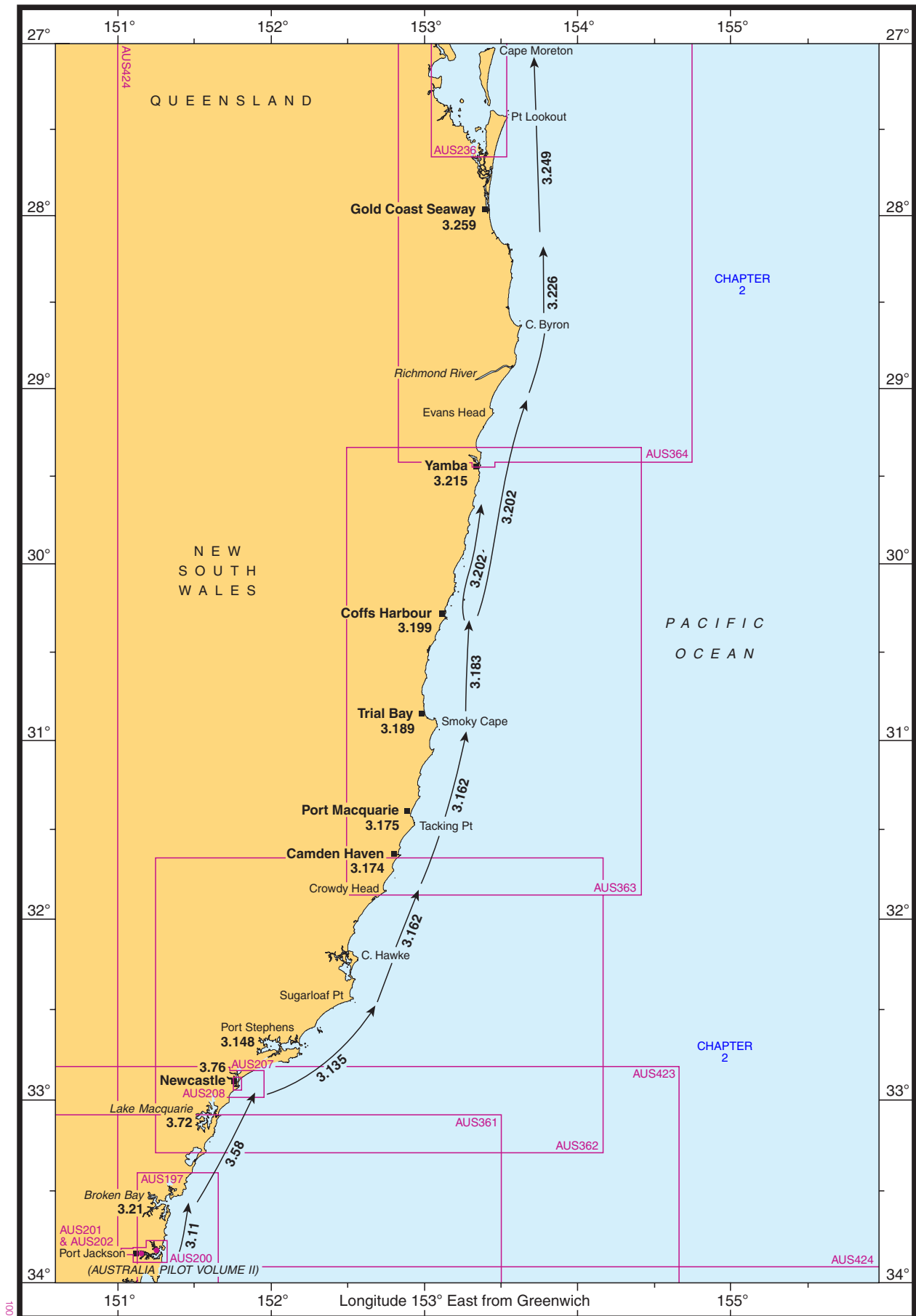
- 1 Récif Nereus (Nereus Reef) (20°05'S 160°25'E) lies near the NW end of Banc du Lansdowne. Breakers marking the reef are unlikely to be seen from far off, even in good light. A 12 m patch, with a reported 18 m patch about 2 miles SW of it, lies 5 miles WNW of the NW end of the reef; these are the outer known dangers. It is preferable to pass N of Nereus Reef if navigating in the vicinity.

Other dangers

2.204

- 1 The existence of a shoal (reported 1946) (19°29'S 161°55'E), is considered doubtful.

Chapter 3 - Coastal Waters of New South Wales and Queensland:
Port Jackson Port Limits to Cape Moreton, including the Port of Newcastle



CHAPTER 3

COASTAL WATERS OF NEW SOUTH WALES AND QUEENSLAND:
PORT JACKSON PORT LIMITS TO CAPE MORETON,
INCLUDING THE PORT OF NEWCASTLE

GENERAL INFORMATION

*Chart Aus 424***Scope of chapter****3.1**

- 1 This chapter describes the coastal routes, ports, harbours and anchorages lying between Port Jackson (33°50'S 151°17'E) and Cape Moreton (27°02'S 153°28'E); the only major port between these two points is the port of Newcastle (32°56'S 151°47'E).

Topography**3.2**

- 1 Some sections of the coast are best described by reference to views on the reference charts quoted in the text; these are supplemented by additional views included with the text itself. In general the coast consists of rocky headlands, sometimes widely spaced, with sandy beaches between which are usually backed by a coastal belt of low and sometimes swampy land with a cover of scrub. The coastal belt, which varies in width, invariably rises to higher ground behind. Landmarks and other conspicuous or useful features are described in the relevant text.

Depths**3.3**

- 1 Dangers off the coast covered in this chapter all lie in depths of less than 55 m (30 fm). Such depths lie closer to shore S of Smoky Cape (30°55'S 153°05'E) than is the case farther N; more detail is given in the appropriate parts of the text.

Caution. Many of the above dangers are steep-to. No attempt should be made to navigate in depths less than 55 m (30 fm) unless the position of the vessel is certain.

Fishing**3.4**

- 1 Fishing traps marked by floats may be encountered over most of the coastal waters of New South Wales at any time of the year. Mariners are requested to keep a good lookout for fishing markers and to avoid, where possible, those

waters inshore of the 110 m (60 fm) depth contour between latitudes 28°30'S and 32°30'S.

- 2 During the period November to April, lobster fishing takes place between Port Stephens (32°45'S) and Bermagui (36°30'S); and for the period January to June between Evans Head (29°05'S) and Port Stephens. When passage permits, mariners are requested to transit outside the 220 m (120 fm) depth contour.

Dumping**3.5**

- 1 The discharge overside of any pollutant or solid material of any description is prohibited on the continental shelf off the coast of New South Wales.

Natural conditions**3.6**

- 1 **Flow.** East Australian Current; see 1.149. Details of localised variations are given in the text.

Surf. A heavy surf generally breaks on the beaches along the whole stretch of this coast.

Port authorities**3.7**

- 1 The boundary between the states of New South Wales and Queensland is drawn inland from the coast at Point Danger (28°10'S 153°33'E).

Management of the ports and harbours of New South Wales is vested almost exclusively in Maritime Services Board of New South Wales which has its Head Office at Circular Quay West, Sydney 2000, and a branch office at Newcastle. A local officer of the Board, whose address is given in the relevant text, covers each port and harbour on the coast of New South Wales.

- 2 An exception to the Maritime Services Board's overall responsibility occurs in an area designated as Naval Waters in Broken Bay (33°34'S 151°19'E).

The ports and harbours of Queensland are administered by the Department of Harbours and Marine, Box 2595 GPO, Brisbane, Queensland 4001.

PORT JACKSON TO SMOKY CAPE

GENERAL INFORMATION

*Chart Aus 424***Scope of section****3.8**

- 1 This section describes the coastal route from Port Jackson (33°50'S 151°17'E) to Smoky Cape (193 miles NNE); also described are the major port of Newcastle (32°56'S 151°47'E), the relatively large inlets of Broken Bay (33°34'S 151°19'E) and Port Stephens (32°42'S 152°10'E), and several minor harbours along the coast.

Depths**3.9**

- 1 Between Port Jackson and Smoky Cape depths of less than 55 m (30 fm) lie between 1 and 6 miles offshore; see Caution at 3.3.

Hazards**3.10**

- 1 **Submarine exercise area** exists off the coast between North Head (33°49'S 151°18'E) and Broken Head (23 miles NNE).

Exercise areas also exist off the coast from Port Jackson (3.11) to Smoky Cape (3.168). See *Annual*

Australian Notices to Mariners for details of areas and for information concerning submarines.

- 2 **Fish aggregation devices** marked by light-buoys (special) are located in the following positions:

33°35'S 151°35'E.
33°30'S 151°38'E.
33°10'S 151°49'E.
32°47'S 152°25'E.
32°13'S 152°41'E.
31°40'S 152°56'E.
31°25'S 153°05'E.

PORT JACKSON TO BROKEN BAY

General information

Chart Aus 197

Description

3.11

- 1 The coastal route from Port Jackson (33°50'S 151°17'E), at the entrance to Sydney Harbour, to Broken Bay (33°34'S 151°19'E) leads N for 16 miles.

Topography

3.12

- 1 From North Head (33°49'S 151°18'E) to the E entrance point to Cabbage Tree Bay (1½ miles N), the coast is precipitous, high and steep-to. From thence N to Broken Bay the coast continues high in a series of bluff heads fringed by rock ledges, with sandy beaches between.

The coast from Cabbage Tree Bay to Narrabeen Head (6 miles N) is built over and forms part of the NE suburbs of Sydney.

Hazards

3.13

- 1 **Small fishing craft**, often difficult to detect in a seaway, operate up to 4 miles off Port Jackson and the coasts N and S; extra vigilance is recommended.

Gales from E sometimes blow very hard causing heavy seas to break with great violence on the coast and occasionally right across the entrance to Port Jackson.

Lights may be obscured by banks of haze which frequently accompany E gales.

Prohibited anchorages

3.14

- 1 Prohibited anchorages in the approaches to Port Jackson are described in *Australia Pilot Volume II*.

Prohibited anchorage exists between Long Reef Point (33°45'S 151°19'E) and Turimetta Head, 2¾ miles farther N, as shown on the chart. Two historic wrecks (1.70), within their own protected sites, lie within the area.

Principal marks

3.15

- 1 **Landmarks:**

North Head (33°49'S 151°18'E), described in *Australia Pilot Volume II*.

Two chimneys (conspicuous) (33°45'S 151°15'E), on Beacon Hill.

- 2 Barrenjoey Head (33°35'S 151°20'E), the S entrance point to Broken Bay; a lighthouse (red round stone tower 20 m in height) stands on the summit. The head is connected to the mainland by a low, narrow, sandy neck and is easily distinguished

from S but when viewed from NE it merges with high land in the background and is not easily identified.

3.16

- 1 **Major lights:**

Macquarie Light (33°51'S 151°17'E): see *Australia Pilot Volume II*.

Barrenjoey Head Light (33°35'S 151°20'E) – as above.

Directions

(continued from *Australia Pilot Volume II*)

3.17

- 1 From a position in the vicinity of the pilot boarding place off Port Jackson (33°50'S 151°17'E) the route leads N for 16 miles to a position off Broken Bay, passing (positions from Long Reef Point (Long Point) (33°45'S 151°19'E)):

E of North Head (5 miles S) (3.15), thence:

E of Long Reef (4 cables E), extending from Long Reef Point; dangerous rollers sweep over the reef.

A rocky patch with a least depth of 11.2 m over it (1 mile SE) is the outermost danger, thence:

- 2 E of Bungan Head (5 miles N), a prominent cliff 61 m high; a reef extends 4½ cables E; water tanks stand 1 mile N and 1¼ miles NNW. Thence:

E of Hole in the Wall (6½ miles N), a remarkable perforated cliff, also 61 m high, thence:

E of Barrenjoey Head (10 miles N) (3.15).

3.18

- 1 **Clearing marks:** the line of bearing 204° of Macquarie Light (33°51'S 151°17'E) (3.16) just open of North Head, clears Long Reef and the rocky patch SE (3.17).

3.19

- 1 **Useful mark:**

Temple (conspicuous) (33°41'S 151°15'E).

Water tower (33°44'S 151°18'E), 16 m in height standing on a plateau 112 m high.

(Directions continue for Broken Bay at 3.34 and for coastal route N at 3.63)

Anchorage

General information

3.20

- 1 Anchorage off this stretch of coast should only be taken up in fine weather, and for short periods, and is generally avoided by vessels regularly entering Port Jackson. The seabed is predominantly rock, as shown on the chart, and instances of fouled and broken anchors have occurred. In bad weather vessels are recommended to proceed offshore in preference to anchoring.

BROKEN BAY

General information

Chart Aus 197 (see 1.15)

Function

3.21

- 1 Broken Bay (33°34'S 151°19'E) is entered between Barrenjoey Head (33°35'S 151°20'E) and Box Head (2 miles NNE) and provides access to Hawkesbury River and sheltered anchorage for vessels of moderate size. The bay is of little significance for commercial shipping but is used extensively for recreation.



Barrenjoey Head

Broken Bay from NE (3.21)

Box Head

(Original dated 1999)

Topography

3.22

- 1 Land in the vicinity of the bay rises above 200 m in many places and is rocky and scrub-covered, with trees in the valleys.

The N coast of Lambert Peninsula (33°37'S 151°15'E) between West Head (33°34'·6S 151°18'·4E), the NE point, and Challenger Head (3 miles SW) is steep and rock-fringed.

Port authority

3.23

- 1 Maritime Services Board of New South Wales. Local officers of the Board may be contacted as follows:

North side of Broken Bay: 12 Regional Arcade, The Boulevard, Woy Woy 2256.

Cowan Creek and lower reaches of Hawkesbury River: Don's Marine Centre, McKell Park, Brooklyn 2253.

- 2 **Hawkesbury River, upper reaches:** 1st Floor, 21A Fitzgerald Street, Windsor 2756.

Pittwater: Mitchells Boatshed, McCarrs Creek Road, Church Point 2105.

The Australian Defence Department has jurisdiction over an area of Naval Waters within Pittwater; see Appendix I and Schedule for regulations and limits.

Limiting conditions

Controlling depths

3.24

- 1 Least depth in fairways to Hawkesbury River 6·7 m. Anchorage depths 8 to 14 m.

Vertical clearances

3.25

- 1 Three bridges cross the lower reaches of Hawkesbury River:

Railway bridge (33°32'S 151°14'E) (3.42) with a vertical clearance of 11·4 m.

Two road bridges (33°32'S 151°12'E) (3.43) with a vertical clearance of 11·1 m.

Tidal levels

3.26

- 1 Mean maximum range at Little Patonga (near Walker Point (33°34'S 151°16'E)) about 1·3 m, mean minimum range about 0·8 m.

For tidal levels in the N and S areas of Broken Bay, see information in *Admiralty Tide Tables* under Ettalong and Pittwater respectively.

Sea and weather

3.27

- 1 Although landlocked, a swell has been experienced at the anchorage in Cowan Creek even in fine weather.

Strong squalls can blow down the valleys throughout the bay.

Harbour

General layout

3.28

- 1 Leading from the outer harbour, immediately within the entrance, are Pittwater (33°35'S 151°19'E) (3.52) on the S side and Brisbane Water (33°28'S 151°20'E) (3.57) on the N; both of these have shallow entrances.

The main fairways of Broken Bay lead W to the inner harbour, thence NW to Hawkesbury River (3.40) or SW to Cowan Creek (33°36'S 151°14'E) (3.47).

- 2 **Wave recording buoys** may be laid in the bay and its approaches from time to time; details are promulgated in *Australian Temporary Notices to Mariners*.

Seaplane area

3.29

- 1 **Seaplanes** operate within Pittwater.

Tidal streams

3.30

<i>Position</i>	<i>Spring rate</i>
Entrance, off Box Head	1 to 2 kn.
Off Flint and Steel Point	2 to 3 kn.
Cowan Creek entrance	1 to 2 kn.
Hawkesbury River entrance	3 to 4 kn.
3 cables SE of Flat Rock Point	3 to 4 kn.

Submarine cables

3.31

- 1 Cables are laid in many parts of Broken Bay and Hawkesbury River; those significant to navigation in the main channels are mentioned in the relevant text. Landing places of cables are usually marked by warning notices on shore.

Speed limits**3.32**

- 1 Limits are in force in numerous small bays and creeks within Broken Bay; they do not generally affect the normal navigation of shipping in the main fairways of the harbour but are given where relevant.

Principal marks**3.33**

- 1 **Landmark:**
Barrenjoey Head (33°35'S 151°20'E) (3.15).
Major light:
Barrenjoey Head Light (33°35'S 151°20'E) (3.16).

Directions*(continued from 3.19)***Approaches****3.34**

- 1 From S the entrance is easily distinguished; from NE it may be difficult to identify. Cape Three Points (33°30'S 151°25'E), consisting of First Point, Second Point and Third Point, is steep-to, but reefs extend up to 7 cables offshore between Third Point and Box Head (4 miles WSW).
- 2 From a position S of Cape Three Points the route leads W into harbour, passing (positions from Box Head (33°33'S 151°21'E)):
- S of East Reef (2½ miles ENE), which dries, thence:
 - S of West Reef (1½ miles ENE) and the 9.7 m shoal 8 cables SSW over which a heavy swell runs with SE winds, thence:
- 3 Between Box Head and Barrenjoey Head (2 miles SSW), thence:
- Across the entrance to Pittwater (Pitt Water) (2 miles SW), and:
 - S of Lion Island (1½ miles WSW), separated from the mainland W by a narrow channel with a depth of 6.9 m.

3.35

- 1 **Useful mark:**
Water tank (conspicuous) (33°32'S 151°18'E), standing on Mount Ettalong.

Lion Island to Eleanor Bluffs**3.36**

- 1 From a position S of Lion Island the route divides to pass either N (the deeper route) or S of Middle Bank, lying midway between Flint and Steel Point (33°34'S 151°17'E) and Juno Point (1¼ miles W); this bank, although not well-defined on the chart, has a least depth of 5.0 m.
- Beyond Middle Bank, the route leads to a position off Eleanor Bluffs (33°35'S 151°15'E), marked by a light-beacon (E cardinal), from where access to Hawkesbury River NW or to Cowan Creek SW may then be obtained.

3.37

- 1 **Passing north of Middle Bank.** From a position S of Lion Island the track leads WNW through the deeper channel along the N shore passing:
- SSW of Middle Head (33°33'S 151°18'E).
- Thence the alignment (249°) of Juno Point (33°34'S 151°15'E) with the N extremity of Eleanor Beach, immediately N of Eleanor Bluffs (7½ cables SW), leads N of Middle Bank in a least depth of 7.8 m.
- 2 Thence the track leads SW in a least depth of 6.7 m to the vicinity of Eleanor Bluffs, passing:

SE of Juno Point; a light-beacon (starboard hand) stands off the point.

3.38

- 1 **Passing south of Middle Bank.** From a position S of Lion Island the track leads W, keeping about 2 cables off the S shore which is steep and rock-fringed, in a least depth of 5.9 m, passing (positions from Flint and Steel Point (33°34'S 151°17'E)):
- N of the N extremity of Commodore Heights (4 cables E), thence:
- 2 2 cables N of Flint and Steel Point, steep-to on its W side; a light-beacon (port hand, pile) stands close N of the point.
- Thence the track leads SW, passing:
- 2 cables or less W of Flint and Steel Point.
- 3 Thence the alignment (055° astern) of Flint and Steel Point with the W extremity of Lion Island (2 miles ENE), leads S of Middle Bank in a least depth of 8 m, passing the anchorage in Flint and Steel Bay (3.51).
- Thence the track leads W to the vicinity of Eleanor Bluffs (2 miles WSW), passing:
- 4 N of Challenger Head (2 miles SW), 128 m in height, steep and rock-fringed; a light-beacon (port hand, red beacon) stands close NW of the head.

3.39

- 1 **Clearing marks:**
The alignment (065°) of Flint and Steel Point with the E extremity of Lion Island (2 miles ENE) clears S of Middle Bank.
The line of bearing 314° of Juno Point clears SW of Middle Bank.
(Directions continue for Hawkesbury River at 3.45 and for Cowan Creek at 3.49)

Hawkesbury River*Chart Aus 197 (see 1.15)***Description****3.40**

- 1 Hawkesbury River enters the W part of Broken Bay between Juno Point (33°34'S 151°15'E) and Eleanor Bluffs (7½ cables SW). The river is the largest on the E watershed of Australia, being 330 miles in length and navigable for the first 70 miles from the sea. The banks are generally high, but the lowlands and valleys are subject to flooding during heavy rains.

Local knowledge is required upstream of Hawkesbury Road Bridges (33°32'S 151°12'E) (3.43).

- 2 **General regulations** for the navigation of navigable rivers are given at 1.57.

Submarine cables run from Flat Rock Point (33°32'9S 151°13'9E), NE to Dangar Island and from the E point of the island to the mainland shore; also from Flat Rock Point to several locations on the other side of the river farther downstream.

3.41

- 1 **Dangar Island** (33°32'S 151°14'E), 67 m in height, stands at the N end of a bank, with depths less than 5 m, and which lies on the W side of the river. The island is a holiday resort and has several small jetties and wharves on its N and W shores.

The town of Brooklyn (33°33'S 151°13'E), a tourist centre, stands on the S bank of Sandbrook Inlet (3.46).

3.42

- 1 **Hawkesbury Railway Bridge** (33°32'S 151°14'E), crosses the river between the E end of Long Island and Mullet Point (4 cables N). The bridge consists of eight steel truss spans; the second and seventh of these, numbered

from S have a navigational width of 128 m and each of the four centre spans have a width of 98 m. The wide second span from S is recommended for navigation; see 3.25 for vertical clearance.

A line of disused piers which supported a former bridge stand 44 m E of the present railway bridge.

3.43

- 1 **Hawkesbury Road Bridges** (33°32'S 151°12'E), two bridges built at different times and with differing pier spacings, cross the river between Kangaroo Point and Mooney Mooney Point (3 cables N). Peats Ferry Bridge, the downstream bridge, has two main spans each with a width of 133 m over the deeper water on the S side of the river; whilst Expressway Bridge, 30 m upstream, has four main spans each with a width of 51 m over the same water. The maximum unobstructed navigational width of 51 m occurs beneath the second, fourth and fifth spans of the upstream bridge, numbered from S; the second span is that recommended for navigation. The controlling vertical clearance (see 3.25), occurs at the downstream bridge.

Anchorage

3.44

- 1 The best anchorage in the entrance to the river is found in a depth of 15 m abreast Gunyah Beach, NW of Eleanor Bluffs (33°35'S 151°15'E), with Croppy Point bearing 005° and Juno Point 086°. See 3.30 for tidal streams.

Directions

(continued from 3.39)

3.45

- 1 From a position close E of Eleanor Bluffs (33°35'S 151°15'E) (3.36), the track leads NNW, then NNE, passing (positions from Croppy Point (33°33'S 151°15'E)):
 - WSW of a bank with depths less than 5 m over it which extends up to 4 cables offshore between Juno Point (1 mile SE) (3.36) and Croppy Point. The bank is marked by light-beacons (starboard hand). And:
- 2 Close ENE of Gunyah Point (9 cables SSW), thence: WSW of Croppy Point; a light-beacon (starboard hand) stands 1 cable S of the point.

Thence the track leads NNE on the outside of the river bed, keeping between 1 and 2 cables off the E shore, then generally WSW, passing (positions from Croppy Point):
- 3 WNW of a wreck with a depth of 10.5 m over it (4 cables NNE), lying close to the E shore, thence: ESE of a bank (least depth 0.6 m) (7 cables N), marked on its SE side by two light-beacons (port hand), thence: ESE then NNW around Dangar Island (1 mile NNW), thence:
- 4 Beneath the second span from S of Hawkesbury Railway Bridge (1½ miles NW) (3.42) between Long Island and Mullet Point. Lights are displayed from the piers supporting this span and from a disused pier 44 m downstream (3.42), which partially obstructs the approach. Thence:
- 5 NNW of Long Island (1¼ miles NW), 110 m in height at its E end, fronting the mainland shore to S between the railway bridge and Kangaroo Point, thence: NNW of Kangaroo Point (2½ miles WNW), thence:
- 6 Beneath the two Hawkesbury Road Bridges (2¾ miles WNW) (3.43), on the alignment of the S main span of the downstream bridge with the second from S main span of the upstream bridge. Lights

are displayed from the piers supporting the second span of the upstream bridge; the pier between the two main spans of the downstream bridge is floodlit at night.

Caution. Above Hawkesbury Road Bridges the surveys are old and much may have changed. Numerous submarine cables, water pipelines, overhead cables and power cables cross the river.

Side channel

3.46

- 1 **West of Dangar Island.** A minor channel with charted depths less than 5 m in places leads between Dangar Island (33°32'S 151°14'E) (3.41) on the one side, and Flat Rock Point (3½ cables SW) and Long Island (2 cables W) on the other. The fairway is marked by light-beacons.

A power cable, with a safe overhead clearance of 26 m, spans the fairway between Long Island and Dangar Island.
- 2 Brooklyn Railway Wharf, at the S end of a narrow neck of land (3.50) which connects the E ends of Long Island to the mainland, is approached through a channel marked by beacons leading W from close N of Flat Rock Point. There are small craft moorings in the channel and a marina lies close S of the wharf. A speed limit of 4 kn is in force in the channel.

Local knowledge is required.

- 3 **Sandbrook Inlet** (33°33'S 151°13'E) is entered between Kangaroo Point (33°33'S 151°12'E) (3.45) and the W extremity of Long Island (1½ cables E); it leads S of Long Island, to a narrow neck of land joining the E end of Long Island (3.45) with the mainland 3 cables W of Flat Rock Point (3.46). There are numerous marine farms and small craft moorings within the inlet.
- 4 The S shore of the inlet is fronted by numerous small wharves and jetties and the fairway is marked by light-beacons (lateral) and by beacons.

The speed limit is 4 kn.

Local knowledge is required.

Cowan Creek

Description

3.47

- 1 Cowan Creek (33°36'S 151°14'E), also known as South-west Arm, is entered between Challenger Head (33°35'S 151°15'E) (3.38) and Eleanor Bluffs (6 cables NNW) and from there extends about 8½ miles SW.

Depths. The least depth in the fairway as far as Cowan Point (33°36'0S 151°13'2E) is 6.0 m. Beyond that point depths increase to between 10 and 27 m in mid-channel for about 4½ miles; thereafter the water shoals to the head of the creek.

Anchorage

3.48

- 1 Cowan Creek (33°36'S 151°14'E), is considered to be the best harbour in Broken Bay. Sheltered anchorage may be found 1 mile within the entrance in a depth of 8 m. See 3.27 for remarks on swell.

Small vessels may anchor in America Bay (33°36'S 151°15'E), immediately S of Challenger Head (3.38), in a depth of about 4.5 m.

Directions

(continued from 3.39)

3.49

- 1 The best route through Cowan Creek is nearly in mid-channel.

Inlets**3.50**

- 1 **Jerusalem Bay** (33°36'S 151°13'E) is entered opposite Cowan Point. There are depths of 9·7 m in the entrance and 11 to 14·5 m within.

Coal and Candle Creek (33°37'S 151°13'E) is entered 1 mile SSW of Cowan Point and extends 2½ miles SE. The creek is deep and narrow and contains a marina.

Smiths Creek (33°38'S 151°12'E) is entered 2 miles SW of Cowan Point and extends 2 miles SE. The creek is deep and narrow.

Anchorage**Flint and Steel Bay****3.51**

- 1 Flint and Steel Bay (33°35'S 151°17'E), provides well sheltered anchorage in depths of 11 to 13 m, sand and mud, good holding, with Flint and Steel Point nearly in line with Middle Head (1½ miles NE) and Juno Point bearing 290°.

Other waters of Broken Bay**Pittwater****3.52**

- 1 **General information.** Pittwater (Pitt Water) (33°35'S 151°19'E) is entered between the W extremity of Barrenjoey Head (33°35'S 151°20'E) and West Head (8 cables WNW), but access is limited by a depth of 2·6 m over the bar. Depths within the bar are everywhere greater than 5 m except close to the shore and in some of the bays and creeks. A depth of 22·5 m is found in the deepest part. The W shore of Pittwater is part of a National Park; the E shore is a densely populated suburban area.

- 2 Scotland Island (33°38'S 151°17'E) near the head of the bay, is separated from Church Point (2 cables SW), on the mainland, by a narrow channel with a depth of 5·6 m.

3.53

- 1 **Function.** A naval diving training area lies within an area of Naval Waters extending 6 cables N from Taylors Point (33°38'S 151°18'E). See 3.23 for jurisdiction.

The remainder of Pittwater is a major recreational boating centre. For small vessels able to cross the bar there is shelter in numerous small coves and bays and there are some public jetties with access, on the E shore, to the suburbs of Palm Beach (33°36'S 151°19'E), Clareville (2 miles S) and Newport (3½ miles S).

3.54

- 1 **Submarine power cables** are laid across the entrance and also SW from Sand Point (33°36'·2S 151°18'·9E). Numerous other submarine cables are laid within the harbour and more may be laid periodically. Cable landing places are marked by notice boards.

3.55

- 1 **Directions.** When crossing the bar the deeper water may be found within 1 cable of the W shore; care is necessary to avoid passing too close to the E side where depths less than 2 m extend up to 2½ cables offshore between the W point of Barrenjoey Head (33°35'S 151°20'E) and Observation Point (9 cables SSW); a light-beacon (port hand, pile), with buoys nearby, stands 1½ cables W of the latter point.

3.56

- 1 **Facilities.** Slipways, boat ramps, fuel and gas, provisions and chandlery are available.

Brisbane Water**3.57**

- 1 **Description.** Brisbane Water (33°28'S 151°20'E) is a sheltered but shallow arm of the sea entered over a bar partially obstructed by sandbanks about 1 mile NW of Box Head (33°33'S 151°21'E). Within the entrance the channel, which is marked but tortuous, winds generally N for about 6 miles before opening into the main body of Brisbane Water which has the city of Gosford (33°25'S 151°20'E) at its head.

- 2 The Rip (33°30'·5S 151°20'·7E), a deep and narrow channel about 1 cable wide, is obstructed by a bank with a least depth of 2·6 m over it which lies under The Rip Bridge (33°30'·4S 151°20'·8E).

Depth over the bar is changeable and sometimes less than 1·2 m.

Local knowledge is necessary.

- 3 **Vertical clearance** beneath The Rip Bridge is 11·9 m.

Tidal streams through The Rip are very strong and with an adverse wind can produce very turbulent conditions on either side of the bridge.

Local weather. In S winds the sea breaks heavily in the bay immediately W of the entrance bar.

Facilities. There are numerous small jetties and wharves and several boat ramps throughout Brisbane Water.

BROKEN BAY TO NEWCASTLE**General information**

Charts Aus 197, Aus 361, Aus 362 (see 1.15)

Route**3.58**

- 1 From a position off Broken Bay (33°34'S 151°19'E), the route leads NNE for 43 miles to a position off the port of Newcastle.

Topography**3.59**

- 1 Between Third Point (33°31'S 151°25'E) (3.34), and Nobbys Head (32°55'S 151°48'E), at the entrance to the port of Newcastle, the coast is formed by sandy beaches separated by rocky points behind which lie Tuggerah Lake and Lake Macquarie. Farther inland the country is mountainous.

Headlands on this stretch of coast are skirted by rocky ledges but these do not extend more than 5 cables from shore except between Crackneck Point (33°24'S 151°29'E) and Norah Head (8 miles NNE).

Historic wreck**3.60**

- 1 An historic wreck (1.70), within a protected area, lies 1¼ miles SSE of Third Point (33°31'S 151°25'E).

Principal marks**3.61**

- 1 **Landmarks** shown in view on chart Aus 362:
Mount Warrawolong (33°03'S 151°16'E), conical.
Table Gorge (32°58'S 151°29'E), a remarkable gap in the mountains.
Mount Sugarloaf (Great Sugar Loaf) (32°54'S 151°33'E); a television tower (conspicuous), with an elevation of 524 m (1720 ft), stands close to the summit.

3.62

- 1 **Major lights:**
Barrenjoey Head Light (33°35'S 151°20'E) (3.16).

Norah Head Light (white concrete tower 27 m in height) (33°17'S 151°35'E).

Nobbys Head Light (white masonry tower 10 m in height) (32°55'1S 151°47'9E).

Directions

(continued from 3.19)

3.63

- 1 From a position off Broken Bay (33°34'S 151°19'E) the track leads NNE to a position off Nobbys Head (32°55'S 151°48'E), keeping at least 2 miles offshore in depths between 35 and 50 m (19 and 27 fm), except between Crackneck Point (33°24'S 151°29'E) and Norah Head, 8 miles farther NNE, where the minimum distance offshore should be increased to 5 miles. The track passes (positions from Norah Head Light (33°17'S 151°35'E)):
 - 2 ESE of Third Point (16 miles SSW) (3.34) and Second and First Points adjacent NE, thence: ESE of The Skillion (12 miles SSW) and Broken Head close N, two distinct steep knolls with steep-to cliffs, connected to the mainland by a low grassy neck. North Avoca Light is displayed from a conspicuous tank standing 6½ cables WSW; two towers (elevation 238 m (780 ft)) stand 4 miles NW on Mount Elliot. Thence:
 - 3 ESE of Crackneck Point (8 miles SSW), at the N end of a cliff 1 mile in extent; thence: ESE of Tuggerah Reef (5 miles SSW); a rocky bottom with irregular depths extends W to the shore. Seas break heavily on the reef with swell from SE, and with onshore winds breakers can extend in a continuous sheet of foam 2 miles to the shore. This reef and other coastal dangers lying between Crackneck Point and Norah Head are covered by the visible sector (000°–040°) of Norah Head green auxiliary light. Thence:
 - 4 ESE of a rocky patch with a depth of 13 m (42 ft) over it (2½ miles S) which breaks in a heavy swell, thence: ESE of a 14 m (48 ft) patch (1¼ miles S); depths of 20 to 27 m (11 to 15 fm) are found between these two patches. Thence: ESE of Norah Head, low and wooded but identifiable by its lighthouse (3.62) and from E by a remarkable white sand patch 5 cables S. Thence: ESE of Bird Island (3½ miles NNE), thence:
 - 5 ESE of Wybung Head (5½ miles NNE), at the N end of a sandy beach extending from Norah Head, thence: ESE of Flat Island (7 miles NNE), lying on a reef which extends 5 cables offshore, thence: ESE of Spoon Rocks (charted as dangerous rocks) (10½ miles NNE), extending 5 cables E from Stinky Point, thence: ESE of Moon Island (12½ miles NNE) (3.74), on which stands a light, thence:
 - 6 ESE of Redhead Point (18 miles NNE), with a prominent cliff face; a sandy beach, backed by sand dunes 6 to 18 m in height, extends 5 miles SW from the point. Thence: ESE of Nobbys Head (32°55'S 151°48'E), formerly an island, which rises abruptly to a height of 28 m from near the centre of Newcastle S breakwater. A light (3.62) is displayed from the head and a white signal tower (12 m in height), equipped with radar, stands close to the light.

Useful marks

3.64

- 1 Tower (elevation 54 m (178 ft)) (33°22'S 151°29'E). Two chimneys (conspicuous) (33°13'S 151°33'E), with elevations of 160 m (524 ft). Three chimneys (conspicuous) (33°10'S 151°33'E), with elevations of 158 m (520 ft). Two chimneys (conspicuous) (33°04'S 151°31'E), standing at a power station.
- 2 Water tower (32°59'1S 151°42'8E) (chart Aus 207), elevation 136 m and conspicuous. Chimney (32°58'4S 151°43'1E) (chart Aus 207), elevation 110 m. Two radio towers (elevations 168 m (550 ft)) (32°57'S 151°43'E).

For other marks in the approaches to Newcastle see 3.107 and 3.110.

(Directions continue for Port of Newcastle at 3.108 and for coastal route NE at 3.140)

Catherine Hill Bay

Charts Aus 361, Aus 362 (see 1.15)

General information

3.65

- 1 **Description.** Catherine Hill Bay (33°09'S 151°38'E) is a privately operated port at which coal is loaded into small coasters for carriage to Newcastle (NSW). The bay is entered between Hales Bluff (33°10'S 151°38'E) and a point 1 mile N.

Port Authority. Coal Operations Australia, Flowers Drive, Catherine Hill Bay, NSW 2285.

- 2 **Largest vessel handled** has been of 6666 dwt and 98 m LOA.

Pilotage. Compulsory except for Company Masters.

3.66

- 1 **Directions.** From a position NE of Hales Bluff the alignment (230½°) of two leading light-beacons, standing 45 m apart on shore close to the root of the jetty, leads towards the berth, passing (positions from Hales Bluff): SE of a dangerous wreck (5 cables NNW), lying close inshore, thence:
 - 2 SE of old wreckage (2½ cables NW) with a depth of 1.8 m (6 ft) over it, and: NW of foul ground (1½ cables N and NNW), lying between Hales Bluff and the line of the jetty (240°/060°).

Anchoring light-beacons:

- 3 Front light-beacon (1½ cables NW of Hales Bluff), on the jetty head. Rear light-beacon (270 m SSW of the front light-beacon), on cliffs midway between Hales Bluff and the root of the jetty.
- 4 The intersection of the alignment (204°) of these light-beacons, with the alignment of the approach leads described above, indicates the position in which an anchor should be let go for swinging into the berth, bows ENE, with about 160 m (6 shackles) of cable veered. The lights are privately maintained.

- 5 **Caution.** The coast and approaches from Hales Bluff (3.65), from where numerous rocks extend 2 cables N, to the N end of Middle Camp Beach which lies at the head of Catherine Hill Bay have been inadequately surveyed.

3.67

- 1 **Berth.** A coaling jetty extends 225 m ENE from the SW side of the bay; on the NW side of the jetty at its outer end is a single berth with depths alongside of 6 to 9 m.

Signals (Diagram 3.67) may be shown from the jetty head.

Day	Night	Meaning
		Unsafe to lie alongside.

Catherine Hill Bay – berthing signals (3.67)

Medical facilities. At Belmont.

Communications. Nearest airport at Belmont, 12 km.

Anchorage and harbours

Chart Aus 197 (see 1.15)

Terrigal Haven

3.68

- General information.** Terrigal Haven (33°27'S 151°27'E), on the NW side of Broken Head (3.63), is a small sandy bight where there is a resort. The harbour provides moorings and anchorage sheltered from S and SW winds for local fishing vessels.

Approach from 1½ miles NE is within the green sector (205°–225°) of North Avoca Light (33°27'S 151°26'E) (3.63).

Anchorage can be found in a depth of about 7 m, 1 cable offshore.

Chart Aus 361 (see 1.15)

Crackneck Point

3.69

- General information.** A good natural boat harbour lies 5 cables N of Crackneck Point (33°24'S 151°29'E) (3.63) off a sandy beach sheltered by rocks fringing the shore. **Approach.** A ledge of rocks extends 1 cable from the foot of Crackneck Point; depths of 7 to 9 m are found close to seaward of the ledge.

Tuggerah Lake

3.70

- General information.** Tuggerah Lake (33°20'S 151°30'E) is entered 3 miles N of Crackneck Point (3.63). A bar at the entrance has below-water rocks in the fairway close to seaward and usual depths of 0.9 m but it sometimes silts up.

Local knowledge is essential.

The channel to the lake is spanned by a fixed road bridge with a maximum vertical clearance of 7.3 m and a navigational width of 24 m.

- The lake is extensive but shallow, with channels that are marked in places by pile beacons; it can be used only by pleasure boats and small fishing craft.

Speed limits of 4 or 8 kn are in force in parts of the lake.

Port authority. Maritime Services Board of New South Wales, with local office at Office 1, No 2 Pacific Highway, Tuggerah 2259.

- Approach.** Tuggerah Reef (33°22'S 151°32'E) (3.63), which is dangerous, lies 2 miles ESE of the entrance.

Berths. There are several small lakeside wharves at two villages S of the entrance. Tuggerah Wharf lies on the W side of the lake 3 miles WNW of the entrance channel.

Norah Head

3.71

- General information.** A boat landing is situated at a sandy beach 5 cables NW of Norah Head (33°17'S

151°35'E) (3.63). A boathouse, where stores are landed for the lighthouse, stands 2 cables NW of the head.

Shelter for small craft may be found off Sandy Point (1½ miles NNW of Norah Head) within an off-lying ledge of rocks.

- Approaches.** A ledge of rocks extending 1½ cables offshore fronts the coast SSW of Norah Head; a wedge-shaped rock, 4.6 m in height and prominent from S lies 1½ cables E of the head near the extremity of this ledge.

A rock (0.6 m in height) (5 cables NE of Norah Head) lies within the 20 m coastal depth contour; below-water rocks, which are always marked by breaking seas, lie ½ cable W. These dangers are covered by the arc of visibility (210°–241°) of the red auxiliary light at Norah Head Light (3.62).

Chart Aus 362 (see 1.15)

Lake Macquarie

3.72

- General information.** Lake Macquarie (33°05'S 151°35'E) is an extensive but shallow stretch of water entered through a narrow channel winding for 2½ miles from a bar lying between two breakwaters.

The fairways of the lake are marked in places.

Depths over the bar are 0.7 to 1.9 m, but can change rapidly; depths in the channel to Swansea are about 0.7 to 5.7 m.

- Tidal levels.** At Swansea, mean maximum range about 1.1 m, mean minimum range about 0.7 m; for further information see *Admiralty Tide Tables*.

Local knowledge is required.

Port authority. Maritime Services Board of New South Wales. Local office at 9/174 Pacific Highway, Swansea 2281.

3.73

- Prohibited anchorage** exists in the vicinity of Swansea Bridge which has submarine power cables laid each side and a submarine water pipeline on the E side.

Speed limits: a limit of 8 kn is in force in the channel upstream of Swansea, and limits of 4 or 8 kn apply in some parts of the lake.

Cables and pipelines. Overhead and submarine cables and submarine pipelines cross the waters of the lake at various points and are usually indicated by warning notices on shore.

- Vertical clearance.** Swansea Bridge, a road bridge, spans the channel at the town of Swansea (33°05'S 151°38'E) standing on the S shore about 1 mile inside the breakwaters. The bridge has a double leaf bascule opening span with a navigational width when open of 14.3 m; vertical clearance beneath the bascule span when closed is 2.1 m and that beneath the remaining fixed spans varies from 1.6 to 2.2 m. Openings for shipping are subject to a local timetable; advance notice of 1 hour, or of 6 hours outside normal working hours, is required. The bridge will not be opened in wind speeds exceeding 27 kn.

- Traffic signals are exhibited on each side of the bridge and consist of two fixed red lights indicating that the bascule is closed, or two fixed green lights indicating that the bascule span is fully open. A directional quick flashing white light from the bridge is used to indicate which vessel should proceed first through the opened span.

- Traffic signals are displayed on each side of the bridge.

Tidal streams through the channel to the lake attain rates of 4 to 5 kn and the current at Swansea Bridge may exceed 2 kn.



Moon I

Lake Macquarie entrance (3.72)

(Original dated 1999)

- 5 The bar is dangerous for small craft on the out-going tidal stream, particularly with weather from NE. Entry or departure for all vessels should only be made on the in-going stream and should not be attempted without the latest information available from the Maritime Services Board local officer.

3.74

- 1 **Directions.** From a position NE of Moon Island (33°05'S 151°40'E) the track leads WSW.

Approach leading lights:

Front light (33°05'3S 151°39'4E).

Rear Light (2½ cables WSW of the front light).

- 2 The alignment (250°) of the above light-beacons leads between the breakwater heads, passing:

NNW of Moon Island, flat-topped and rocky, on which stands a light; numerous rocks extend SW towards the shore and together with the island form a natural breakwater. Thence:

Between N and S breakwaters; the bar is marked by light-buoys (port hand).

- 3 Thence the track follows a channel with a general width of ¼ cable which leads NW to the N training wall, thence generally W following this training wall and through the opening span of Swansea Bridge (3.73). Pile mooring dolphins are available on the W side of the bridge for the use of vessels awaiting passage.

- 4 Beyond Swansea the channel, which is constantly changing, leads generally N for a further mile through flats of mud and sand to the entrance to the lake. The marks and leads which are placed from time to time to indicate these channels should be followed closely.

3.75

- 1 **Alternative channel.** Between Moon Island (33°06'S 151°40'E) (3.74), and the mainland W there is a channel close inshore with a depth of 4.5 m; it is used only by small craft trading to the lake, and by those thoroughly acquainted with the numerous rocks on both sides.

Berths. There is a wharf at Swansea with a depth of 4 m alongside.

PORT OF NEWCASTLE**General information**

Charts Aus 207, Aus 208, Aus 362

Position**3.76**

- 1 The port of Newcastle (32°56'S 151°47'E) lies at the entrance to Hunter River, 60 miles NNE of Sydney.

Function**3.77**

- 1 Newcastle is the second major port of New South Wales, a major coal exporting port and the main port for the N part of the state including the rich Hunter Valley where there are extensive coal deposits and primary and secondary industries. The harbour is reported to be safe in all weathers.

In 2004 the estimated population of the city was 505 600.

Topography**3.78**

- 1 To N the suburb of Stockton stands on a low peninsula at the S end of sand dunes stretching ENE (3.136).

To S the city of Newcastle stands on the slopes of higher ground at the N end of a stretch of coast consisting of cliffs separated by sandy beaches. Part of the city can be seen immediately S of Flagstaff Hill (9 cables SW of the entrance) (3.110).

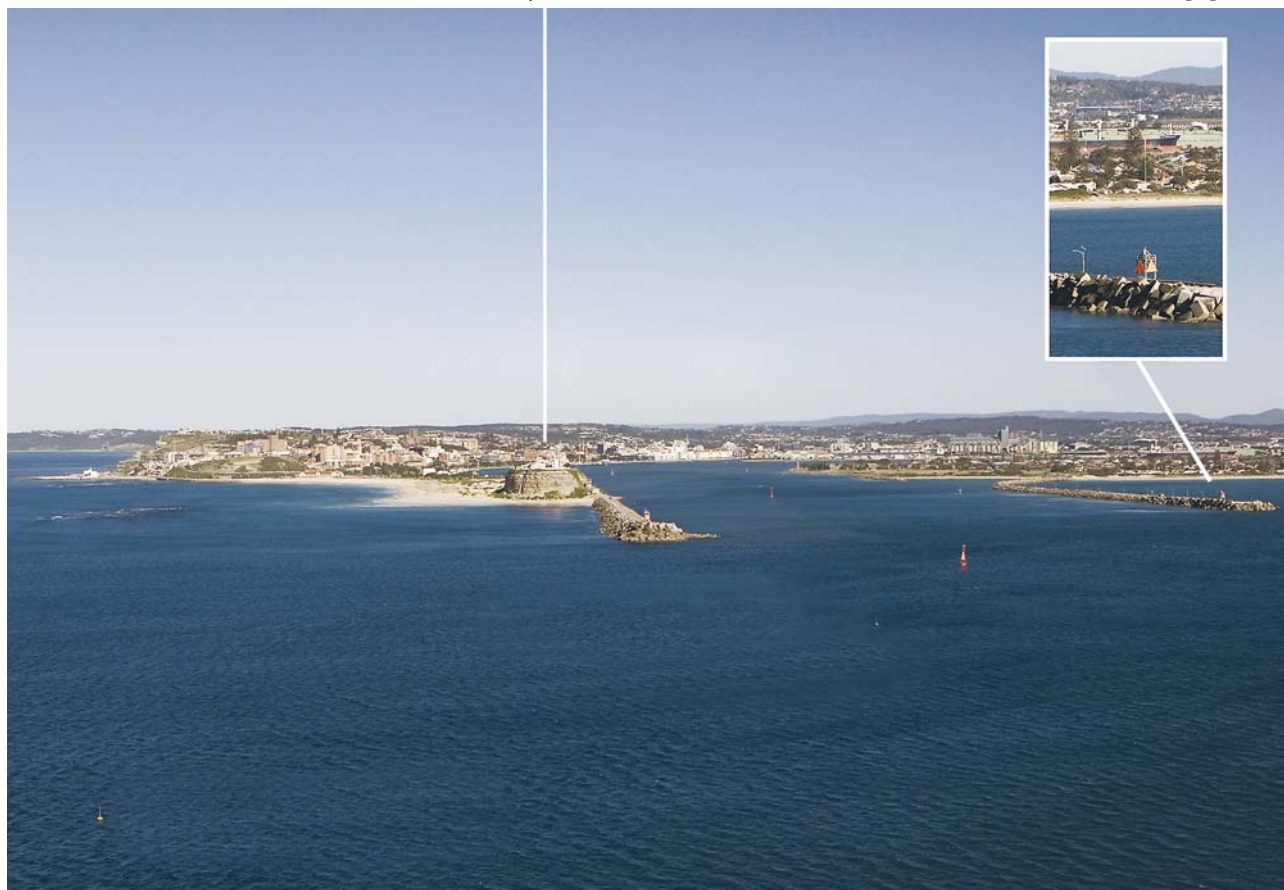
Port limits**3.79**

- 1 To seaward: a line, radius 3 miles from Nobbys Head Lighthouse (32°55'1S 151°47'9E).

Inner limits: Tourle Street Bridge (32°52'7S 151°44'0E) (chart Aus 207) and Hexham Bridge (32°49'S 151°41'E) (3.84) in the South and North Arms respectively of Hunter River.

Nobbys Head

N. Breakwater leading lights



Newcastle Harbour entrance from E (3.76)

(Original dated 2005)

(Photograph – Newcastle Port Corporation)

Approach and entry 3.80

- 1 The approach to the port from seaward is clear of off-lying dangers except for one group of rock patches (32°54'S 151°51'E) (3.108). The harbour is entered through a channel dredged between breakwaters. Ample visual marks are available.

Traffic 3.81

- 1 In 2004 the port handled 1447 vessels totalling 100 222 436 dwt.

Port authority 3.82

- 1 Newcastle Port Corporation, PO Box 663, Newcastle, NSW 2300.
Website: www.newportcorp.com
Email: mail@newportcorp.com

Limiting conditions

Controlling depths 3.83

- 1 The dredged channel from abeam Nobbys Head (3.63) to The Horse Shoe (3.117) has a maximum width of 185 m decreasing to a width of 180 m in Steelworks Channel. Minimum channel depths as follows:
From sea to Steelworks Channel and Kooragang (Steelworks Channel) swinging basin is 15.2 m.
From sea to The Basin 12.8 m.

Stockton Crossing 3.6 m.
North Arm (SE Hexham) 2.4 m.

- 2 **Caution.** Depths throughout the harbour are changeable and subject to siltation (3.88), necessitating a continuing programme of maintenance dredging; depths given in these directions should therefore be accepted only as a guide. Depth information is updated at six-monthly intervals in *Australian Temporary Notices to Mariners* but the latest figures should be obtained from the Harbour Master.

Vertical clearance 3.84

- 1 Stockton Bridge (32°53'1S 151°47'2E), a fixed span road bridge, crosses the N arm of Hunter River between Kooragang Island and Stockton peninsula. The navigational span of the bridge is located centrally between piers 11 and 12 where there is a navigable width of 60 m between fenders and a vertical clearance of 30 m.

Tourle Street Bridge (32°52'7S 151°44'0E) with a vertical clearance of 2.8 m.

Under-keel clearance 3.85

- 1 A minimum allowance of 10% of draught is required when underway; vessels berthed must remain afloat at all times with a minimum under-keel clearance of 0.3 m.

Deepest and longest berths 3.86

- 1 Kooragang berths No 4, 5 and 6 (3.124).

Tidal levels

3.87

- 1 See information in *Admiralty Tide Tables*. Mean maximum range about 1.2 m, mean minimum range about 0.8 m.

Abnormal conditions

3.88

- 1 Flood water running from Hunter River and tributaries can cause rapid and extensive changes to depths and water conditions within the harbour. Silting to a depth of 0.2 m in the harbour channels has occurred during freshets.

Density of water

3.89

- 1 The average density is about 1.023 g/cm³ after dry periods but this can vary with the tide. During periods of heavy rain it is not uncommon to have considerable layering occurring, with fresh water to a depth of 3 m and density of 1.015 g/cm³ at a depth of 10 m. The layering will decrease as the fresh water is washed out over several tidal movements.

Maximum size of vessels handled

3.90

- 1 Vessels up to 300 m LOA and 50 m beam can be accepted up to the Kooragang berths. The maximum size for entry to The Basin area is 265 m LOA and 35 m beam. Vessels over 290 m LOA are restricted to entering harbour in daylight only.

Local weather and sea state

3.91

- 1 Onshore winds can sometimes increase strongly within the hour, and occasionally during summer, at the end of a hot day a Southerly Buster (1.174) can persist for several hours. During autumn, significant swells are generated by cyclonic depressions (known locally as an East Coast Low) in the central Tasman Sea and during winter extreme weather is caused by lows forming close to the coast. During these periods of extreme weather, coastal swells may exceed 10 m in height.
- 2 At night during suitable conditions, radiation fog can form over low lying areas to the N and W of the port. Light katabatic NW winds bring the fog over the port area and may remain until mid morning. In severe SE weather a confused sea builds up in Stockton Bight creating a dangerous lee shore, particularly for small vessels. Rollers break a long distance offshore. The same conditions generate a strong NW set across the harbour entrance.
- 3 In a moderate to heavy swell, particularly from S or SE, waves in the area between about 3 and 8 cables from the entrance can build to twice the height prevailing in the open sea and cause shiphandling problems in that critical stage of the approach. Vessels up to 240 m LOA in ballast will generally be handled in winds up to 35 kn; larger vessels in ballast will not be handled in winds over 25 kn.
- 4 During S weather, sea and swell conditions can become confused, if so, it is recommended that vessels weigh anchor and proceed to sea until the weather moderates. When swell conditions make it imprudent to anchor, notice of arrival can be made to VTIC when at a distance of 5 miles from Nobbys Head Light (32°55'1S 151°47'9E), prior to proceeding seaward to drift.

Arrival information

Vessel Traffic Service

3.92

- 1 **Vessel Traffic Service.** A Vessel Traffic Information Centre (VTIC) with radar surveillance is maintained at a port radio and signal station at Nobbys Head (32°55'S 151°48'E) (3.63) for the control of movements of all sea-going vessels other than fishing boats. Participation is mandatory within the port limits; for details and reports required see *Admiralty List of Radio Signals Volume 6(4)*.

Notice of ETA

3.93

- 1 Arrival times should be notified at least 24 hours in advance and confirmed 4 hours beforehand. Mariners are requested to notify the VTIC when 10 miles from Nobbys Head. See *Admiralty List of Radio Signals Volume 6(4)*.

Outer anchorages

3.94

- 1 Whilst no anchorage off the port can be recommended as suitable for all weather use, good fair weather anchorage can be found S of 32°58'S at a distance greater than 2 miles from the shore. Where there are several vessels at anchor a safe clearance from other vessels should be maintained in case of vessels dragging anchor. A good anchor watch should be maintained and main engines should not be dismantled or immobilised in any way as weather conditions may deteriorate rapidly.

Prohibited anchorages

3.95

- 1 **Little Redhead Point.** An area of radius 4 cables in which anchoring, trawling and fishing are prohibited, is centred on a sewerage outlet 7½ cables E of Little Redhead Point (32°58'S 151°44'E).
- 2 **Restricted area** lies between bearings 057° from Northern Breakwater Head Light (32°54'8S 151°47'9E) and 127° from Southern Breakwater Head Light (3 cables SE) out to the port limit. This restricted area represents a fairway for commercial shipping and vessels should neither anchor in this area nor hamper the navigation of commercial shipping in any way.
- 3 **Historic wrecks** (1.70), the *Yarra Yarra* and the *Commodore*, each within a protected area, lie 9 cables N and ¾ miles E respectively from Nobbys Head Light (32°55'1S 151°47'9E).

Dumping grounds

3.96

- 1 **Spoil ground** (32°56'S 151°49'E) is shown on chart Aus 207. **Dumping ground**, (charted as spoil ground) disused and uncharted, lies within an area bounded as follows: from a position ¼ miles SE of Nobbys Head (32°55'S 151°48'E), a line drawn NW for 5 cables, thence NE for 5 cables, thence SE for 5 cables. The SE limit is not defined. **Dumping ground** containing explosive devices which are hazardous to underwater operations exists within 300 m of 32°53'7S 151°51'2E.

Pilotage

3.97

- 1 Pilotage is compulsory and is available day and night. Pilots board in position 32°57'1S 151°51'4E by helicopter or by pilot launch which is 17 m in length, fitted with VHF radio and painted orange and yellow with the

word 'PILOT' in large black letters on each side of the superstructure.

Tugs

3.98

- 1 Tugs are available and requirements for them should be arranged before entry; they will normally attend from close within the breakwater heads.

Local knowledge

3.99

- 1 Because of the changeable nature of depths and conditions in the port, masters holding Pilotage Exemption Certificates but lacking recent local knowledge, or in deep-draught vessels, are advised to engage a pilot until fully familiar with the latest information.

Regulations

3.100

- 1 **Speed limits** are in force for vessels over 24 m LOA; the limits are 8 kn within the heads of the breakwaters, and 6 kn W of Pirate Point (32°55'0S 151°47'4E) and in Stockton Channel N of Stockton Crossing. In Basin Cut the speed limit is 4 kn.

Speed should be reduced to the minimum consistent with safe navigation when passing vessels moored in Steelworks Channel, when proceeding through Basin Cut and when passing dredging operations, which should in any case be given a wide berth.

Vessels in ballast are required to have propellers fully immersed and be trimmed within 1% of LOA.

Quarantine

3.101

- 1 Newcastle is a first port of entry; the quarantine line is drawn between the heads of the two breakwaters.

There is no quarantine anchorage for the port; vessels requesting pratique will usually be given permission to berth for examination alongside by the Quarantine Medical Officer, but no one may board or leave the vessel until free pratique is granted.

For extracts from the Quarantine Act see 1.64.

Harbour

General layout

3.102

- 1 From sea the entrance channel leads between the breakwaters, with wave-traps at their inner ends, into The Horse Shoe; thence the harbour divides WSW to The Basin and Throsby Basin where the main general wharfage is situated, and NNW to Steelworks Channel and Kooragang Basin where berths are generally equipped for handling specialized bulk cargoes.
- 2 The S arm of Hunter River enters the harbour through the NW side of Kooragang Basin, but the arm is shallow and is crossed by a number of low fixed bridges. The navigable N arm enters Steelworks Channel from the NE over a bar extending S from Walsh Point (32°54'1S 151°46'5E).

Hazards

3.103

- 1 **Dredging** is a continuing operation within the port and its approach channel.

Passenger ferries cross The Horse Shoe at all hours between Stockton Ferry Wharf (32°55'2S 151°46'9E) and Newcastle Ferry Terminal (4 cables SSW). A fog signal is sounded from each of these ferry terminals.

Visual signals

3.104

- 1 The signals described at 1.77 may be shown from Nobbys Head signal station for information or for the control of vessels navigating within the port limits.

Visual storm signals (1.79) may be shown at the pilot station (32°55'4S 151°47'3E) for the benefit of small craft.

Natural conditions

3.105

- 1 **Tidal streams.** Streams within the harbour begin approximately 40 minutes after HW and LW and achieve their maximum rate 1 hour later as follows:

<i>Position</i>	<i>Rate</i>
Harbour entrance abreast Nobbys Head	1 kn
The Horse Shoe	1.3 kn
Stockton Crossing	1.5 kn

During freshets the out-going rate may be increased to 4 kn.

- 2 Strong and variable cross-tides are experienced in The Horse Shoe; the out-going stream there is deflected into the entrance channel by the guide wall of the S wave-trap (32°55'4S 151°47'4E).

The outflow from Hunter River through Stockton Channel normally creates a set onto Dockyard berths, No 4 and 5 and Dyke berths No 1 and 2 during both in- and out-going streams.

Climatic table, see 1.192 and 1.196.

Nature of the bottom

3.106

- 1 With the exception of the harbour entrance, which is rock, and the Dockyard area adjacent to Dyke Point (32°55'4S 151°46'6E) which is partly rock, the bottom in the berths and their approaches is sand, silt and clay.

Principal marks

3.107

- 1 **Landmarks:**

Mount Sugarloaf (32°54'S 151°33'E) (3.61).

Water tower (conspicuous) (32°56'2S 151°46'6E), standing 2 cables ENE of Shepherds Hill; the hill is more prominent than Flagstaff Hill (1¼ miles NE) or Nobbys Head (1¼ miles NE) (3.63).

- 2 Chimney (conspicuous, elevation 86 m) (32°53'8S 151°46'7E); two further chimneys (conspicuous, orange and white, elevations 66 and 57 m), stand 3½ and 5 cables N respectively.

Cathedral (32°55'7S 151°46'8E), floodlight occasionally.

Major light:

Nobbys Head Light (32°55'1S 151°47'9E) (3.62).

Directions*(continued from 3.64)***Approach****3.108**

- 1 From a position at least 3 miles SE of Nobbys Head Light (32°55'·1S 151°47'·9E) (3.62), the track leads NW to a position E of the harbour entrance, passing (positions from Southern Breakwater Head Light (orange square daymark on black wooden framework tower) (32°55'·0S 151°48'·2E):

- 2 SW of a light-buoy (isolated danger) (3 miles ENE) marking the S of two rock patches with depths of 15·4 m over them; a 17·0 m patch lies 2 cables SW, thence:

NE of Outer Ledges (extending 3 cables SE); Big Ben Rock, on which seas break heavily in bad weather, lies near the NE extremity.

Course can then be adjusted to make either of the approach leading lines below.

3.109

- 1 **North Breakwater Approach Leading Lights:**

Front light, Northern Breakwater Head Light (see above).

Rear light (5 cables W of the front light).

The alignment (265°) of the above lights leads into the Approach Channel in a least depth of 17·7 m, passing (positions from the front light):

- 2 N of two light-buoys (special; wave rider) (6 cables E); which may be moved from time to time, thence:

N of a light-buoy (port hand) (3½ cables E), marking the SE limit of the dredged channel.

Course is then adjusted to make the entrance channel, alternatively approach can be made on the other set of leading lights as below.

- 3 **Approach Channel Leading Lights:**

Front light (orange stripe on mast, 15 m in height) (32°55'·2S 151°47'·2E) known locally as Stockton Beacon, standing near the S extremity of Stockton.

Rear light, Dyke Point Light, (orange stripe on mast, 24 m in height) (5½ cables WSW).

- 4 The alignment (244¾°) of the above lights leads into the Approach Channel, passing (positions from the front light):

NNW of the two light-buoys (special; wave rider) (1¼ miles ENE), see above, thence:

NNW of a light-buoy (port hand) (1 mile ENE), see above, thence:

Between the N and S breakwater heads (8 cables ENE) into the entrance channel.

3.110

- 1 **Useful marks.**

Flagstaff Hill (32°55'·6S 151°47'·5E), a prominent hummock 35 m in height surmounted by a flagstaff; the buildings of the Royal Newcastle Hospital stand 3½ cables SW, immediately above a beach.

Pine tree (conspicuous in 1999) (32°54'·5S 151°47'·2E), standing in Stockton (see 1.20).

Tank (conspicuous) (32°54'·1S 151°47'·1E), standing in Stockton.

Stranded wreck (32°51'·5S 151°50'·6E).

Entrance channel**3.111**

- 1 From a position between the breakwater heads, the track leads SW through the entrance channel.

Main Leading Lights:

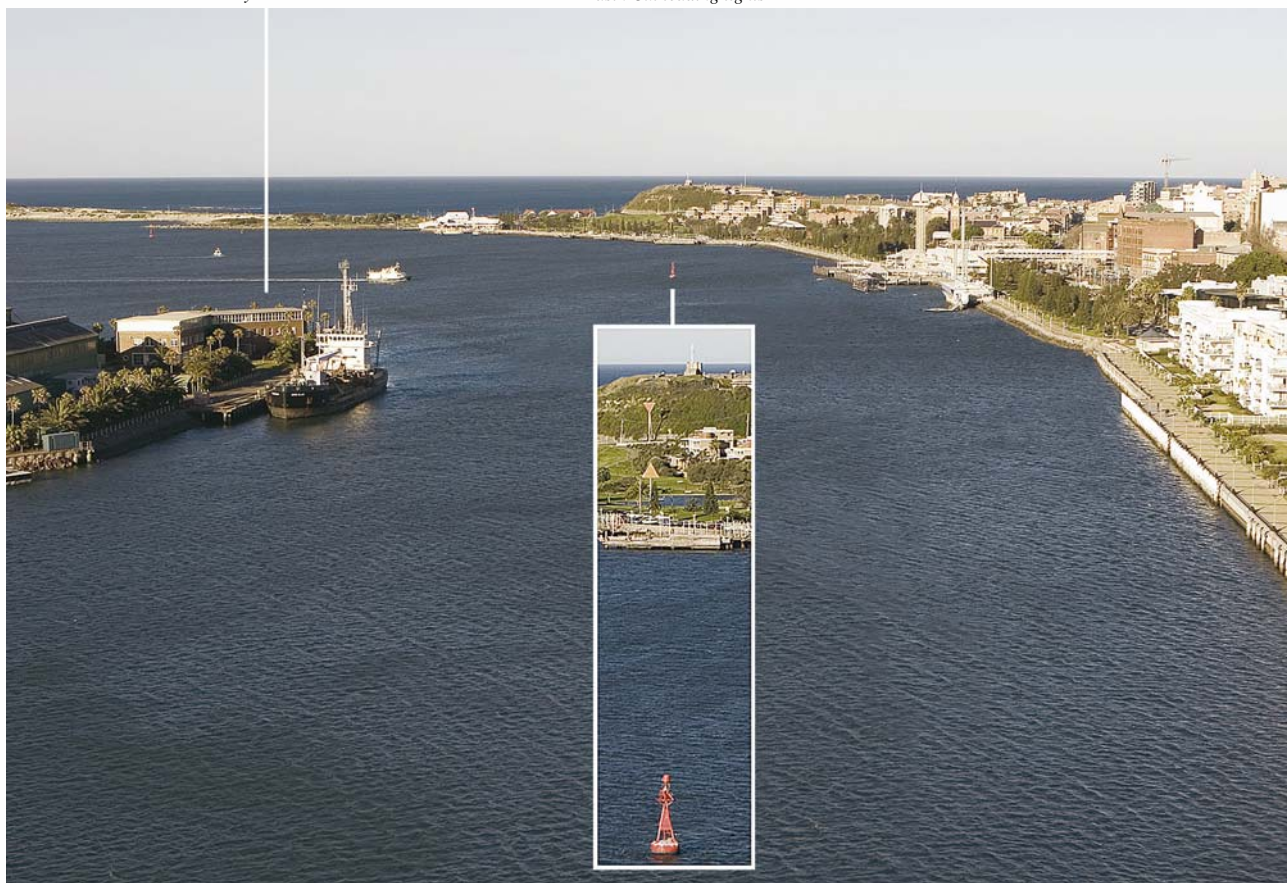
Front light (orange stripe on metal mast) (32°55'·5S 151°46'·8E), standing on the waterfront.

Rear light (orange stripe on metal mast) (2¼ cables SW), standing on higher ground.

*Main leading lights**Dyke Point**Queens Wharf***The Horse Shoe and Basin Cut from NE (3.111)***(Original dated 2005)**(Photograph – Newcastle Port Corporation)*

Dyke Point

Basin Cut leading lights



Basin Cut and the Horse Shoe from W (3.115)

(Original dated 2005)

(Photograph – Newcastle Port Corporation)

- 2 These lights are displayed by day in poor visibility. Their alignment (236°) leads in the centre of the entrance channel, passing:

Between numbered light-buoys (lateral) marking the channel edges.

3.112**1 Lights in line:**

A pair of light-beacons (steel poles 12 m in height, orange stripe daymarks, floodlit at night) ($32^\circ 55' 5S$ $151^\circ 46' 8E$) stand one close each side of the front Main Leading Light; these light-beacons in line with the rear Main Leading Light bearing $234\frac{3}{4}^\circ$ and $238\frac{1}{2}^\circ$ indicate the safe limit each side of the Main lead as shown on chart Aus 208.

3.113

- 1 From the inner end of the entrance channel abreast the pilot station ($32^\circ 55' 4S$ $151^\circ 47' 3E$), the track leads WSW through The Horse Shoe to Basin Cut, or W then NNW to Steelworks Channel.

Caution. See 3.105 for cross-tides in The Horse Shoe.

3.114

- 1 **Useful marks** (positions from the front Main Leading Light ($32^\circ 55' 5S$ $151^\circ 46' 8E$) (3.111)):

Clock tower (conspicuous) ($2\frac{3}{4}$ cables ESE).

Stone tower (conspicuous) ($2\frac{3}{4}$ cables SSW).

Town Hall tower (conspicuous) (4 cables WSW).

Basin Cut**3.115**

- 1 From the inner end of the entrance channel, abreast the pilot station, the track leads WSW to Basin Cut, passing (positions from Dyke Point Light ($32^\circ 55' 4S$ $151^\circ 46' 6E$) (3.109)):

- 2 NW of No 6 light-buoy (port hand) ($2\frac{1}{2}$ cables ESE) marking the N edge of an area of rock bottom; the buoy is moored close to the intersection of the Main and Basin Cut leads, thence:
SE of Birubi Light-buoy (E cardinal) (1 cable E) marking shoal depths extending E from Dyke Point; this buoy is moored at the intersection of dredging limits.

3.116**1 Basin Cut Leading Lights:**

Front light (mast, red triangular daymark point up) ($32^\circ 55' 5S$ $151^\circ 47' 2E$).

Rear light (mast, red triangular daymark point down) ($1\frac{3}{4}$ cables E of the front leading light).

Throsby No 1 Directional Light (grey metal tower, 32 m in height) ($32^\circ 55' 4S$ $151^\circ 45' 7E$).

- 2 The alignment of Basin Cut Leading Lights ($094\frac{1}{2}^\circ$) astern and Throsby No 1 Directional Light ($274\frac{1}{2}^\circ$) ahead leads through Basin Cut in a channel 122 m wide between Dyke Point and Merewether Street Wharf into The Basin

Throsby Wharf

Dyke Point



No. 6 buoy

The Basin and Throsby Basin from E (3.116)

(Original dated 2005)

(Photograph – Newcastle Port Corporation)

(32°55′.4S 151°46′.2E), whence course can be directed to the berth or to a berth in Throsby Basin (3 cables W).

Sound signals. Vessels entering or leaving The Basin must sound one prolonged blast on the whistle or siren.

Steelworks Channel

3.117

- 1 From the inner end of the entrance channel abreast the pilot station, the track leads WNW.

Horse Shoe Leading Lights:

Front light (orange triangle point up on mast) (32°55′.4S 151°47′.4E).

Rear light (orange triangle point down on metal framework tower) (1 cable ESE of the front light).

- 2 The alignment (102½°) of these lights astern leads through The Horse Shoe, passing:

SSW of light-buoys (starboard hand) marking the edge of the channel S and SW of Stockton peninsula, and:

NNE of Birubi Light-buoy (1 cable E of Dyke Point) (3.115), thence:

NNE of Dyke Point (32°55′.4S 151°46′.6E).

Thence the track leads NNW into Steelworks Channel.

3.118

- 1 **Steelworks Channel Directional Lights**, (two horizontal lights 10 m apart on metal columns 60 m in height) (32°53′.2S 151°46′.2E).

State Dockyard Leading Lights:

Front light (orange square, floodlit at night) (32°55′.1S 151°46′.4E).

- 2 Rear light (similar mark) (2 cables S of the front light).

The alignment of the above marks (174¾°) astern and Steelworks Directional Lights (354¾°) ahead leads through the centre and N part of Steelworks Channel, with the controlling width (3.83) in the fairway, to Kooragang Swinging Basin.

Stockton Channel

3.119

- 1 From a position in Steelworks Channel abreast Dyke Berths No 1 and 2 the track leads NE.

Stockton Crossing Leading Lights:

Front light (orange triangle point up on pile beacon) (32°54′.4S 151°46′.8E) standing on the NW shore of Stockton.

- 2 Rear light (orange triangle point up with white border, metal framework tower) (1 cable NE of the front light).

The alignment (039½°) of the above lights leads through Stockton Crossing (see 3.83 for controlling depth), passing (positions from the front light):

- 3 Between Nos 9 and 11 light-buoys (starboard hand) (5½ cables SSW and 4 cables WSW, respectively), marking the E edge of Steelworks Channel.

Dyke Point

Dockyard leading lights



Steelworks Channel from N (3.117)

(Original dated 2005)

(Photograph – Newcastle Port Corporation)

Thence the track continues NE through Stockton Channel, then N to Stockton Bridge, passing (positions from Stockton Bridge (32°53'1S 151°47'2E)):

NW of Boat Harbour (1.4 miles SSW) and some small slipways close SW.

Along the NW coast of Stockton, and:

NW of a beacon (starboard hand) (8½ cables S), thence:

W of a light-buoy (starboard hand) (6¼ cables S), thence:

W of No 1 Light-beacon (starboard hand) (3 cables S), thence:

Beneath the central navigational span of Stockton Bridge (3.84); lights mark the centre of the span, and lights (port and starboard hand) mark the piers each side.

(Directions for

Hunter River above Stockton Bridge continue at 3.130)

Berths

General information

3.120

Berths are generally numbered and shown on the chart together with their depths alongside. Due to silting (see 3.88) the latest depths should be obtained from the Harbour Master.

The Basin

3.121

Total length of wharves 888 m; depths alongside 11.6 m. Largest wharf Western Basin No 3 and 4 berths (32°55'2S 151°46'1E), total length 503 m, depth alongside 11.6 m.

Throsby Basin

3.122

The basin is used mainly by fishing vessels and small craft with the exception of Throsby Wharf No 1 (32°55'4S

151°45'8E); length 183 m, maintained depth alongside 11.0 m, which is used by passenger and visiting naval vessels.

Steelworks Channel

3.123

Total length of wharves 1402 m; depths alongside 7.0 to 16.5 m. Largest wharf Dyke No 4 and 5 berths (32°54'2S 151°46'2E), also known as Steelworks Channel Coal Loader berths; total length 558 m, maintained depth alongside 16.5 m.

Kooragang Basin Area

3.124

Total length of Kooragang wharves 1452 m; depths alongside 11.6 to 16.5 m. Largest wharf Kooragang berths No 4, 5 and 6 (32°53'3S 151°46'1E), length 1080 m, maintained depth alongside 16.5 m.

The former BHP site and wharves situated on the SW side of The Basin area are no longer used commercially, with the exception of No 6 berth, which has a length of 55 m and depth alongside of 7.9 m and is used by small tankers. It is the intention (2005) that this site will become a multi purpose terminal.

Port services

Repairs

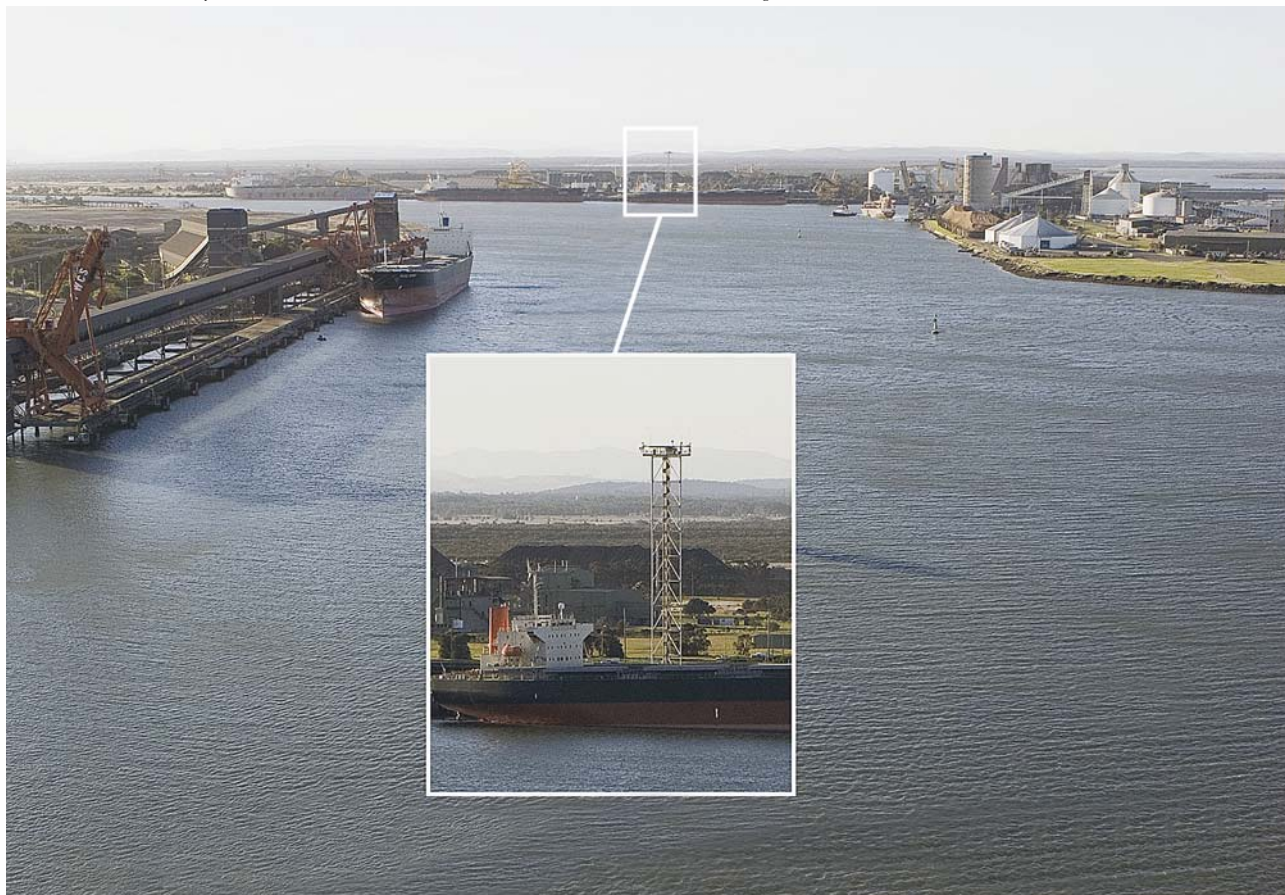
3.125

Floating dock: can accept vessels up to 202 m LOA, 32 m beam and 14 500 tonnes.

Patent slips: the larger of two has a lifting capacity of 1250 tonnes. Ships up to 60 m LOA, 11.0 m beam, 3.5 m draught and 1000 dwt can be accommodated.

Major repairs can be effected.

Other slipways, and building and repair facilities are available in the port.



Steelworks Channel and entrance to Kooragang from S (3.123)

(Original dated 2005)

(Photograph – Newcastle Port Corporation)

Other facilities**3.126**

- 1 Compass adjustment; deratting; hospitals; customs board at the berth; oily waste disposal facilities by arrangement.

Supplies**3.127**

- 1 **Marine diesel** and lubricating oils by road tanker.
Fresh water is piped to all berths.
 A Marine Services Board Patrol Officer meets all vessels berthing at all wharves to arrange supply of shore services.
Provisions are plentiful.

Communications**3.128**

- 1 Nearest airport Williamtown (15 km N).

Rescue**3.129**

- 1 The pilot vessel is equipped with a man overboard recovery system.
 A sea-going Police boat acts as rescue vessel for small craft.
 See 1.87 for details of area rescue services.

Hunter River**Description****3.130**

- 1 Hunter River is 300 miles in length and the second largest in New South Wales but is only a minor navigational waterway.

The N arm of the river is navigable by vessels of appropriate size and draught to Hexham (32°50'S 151°41'E) where two bridges cross the river; above these bridges the river is only used by small craft.

Local knowledge is necessary for all sections of Hunter River above Stockton.

Limiting conditions**3.131**

- 1 **Controlling depth** in the river between Stockton Bridge and Hexham is 2.4 m.

3.132

- 1 **Vertical clearances.** Hexham Bridges (32°49'·4S 151°41'·1E) consist of two road bridges situated close together. The downstream bridge has five fixed truss spans and one vertical lift span which is located between Piers 3 and 4 from S and is marked by lights (port and starboard hand). The lifting span has a navigable width of 30 m and a vertical clearance of 30 m when open; vertical clearance on the lifting span when closed and on all fixed spans is 4.2 m. Special traffic signals and regulations are in force.

- 2 The navigational span of the newer upstream bridge, where the controlling vertical clearance of 9.5 m beneath the two bridges is found, is marked by lights (port and starboard hand).

Arrival information

3.133

- 1 **Pilotage** is compulsory for commercial vessels over 30 m LOA. Pilotage is not compulsory upriver of Hexham Bridge.

General regulations for the navigation of navigable rivers are given at 1.57.

Speed limit. A limit of 6 kn is in force in the river for vessels over 24 m LOA.

- 2 **Cables and pipelines.** Submarine cables and pipelines and overhead power cables crossing the river between Stockton Bridge and Hexham Bridges are shown on chart Aus 207.

Tidal streams in the river run at 1 to 2 kn, but during freshets the out-going rate may be increased to 6 kn.

Directions

3.134

- 1 From Stockton Bridge (32°53'1S 151°47'2E) (3.84) the track leads NNW then WNW for 7 miles to Hexham (32°50'S 151°41'E) through a channel which has a least width of 60 m in places and is marked by a series of numbered light-buoys and light-beacons and by sets of leading lights.

NEWCASTLE TO SUGARLOAF POINT

General information

Chart Aus 362 (see 1.15)

Description

3.135

- 1 The coastal route from a position off Port of Newcastle (32°56'S 151°47'E) to Sugarloaf Point (32°26'S 152°32'E) leads for 46 miles, first ENE to pass Point Stephens (32°45'S 152°12'E) then NE to a position off Sugarloaf Point.

Topography

3.136

- 1 To the NE of Newcastle the coast forming Stockton Bight consists of a sandy beach extending about 16 miles ENE to the vicinity of Morna Point (32°47'S 152°07'E) (3.140); the beach is backed by conspicuous sand dunes for its entire length except at the extreme S end where the suburb of Stockton can be seen. Behind the sand dunes the coastal belt is relatively low-lying to a width of about 8 miles.
- 2 From thence for about 8 miles NE the coast is generally rocky and indented and consists of a series of steep hills and headlands, the highest and northernmost of which is Yacaaba Head (32°42'S 152°12'E) (3.151) on the N side of the entrance to Port Stephens; three small islands lie up to 1¾ miles to seaward of Yacaaba Head.
- 3 From Yacaaba Head NE to Sugarloaf Point (32°26'S 152°32'E) the coast is again generally low with long sandy beaches backed by sandhills broken only by Dark Point (32°36'S 152°16'E) and the off-lying Broughton Islands. South-east of Dark Point the sandhills are bare and white with a large plantation of pines standing inland of the centre of the beach, whilst NE of that point the sandhills are more remarkable with patches of green scrub; these continue to Sugarloaf Point where the coast is higher and

rocky, with Seal Rocks and other dangers lying up to 2½ miles offshore.

Fishing areas

3.137

- 1 In addition to the guidance on fishing areas at 3.4, the area inshore of the 110 m (60 fm) depth contour between Morna Point (32°47'S 152°07'E) and Seal Rocks (29 miles NE) is particularly subject to extensive lobster fishing throughout the year and should if possible be avoided by shipping.

Historic wreck

3.138

- 1 An historic wreck (1.70), within a protected area, lies 2¼ miles SSW of Sugarloaf Point (32°26'S 152°32'E).

Major Lights

3.139

- 1 Nobbys Head Light (32°55'1S 151°47'9E) (3.62).
Point Stephens Light (white stone tower, 21 m in height) (32°45'S 152°12'E).
Sugarloaf Point Light (white round masonry tower, 15 m in height) (32°26'S 152°32'E).

Directions

(continued from 3.64)

3.140

- 1 From a position off Port of Newcastle (32°56'S 151°47'E) the track leads ENE, making a safe offing from the shore of Stockton Bight where there is always a heavy surf and which can be a dangerous lee shore, passing (positions from Point Stephens Light (32°45'S 152°12'E)):
Clear of a light-buoy (isolated danger) (20 miles WSW) (3.108), thence:
- 2 SSE of Telegraph Shoal (5¼ miles SW). The shoal lies 9 cables SW of Morna Point, a bluff headland standing at the W end of Anna Bay (32°46'S 152°07'E). A patch with a depth of 5.4 m over it lies 1 mile W of Telegraph Shoal; both of these break in bad weather. Thence:
SSE of a patch with a depth of 8.2 m over it (2¾ miles SW), lying 4 cables offshore at the E end of Anna Bay; there is a sandy beach 1 mile in length at the head of the bay. Thence:
- 3 At least 1 mile SE of Point Stephens Light (3.139), standing on the E slope of Mount Stephens peninsula, which is 77 m in height, and on the rocky promontory of Point Stephens; the peninsula is connected to the mainland by Fingal Spit (8 cables WNW), a bare sandy neck. Foul ground over which the sea breaks extends 2½ cables offshore from Point Stephens.
- 4 Thence the track leads NE, passing (positions from Point Stephens Light (32°45'S 152°12'E)):
SE of an underwater pinnacle of rock (1½ miles NE) (3.153) with a depth of 11 m over it, lying in the approaches to Port Stephens, thence:
SE of Boondelbah Island (2¾ miles NNE), which is bare; Yacaaba Head (3.151), easily identified, stands 1 mile farther WNW. Thence:
- 5 SE of Little Island (3½ miles NE), also bare; Cabbage Tree Island, the largest and N-most of the three islands, lies 1 mile farther NW; see 3.143 for passage inshore and for dangers W and N of Cabbage Tree Island. Thence:
- 6 SE of Broughton Islands (9½ miles NE) (3.160); a light is displayed from near the summit of the E

island; depths of 35 m are found 5 cables E of the islands. Thence:

SE of The Big Gibber (Big Gibber Headland) (19 miles NE), a dune; a rock which dries 1.5 m lies 3 cables offshore and a rocky spit with depths less than 11 m extends 7 cables SSE from the dune, thence:

SE of Edith Breaker (22 miles NE), a dangerous rocky shoal, which does not always break, lying in the track of small vessels passing inshore of Seal Rocks; depths of 20 m are found at about 1 cable from the shoal. A patch with a depth of 11 m over it lies 6 cables SE of Edith Breaker. Thence:

SE of Seal Rocks (24 miles NE), a rock (11 m in height) with a below-water rock (charted as dangerous) 1 cable SE and a patch with a depth of 6.1 m over it 1 cable N. Bull Rock with a depth of 7.9 m over it lies 5 cables WNW. Little Seal Rocks (0.9 m in height) lie 7 cables SSE from Seal Rocks; a shoal patch with a depth of 3.4 m over it and which breaks, lies 3 cables farther S. Seal Rocks, Little Seal Rocks and Bull Rock are covered by the arc of visibility (307°–010°) of Sugarloaf Point red auxiliary light. Thence:

SE of Sugarloaf Point (25 miles NE). A light (3.139) stands near the SE extremity; Seagull Island (Peaked Rock) (6 m in height), stands 4½ cables SSE of the light and at the end of a reef extending from the point; Statis Rock, a white-topped rock (11 m in height) stands 6 cables NNW of the light and near the end of a reef extending from the N extremity of the point.

3.141

Clearing marks:

The alignment (047°) of Fingal Point (32°45'8S 152°10'2E), with Mount Stephens (1½ miles NE) passes 5 cables SE of Telegraph Shoal (3½ miles SW) in a depth of 33 m (18 fm). Two islets, 9 m (30 ft) in height, stand close together on a drying reef extending 1½ cables SSE from Fingal Point. (*Directions continue at 3.166*)

Inshore channels

Chart Aus 362 (see 1.15)

Providence Bay

3.142

An inshore route for vessels N-bound from Port Stephens (32°42'S 152°10'E) (3.148), taking advantage of a N-going eddy current, leads W of Cabbage Tree Island (32°41'S 152°13'E) thence across Providence Bay and W of Broughton Islands (6 miles NE). Alternatively that part of the route leading W of Broughton Islands may be joined by vessels from S passing E of Little Island (32°42'S 152°15'E) (3.140).

Local knowledge is required.

Limiting conditions. The channel inshore of Broughton Islands is about 4 cables in width and has depths between 10 and 18 m in the fairway.

3.143

Directions. From a position close off the entrance to Port Stephens the track leads N, passing (positions from Yacaaba Head (32°42'S 152°12'E) (3.151)):

2 cables E of Yacaaba Head, and:

W of Cabbage Tree Island; depths less than 4.1 m (13 ft) extend 1½ cables WNW from the NW point the island; marine farms and a dangerous wreck lie 6½ cables N and 6 cables NE, respectively, of the same point.

Thence the track leads across Providence Bay.

Leading marks: the line of bearing, 204° astern, of Point Stephens Light (32°45'S 152°12'E) (3.139), seen midway between Boondelbah Island and Cabbage Tree Island (3 and 4 miles NNE respectively) (3.140) leads NNE, passing (positions from Dark Point (32°36'S 152°16'E)):

ESE of Dark Point, 21 m in height, the only rock bluff on the beach for several miles, and:

WNW of Dry Rock which dries 1.8 m (6 ft) (9 cables ESE), the W rock of The Sisters; and the westernmost danger extending from Broughton Islands.

Thence, when clear N of Dry Rock (see 3.144 for clearing marks), the track leads ENE passing:

5 cables NW of Inner Rock, 17 m high; a rock (charted as dangerous) lies ½ cable NW.

Thence course may be directed as required to pass Sugarloaf Point.

3.144

Clearing marks:

The alignment (086°) of the S end of Inner Rock (32°36'S 152°18'E) with North Rock (1 mile E) (3.160), clears N of Dry Rock.

Seal Rocks

3.145

A route used by small vessels of appropriate size and draught leads NE from a position SW of Sugarloaf Point Light (32°26'S 152°32'E) passing inshore of Seal Rocks (1½ miles SSE) (3.140).

Clearing Marks:

The alignment (049°) of Treachery Head (32°27'S 152°31'E) with Sugarloaf Point Light (32°26'S 152°32'E), passes W of Edith Breaker (2 miles SW) (3.140).

Anchorage

Fly Roads

3.146

Good temporary anchorage in winds between S and W may be found in Fly Roads in a depth of 20 m (11 fm), sand, 9 cables NNW of Point Stephens Light (32°45'S 152°12'E) (3.139). Smaller vessels can anchor closer inshore.

Caution. A dangerous wreck lies 1.1 miles NNW of Point Stephens Light; shoal patches with depths of 8.1 m (26 ft) and 9.6 m (31 ft) lie 1 cable SSE and 2½ cables S respectively of the wreck.

A submarine power cable (disused) is laid across the head of the roads about 1½ cables NE of Fingal Spit.

Providence Bay

3.147

An anchorage suitable for vessels of appropriate size and draught in S and W winds may be obtained in the S part of Providence Bay on the N side of Yacaaba Head (32°42'S 152°12'E) (3.151); the anchorage is partly sheltered by Cabbage Tree Island (1 mile ENE). See 3.143 for dangers N and W of Cabbage Tree Island.

Port Stephens

General information

3.148

- 1 Port Stephens (32°42'S 152°10'E) is a large inlet extending about 11 miles inland but much obstructed by extensive sandbanks, some of which dry in patches. The harbour offers secure and landlocked anchorage for medium sized vessels (see 3.149) using the main channels described in Directions (3.154), but only small vessels of appropriate size and draught and with local knowledge should venture elsewhere. The port is used extensively by small pleasure craft.

- 2 **Port limit** is drawn at the entrance between the SE extremities of Tomaree Head (32°43'S 152°11'E) and Yacaaba Head (1¼ miles NE).

Port authority. Maritime Services Board of New South Wales. Local office at 1/34 Stockton Road, Nelson Bay 2315.

Limiting conditions

3.149

- 1 **Controlling depths.** Vessels up to a maximum of about 13 500 gt with draught not exceeding 6.7 m can reach the inner anchorages at HW.

Vessels at draughts approaching the above figure are recommended not to enter the port at night.

Anchorage depths are 7 to 27 m (23 ft to 15 fm).

Tidal levels: See information in *Admiralty Tide Tables*. At Nelson Bay (32°43'S 152°09'E) mean maximum range about 1.3 m; mean minimum range about 0.7 m.

- 2 **Local weather and sea state.** In winter strong W winds prevail which may impede vessels entering at light draught. In summer the wind is generally off the land until about 1000 when a sea breeze sets in from SE which gradually shifts through E to NE during the day.

On the out-going tidal stream after strong E or SE winds, heavy tide-rips and overfalls extend right across the entrance. At such times, or in otherwise bad weather, entry should only be made on the in-going stream.

Arrival information

3.150

- 1 **Cables and pipelines.** Overhead cables and submarine cables and pipelines are situated at various points in Port Stephens and its inlets; they are usually indicated by warning notices on shore.

Local knowledge is required.

Harbour

3.151

- 1 **General layout.** The port area consists of Nelson Bay (32°43'S 152°09'E), where there are jetties and a detached breakwater fronting the town of the same name, and a spacious and secure anchorage area farther W which includes Salamander Bay (32°44'S 152°06'E).

- 2 The Narrows, a deep channel lying N of Soldiers Point (32°42'S 152°04'E), leads to a large inner harbour which has depths of 20 m and good anchorage in its deepest part but is otherwise shallow.

Myall River enters the harbour 2¾ miles WNW of Yacaaba Head (32°42'S 152°12'E) and Karuah River enters 11 miles W of the same head.

- 3 **Seaplanes** operate in the W section of South Channel (32°43'S 152°07'E)

Tidal streams:

<i>Position</i>	<i>Rate</i>
Off Yacaaba Head	1 to 2 kn.
Close W of Entrance Shoal	2 kn.
Off Fly Point	3 kn.

Care is necessary when proceeding through South Channel due to eddies off the S shore.

Landmark:

Yacaaba Head (32°42'S 152°12'E), a peaked hill easily identified, with a precipitous descent to the sea on all sides except NW where it is joined to the mainland by a low and narrow strip of sand covered by scrub. Some rocks, always visible and steep-to, lie close off the SE point of the head; the SW side is foul to a distance of 1 cable offshore.

Directions

3.152

- 1 **Approaches.** Yacaaba Head (32°42'S 152°12'E) and the three off-lying islands (3.140) are good guides for the port, as is Point Stephens Light (32°45'S 152°12'E) (3.139). From the offing the land appears as a series of detached, conical hills.

3.153

- 1 From a position SSE of Yacaaba Head (32°42'S 152°12'E) (3.151), the track leads NNW with the W slope of the head bearing about 336°, passing (positions from Yacaaba Head):

Not less than 1 mile ENE of Point Stephens Light (3 miles S) (3.139), thence:

- 2 Clear of the pinnacle rock with a depth of 11 m over it (2 miles SSE), thence:
ENE of Tomaree Head (7 cables SW), the N of four conspicuous rounded summits separated by low land between; a light stands on the NE extremity of the head.

- 3 **Leading marks:**

A directional light (white triangle point down on beacon) (3½ miles WNW), standing towards the S end of Corrie Island, low, swampy and bush-covered.
A distant pyramid-shaped hill

- 4 The white sector (292°–295°) of the above light, or the line of bearing (293°) of the pyramid-shaped hill, lead separately WNW through the entrance which has a least depth of 7.7 m over a width of 2 cables, passing:

Not less than 1½ cables SSW of Yacaaba Head, and:
NNE of Entrance Shoal (4 cables SW) a spit, with a depth at its NE extremity of 4.8 m, extending NE from a bank which nearly fills Shoal Bay (1 mile farther SW).

3.154

- 1 **Harbour.** From a position in the entrance close SW of Yacaaba Head (32°42'S 152°12'E) the track leads W then SW to Nelson Bay, thence farther W to the inner anchorages.

Leading marks: the alignment (267¼°) of Middle Ground Light–beacon (S cardinal) (32°42'2S 152°09'4E) with Middle Channel Light–beacon (starboard hand) (1½ miles farther W) leads W in a least depth of 8.2 m, passing (positions from Nelson Head (32°43'S 152°10'E)):

- 2 N of Entrance Shoal (1¼ miles ENE) (3.153), thence:
S of a shoal (1¼ miles NE), with a least depth of 1.6 m; depths less than 5 m extend 1 cable farther S.

Leading marks:

Front mark a beacon (white triangular topmark) (6 cables WSW) standing on Fly Point.

- 3 Rear mark Leading Knoll (1¼ miles SW of the beacon), a little more than 120 m in height; a tower (conspicuous, elevation 161 m) stands 1½ cables SSW of the knoll.

The alignment (229¼°) of the above marks leads SW passing:

- 4 NW of Entrance Shoal (1¼ miles ENE), and: SE of Middle Ground (5 cables NW), with drying patches which shift; the bank is the S part of an extensive flat occupying much of the N side of the port. Middle Ground Light-beacon (4 cables NNW) (see above), and a light-beacon (starboard hand) (5 cables W) mark the SE edge of the bank which is steep-to.
- 5 Thence the track leads WSW, passing: 1 cable NNW of Nelson Head, a steep-to, round, wooded hillock; a lighthouse (conspicuous, disused) stands on the summit, thence: NNW of Fly Point (6 cables WSW), an artificial reef with a least depth of 3 m over it lies 1 cable W of the point, thence:
- 6 N of West Point (1¼ miles WSW), the rocky W entrance point of Nelson Bay; shallow water extends about 1 cable offshore for 1¾ miles W from the point.

Leading lights:

Front light-beacon (red rectangular daymark) (7 cables SW), standing on the E shore of Nelson Bay.

- 7 Rear light-beacon (similar daymark) (64 m E of the front beacon); buildings stand in the vicinity.

The alignment (092° astern) of the above light-beacons leads W through South Channel, passing:

- N of Red Patch Rocks (1½ miles WSW) with a least depth of 2.7 m over them; a light-buoy (isolated danger) is moored close NW of the rocks, and:
- 8 S of Manton Bank with a least depth of 0.9 m over it (2 miles W); a light-beacon (starboard hand) marks the S edge of the bank.

Thence the track continues W in a least depth of 6.1 m, passing (positions from Nelson Head Lighthouse (32°43'S 152°10'E):

- N of Sandy Point (2½ miles WSW), thence:
- 9 N of Corlette Point (3 miles WSW). Lights which stand at the head of the E and W breakwaters indicate the entrance of a marina situated on the N side of the point.

Course may then be directed to an anchorage, or as otherwise required, passing:

- 10 Clear of a dangerous wreck (bearing 261° distant 3.6 miles) with a depth of 4.2 m over it, lying in Salamander Bay. Shellfish beds marked by light-buoys (special), lie 3 cables W of the wreck. Clear of West Bank with a depth of 1.7 m over it (3½ miles W); a light-beacon (starboard hand) marks the S edge of the bank. Ballast Bank, with a depth of 7.9 m over it, lies 4½ cables WSW of West Bank.

Myall River approaches**3.155**

- 1 Schooner Channel (32°41'S 152°06'E) is the only navigable approach to Myall River (3.158); it leads NE

from a position N of the W end of South Channel (32°43'S 152°07'E) (3.154) and passes between the NW edge of Middle Ground and the mainland. From the inner end of Schooner Channel a further channel leads N into Pindimar Bay thence E through Corrie Creek, passing N of Corrie Island (32°41'S 152°08'E) (3.153), into Myall River. The channels are marked by light-beacons and beacons. There is a least depth of 7.8 m in the entrance to Schooner Channel and depths of about 4.2 m in Pindimar Bay, shoaling to about 2 m towards the E end of Corrie Creek. The town of North Pindimar stands on the W shore of Pindimar Bay.

A **speed limit** of 8 kn is in force in Corrie Creek.

Inner harbour**3.156**

- 1 The inner part of the harbour is entered through The Narrows leading WNW between Soldiers Point (32°42'S 152°04'E) and North Point (6 cables NNE); Soldier Spit, with a depth of 1.9 m over it, extends 3 cables ESE of Soldiers Point.

- 2 Boondaba Island, also known as Middle Island, lies 3 cables NNE of Soldiers Point and in the centre of The Narrows; Channel Banks, with a least depth of 6.7 m over them, and Fly Rock (charted as a dangerous rock), marked on its SW side by a light-beacon (isolated danger), lie respectively 5 cables ESE and 1 cable WNW of the island. The W side of Boondaba Island has depths less than 5 m extending 1 cable W; a patch with a depth of 5.5 m over it lies 3 cables W of the same island and between these lies a narrow channel with depths of more than 15 m.

- 3 Shag Rocks, which dry 1.5 m, lie 7 cables NW of Soldiers Point and on a reef at the N extremity of a bank extending from the point. A light-beacon (N cardinal) stands at the N end of Shag Rocks.

Baromee Point lies N of the fairway and 1½ miles NW of Soldiers Point; a shoal with depths between 2.7 and 6.4 m over it extends up to 2 cables E and S from Baromee Point. The E side of the bank is marked by a light-buoy (port hand).

- 4 The deep-water area of the inner harbour extends SW from Baromee Point to about halfway between there and Snapper Island (32°42'S 152°00'E).

Anchorage**3.157**

- 1 **Shoal Bay** (32°43'S 152°10'E), provides anchorage for small vessels in depths between 3 and 6 m. Tomaree Wharf is situated on the E side of the bay. A depth of 1.2 m lies 4 cables W of Tomaree Head.

Nelson Head (32°43'S 152°10'E), provides fair weather anchorage in depths between 10 and 20 m N of the head but it is unsafe in adverse conditions.

- 2 **Nelson Bay** (32°43'S 152°09'E), provides sheltered anchorage, out of the tidal stream, in depths between 5 and 15 m off the centre of the beach with the summit of Yacaaba Head (32°42'S 152°12'E) shut in by Nelson Head. This anchorage is used frequently by coasters in bad weather.

A sewer outfall, lying W of the anchorage, extends 1½ cables N from West Point (3.154).

- 3 **Salamander Bay** (32°43'S 152°05'E), is spacious and affords excellent anchorage, sheltered from all winds, in depths between 10 and 16 m. See 3.154 for details of a dangerous wreck.

Inner harbour. Good anchorage may be found about 1½ miles WNW of Soldiers Point (32°42'S 152°04'E) in depths between 14 and 20 m.

Myall River

3.158

- 1 **Myall River** flows into Port Stephens close E of Corrie Island (32°41'S 152°08'E) (3.153) but the entrance is shallow and exposed and liable to change due to the heavy seas breaking there. Vessels approach the river by way of Schooner Channel (32°41'6S 152°06'6E) (3.155). The town of Tea Gardens (32°40'S 152°10'E), where there are public wharves, stands within the river on the W bank, with the towns of Hawks Nest (7 cables ESE) on the E bank, and Winda Woppa (1 mile S) on the S bank. From Tea Gardens the river winds generally NE behind the coast for 12 miles to The Broadwater (Bombah Broadwater) (32°32'S 152°17'E) and Myall Lake (32°26'S 152°23'E). The river and lakes serve the timber, fishing and tourist industries.

- 2 **Local knowledge** is required.

A road bridge with a vertical clearance of 10.6 m spans the river between Tea Gardens and Hawks Nest. The channel as far as the bridge is marked by light-beacons and beacons, and from there on by buoys and beacons only. Depths between Tea Gardens and The Broadwater are no more than 1.5 m and subject to siltation.

Speed limits of 8 kn are in force from the river entrance to the road bridge, thence 4 kn for 1 mile passing Tea Gardens, thence 8 kn continuing upstream.

Karuah River

3.159

- 1 **Karuah River** enters the head of Port Stephens from NW and passes each side of Wirrung Island (32°40'S 151°59'E) which is fringed with mangroves. The entrance is wide and shallow but within the bar the river has depths of about 2.4 m for a distance of 12 miles to Booral Wharf.

Local knowledge is required.

A road bridge consisting of six fixed spans crosses the river at the town of Karuah (32°39'S 151°58'E); the maximum vertical clearance of 6 m is found beneath the narrowest span which has a navigable width of 16 m.

- 2 **Overhead cables** with a vertical clearance of 21 m span the river below Karuah bridge and other cables with a vertical clearance of 9 m cross above it. Submarine cables cross the river close upstream of the bridge.

The river should not be navigated at night as there are no lighted beacons in the area.

A **speed limit** of 8 kn is in force on the river.

Broughton Islands

Description

3.160

- 1 Broughton Islands (32°37'S 152°19'E) consist of a group of two small islands, islets and rocks from which off-lying reefs of above and below-water rocks extend up to 1 mile except on the E side; the SW side where the sea breaks in strong SE winds is particularly dangerous. A deep-water channel (3.142) lies between the W extremity of the reefs and the mainland in the vicinity of Dark Point (32°36'S 152°16'E).

Local knowledge is required for navigation in the area.

- 2 Little Broughton Island, the outer island, is the higher and is steep and rocky with patches of green scrub on the summit; it is joined at LW by a chain of rocks to the larger, inner island which rises at its E end to a steep, rocky, conical peak with a vertical face on its seaward side; the W part of the larger island is low and scrub-covered. Esmeralda Cove, 3 cables in length and 2 cables wide in its entrance, lies close SW of the peak and has depths of 5 to 20 m in the entrance decreasing to 2.4 m at ½ cable from a sandy beach at the head. A rock with a depth of 3.4 m over it, which breaks, lies close off the W entrance point, and Looking Glass Isle (South Rock), sugarloaf-shaped and steep-to, lies S of the same point and is connected to it by a reef; there are depths of 20 m within 1 cable E and W of Looking Glass Isle and deeper water S.

- 3 North Rock lies near the NE extremity of the reefs N of the larger island; the rock has a cliff face on its E side where it is steep-to, but it is rocky and foul to the W and S.

A reef of above and below-water rocks lies about midway between North Rock and Inner Rock (1 mile W); there are depths of 10 to 15 m close E and W of the reef.

Anchorage

3.161

- 1 Small vessels of appropriate size and draught can obtain anchorage sheltered from all winds amongst the islands. In S winds anchorage can be found 2½ cables E of Providence Point (32°36'4S 152°18'3E), the NW extremity of the larger island between two reefs in a depth of 9 m, sand.

In NE or E winds good anchorage can be found in depths of 15 to 20 m, 3 cables SSW of the same point.

- 2 Anchorage for small vessels may also be obtained on the SW side of the islands in Coal Shaft Bay, a cove 7 cables SSE of Providence Point. A rock patch, with a depth of 1.5 m over it, lies in the middle of the entrance to the cove and should be passed on its N side.

SUGARLOAF POINT TO SMOKY CAPE

General information

Charts Aus 362, Aus 363 (see 1.15)

Route

3.162

- 1 The coastal route from a position off Sugarloaf Point (32°26'S 152°32'E) leads 98 miles NNE to a position off Smoky Cape (30°55'S 153°05'E).

Topography

3.163

- 1 The coastal belt N from Sugarloaf Point to Smoky Cape is generally low and wooded, and through it a number of rivers enter the sea. The coast is fronted by sandy beaches broken by rocky headlands.

Harrington Inlet (31°53'S 152°42'E), an entrance on the delta of Manning River, is navigable in favourable conditions, but local knowledge is essential.

- 2 From Port Macquarie (31°26'S 152°55'E) to Smoky Cape (31½ miles NNE), the coast is mostly covered with thick scrub; behind the coast the land rises quickly to irregular, sharp, wooded peaks. The headlands, when first

seen from the offing, appear as islands. A heavy surf generally breaks on the beaches.

Historic wrecks

3.164

- 1 Historic wrecks, each within a protected area, lie in the following positions:
- 2 miles ENE of Sugarloaf Point.
 - 2 cables ENE of Perpendicular Point (31°38'6S 152°51'0E) (3.167).
 - 5 cables W of Perpendicular Point.
- For further information see 1.70.

Principal marks

3.165

- 1 **Landmark:**
- Tower (conspicuous) (31°46'S 152°34'E), standing on Vincents Lookout.
- Major lights:**
- Sugarloaf Point Light (32°26'S 152°32'E) (3.139).
 - Crowdy Head Light (white masonry tower, 7 m in height) (31°51'S 152°45'E).
 - Tacking Point Light (white masonry tower and dwellings, 8 m in height) (31°29'S 152°56'E).
 - Smoky Cape Light (white octagonal tower, 17 m in height) (30°55'S 153°05'E).

Directions

(continued from 3.141)

3.166

- 1 From a position SE of Sugarloaf Point (32°26'S 152°32'E) (3.140), the track leads NNE, passing (positions from Sugarloaf Point Light):
- Clear of an historic wreck (2 miles ENE) (3.164), and of a patch with a depth of 12.8 m over it (1¾ miles NE), steep-to, thence:
 - 2 ESE of Skeleton (Black) Rocks (2 miles N), steep-to with depths of 25 to 30 m close around; a rock which dries 1.2 m lies 1 cable N of the main group and is the N-most danger, thence:
 - 3 ESE of Charlotte Head (6¼ miles N), a bold headland with its seaward side bare of trees and grass-covered; South Woody Peak, 212 m in height, with a remarkable bare green patch on its lower NE slope, and Booti Hill, 190 m in height, stand respectively 2 miles SSW and 1½ miles NW of the head. Thence:
 - 4 ESE of Cape Hawke (13½ miles N), densely wooded to its summit and from a distance appears as two hillocks; Latitude Rock lies at the outer end of a reef extending 5 cables N. A shoal depth of 22 m (1962) has been reported 1¾ miles ESE of the cape.

3.167

- 1 Thence the track continues NNE, passing (positions from Crowdy Head Light (31°51'S 152°45'E)):
- ESE of Hallidays Point (Black Head) (17½ miles SW). Depths of less than 10 m extend 6 cables SE from the point; a reef with a depth of 6.9 m over its outer end extends 5 cables E from Red Head, 9 cables N of the point. Thence:
 - 2 ESE of Schnapper Rock (13½ miles SW), with a depth of 8.1 m over it, depths more than 20 m are

found close to it. The rock lies 2 miles SE of Wallabi Point, rocky and 14 m in height. Thence: ESE of Dennis Shoal (10 miles SW), with a depth of 6.9 m over it; a reef extending from the shore, with a depth of 4.5 m over its outer end which breaks, lies 1 mile W of the shoal, thence:

ESE of Crowdy Head, a prominent headland 56 m in height, jutting out from the low, wooded land behind; Crowdy Head Light (3.165) stands on the head. A 7.3 m patch which breaks lies 4 cables E of the head, and Forde Rock, awash, lies near the NE edge of a spit extending 2½ cables N from the head. Thence:

ESE of Curphey Shoal (3 miles NE), a rock with a depth of 8.2 m over it, which breaks in a swell from SE; Giles Shoal lies 1½ miles WSW of Curphey Shoal, thence:

ESE of Mermaid Reef (5 miles NNE), with three distinct heads, the centre one dries and always breaks; the reef lies at the outer end of a spit with depths between 10 and 20 m over it, extending E from shore. Mermaid Reef and Curphey Shoal (above) are covered by the red sector (197°–227°) of Crowdy Head Light (3.165). Thence:

ESE of Diamond Head (7½ miles NNE), a bare summit and a cliffy E face with rocks lying close N and S; a patch with a depth of 6.7 m over it lies 1¼ miles S of the head; thence:

- 5 ESE of Camden Head (12½ miles NNE) which is bare; the head terminates in Perpendicular Point, a brown sandstone bluff 53 m in height, standing 5 cables NE. Telegraph Rock (charted as a drying rock), over which seas can break heavily even in calm weather, lies 1½ cables E of Perpendicular Point; an historic wreck (3.164) lies ½ cable NE of the rock. Thence:

- 6 ESE of Grants Head (15½ miles NNE), a bluff headland of brown sandstone 51 m in height and fringed with rocks on its N side; a tank (elevation 58 m) stands on the head. Shag Rock (1.8 m in height) lies close offshore 2¼ miles N of the head. Thence:

ESE of a 14.9 m patch (21 miles NNE) as required by draught, thence:

- 7 ESE of Tacking Point (24 miles NNE), 59 m in height, the SE end of a steep section of coast extending about 3 miles NNW and fringed with rocks lying up to 3 cables offshore; the coast is backed by relatively high and thickly wooded land. The summit of Tacking Point is composed of irregular hummocks, the N being in sugarloaf form; Tacking Point Light (3.165) stands on the point and a pine tree (conspicuous) (see 1.20) stands 1¼ miles WSW.

3.168

- 1 Thence the track continues NNE, passing (positions from Smoky Cape Light (30°55'S 153°05'E)):
- ESE of Point Plomer (24½ miles SSW); rocks extend to 2½ cables from the point. Thence:
 - ESE of Green Islet, (21 miles SSW); rocks lie between the islet and the coast 3 cables W. Thence:
 - ESE of Crescent Head (17 miles SSW); a tank (elevation 63 m) (conspicuous) stands on the head; thence:
 - 2 ESE of Point Korogoro (7½ miles S), conical, see view B on chart Aus 363, thence:

ESE of Smoky Cape, a formation of three hills in line, Big Smoky being the S and highest; see view B on chart Aus 363. Smoky Cape Light (3.165) stands on the S point of the cape; Black Rocks lie 1¼ miles SSW, Fish Rock, on which stands a light-beacon (1 m in height), 1¼ miles SE and Green Islet, 37 m in height, stands 8 cables NNE of the light.

Useful marks

3.169

- 1 South Brother (31°45'S 152°40'E), Middle Brother (2½ miles N) and North Brother (7½ miles NE), three prominent and densely wooded hills. See view A on chart Aus 363. A tower stands on the summit of Middle Brother, with a second tower 3½ cables SW.

Jolly Nose, a hill (31°35'S 152°48'E); see view A on chart Aus 363.

- 2 Beranghi (Dulkoonghi Hill), a densely wooded hill, (31°10'S 152°57'E).

Tower (visually and radar conspicuous; red obstruction lights) (31°00'S 152°57'E); radar ranges of 14 miles can be expected.

(Directions continue at 3.187)

Anchorage and harbours

Chart Aus 362 (see 1.15)

Sugarloaf Bay anchorage

3.170

- 1 Sugarloaf Bay lies on the N side of Sugarloaf Point (32°26'S 152°32'E) (3.140), and is entered between the reef extending N from that point and a second reef (3½ cables W), forming the W side of the bay; a dangerous rock, lies near the outer end of the W reef.

Anchorage sheltered from S and SW winds may be obtained by small vessels of appropriate size and draught in a depth of 7.5 m with Stasis Rock (3.140) bearing 077° distant 2 cables.

Charlotte Head anchorage

3.171

- 1 **Anchorage** sheltered from S winds may be obtained by small vessels of appropriate draught in a depth of 7 m on the N side of Charlotte Head (32°20'S 152°33'E) (3.166).

Local knowledge is required.

Cape Hawke Harbour

3.172

- 1 **General information.** Cape Hawke Harbour (32°11'S 152°30'E) lies at the entrance to Wallis Lake. The towns of Forster and Tuncurry stand on the E and W sides respectively of the harbour and are connected 4 cables within the entrance by a road bridge. The harbour is navigable on the Tuncurry side by coasters of appropriate size and draught as far as the bridge; beyond the bridge navigation in Wallis Lake and Wallamba River is restricted to shallow-draught craft only.

- 2 **Port authority.** Maritime Services Board of New South Wales, with local office at Shop 9, Forster Towers, Wallis Street, Forster 2482.

Vertical clearance. The road bridge connecting Tuncurry and Forster has a vertical clearance 5.8 m under the spans at each end.

Pilotage not available. The Board's local officer should be consulted before entry and will, whilst taking no responsibility, provide advice and assistance.

- 3 **Local knowledge** is essential.

Signal station (white square tower, 3 m in height) stands 2 cables S of the entrance. No regular watch is kept; visual signals (see 1.77) can be displayed by prior arrangement with the Board's local officer but display is not otherwise automatic.

- 4 **Harbour:** entered over a bar with a depth of 2.9 m, thence between two breakwaters about 110 m apart. Channels then lead W to the berths at Tuncurry and S to a boat harbour and jetties at Forster.

Tidal streams change 2 hours after HW and LW.

Caution. The entry is difficult and can be dangerous with depths over the bar and harbour subject to change.

- 5 The approaches to the entrance channel have been inadequately surveyed.

Directions – Leading lights:

Front light (triangle topmark, point up) (32°10'4S 152°30'6E)

Rear light (triangle topmark, point down) stands 326 m W of the front light.

The alignment (260°) of the above lights leads to the entrance between the N and S breakwaters; a light (mast) stands on the head of each breakwater.

- 6 Thence the track leads SW between the N breakwater and the S training wall, when abreast of the light-beacon standing at the E end of the N training wall at Tuncurry, the tracks lead generally W through a channel marked by a light-buoy and buoys (port hand) to Tuncurry, and S through a channel marked by a light-buoy and light-beacon and buoys (lateral) to Forster.

- 7 Channels in Wallis Lake are marked by beacons.

Anchorage. Good anchorage in 14 to 18 m, white sand, about 7 cables NE of the harbour entrance, sheltered from winds from SE through W to NW.

Crowdy Bay

3.173

- 1 **Description.** A boat harbour lying within breakwaters on the NW side of Crowdy Head (31°51'S 152°45'E) (3.167), provides shelter for a limited number of fishing vessels and other small craft up to 15 m LOA. Depths 2.0 m in the entrance and generally 1.8 m within.

Local knowledge is required.

Directions. Dangers off Crowdy Head, and between there and Diamond Head (7½ miles NNE), are described at 3.167.

- 2 From a position in the S part of Crowdy Bay:

Leading marks:

Front mark a light-beacon (post) standing on shore W of the Fisherman's Co-operative buildings.

Rear mark Crowdy Head Lighthouse (3.165).

The alignment of the above marks leads between the N and S breakwaters into harbour; a light (post, 3 m in height) stands on the head of each breakwater.

- 3 **Anchorage,** sheltered from winds between S and W, can be obtained by vessels of appropriate size and draught in depths of 7 m NW of Crowdy Head (31°51'S 152°45'E) (3.167).

Light



Crowdy Head from NE (3.173)

(Original dated 1999)

Crowdy Bay Boat Harbour

Berths: alongside two fisheries jetties, each about 91 m in length. Visiting vessels may use the S jetty.

Facilities: fuel, stores and water available.

Chart Aus 363 (see 1.15)

Camden Haven 3.174

- 1 **General information.** Camden Haven (31°38'S 152°50'E) lies at the estuary of Queen's Lake (2½ miles WNW) and Watson Taylors Lake (4 miles SW), both of which are tidal. The town of Laurieton stands on the W bank 2 miles within the entrance. Entry to Camden Haven itself is limited to small craft.

A sand bar, very dangerous but clear of rocks within 2½ cables and with a depth of 3.1 m, extends up to 1½ cables to seaward of breakwaters at the entrance. Entry should only be made on the last quarter of the in-going tidal stream.

- 2 A strong S set is usual across the entrance, particularly after S winds; occasionally the set is N-going.

Port authority. Maritime Services Board of New South Wales, with local office at 3 Jeanaree Arcade, Bold Street, Laurieton 2443.

Vertical clearance. A fixed road bridge spanning the channel to Queen's Lake stands at the N end of Laurieton, and another, spanning the channel to Watson Taylors Lake at the S end; vertical clearances are 3.2 m and 4.1 m respectively.

- 3 **Cables and pipelines.** Overhead and submarine cables and submarine pipelines cross the channels at various points above and below the bridges; they are usually indicated by warning notices on shore.

Outer anchorage, sheltered from SE and S and from offshore winds, can be obtained by vessels of appropriate size and draught in depths of 7 m, sand, off the entrance to Camden Haven (31°38'S 152°50'E) with the signal station bearing 259° and Telegraph Rock (3.167) bearing 124°.



Perpendicular Point

Camden Haven from NE (3.174)

(Original dated 1999)



Pelican Point

Port Macquarie from ENE (3.175)

(Original dated 1999)

- 4 **Pilotage.** Not available but the Board's local officer, whilst taking no responsibility, will provide advice and assistance by prior arrangement.

Local knowledge is required.

Signal station, from which no regular watch is kept, stands $2\frac{1}{2}$ cables SSW of the entrance. Visual signals (see 1.77, but using white instead of black shapes by day on account of the dark background) can be displayed by prior arrangement with the Board's local officer; however display is not otherwise automatic.

- 5 **Directions.** From a position well clear ENE of the entrance, the track leads WSW.

Leading lights:

Front light (white square beacon, black stripe) ($31^{\circ}38'S$ $152^{\circ}50'E$), standing on the middle training wall inside the breakwaters.

Rear light (similar beacon), also on the middle training wall.

- 6 The alignment ($245\frac{1}{2}^{\circ}$) of the above light-beacons, which are moved to meet changes in the channel, leads across the bar thence between the N and S breakwaters; a light (pole) stands on the head of each breakwater.

Thence the track leads WSW between the middle and N training walls, thence via a channel, marked by buoys and beacons (lateral), to Laurieton.

Berths: small jetties at Dunbogan, on the S side of the channel $1\frac{1}{2}$ miles within the entrance, and at Laurieton.

Port Macquarie

3.175

- 1 **General information:**

The harbour of Port Macquarie ($31^{\circ}26'S$ $152^{\circ}55'E$) lies at the mouth of Hastings River and is entered between two breakwaters; the town, a tourist resort, stands immediately S of the entrance. Entry is made dangerous by shifting sandbanks on a bar with a least depth of 3.8 m over it which extends about 4 cables to seaward of the breakwater

heads. The best time for entry is on the last of the in-going tidal stream.

- 2 An historic wreck (1.70), *SS Ballina*, within a protected area, lies between the breakwater heads.

Port authority. Maritime Services Board of New South Wales, with local office at 79 Clarence Street, Port Macquarie 2444.

3.176

- 1 **Tidal levels.** See information in *Admiralty Tide Tables*. Mean maximum range about 1.1 m; mean minimum range about 0.7 m. Tides can be considerably affected by weather, with resultant effects on the start and duration of flow.

- 2 **Outer Anchorage,** good, with smooth water in offshore winds, may be obtained in 11 m (36 ft), hard sand, $6\frac{1}{2}$ cables E of the entrance with Bird Rock ($31^{\circ}26'S$ $152^{\circ}56'E$) bearing 168° and Green Mound, a conical-shaped hillock projecting slightly from the coast, ($4\frac{1}{2}$ cables WNW), bearing 246° .

- 3 **Pilotage** not available. The Board's local officer, whilst taking no responsibility, should be consulted before entry for advice and assistance.

Local knowledge is essential for entry and in the river.

Speed limits of 4 kn are in force in some side channels leading from the harbour and river.

3.177

- 1 **Hastings River:**

Navigable for 20 miles to the town of Wauchope ($31^{\circ}27'S$ $152^{\circ}44'E$) but depths are variable.

Vehicle ferries cross the river on wires, (positions from the harbour entrance ($31^{\circ}26'S$ $152^{\circ}55'E$)): at Settlement Point ($1\frac{1}{2}$ miles NW), at the town of Hibbard (3 miles WNW) and at Wauchope ($9\frac{1}{2}$ miles WSW), downstream of the railway bridge. A whistle or siren should be sounded when approaching the crossings.

- 2 Dennis Bridge, a road bridge with vertical clearance 7.0 m and navigable width of 22 m, spans the river upstream of Hibbard and another with vertical clearance 5.6 m and navigable width 20 m crosses $2\frac{1}{2}$ miles farther

upstream. A railway bridge with vertical clearance 8.2 m and navigable width 28 m spans the river at Wauchope.

- 3 Seaplanes may operate by day in the river between Settlement Point (31°25'S 152°54'E) and Blackmans Point (2½ miles WNW).

Overhead cables cross the river near Dennis Bridge and near Wauchope railway bridge; a submarine power cable crosses at Settlement Point and other submarine cables cross at Hibbard and 2½ cables downstream of Wauchope railway bridge. Cable crossings are usually indicated by warning notices on shore.

3.178

- 1 **Directions:**

From a position ENE of the entrance, the track leads WSW passing, (positions from Bird Rock (31°26'S 152°56'E):

NNW of Bird Rock, lying 3 cables offshore; a reef which dries in places extends from shore to ½ cable SW of the rock; a 2.7 m patch lies ½ cable N of the rock.

- 2 **Leading light-beacons:**

Front light-beacon (red triangle point up) (9½ cables WNW), standing on the S breakwater.

Rear light-beacon (red triangle point down) standing about 250 m WSW of the front beacon.

The alignment (261¾°) of the above light-beacons leads

across the bar and to the harbour entrance, passing:

- 3 NNW of Diamantina Rocks (6½ cables WNW), a dangerous ledge with two drying heads, thence: Between the heads of the N and S breakwaters (8 cables WNW); a light (white octagonal tower) stands on the S head; a light also stands on the N head; and:

- 4 Clear of the historic wreck site (8½ cables WNW) (3.175), lying about midway between the above two lights.

Thence the track leads W for 3½ cables, keeping S of mid-channel until the W end of S breakwater curves away SW, whence course may be directed as locally advised for the Hastings River.

Useful mark:

Mount Cairncross (31°21'S 152°41'E), a good landmark when making the port.

3.179

- 1 **Berths:** wharves at Port Macquarie are no longer in use other than for small craft; vessels berth at the town of Hibbard on the S side of the river, 5 miles within the entrance.

Facilities: slipway built 1986 capable of taking vessels up to 61 m LOA, 9.1 m beam, 4.1 m draught and 400 dwt; more than one vessel can be slipped at a time; covered slipway available; full repair facilities. Small hospital.

SMOKY CAPE TO CAPE MORETON

GENERAL INFORMATION

Charts Aus 363, Aus 364

Scope of section

3.180

- 1 This section describes the coastal route from Smoky Cape (30°55'S 153°05'E) to Cape Moreton, 233 miles N. Also described are several minor harbours along the coast; there are no major ports in this section.

Depths

3.181

- 1 Between Smoky Cape and Cape Moreton depths of less than 55 m (30 fm) lie between 1 and 9 miles offshore; see Caution at 3.3.

Fishing

3.182

- 1 **Fish aggregation devices** marked by a light-buoy (special) are located in the following positions:
- 30°51'S 153°12'E.
 - 30°15'S 153°22'E.
 - 29°53'S 153°26'E.
 - 28°35'S 153°38'E.

SMOKY CAPE TO COFFS HARBOUR

General information

Chart Aus 363 (see 1.15)

Route

3.183

- 1 The coastal route from a position ESE of Smoky Cape (30°55'S 153°05'E) leads 37 miles N to a position off Coffs Harbour (30°19'S 153°09'E).

Topography

3.184

- 1 From Lagers Point, the N extremity of Smoky Cape (3.168), the coast trends W for 2½ miles to enclose Trial Bay and the mouth of Macleay River, then turns N. Between the mouth of Macleay River (30°52'S 153°02'E) and Coffs Harbour (34 miles N), the coast is low and consists of sandy beaches and rocky points; it is intersected by the mouths of Nambucca and Bellinger Rivers and several creeks.

Exercise areas

3.185

- 1 Military exercise areas exist off Smoky Cape (3.168) as indicated on the chart. See *Annual Australian Notices to Mariners* for details.

Major Lights

3.186

- 1 Smoky Cape Light (30°55'S 153°05'E) (3.165).
Coffs Harbour Airport Light (metal tower, 15 m in height) (30°20'S 153°07'E).
South Solitary Island Light (30°13'S 153°16'E) (3.206).

Directions

(continued from 3.169)

3.187

- 1 **Caution.** This section of coast should not be approached within 1 mile, particularly that part lying between Nambucca North Head (30°39'S 153°01'E) and the mouth of Pine and Bonville Creeks (17 miles NNE), which has not been surveyed.

From a position ESE of Smoky Cape (30°55'S 153°05'E) (3.168), the track leads N passing, (positions from Nambucca North Head (30°39'S 153°01'E):

- 2 E of Grassy Head (8½ miles S). Macleay River formerly entered the sea close S; foul ground extends 5 cables ENE of the head; thence:
- E of Nambucca North Head, low and rocky, at the mouth of the Nambucca River; a rock with a depth of 4.5 m (charted as 12 ft) over it, which breaks, lies 1½ miles NNE of the head; thence:
- E of Wenonah Head (6 miles N); a reef extends 5 cables E from the head; thence:
- 3 E of a reef (13½ miles NNE) extending 4 cables E of a point on the coast; thence:
- E of Sawtell Shoal (18 miles NNE); a reef extends 6 cables E from a point on shore 1½ miles farther WSW; the town of Sawtell stands on the coast 1½ miles W of the shoal; red obstruction lights are displayed from a water tank at the N end of the town. Whitmore Shoal lies 1 mile NNE of Sawtell Shoal. Thence:
- 4 E of Changte Shoal (22 miles NNE), with a depth of 6.4 m over it, the E—most danger in the approaches to Coffs Harbour; several shoal patches, with a least depth of 11.3 m (charted as 39 ft) over them, lie on an uneven bottom between Changte Shoal and the harbour entrance. Thence:
- E of Muttonbird Island (22 miles NNE), the N entrance point to Coffs Harbour (3.199).

Useful marks

3.188

- 1 Mount Yarrhapinni (30°49'S 152°55'E), the prominent SW summit of Macleay Hills; see view B on the chart. A radio mast stands on the summit; a wooded ridge slopes nearly 5 miles NE towards the coast. The mountain is a useful mark when making Trial Bay or Macleay River.
- Bellinger Peak (Picket) (30°34'S 152°59'E), a prominent conical peak; see view B on the chart.
- 2 Two radio masts (80 m apart; elevations 176 m (577 ft); obstruction light) (30°28'S 153°02'E) conspicuous, standing at Mylestom.
- Tower (conspicuous) (30°19'S 152°52'E) on Moombil mountain.
- Aero light—beacon (elevation 66 m (216 ft); obstruction light) (30°19'S 153°08'E).
- 3 Korffs Islet Light (30°19'S 153°09'E).
- Radio tower (elevation 310 m (1016 ft); obstruction light reported seen at 30 miles) (30°16'S 153°07'E).
- Tower (conspicuous) (30°13'S 153°03'E) on Coramba mountain.

(Directions continue at 3.207)

Trial Bay and Macleay River

Chart Aus 363 (see 1.15)

General information

3.189

- 1 **Position and function.** The harbour at Trial Bay (30°53'S 153°03'E) was formerly used for the import of petroleum products through a submarine pipeline laid to a tanker mooring in the bay. See 1.44.

Approach and entry. The harbour is approached from a position off Smoky Cape (30°55'S 153°05'E) (3.168), and is entered immediately W of Laggars Point, the N extremity of that cape.

Port authority Trial Bay Pilot, The Pilot Station, Gregory Street, South West Rocks, NSW 2431.

Arrival information

3.190

- 1 **Port radio station** is located in the town of South West Rocks on the S shore of the bay. For details, see *Admiralty List of Radio Signals Volume 6(4)*.

Harbour

3.191

- 1 Trial Bay lies between Laggars Point (30°53'S 153°04'E) and the entrance to Macleay River (2 miles W). The E part of the bay, SSW from that point, is shallow with the 5 m depth contour extending up to 4½ cables from shore.

Three mooring buoys, two for small craft seeking a safe haven, and one for the use of fishing vessels; lie at the head of the disused submarine pipeline.

Anchorage

3.192

- 1 Good anchorage, sheltered from most weathers except from between NW and ENE, can be found either in the lee of Laggars Point, or in the W part of the bay off Monument Point, clear of the moorings buoys at the head of the pipeline which bears 054° distant 6½ cables from Monument Point (30°53'S 153°03'E).

Landing for boats may be obtained on the in-going tidal stream during daylight, in South West Rocks Creek, entered close W of Point Briner (Flagstaff Point) (2 cables W of Monument Point).

Port services

3.193

- 1 No facilities are documented.

Macleay River

3.194

- 1 **General information.** Macleay River (30°53'S 153°01'E) is entered over a bar on the W side of Trial Bay. The river is about 100 miles in length with several towns on its banks, and is navigable by coasters of appropriate size and draught for 5 miles to the town of Jerseyville (30°56'S 153°02'E); shallow-draught vessels can proceed 20 miles farther upstream to the large town of Kempsey (31°05'S 152°50'E).

- 2 A short breakwater extends NE from each side of the entrance, which has a width of about 210 m. From the roots of the breakwaters, training walls extend for a considerable distance up-river.

The channel upstream from the entrance is marked in places by light-beacons and beacons.

Controlling depth. The bar, depth 1.5 m, is liable to shift position and should always be approached with caution; depths over it are changeable and likely to decrease in strong NE winds. The most favourable time for entry is on the last of the in-going tidal stream.

- 3 **Vertical clearance.** A fixed span road bridge crosses the river at Jerseyville (30°56'S 153°02'E); the navigable span is illuminated and has a vertical clearance of 9 m and a navigable width of 35 m. Further road bridges cross at Smithtown (31°01'S 152°57'E) and at Kempsey (31°05'S 152°50'E) where there is also a rail bridge 1 mile farther upstream. The controlling vertical clearance for these bridges is found at Jerseyville, and the least navigable width (30 m) at Smithtown.

- 4 **Cables and pipelines.** Overhead and submarine cables and pipelines cross the river at various points and are usually indicated by warning notices on shore.

Local knowledge is required.

Speed limit of 4 kn is in force in part of the river.



Macleay River from NNE (3.194)

(Original dated 1999)

Tidal streams. The in-going tidal stream sets N round the head of the S breakwater and the out-going stream S.

3.195

- 1 **Directions.** From a position ENE of the entrance the track leads WSW.

Bar Leading Lights:

Front light (white triangle point up, black stripe; 3 m in height) (30°53'S 153°01'E) standing close to the N training wall and 4 cables SW of the head of the N breakwater.

- 2 Rear light (white triangle point down, black stripe; 5 m in height) (75 m WSW of the front beacon).

The above lights may be discontinued if the channel becomes silted. Otherwise their alignment (243°) leads across the bar, passing (position from the front light):

NNW of the head of the S breakwater (6½ cables ENE); a light stands on the head.

- 3 Thence the track continues WSW following the line of the S breakwater, at about 15 m off for 3½ cables to its inner end.

Thence the track crosses to the N training wall, following this at a similar distance off as it curves S and leads to the river anchorage (see 3.196).

From thence upstream, courses depend upon local knowledge.

3.196

- 1 **Anchorage** may be obtained in Trial Bay (30°53'S 153°03'E) (3.192) or, by small craft only, in the river in a depth of 4 m (13 ft), 1 mile within the entrance.

Facilities. Provisions are obtainable.

Other harbour and rivers**Nambucca River****3.197**

- 1 **Description.** A good boat landing exists in the bay on the N side of Nambucca North Head (30°39'S 153°01'E) (3.187).

The entrance to Nambucca River, immediately S of Nambucca North Head, is closed to all vessels except small

craft due to frequent and uncertain changes on the bar over which depths may be less than 1.4 m (5 ft).

The river is navigable some distance beyond the town of Macksville (30°42'S 152°55'E) where two bridges and some overhead cables span the river; controlling vertical clearance is 4.5 m at each bridge.

- 2 **Local knowledge** is essential.

Berth. There is a wharf in the Heads Basin fronting the town of Nambucca about 7 cables within the entrance, and further wharves at Macksville.

Bellinger River**3.198**

- 1 **Description.** The entrance to Bellinger River (30°30'S 153°02'E) is always shallow and is closed to all vessels except small craft. The bar is changeable with depths which may not exceed 0.9 m (3 ft). During the summer the channel is likely to run close along the S breakwater; in winter it frequently runs along the beach N of the entrance. Entry should only be made on the in-going tidal stream.

Inside the entrance the river divides: Kalang River (South Arm Bellinger River) branches generally W past the town of Urunga (1 mile W of the entrance), whilst Bellinger River itself turns initially N.

The channels in the two rivers are marked in places by beacons and buoys.

- 2 **Vertical clearance.** Bellinger River is spanned by a railway bridge at the town of Repton (30°27'S 153°02'E); vertical clearance is 6.8 m and navigable width 45 m; a road bridge with vertical clearance 5.4 m and navigable width of 29 m crosses the river 1¼ miles farther upstream. Kalang River is spanned by adjacent rail and road bridges on the NW side of Urunga; the controlling vertical clearance and navigable width beneath the two bridges is 5.9 m and 39 m respectively. Another road bridge with lesser clearances crosses Kalang River to Newry Island farther upstream.

- 3 **Cables and pipelines.** Overhead and submarine cables and pipelines cross the two rivers at various points and are usually indicated by warning notices on shore.

Local knowledge is essential.



Korff's Islet

Coffs Harbour from ESE (3.199)

Muttonbird I.

(Original dated 1999)

Speed limit of 8 kn is in force in some of the lower parts of the two rivers.

Coffs Harbour 3.199

- 1 **Coffs Harbour** (30°19'S 153°09'E) is reported to be no longer used commercially. Fishing vessels and small craft use the boat harbour which is contained within inner breakwaters on the N side.

The harbour is a customs port and a first port of entry; see 1.64 for regulations. The quarantine line is drawn between the heads of the inner breakwaters enclosing the boat harbour.

- 2 **Port authority** is Maritime Services Board of New South Wales, with a local office at PO Box J23, Coffs Harbour, NSW 2450.

Pilotage is compulsory; the boarding position is 5 cables E of the E breakwater light. For details see *Admiralty List of Radio Signals Volume 6(4)*.

Local knowledge is required if entering at night.

3.200

- 1 **Directions.** The harbour is open E with lights displayed from Eastern Breakwater, Boat Harbour breakwaters, Jetty Head and Boat Ramp.

Leading Lights:

Front light (orange triangle, point up) (30°19'S 153°08'E), standing near the foreshore at the head of the harbour.

Rear light (orange triangle, point down) (1 cable W of the front light).

From a position E of the harbour entrance, the alignment (271°) of the above lights leads W into the harbour.

3.201

- 1 **Anchorage** may be obtained in good weather in the middle of the harbour in depths of 6 to 8 m, sand over clay. A quarantine anchorage is established between the disused commercial jetty and the W breakwater of the boat harbour. In adverse weather anchorages in the harbour are unsafe and heavy surge conditions may be experienced.
- 2 **Berths** are available in the boat harbour which has general depths of 3 to 4 m (10 to 13 ft).

Repairs: a slip, capacity 60 tonnes and capable of taking eight vessels at one time, lies at the W end of the boat harbour; minor repairs can be effected.

Supplies: fresh water, diesel and petrol.

Other facilities: small hospital; boat ramp.

COFFS HARBOUR TO EVANS HEAD

General information

Charts Aus 363, Aus 364 (see 1.15)

Route

3.202

- 1 The coastal route from a position off Coffs Harbour (30°19'S 153°09'E) passes to seaward of the Solitary Islands (3.203) and leads NNE for 71 miles to a position off Evans Head (29°08'S 153°27'E).

Deep-draught vessels may avoid the reefs in the vicinity of Evans Head by keeping at least 3 miles off that part of the coast.

Topography

3.203

- 1 From Coffs Harbour to Evans Head the coast continues to be low but is less regular in outline and the rocky hills behind are generally closer to the sea than is the case farther S. Many rivers enter the sea on this stretch of coast, the most important of which is Clarence River entering close N of Clarence Head (29°26'S 153°22'E).
- 2 Off-lying dangers and islands all lie in depths of less than 55 m (30 fm) and within 6½ miles of the shore; the most significant of these are Solitary Islands, a scattered group of islands and rocks, which lie off the S part of this stretch of the coast between Split Solitary Island (30°14'S 153°11'E) and North Solitary Island (22 miles NNE).

Exercise area

3.204

- 1 A military exercise area, in which bombing exercises and other military practices take place, exists off Evans

Head as indicated on the charts. See *Annual Australian Notices to Mariners* for details.

Local knowledge

3.205

- 1 Local knowledge is required for the inshore passage W of the outer Solitary Islands (see 3.209), and for passages close inshore off Sandon Bluffs (29°41'S 153°20'E) (see 3.211), and off Evans Head (29°09'S 153°27'E) (see 3.213).

Major Lights

3.206

- 1 Coffs Harbour Airport Light (30°20'S 153°07'E) (3.186).
South Solitary Island Light (white masonry tower, 20 m in height) (30°13'S 153°16'E).
Clarence Head Light (white concrete tower, 17 m in height) (29°26'S 153°22'E).

Directions

(continued from 3.188)

3.207

- 1 From a position E of Coffs Harbour (30°19'S 153°09'E) the track leads between N and NNE passing (positions from North Solitary Island Light (29°55'S 153°23'E)):
E of a rock patch with least depth 4.9 m (14 ft) (25½ miles SSW), which breaks; two other rock patches with depths of 9.3 m and 9.7 m over them lie midway between the 4.9 m patch and Muttonbird Island lying 5 cables S (3.187); thence:
2 E of McCauleys Head (24½ miles SSW); shoal patches with depths of 13.7 m (45 ft) and 14.6 m (48 ft) over them lie ¾ mile and 2½ miles E of the head; foul ground extends 5 cables offshore between the head and Green Bluff 4 miles N; thence:
3 Not less than 2¼ miles ESE of Split Solitary Island (22 miles SSW), divided into two parts by a cleft; depths W are irregular; Marsh Shoal with a depth of 5.8 m (19 ft) over it lies 1 mile SSW, Jeffreys Shoal lies 1¼ miles ESE and Cell Rock with a depth of 3.7 m (12 ft) over it, which breaks, lies 7½ cables E, each from the island. Thence:
4 E of South Solitary Island (18 miles SSW); a light (3.206) stands on the summit; Arched Rock lies close E and two detached above-water rocks lie N of the island; Black Rock lies 5 cables NW of the island and a rock which dries 0.6 m (2 ft) lies 2½ cables farther WNW. Thence:
5 Not less than 1 mile E of Breaker Rocks (6½ miles SW), the outermost danger in the vicinity of North West Solitary Island (3.210) lying 2¼ miles WSW of the rocks; thence:
E of North Solitary Island, two rocks standing about 60 m apart; North Solitary Island Light (white GRP hut, 4 m in height) stands on the summit of the N rock; thence:
6 E of North West Rock, consisting of two rocks, the higher 4.5 m (15 ft) in height (6 cables NNW), lying near the middle of a detached bank; a 2 m (7 ft) patch lies on the N extremity of the bank distant 5 cables from North West Rock, and a 4.5 m (15 ft) patch which breaks, lies on the SE extremity distant 4 cables; a dangerous rock (reported 1972) lies 1 mile N of North West Rock. Thence:
7 E of Pimpernel Rock (13½ miles N), thence:

E of Sandon Bluffs (15 miles NNW), showing as white cliffs covered by low scrub and lying at the N end of some sandhills; thence:

- E of Brooms Head (19 miles N); Buchanans Rock, which breaks in heavy weather, and a rock with a depth of 4.6 m (15 ft) over it are the outermost dangers lying respectively NE and NNE both distant 9 cables from the point; thence:
8 E of Angourie Point (26½ miles N); Freeburn Rock, which breaks, lies 2 miles S of the point; thence:
Not less than 1 mile E of Clarence Head (29½ miles N); a light (3.206) stands near the head; a bar extends up to 8 cables E from the entrance to the Clarence River 5 cables NW of the head.
9 Thence the track continues leading between N and NNE, passing (positions from Clarence Head Light (29°26'S 153°22'E)):
E of Woody Head (4 miles N), 55 m in height and thickly timbered; the head shows as a white cliff from E and is conspicuous from N; a spit with a depth of 3.4 m (11 ft) over it extends 7 cables N from the head and a reef which breaks extends 1¼ miles NW into the bight NW of the head. Thence:
10 E of a spit with a least depth of 1.8 m (6 ft) over it (12 miles N), which extends 1½ miles SE from the coast. See 3.202 for the distance recommended to be kept offshore. Thence:
E of South Evans Reef (13 miles NNE) which breaks occasionally; a 9 m (30 ft) patch lies 8 cables NE of the reef; thence:
11 E of North Evans Reef (16 miles NNE) which dries and always breaks. The reef lies on a bank with depths of less than 11 m (36 ft) over it extending 2 miles SSE from the coast. Thence:
E of Evans Head (18 miles NNE), a low, sandy point; Evans Head Light (white GRP hut, 4 m in height), stands 1¼ miles NNW of the head. Evans Head and the above dangers immediately S lie within the red sector (323°–027°) of Evans Head Light.

Useful marks

3.208

- 1 Radio tower (30°16'S 153°07'E) (3.188).
Tower (30°13'S 153°03'E) (3.188).
Browns Knob (29°55'S 153°08'E), the S peak of the Coast Range extending 22 miles NNE.
Cabbage Tree Mountain (two peaks, the N about 235 m (770 ft) in height) (29°54'S 153°14'E).
2 Tank (conspicuous) (29°52'S 153°16'E), standing N of the mouth of the Wooli Wooli River.
Clarence Peak (29°35'S 153°17'E), conical and conspicuous; it is the N peak of the Coast Range.
Mount Leone (29°33'S 153°20'E).
Chatsworth (29°22'S 153°13'E), a hill visible at 15 to 20 miles.

(Directions continue at 3.231)

Passage inshore of the Solitary Islands

Chart Aus 363 (see 1.15)

Route

3.209

- 1 From a position SSW of South Solitary Island (30°13'S 153°16'E), a route may be selected leading generally N for 23 miles to a position E of the entrance to Wooli Wooli River (29°53'S 153°16'E), passing between the mainland coast and the outer Solitary Islands.

Caution. Due to the irregular depths in the area and lack of modern surveys, this route should not be taken other than by vessels of appropriate size and draught and in daylight; see also 3.205 for the need for local knowledge.

Directions

3.210

- 1 From a position SSW of South Solitary Island (30°13'S 153°16'E) the track leads N, passing (positions from North Solitary Island Light (29°55'S 153°23'E)):
 - Not less than 2¼ miles E of Split Solitary Island (22 miles SSW) (3.207); passage between Split Solitary Island and White Bluff lying 1½ miles W is not recommended; thence:
 - Clear of Sidney Shoal which breaks (19 miles SSW) and:
- 2 W of South Solitary Island (18 miles SSW) (3.207) and the off-lying dangers extending 8 cables NW; thence:
 - E of Look-at-me-now (18½ miles SW), a point surmounted by a tower; thence:
 - Clear of Groper Islet (16½ miles SSW); reefs extend 5 cables SW and 1½ cables SE from the islet; and:
- 3 E of Bare Bluff (17 miles SW); a rock (charted as drying) lies about 2 cables E of the bluff; Stack Rock lies close offshore 1½ miles N; thence:
 - E of Green Bluff (14½ miles SW), low and saddle-backed, on which stands the town of Woolgoolga and a tank (conspicuous); a reef of above and below-water rocks extends 2 cables E from the bluff; thence:
- 4 E of Woolgoolga Bay (14½ miles SW), lying on the NW side of Green Bluff; the bay is not used as a port and anchoring is unsafe; holding ground in this vicinity is bad and winds with an E component send in heavy breaking seas. From the N entrance point of the bay a reef of above and below-water rocks extends 6 cables E; the shore is rocky out to 5 cables off for another 2½ miles N. Thence:
- 5 Clear of North West Solitary Island (8½ miles SW); a shoal with a depth of 2.4 m (8 ft) over it, which breaks, lies 5 cables N of the island. Breaker Rocks (3.207) lie 2¼ miles ENE with two patches with a least depth of 15.8 m (52 ft) over them lying between; Chopper Rock, at the N end of a bank with depths less than 5.5 m (18 ft) over it, lies 1 mile NW of the island and a 5.2 m (17 ft) patch lies 8 cables farther W. A depth (5.8 m (19 ft)) lies 2 miles W of North West Solitary Island at the E end of a spit which breaks on its SE side and which extends 1¾ miles NE from the shore. Thence:
- 6 E of the entrance to Corindi River (9 miles WSW) (see 3.225 for entry limitations); the village of Red Rock stands on the S entrance point; thence:
 - E of North Rock (7½ miles WSW), the S extremity of a dangerous stretch of banks and spits of above and below-water rocks, some of which may break, extending up to 1¼ miles offshore for 5¼ miles N to the S side of the entrance to the Wooli Wooli River (3.224); thence:
- 7 Not less than 1½ miles E of the mainland coast, and:
 - W of North Solitary Island (3.207) and North West Rock (6 cables NNW); a 9.1 m (30 ft) patch lies

4¾ miles W of the island and 1½ miles offshore; thence:

E of the entrance to Wooli Wooli River (6¾ miles WNW) (3.224); a detached rock patch, with a depth 9.1 m (30 ft) over it, lying 1½ miles ENE of the entrance is the outermost danger.

From thence course may be directed as required to continue the coastal passage N.

Inshore passage off Sandon Bluffs

Route

3.211

- 1 From a position E of One Tree Point (29°47'S 153°18'E) a route for vessels of appropriate size and draught leads W of Pimpernel Rock (7 miles NE) and either side of Sandon Shoal (4½ miles NNE), which breaks in heavy weather. See 3.205 for the need of local knowledge.

Clearing marks

3.212

- 1 **Passing east of Sandon Shoal.** The alignment (349°) of Brooms Head (29°37'S 153°20'E) (3.207) with the summit of Mount Leone (4 miles NNW) passes 5 cables E of Sandon Shoal.
- Passing west of Sandon Shoal.** The alignment (358°) of Sandon Bluffs (29°41'S 153°20'E) (3.207) with the summit of Mount Leone (8 miles N) passes 7 cables W of Sandon Shoal.

Passage inshore of Evans Reefs

Chart Aus 364 (see 1.15)

Route

3.213

- 1 A route which may be used by vessels of appropriate size and draught N-bound, avoiding the strength of the East Australian Current, leads inshore of both South Evans Reef (29°13'S 153°26'E) (3.207) and North Evans Reef (3½ miles NE). See 3.205 for the need for local knowledge.

Anchorage

3.214

- 1 There are no documented anchorages where larger vessels may seek shelter on this stretch of coast.
 - Anchorage**, exposed but with good holding ground, sand, may be obtained in depths of 15 to 20 m (49 ft to 11 fm) between 1 and 2 miles E of the entrance to the Clarence River (29°26'S 153°22'E).

Clarence River and Port of Yamba

Charts Aus 363, Aus 364 (see 1.15)

General information

3.215

- 1 **Clarence River** is entered between two breakwaters lying close N of Clarence Head (29°26'S 153°22'E) (3.207); the river is 240 miles in length with several towns on its banks and is navigable by light-draught vessels to the city of Copmanhurst about 61 miles above the



Clarence River from E (3.215)

(Original dated 2004)

(Photograph – Copyright Granted)

entrance. The river is an outlet for the surrounding rich agricultural area, with livestock being exported and timber products being imported.

- 2 The channel from sea to Harwood Bridge (3.216) is well-marked by a series of leading lights, beacons and buoys, and may be used by day or night; the marks may however be moved to meet changes in the channel.

Port limits lie across the seaward ends of the N and S breakwaters. The inner port limits terminate at Harwood Bridge, 10½ miles above the entrance.

- 3 **Traffic.** In 2004 the port handled 11 vessels totalling 26 900 dwt.

Port authority for Port of Yamba, including Clarence River, is the NSW Maritime Authority, PO Box 143, Yamba, NSW 2464. There is a resident Harbour Master/Pilot.

Website: www.yamba.nsw.gov.au

Email: pilot@nor.com.au

Limiting conditions 3.216

- 1 **Controlling depth:** 2·4 m over the inner bar (3.218). Depths over the outer bar are subject to frequent change; the latest information should be obtained from the Port Authority before entry.

It has been reported (2005) that the river will be dredged to 6·0 m as far as Goodwood Island wharf (3.222).

- 2 **Vertical clearance:** A road bridge consisting of 34 spans supported on concrete piers crosses the river at Harwood (29°26'S 153°15'E); the centre one of seven truss spans in the middle is a lift span with a vertical clearance of 35 m when raised and a navigable width of 30·4 m between fenders; vertical clearance under the lift span when closed, and under the three adjacent truss spans on each side, is 8·7 m. The piers of the lift span are marked by lights and are protected up and downstream on both sides by dolphins. Twenty-four hours preliminary notice to the Department of Main Roads, Grafton, is required for the lift span to be raised; followed by 1 hour's notice of ETA at the bridge. Special signals are in force at the bridge.

- 3 A road and rail bridge consisting of six spans crosses the river at Grafton (29°42'S 152°56'E); vertical clearance is 7·9 m and there are horizontal clearances of 67 m through five of the spans; a single narrow span near the S side of the river with a horizontal clearance of 19·8 m was previously a bascule opening span which is no longer operated.

Numerous other bridges cross the side channels and other arms of Clarence River.

- 4 **Deepest and longest berth:** at Goodwood Island (3.222).

Tidal levels. *Admiralty Tide Tables.* At Yamba; mean maximum range about 1·2 m; mean minimum range about 0·7 m.

Maximum size of vessel handled. The largest vessel to have used the port has been of 7947 dwt, 5.2 m draught, and 119 m LOA.

- 5 **Local weather and sea state.** The outer bar, lying between and to seaward of the breakwaters, is subject to frequent change and can break heavily even in fine weather; it should only be crossed on the in-going tidal stream. Conditions on the out-going stream are often dangerous for boats.

Arrival information

3.217

- 1 **Port radio** is situated in the town of Yamba (29°26'S 153°22'E) but a continuous watch is not kept. For details, see *Admiralty List of Radio Signals Volume 6(4)*.

Notice of ETA and request for a pilot should be given 72 hours and 24 hours, with confirmation 2 hours before arrival. For details see *Admiralty List of Radio Signals Volume 6(4)*.

- 2 **Outer anchorage.** Vessels awaiting a pilot or the tide may anchor E of the entrance; see 3.214 for details.

Cables and pipelines. Upriver from Harwood Bridge (3.216) there are overhead and submarine cables and submarine pipelines which cross the river at various points and are usually indicated by warning notices on shore.

- 3 **Pilotage** is compulsory for all vessels over 30 m LOA. Pilots are available 24 hours and board about 1 mile NE of the breakwater heads subject to weather conditions. The pilot vessel *Francis Freeburn* is a black-hulled tug of 15 m LOA with black funnel and white superstructure and is fitted with VHF radio.

Tug. The pilot vessel has a bollard pull of 5 tonnes when used as a tug. Towage is not normally required for vessels of less than 75 m, but this will depend on the vessel and the weather.

- 4 **Local knowledge** is required.

General regulations for the navigation of navigable rivers are given at 1.57.

Quarantine. The port is a first port of entry for quarantine purposes; see 1.64 for extracts from the Quarantine Act.

Harbour

3.218

- 1 **General layout.** Training walls extend about 3¼ miles above the entrance.

Yamba Channel, lying to the S of the SW half-tide training wall immediately within the entrance, leads to a marina and to the N side of the town of Yamba (29°26'S 153°21'E), from which the port takes its name. The channel is navigable by small craft but requires local knowledge.

An inner bar, subject to frequent change, lies 1 mile within the seaward ends of the breakwaters in that part of the river known as North Channel.

- 2 Upstream of the inner bar the river winds generally NW then SW to the towns, with their wharves and other facilities standing on its banks.

Seaplanes may operate by day between the town of Maclean (29°28'S 153°12'E) and Harwood Island 2 miles downstream.

Ferries, working on wires, cross the river at Bluff Point (29°30'S 153°07'E) on Woodford Island, and at Ulmarra (29°38'S 153°02'E).

- 3 **Tidal streams** between the breakwaters average 3 to 5 kn, but heavy rains may increase rates to 5 to 8 kn. For several days after freshets the duration of the out-going stream may be as much as 9 hours and the in-going stream

be correspondingly reduced so that it is not felt above Grafton. Under normal conditions slack water occurs 2 hours after HW and 2½ hours after LW.

Caution. The tidal stream runs at an angle of 12° to the line of the channel under the lift span of Harwood Bridge (3.216), setting S on the in-going and N on the out-going streams.

Directions

3.219

- 1 From a position NE of the harbour entrance (29°26'S 153°22'E) the approach track leads WSW.

Approach Leading Lights:

- Front light (post) (29°26'S 153°22'E), standing on the head of the S breakwater.
- 2 Rear light, Clarence Head Light (4½ cables WSW of the front light) (3.206).

The alignment (237½°) of the above lights leads across the outer bar in a least depth of 2.9 m (2003) to the head of the S breakwater.

Caution. Depths on the Approach Leading Lights may vary following heavy weather or river floods.

3.220

- 1 **Entrance Leading Lights:**

Front light (moved to meet changes in the channel; triangle point up, on beacon) (about 8 cables WNW of Clarence Head Light), standing on the SW half-tide training wall.

- 2 Rear light (triangle, point down, on beacon) (3¾ cables W of the front light), standing at the N end of Dart Island; this light is a common rear mark also used for the Iluka Crossing leads, see below.

The alignment (about 278½°) of the above lights (both lights and daymarks visible on the leading line only) leads between the breakwaters and across that part of the outer bar lying between them, passing (positions from the rear light):

- 3 S of a shoal extending S from North Spit (8½ cables E), thence:
N of the outer end of the SW half-tide training wall (8½ cables E); a light-beacon (E cardinal) stands on the extremity of the wall.

North Channel Leading Lights:

- Front light (triangle point up, on beacon) (1½ cables W of Clarence Head Light), standing on shore at the root of the S breakwater.
- 4 Centre light (beacon) (64 m SE of the front light).
Rear light (triangle, point down, on beacon) (145 m SE of the front light), standing on higher ground.

The alignment (142½°) astern of the above lights leads NW through North Channel between training walls and across the inner bar where the controlling depth (3.216) for the river is found.

- 5 **Auxiliary North Channel Leading Lights:**

Front light (triangle, point up, on beacon) (5 cables NW of Clarence Head Light), standing on the SW half-tide training wall and on the 142½° alignment above.

Rear light, Clarence Head Light (above).

The alignment (131½°) astern of the above auxiliary leading lights leads separately NW through North Channel.

- 6 **Iluka Crossing Leading Lights:**

Front light (triangle point up on beacon) (1.4 miles NW of Clarence Head Light), standing on the S side of an opening in the SW half-tide training wall.

Rear light (triangle point down on beacon) (4¼ cables S of the front light), a common mark (see Entrance Leading Lights above), standing at the N end of Dart Island.

- 7 The alignment (178°) astern of the above lights (both lights and daymarks visible on the leading line only) leads N to Iluka anchorage (3.221) and towards the Goodwood half-tide training wall beyond, passing (positions from the front light):

E of Freeburn Island (2 cables NNW), thence:

- 8 W of Iluka half-tide training wall (6 cables N); a light stands on the S extremity of the wall; thence: SSW of a light-beacon (white) (1 mile N), marking the S extremity of the Goodwood half-tide training wall.

Thence course should be directed to pass W of the Goodwood half-tide training wall and as required to follow the marks for the passage up-river.

Anchorage

3.221

- 1 Anchorages in the river are only suitable for small craft due to restricted swinging room. Anchorage may be obtained bearing 322° distant 1.6 miles from Clarence Head Light (29°26'S 153°22'E), in a depth of 6 m with radius 145 m, abreast Iluka Bay N entrance; and also below Harwood Bridge (9 miles farther upstream) in a depth of 8 m.

Berths

3.222

- 1 At Goodwood Island (29°23'S 153°18'E) on the N side of the river; length 70 m with additional bollards 24 m and 30 m up and downstream respectively, to accommodate longer vessels; depth alongside 7 m. The berth is used mainly for timber exports and imports, with exports to Lord Howe and Norfolk Islands.
- 2 There are also small craft wharves at Maclean (29°28'S 153°12'E), Woodford Island (3 miles farther upstream), Ulmarra (29°38'S 153°02'E) and at South Grafton (29°42'S 152°56'E), where the depth alongside is 4.6 m.
The wharves at Iluka (29°25'S 153°21'E) and Yamba (29°26'S 153°21'E) are no longer used commercially.

Port services

3.223

- 1 **Repairs.** Dry dock at Ashby (29°27'S 153°12'E), length 61.0 m, breadth 13.0 m. Largest slip is at Harwood (29°26'S 153°15'E), length of cradle 50 m, lifting capacity 800 tonnes. Routine maintenance and light engineering repairs can be effected.
Other facilities. Customs officer; compass adjustment; hospitals and doctors at Yamba, Maclean and Grafton. Oily waste reception is available in limited amounts by road tanker.
- 2 **Supplies.** Most grades of fuel and lubricants available by road. Fresh water at 30 tons per hour is laid on to the berths at Goodwood Island. Provisions are plentiful at Grafton but may be limited in quantity elsewhere.
Communications. Nearest airport Grafton, 75 km.

Other rivers

Wooli Wooli River

3.224

- 1 Small craft may obtain anchorage sheltered from S and SW winds under the lee of South Head lying 4½ cables SE of the entrance to Wooli Wooli River (29°53'S 153°16'E); a

rock ledge with depths less than 2.0 m over it extends N and NE for 3 cables from the head.

Wooli Wooli River, entered between breakwaters which are marked by lights, is only suitable for boats.

Corindi and Sandon Rivers

3.225

- 1 Corindi River (29°59'S 153°14'E) (3.210) and the Sandon River (29°41'S 153°20'E) can be entered by boats only.

EVANS HEAD TO POINT DANGER

General information

Chart Aus 364 (see 1.15)

Route

3.226

- 1 The coastal route from a position off Evans Head (29°08'S 153°27'E) leads initially NNE to clear Cape Byron (28°38'S 153°38'E), the E extremity of the continent of Australia; thence N to a position off Point Danger (28°10'S 153°33'E).

Topography

3.227

- 1 Between Evans Head and Point Danger the land appears from the offing to be bold and in parts rugged, but the coast itself is generally low and sandy. Two prominent but uncharted white sandy patches lie on the coast 5 miles N of Evans Head. The country a few miles inland, from Richmond River towards Mount Warning, rises to hills of moderate elevation and is scantily wooded; around Mount Warning however it is hilly and well-wooded and has altogether a more fertile appearance than is generally seen so near the sea on this part of the coast.
- 2 With the exception of Windarra Bank (28°27'S 153°42'E), all dangers lie in depths of less than 37 m (20 fm) and within 3½ miles of the coast. See Caution at 3.3.

Exercise areas

3.228

- 1 Military exercise areas, in which bombing exercises and other military practices take place, exist off Evans Head and between Ballina Head (28°52'S 153°36'E) and Point Danger (28°10'S 153°33'E), as indicated on the chart. See *Annual Australian Notices to Mariners* for details.

Historic wrecks

3.229

- 1 Historic wrecks, each within a protected area, lie in the following positions:
5 cables NE of Cudgen Headland (3.232).
1 mile E of Fingal Head (3.232).
For further information see 1.70.

Principal marks

3.230

- 1 **Landmark:**
Mount Warning (28°24'S 153°16'E), visible in fine weather for about 60 miles.
- Major lights:**
Ballina Head Light (white masonry tower, 7 m in height) (28°52'S 153°36'E).
Cape Byron Light (white concrete tower, 22 m in height) (28°38'S 153°38'E).
- 2 Fingal Head Light (white stone tower, 7 m in height) (28°12'S 153°34'E); the light is obscured when

near to Cook Island (5 cables ENE) between bearings 229° and 242°.
Coolangatta Aero Light (28°10'S 153°30'E).

Directions

(continued from 3.208)

3.231

- 1 From a position not less than 3 miles E of Evans Head (29°08'S 153°27'E) (3.207) the track leads NNE passing (positions from Cape Byron Light (28°38'S 153°38'E)):
 - ESE of both South Riordan Shoal (23 miles SSW) and North Riordan Shoal lying 2½ miles NNE of the former; thence:
- 2 ESE of Ballina Head (14 miles S); a light (3.230) stands on the head; a conspicuous building stands 4 cables SW of the head close to the root of the N breakwater at the entrance to Richmond River (3.238); a prominent water tank stands on the summit of Bald Hill 3 cables NW of the head. Thence:
 - ESE of Sand Point (12½ miles S), 15 m in height; a reef with a depth of 1.2 m (4 ft) over its outer end extends 4 cables E from the point; thence:
- 3 ESE of Lennox Head (10½ miles S); underwater rocks extend 2½ cables from the head; two pine clumps (conspicuous) (see 1.20) stand 9 cables WSW and 3½ cables W of the head; two red obstruction lights are displayed from close S of the S pine clump. Thence:
 - ESE of Broken Head (4½ miles S), formed of three points, the S being Jews Point; Cocked Hat Rock lies off the N point. Thence:
- 4 ESE of Cape Byron (28°38'S 153°38'E), steep, wooded and projecting 2 miles from the foot of the hills inland; a light (3.230) stands on the cape. From E the cape shows as white cliffs and from a distance S and N it appears as an island and is visible for 25 miles in clear weather. A reef extends 3½ cables N from the cape. A strong tide race occurs at times off the E and N sides of the cape. Thence:
- 5 ESE of Julian Rocks (1½ miles NNW), a group of three rocks, the highest being 23 m in height, with other below-water rocks around them; a 22 m (12 fm) patch lies 1¼ miles E and a 10.7 m (35 ft) patch lies 4 cables N, both from the rocks. Julian Rocks are covered by the arc of visibility (148°–189°) of the red auxiliary light at Cape Byron Light (3.230). Thence:
 - ESE of a light-buoy (special) (2¾ miles N) marking a fish aggregation device.

3.232

- 1 Thence the track leads N, passing (positions from Cape Byron Light (28°38'S 153°38'E)):
 - Clear of Windarra Bank (11¼ miles NNE), as required by draught; thence:
- 2 E of Hastings Point (17 miles N), identifiable by Coast Hill, more than 91 m high, standing 8 cables W of the point; depths of less than 5.5 m (18 ft) extend 5 cables seaward and an 8.2 m (27 ft) patch lies 2½ miles S of the point. Thence:
 - E of Cudgen Headland (23 miles N) from which a reef extends 5 cables ENE; a 14 m (46 ft) patch lying 1½ miles NE of the headland is the outermost danger. Thence:
- 3 E of Outer Reef (26½ miles N); and not less than 4 miles E of Fingal Head (3¼ miles W of the reef)

by day, keeping farther E by night in depths of more than 55 m (30 fm). Outer Reef is the E–most of three rocky patches which all break and together form Danger Reefs; the reefs are covered by the red sector (251°–294°) of Fingal Head Light (3.230). Thence:

- 4 E of Point Danger (29 miles N); a light (3.233) stands on the point; Tweed River (3.248) is entered close SE of the point.

Caution. Overfalls (charted as strong ripples) occur in an area centred about 7 miles ENE of Fingal Head; they appear to be due to deflection of the S–going East Australian Current (1.149) by Danger Reefs, and to the effect of a strong inshore eddy setting N.

Useful marks

3.233

- 1 Two grey tanks (conspicuous) (29°04'S 153°23'E). Radio tower (conspicuous) (28°56'S 153°25'E); standing on Meerschaum Hill.
Tower (conspicuous) (28°39'S 153°37'E).
Chincogan (28°32'S 153°30'E), two peaks of equal height.
Building (conspicuous) (28°12'S 153°33'E), white and 28 storeys high.
Point Danger Light (displayed from the Captain Cook Memorial Tower, a white concrete column, 20 m in height, floodlit at night) (28°10'S 153°33'E).
(Directions continue at 3.255)

Side channels

Passages through Danger Reefs

3.234

- 1 **Routes.** A clear passage, 1½ cables in width with a least depth of 9.1 m (30 ft) in the fairway, which is used by vessels of a suitable size in fine weather during daylight, lies off Fingal Head (28°12'S 153°34'E) (3.232) between rocks extending 1½ cables E of Cook Island (5 cables ENE) and Inner Reef, lying 5 cables E of the island.
- 2 Another passage leads NW between South and Outer Reefs; see below for leading marks.

Local knowledge is required.

Tide-rips occur over the whole general area of Danger Reefs and are particularly strong over the shallow ledge between Cook Island and the mainland.

3.235

Leading marks:

- 1 Point Danger (28°10'S 153°33'E) (3.232) bearing 322°; seen midway between Cook Island (2¼ miles SE) and Guy Rock, above-water, lying 1 cable N of the island; leads inside Danger Reefs but over a 10.4 m (34 ft) patch lying 1 mile SE of Cook Island.
- 2 Burleigh Head (28°06'S 153°28'E); a prominent, bold and rocky headland 91 m in height and bare of trees on its seaward side; bearing 309° and open N of Point Danger (6½ miles SE), leads SW of Outer Reef and NE of South and Inner Reefs.

Anchorage

Byron Bay

3.236

- 1 **Description.** Byron Bay lies on the W side of Cape Byron (28°38'S 153°38'E) (3.231), with the town of the same name on its S shore. The root of a jetty, demolished by storms, lies bearing 281° distant 1.9 miles from Cape Byron Light and 2 cables NW of a canning factory

standing at the W end of the town. The jetty previously extended 3 cables NE from shore and the vicinity is foul with debris and should be avoided.

- 2 The reef on the N side of Cape Byron stretches W for 1 mile into the SE part of Byron Bay which is foul with drying and underwater rocks extending to 6 cables offshore and to just outside the 5.5 m (18 ft) depth contour.

Julian Rocks (1½ miles NNW of Cape Byron), are described at 3.231.

Tidal levels: see chart. Mean spring range about 1.0 m.

- 3 **Tidal Streams.** The stream sets E round the bay on a rising tide at a rate of ½ kn. See also 3.231 for remarks on tide races.

Anchorage, good in offshore winds but often subject to considerable swell, can be obtained in depths between 11 and 13 m (36 and 43 ft), midway between the demolished jetty and Julian Rocks with those rocks bearing 044° and Cape Byron bearing 117°. Anchorage farther E is not recommended.

- 4 **Leading marks.** The alignment (269°) of the following marks leads towards the above anchorage passing N of the reef extending from Cape Byron and S of Julian Rocks:

A prominent white patch of sand (bearing 290° distant 2.6 miles from Cape Byron Light), on the W shore of Byron Bay, and:

Flat Top Hill (5½ miles farther W).

- 5 **Clearing bearing.** The line of bearing 120° of Cape Byron Light (28°38'S 153°38'E) (3.230) clears N of the dangers in the SE part of the bay (3.236).

Facilities. There are no documented facilities for vessels using the anchorage.

Fingal Head

3.237

- 1 **Anchorage** in offshore winds may be obtained in a depth of 13 m (43 ft) off the NW side of Cook Island lying 5 cables ENE of Fingal Head (28°12'S 153°34'E) (3.232). See also 3.234 for directions in the vicinity of Danger Reefs.

Richmond River

Chart Aus 364 (see 1.15)

General information

3.238

- 1 Richmond River, fast flowing and about 120 miles long, is entered between breakwaters close S of Ballina Head (28°52'S 153°36'E) and is navigable from there by small vessels to its confluence with Wilsons River (Richmond River, North Arm) at the town of Coraki (28°59'S 153°17'E). From Coraki, Richmond River is navigable only by shallow-draught craft to the town of Casino (15 miles WNW). Wilsons River, although narrow and intricate, is navigable by vessels of appropriate size and draught from Coraki to Lismore (28°49'S 153°16'E).

- 2 A channel has been dredged to a depth of 3.9 m (13 ft) through a rock section of the bed of Richmond River off Byrnes Point about 3½ miles above the town of Wardell (28°57'S 153°28'E).

Port limits are drawn between the heads of the N and S breakwaters at the entrance to the river.

Port authority is Maritime Services Board of New South Wales, with local office at 3/144 River Street, Ballina 2478.

Limiting conditions

3.239

- 1 **Controlling depth:** 3.4 m over the entrance bar.
Vertical clearances. A road bridge with a lifting span crosses the river upstream of Wardell (28°57'S 153°28'E). Vertical clearance with the lift span raised is 24 m, and 5.4 m when closed; navigable width through the same span is 19.8 m. Preliminary notice of 24 hours for opening Wardell Bridge is required by the Department of Main Roads, Ballina, followed by 1 hour's notice of ETA at the bridge; special regulations and signals are in force.

- 2 A fixed road bridge crosses the river at the town of Woodburn (29°05'S 153°21'E); the channel leads through the centre span which has a vertical clearance of 8.5 m and a navigable width of 15.0 m.

Another road bridge crosses Richmond River at Coraki (28°59'S 153°17'E); vertical clearance 6 m and horizontal clearance 18.2 m.

- 3 A road bridge crosses Wilsons River at Lismore (28°49'S 153°16'E); vertical clearance 12.1 m and horizontal clearance 23.4 m.

Tidal levels. See *Admiralty Tide Tables*. At Ballina mean maximum range about 1.2 m; mean minimum range about 0.6 m.

Arrival information

3.240

- 1 **Port radio, pilot and signal station** stands close to Ballina Head Light (28°52'S 153°36'E) (3.230) but continuous watch is not kept.

Cables and pipelines. Overhead and submarine cables and submarine pipelines cross the river at various points; they are usually indicated by warning notices on shore.

- 2 **Pilotage** is compulsory except for exempted vessels and is available by prior arrangement; the boarding position is 7 cables SE of the breakwater heads.

Local knowledge is required.

Regulations. A speed limit of 6 kn is in force for vessels over 30 m LOA.

General regulations for the navigation of navigable rivers are given at 1.57.

Harbour

3.241

- 1 **Ferries** working on wires cross the river at various points upstream of Ballina.

Visual signals described at 1.77 may be displayed at Ballina Head Signal Station (3.240), but this is not automatic. A local code of bar signals may be displayed for exempt vessels by prior arrangement.

- 2 **Tidal streams** in the entrance may attain a rate of 3 to 3½ kn. At the head of the N breakwater the in-going stream sets S turning thence into the river; the out-going stream sets NE.

Directions

3.242

- 1 **Caution.** A sand bar close seaward of the entrance to Richmond River is subject to change. Seas break heavily on this outer bar on the out-going tidal stream, even in fine weather.

The channel from the outer bar inwards to the wharves at the town of Ballina, 2 miles W of the entrance, is also changeable; leading marks therein are moved or may be changed to conform to the best water.

- 2 From a position SE of Ballina Head (28°52'S 153°36'E) (3.231) the track leads NW. Positions of front marks are given from Ballina Head Light (3.230);

Entrance leading lights:

Front light (triangular topmark, point up) (4½ cables SW), standing on the sea wall on the N side within the entrance.

Rear light (triangular topmark, point down) (5 cables NW of the front light).

- 3 The alignment (310¼°) (see caution above) of these beacons, leads across the bar (see depth at 3.239) towards the N sea wall, passing between N and S breakwaters; a light (mast) stands near the head of each breakwater. Thence:

Inner leading beacons:

Front beacon (9 cables WSW), standing on the half-tide training wall which continues up-river on the S side from the line of the S breakwater.

- 4 Rear light-beacon (80 m WSW of the front beacon), also standing on and marking the training wall.

The alignment (250°) (see caution above) of these beacons leads across an inner bar to the training wall on which they stand, passing NNW of a lightbeacon (port hand) standing ¾ cable ENE of the front beacon.

- 5 Thence the training wall, which is submerged at periods of HW, should be followed.

Leading lights:

Front light (post) (1.4 miles WSW), standing on the training wall.

Rear light (post) (480 m SE of the front light-beacon).

- 6 The alignment (129¾°) of these lights astern then leads NW towards Ballina town foreshore on the N side of the river, passing NE of light-buoys (port hand) marking the SW side of the fairway.

Course may then be directed as required for the wharves at Ballina.

3.243

- 1 Above Ballina the river channels are marked by leading beacons (orange triangles; the front beacons point up, the rear beacons point down); lights are displayed from some of these leading beacons, (the front lights green, the rear lights red). Some buoys are also used as marks but are frequently displaced by tidal stream or by freshets and should not be relied upon. The beacons on shore, leading through channels which may be narrow, should always be kept in line.

Berths

3.244

- 1 There are wharves at Ballina and a number of others at the several towns and villages standing on the banks of Richmond and Wilsons Rivers.

A commercial boat harbour, with a depth of 2.7 m (9 ft), lies on the W side of North Creek Canal 2¼ miles W of Ballina Head Light.

Port services

3.245

- 1 **Repairs.** Dry dock for building and repairs at Rileys Hill 20 miles above Ballina; extreme length 69.0 m, breadth 13.0 m. Slipway for repairs at Ballina for vessels up to 35 m LOA, 3.5 m draught, 10.0 m beam and 300 dwt.

Other facilities. The customs authority for the port is located at Ballina; small quantities of provisions available; water is laid on to the wharves; hospitals.

Other rivers

Chart Aus 364 (see 1.15)

Evans River

3.246

- 1 The entrance to Evans River (29°07'S 153°26'E), with the town of Evans Head close W, lies between breakwaters from the heads of which lights are displayed. A road bridge, with vertical clearance 3 m and a horizontal clearance of 10.2 m between piers, spans the river 7 cables within the entrance. A commercial boat harbour lies on the S side of the river immediately downstream of the bridge.

Local knowledge is required.

Brunswick River

3.247

- 1 The entrance to Brunswick River (28°32'S 153°33'E) lies between two breakwaters from the heads of which lights are displayed; the entry channel is narrow and dangerous, with depths that vary continually.

Local knowledge is required.

- 2 The town of Brunswick Heads stands inside the entrance where the river, partly contained by training walls, divides into Marshalls Creek to the N, and Simpsons Creek to the S with the river continuing W. A boat harbour used by local fishing vessels lies on the S side of the river 6½ cables from the sea, opposite North Training Wall.

Tweed River

3.248

- 1 **General information.** Tweed River is entered between breakwaters 3½ cables SE of Point Danger (28°10'S 153°33'E) (3.232); a light is displayed from near the head of each breakwater. A jetty, from the head of which a light is displayed, lies 5½ cables SE of Point Danger. The towns of Tweed Heads (New South Wales) and Coolangatta (Queensland) stand close W of the entrance.

- 2 A sand bar lying across the entrance is exposed to the ocean swell and subject to frequent change; it can be very dangerous on the out-going tidal stream and should only be crossed on the in-going stream. Depth over the bar is 1 m (1992). After heavy weather the depth and width of the channel are temporarily reduced by an extension of Letitia Spit reaching N from the head of the S breakwater; the channel however soon scours out again. When the channel is near Danger Point the bar can only be crossed in a smooth sea.

- 3 The river is navigable by day to the town of Murwillumbah (28°20'S 153°24'E) by small craft with a draught of 1.3 m (4 ft) or less. Some road bridges span the river; the controlling vertical clearance of 4.8 m occurs at Condong Bridge, 2 miles downstream of Murwillumbah.

From its junction with Tweed River 1 mile S of Point Danger, Terranora Inlet leads W to Boyds Bay, on the S side of the town of Tweed Heads, and to Boyds Bay Bridge which has a lift span with a vertical clearance of 8.6 m when raised. Boyds Bay can be reached by small craft with a maximum draught of 1.8 m (6 ft).

- 4 The channels in Tweed River and Terranora Inlet are marked in places by beacons and buoys, some of which are lit.

Port authority is Maritime Services Board of New South Wales, with local office at 14A Bay Street, Tweed Heads 2485.

Signal station stands on Point Danger but continuous watch is not kept. Storm warning and other visual signals (see 1.77) can be displayed by prior arrangement with the Board's local officer but display is not otherwise automatic.

5 **Anchorage.** Vessels waiting to enter the river can obtain good anchorage in a depth of 15 m (49 ft) off Coolangatta, with Point Danger bearing 118° and the smaller Kirra Point (8 cables farther W) bearing 167°.

6 **Pilotage.** Not available. No attempt should be made to enter the river without prior consultation with the Board's local officer who, whilst taking no responsibility, will provide advice and assistance.

Local knowledge is required.

Speed limits of 4 or 8 kn are in force in parts of the river and connecting waters.

Berths: a wharf at Boyds Bay and others at towns on the river.

Facilities. Slipway for fishing boats at Boyds Bay.

POINT DANGER TO CAPE MORETON

General information

Charts Aus 364, Aus 236 (see 1.15)

Route

3.249

1 The coastal route from a position off Point Danger (28°10'S 153°33'E) leads 68 miles N to a position off Cape Moreton (27°02'S 153°28'E).

Topography

3.250

1 Apart from Burleigh Head (6½ miles NW) (3.235), the coast from Point Danger (28°10'S 153°33'E) for about 13 miles NNW consists of a series of beaches backed by towns; high ground continues to be evident farther inland. See view A on chart Aus 364. Towards the N end of this short stretch of coast there are a number of conspicuous buildings in the town of Surfers Paradise (28°00'S 153°26'E).

2 The entrance to Nerang River lies about 3 miles N of Surfers Paradise and from there N to Cape Moreton (27°02'S 153°28'E) the coast consists of a chain of islands behind which lie Moreton Bay and the port of Brisbane. South Stradbroke Island, the S island, is low, wooded and sandy with some swampy ground, whilst North Stradbroke and Moreton Islands are for the most part hilly and thickly wooded; see views A and B on chart Aus 364. The Stradbroke Islands are bird sanctuaries.

Depths

3.251

1 The coast between Point Danger (28°10'S 153°33'E) and Point Lookout (44 miles N) may, in fine weather, be approached to a distance of 1 mile except off the entrance to Nerang River (14½ miles NNW) and off Jumpinpin (25½ miles NNW); see 3.255 for details of both, and for dangers offshore between Point Lookout and Cape Moreton, 25 miles farther N.

Exercise areas

3.252

1 Military exercise areas, exist offshore, between Point Danger (28°10'S 153°33'E) and Cape Moreton (27°02'S 153°28'E), as indicated on the chart. See *Annual Australian Notices to Mariners* for details.

Current

3.253

1 A slight N-going current is sometimes felt close inshore off the E coasts of South and North Stradbroke Islands.

Major Lights

3.254

1 Coolangatta Aero Light (28°10'S 153°30'E) (3.230).
Point Lookout Light (white square concrete tower, 5 m in height) (27°26'S 153°32'E).

Cape Moreton Light (white stone tower 23 m in height, red bands and cupola) (27°02'S 153°28'E), prominent; a red house stands nearby.

Directions

(continued from 3.233)

3.255

1 From a position E of Point Danger (28°10'S 153°33'E) (3.232) the track leads N, passing (positions from Point Lookout (27°26'S 153°33'E)):

E of Southport bar (3.260), lying off the entrance to Gold Coast Seaway and Nerang River (30½ miles SSW), in depths not less than 30 m; depths off the entrance are subject to frequent change. Thence:

2 E of Jumpinpin (Jumpin Pin) (18½ miles SSW) in depths not less than 30 m; shoal depths extend about 1 mile E of Jumpinpin and positions of off-lying banks are subject to frequent change; thence:

3 E of Point Lookout (27°26'S 153°33'E), a low point about 15 m in height rising to higher ground W (see view A on chart Aus 364); Point Lookout Light (3.254) stands near the point; Boat Rock is the outermost danger on a reef of above and below-water rocks extending 1 mile NNE from the point. Thence:

4 E of Flat Rock (2½ miles N); a rock (awash) lies close S; patches with depths of 7.3 m (24 ft) and 19.8 m (65 ft) (chart Aus 364) over them lie 3 cables and 1 mile NE of the rock respectively; the former breaks in SE gales. The current sets strongly SE between Point Lookout and Flat Rock, causing confused seas in S winds; there is sometimes an in-draught on to Flat Rock.

5 Thence the track continues N passing (positions from Cape Moreton (27°02'S 153°28'E)):

E of Henderson Rock which breaks in heavy weather (6 miles S); a rock patch with a depth of 18.3 m (60 ft) over it lies 2¾ miles N; thence:

6 E of Cape Moreton, easily identified and visible in clear weather for 25 miles; from a distance SE the cape appears detached (see view B on chart Aus 364); Cape Moreton Light (3.254) stands on the summit; and:

E of Roberts Shoal (1 mile E), the S-most danger on a ridge extending 5½ miles N from the shoal; thence:

7 E of the ridge extending N from Roberts Shoal on which lie Brennan Shoal (1 mile ENE) and Smith Rock (1¾ miles NNE) which both break occasionally, Flinders Reef (3¼ miles NNE) which dries and is marked by a light-buoy (N cardinal), and Hutchison Shoal which seldom breaks and is the N-most danger on the ridge. Roberts and Brennan Shoals are covered by a red sector (258°–294°) of North Point Light (27°01'S 153°27'E) (4.32); Smith Rock, Flinders Reef and Hutchison Shoal are covered by another red sector (192°–244°) of the same light.

8 A passage between Roberts Shoal and Cape Moreton, which should only be used in good weather by vessels

bound for Moreton Bay (27°15'S 153°15'E), is described at 4.31.

Caution. Great care is required to avoid the above off-lying dangers when approaching Cape Moreton, particularly in thick or bad weather.

Useful marks

3.256

- 1 Mount Warning (28°24'S 153°16'E) (3.230); see view A on chart Aus 364.
Fingal Head Light (28°12'S 153°34'E) (3.230).
Building (conspicuous, elevation 105 m (344 ft), from where a light is displayed by day and night) (27°56'S 153°24'E), known as Broadwater Tower.
- 2 Radar tower (conspicuous) (27°30'S 153°27'E) standing on Mount Hardgrave, the highest summit of North Stradbroke Island.



Radar tower, North Stradbroke I. (3.256)

(Original dated 1999)

Point Danger Light (28°10'S 153°33'E) (3.233).
(Directions continue for the Port of Brisbane at 4.18 and for coastal passage N at 5.41)

Alternative channel

South Passage

3.257

- 1 **Description.** South Passage leads into Moreton Bay between Amity Point (27°24'S 153°27'E), the NW extremity of North Stradbroke Island, and Reeder's Point, the low S extremity of Moreton Island, 1¼ miles farther NNW. Entrance to the passage from seaward is over a bar which is subject to frequent change and lies between extensive areas of breakers. The passage is dangerous in all but calm weather and should only then be used in daylight by shallow-draught craft.
- 2 From the inner end of South Passage, between Amity and Reeder's Point, Amity Banks and Moreton Banks (drying banks of sand and mud), within which there are many blind channels, extend up to 7 miles WSW to the deeper waters of Moreton Bay; Rous Channel and Rainbow Channel, which are both changeable but marked, lead separately through these banks.

Local knowledge is required.

- 3 **Current** close seaward of the entrance bar to South Passage is irregular but sometimes sets S at a rate of 2 to 3 kn.

Tidal streams through the entrance to South Passage attain rates of 3 to 4½ kn; from W of Amity Point these rates reduce to 2 to 3 kn but the stream may set obliquely across the banks and channels.

Anchorage

Point Lookout

3.258

- 1 **Anchorage** may be found in fine weather or in offshore winds off the N coast of North Stradbroke Island in depths of 11 to 15 m between 5 cables and 1 mile WNW of Shag Rock (27°25'S 153°31'E).

A 7.3 m patch lies 7 cables NE of Shag Rock. Other dangers and sea conditions in the vicinity of Point Lookout (27°26'S 153°33'E) are given under Directions at 3.255.

Local knowledge is required if the anchorage is approached passing between Point Lookout and Flat Rock (2½ miles N).

Gold Coast Seaway

Chart Aus 364 (see 1.15)

General information

3.259

- 1 **Description.** The City of the Gold Coast is a major tourist resort and residential area with a growing population of about 400 000 (2000). The Gold Coast region stretches from the NSW border to the S end of Moreton Bay and W into the tropical hinterland. Nerang, Coomera, Pimpama and Logan Rivers, which together form an extensive network of channels and residential canals known as Gold Coast Waterways, flow into The Broadwater at Southport.
- 2 Gold Coast Seaway, at the mouth of Nerang River, is entered 15 miles NNW of Point Danger (28°10'S 153°33'E) between Nerang Head, at the N end of a low sandy spit continuing N from the vicinity of Surfers Paradise; and Porpoise Point, the SE extremity of South Stradbroke Island. A white observation tower known as the Seaway Tower, 14 m in height and manned by local Marine Rescue and Coastguard organisations, stands on Nerang Head.
- 3 Beyond Wavebreak Island (27°56'S 153°25'E) the Seaway opens into The Broadwater, which has extensive drying banks, with channels marked by light-beacons. The resort of Southport fronts the W shore of The Broadwater; the shallow Nerang River flows into its S end, and the N end connects with Moreton Bay through channels navigable by small craft.

Local knowledge is required.

3.260

- 1 **Southport bar** lies off the entrance to the Seaway; see 3.262 for remarks on depth. The area of the bar and farther seaward is prone to heavy breakers. The out-going tidal stream sets strongly through the Seaway and it is recommended that the bar should not be crossed from 4 to 6 hours after HW when the out-going stream runs at full strength.

3.261

- 1 **Port authority.** The maritime authority for Gold Coast Seaway and all connecting inner waters is Queensland Department of Transport (Maritime Division), Marine Operations Base, 40-44 Seaworld Drive, Main Beach.

Limiting conditions**3.262****1 Controlling depths:**

South Channel dredged to 4.5 m.

North Channel dredged to 2.8 m.

Depths for entry through Seaway Channel have not been designated.

Vertical clearance. Gold Coast Bridge, vertical clearance 5.2 m, spans Nerang River about 3 cables beyond the S end of South Channel (3.264).

2 Tidal levels. See information in *Admiralty Tide Tables*. Mean maximum range about 1.2 m; mean minimum range about 0.6 m.

Local weather. Passage through the Seaway should not be attempted in rough weather when waves are breaking across the entrance.

Arrival information**3.263****1 Port radio.** The Seaway Tower is manned during daylight hours, and may be contacted on VHF for port information.

Prohibited anchorage. An historic wreck (1.70), *Scottish Prince*, lies within a protected area 1½ miles S of Nerang Head and 2½ cables offshore.

2 Pilotage is compulsory for Australian registered vessels over 50 m LOA and all other vessels over 35 m LOA. Vessels requiring a pilot should give 24 hours notice to the Port Authority (3.261). Pilots board 2 miles E of the entrance to the Seaway.

Measured distance is sited S of the entrance to the Seaway, (positions from Broadwater Tower (27°56'S 153°24'E) (3.256):

- 3** N limit mark SJ1 light-beacon (yellow cross on yellow beacon) (1¾ miles ESE), standing at the head of Sand by-pass Jetty.
- S limit marks (two beacons) (2¼ miles SE), standing on shore. The alignment of this pair of beacons is 270°.
- Distance 1852 m, running track 000°/180°.

Directions**3.264**

- 1** From a position ESE of Broadwater Tower (27°56'S 153°24'E) (3.256) the track leads WNW to the entrance to the Seaway.

Approach leading lights:

Front light GS1 Light-beacon (1½ miles ESE of Broadwater Tower), standing at the head of the N breakwater forming the SE extremity of Porpoise Point.

- 2** Rear light displayed from Broadwater Tower.

The alignment (290¾°) of the above lights leads over Southport Bar passing NE of GS2 Light-beacon standing on the head of the S breakwater; thence:

Entrance leading lights:

Front light (white tower, 5 m in height) (1 mile SE of Broadwater Tower), standing on Wavebreak Island.

Rear light (white pole) (5½ cables WSW of the front light), standing on the mainland shore.

- 3** The alignment (255°) of the above lights leads through Gold Coast Seaway to a position E of Wavebreak Island from where channels, see below, lead S or NNW.

South Channel, marked by pairs of light-beacons, leads S for 2 miles.

North Channel, marked by pairs of light-beacons, leads NNW for 1¼ miles to join deeper water W of South Stradbroke Island.

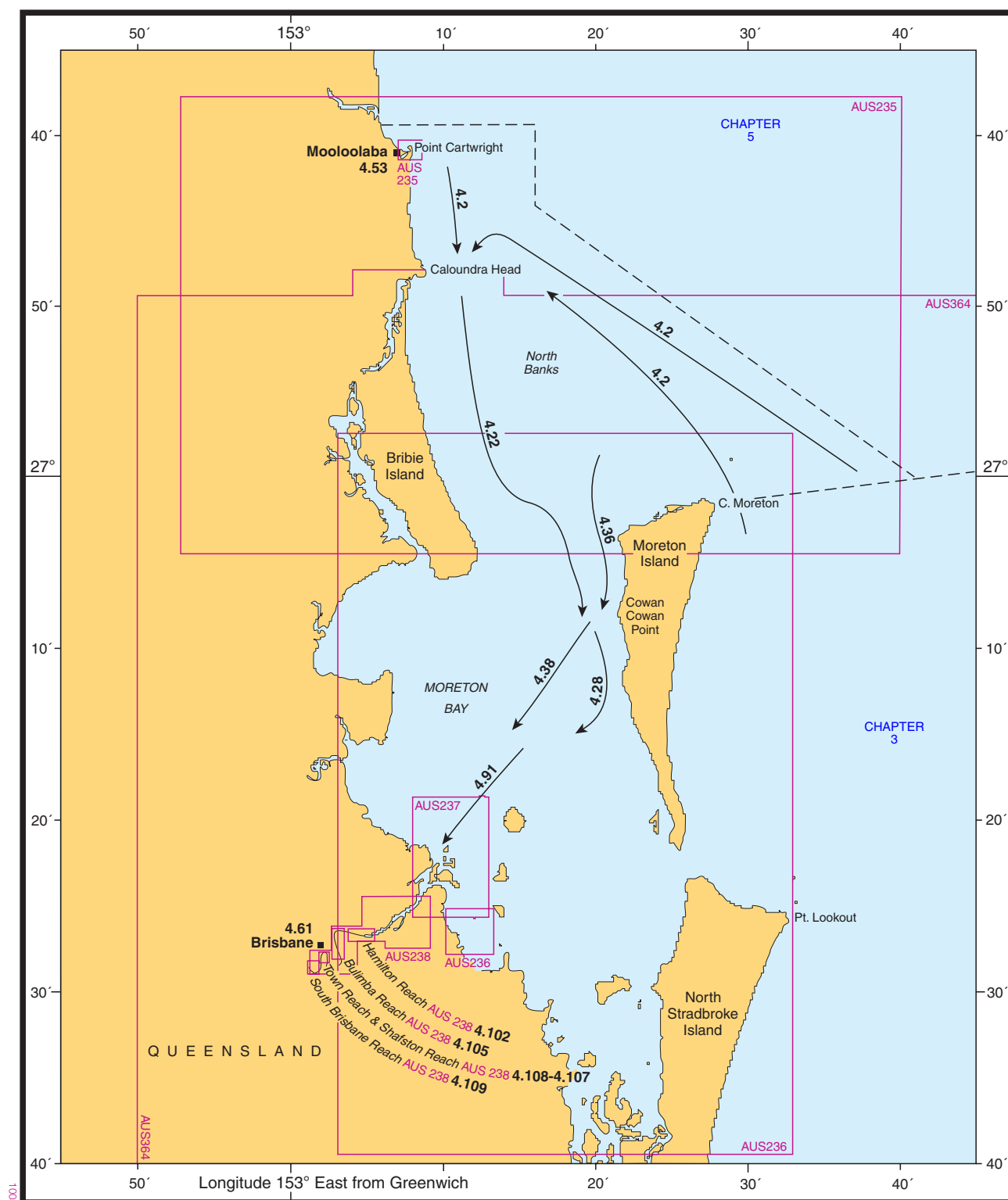
Berths**3.265**

- 1** A jetty (2¼ miles SSE from Broadwater Tower (3.256)) at Southport has a depth of 1 m at its head. There are numerous small jetties servicing local recreational and tourist operations, but no commercial wharves.

Facilities**3.266**

- 1** There are marinas, maintenance facilities and several boat ramps within The Broadwater and the lower reaches of Nerang River. There is a hospital in Southport.

Chapter 4 - Brisbane and approaches



CHAPTER 4

BRISBANE AND APPROACHES

BRISBANE

GENERAL INFORMATION

Charts Aus 235, Aus 236, Aus 364, Aus 365

Scope of chapter**4.1**

- 1 The chapter covers an area extending from about 40 miles N to 15 miles S of the entrance to the Brisbane River. Most of the area described lies within the confines of Moreton Bay.

MORETON BAY AND APPROACHES

Routes**4.2**

- 1 Moreton Bay, leading to Brisbane, is approached from seaward between Cape Moreton (27°02'S 153°28'E) and Caloundra Head (22 miles NW) but the entrance and whole N part of the bay is obstructed by shoals. The principal route into the bay from sea leads through North West Channel, entered 1½ miles S of Caloundra Head, thence through Spitfire Channel, through the N part of Main Channel and finally through East Channel; these and the secondary channels are described in the relevant parts of the text.
- 2 When closing the coast from E, a landfall should be planned in the vicinity of Cape Moreton (3.255). See also Caution at 3.255.

Topography**4.3**

- 1 The E coast of Moreton Island (27°10'S 153°25'E), as viewed from seaward, is described at 3.250. The N coast of the same island SW from North Point (27°01'S 153°27'E) is formed by a sandy beach fronted by drying sand flats. Five Hills (27°03'S 153°24'E), sandy cliffs with scrub-covered summits rising to Smith Peak (1½ miles SSE), stand in the middle of this stretch of coast.
- 2 Significant features of the mainland coast seen from the approaches are Glasshouse Mountains (26°55'S 152°55'E) which rise abruptly from a rocky or sandy plain, covered with trees and scrub.

4.4

- 1 The coast S from Point Cartwright (26°41'S 153°08'E), which then continues S to form the W side of Moreton Bay, is generally low-lying and swampy except for Caloundra Head and some low promontories within the bay. The coast to the head of Moreton Bay is similar, with mangroves being common on the coast and islands. Bribie Island (27°00'S 153°08'E) is also low and swampy but densely wooded at its N end; a sandy beach backed by scrub-topped sand ridges 3 to 5 m high, runs the length of its E side. South of Bribie Island, the islands and W shores of Moreton Bay are generally fronted by drying flats of sand and mud.

The city of Brisbane on the SW side of Moreton Bay is backed by the foothills of D'Aguiar Range.

4.5

- 1 On the E side of Moreton Bay, the coast in the vicinity of Comboyuro Point (27°04'S 153°22'E) consists of sandy

beach backed by low and swampy ground; a narrow strip of similar ground continues 4½ miles S to Cowan Cowan Point. Inland of this coastal strip the ground rises steeply to the central ridge of Moreton island with some summits more than 200 m in height.

- 2 The coast continues sandy and backed by steeply rising ground to Tangalooma Point (27°12'S 153°22'E) which falls steeply to the sea from a prominent hill 7 cables N (4.30). South of Tangalooma Point the land becomes lower and falls away to the sand hills and swampy ground of Clohertys Peninsula (27°20'S 153°26'E) at the S end of the island.

Depths**4.6**

- 1 The seaward approach to Moreton Bay is partially obstructed by shoals which reach from the N side of Moreton Island NW nearly to Caloundra Head (26°48'S 153°09'E). These shoals are predominantly of white sand and have been described in reports of survey as dynamic, with depths generally less than 5 m but subject to continual change: their seaward edges are normally marked by breakers.
- 2 Shoals with similar changeable depths also partially obstruct the entrance to the bay and extend as far S as its central part. The shoals and banks significant to navigation are described in the relevant parts of the text.

The central part of Moreton Bay is deeper and relatively clear, with the bottom shelving gently to shore on the W side of the bay, but steep-to on the E.

- 3 The head of Moreton Bay, S of Mud Island (27°20'S 153°15'E), is partially obstructed by many islands and drying shoals: the shoals and channels between them are subject to frequent change.

4.7

- 1 **Controlling depths** in the principal channels from sea to Brisbane River are given at 4.66: under-keel allowances required for the same channels are given at 4.67.

Exercise areas**4.8**

- 1 Military exercise areas exist off Cape Moreton (27°02'S 153°28'E), as shown on the chart. See *Annual Australian Notices to Mariners* for further details.

Notice of ETA**4.9**

- 1 Notice of arrival at the pilot station is required 24 hours in advance. See *Admiralty List of Radio Signals Volume 6(4)*.

Pilotage**4.10**

- 1 Pilotage, which is compulsory except for exempted vessels and those under 35 m LOA, is available by day and night. The pilot station is at Mooloolaba Harbour (4.53), close W of Point Cartwright (26°41'S 153°08'E) and the boarding ground, shown on the chart, is 3 miles SE of the same point: this boarding position may be varied by prior arrangement.

- 2 The pilot vessels are large launches with orange superstructures and white hulls with the word "Pilots" in black on each side.

Pilots for the Inner Route of Great Barrier Reef may also be embarked here.

See also *Admiralty List of Radio Signals Volume 6(4)*.

Local knowledge

4.11

- 1 Owing to the frequent changes in the shoals and channels and resulting changes to navigation marks; local knowledge is required. Only exempted vessels should enter Moreton Bay without a pilot.

Vessel Traffic Service

4.12

- 1 A Vessel Traffic Service scheme with radar surveillance is maintained for the control of shipping: for details and reporting requirements see *Admiralty List of Radio Signals Volume 6(4)*.

The scheme is mandatory for vessels of 35 m or more in length navigating within the port limits.

Natural conditions

4.13

- 1 **Local magnetic anomaly.** In 1976 a local magnetic anomaly causing deflection of the compass was reported to occur approximately 4½ miles SSW of Cowan Cowan Point Light (27°09'S 153°22'E).

4.14

- 1 **Tidal streams.** The in-going tidal stream in Moreton Bay sets generally S and the out-going stream generally N, with mean spring rates up to 3½ kn; these directions however vary amongst the shoals and in the channels between them. The charts (Aus 235, Aus 236) should be consulted for the direction and rate of the tidal stream shown in numerous positions. Streams are weaker away from the shores of the bay and from the shoals, and also in the deeper middle part of the bay. The in-going stream is felt as far S as Russell Island (27°39'S 153°23'E).

- 2 Abreast Cowan Cowan Point (27°08'S 153°22'E), the strength of the in-going stream can cause a short sea dangerous to small craft in SW winds.

Tidal streams running through South Passage (27°22'S 153°26'E) and over the banks W are given at 3.257.

Caution. Tidal streams set obliquely across the channels in many places and must invariably be allowed for.

Tide-rips often indicate the vicinity of shallow water throughout the bay.

Principal marks

4.15

- 1 **Landmarks:**

Cape Moreton (27°02'S 153°28'E) (3.255).

Mount Beerwah (26°54'S 152°53'E), the highest summit of Glass House Mountains and visible from about 50 miles.

4.16

- 1 **Major lights:**

Cape Moreton Light (27°02'S 153°28'E) (3.254).

Caloundra Head Light (building, 17 m in height) (26°48'S 153°09'E).

Point Cartwright Light (white five-sided concrete tower, 32 m in height) (26°41'S 153°08'E); a conspicuous water tower (chart Aus 235 plan of Mooloolaba Harbour) stands close SSW of the light.

Navigation marks

4.17

- 1 **Direction of buoyage.** The general direction of buoyage for lateral marks throughout Moreton Bay conforms to that applicable when sailing towards Brisbane.

Cautions. Navigation marks are liable to be moved to meet changes in the channels.

The outer buoys are liable to be off station or break adrift in bad weather.

Directions

(continued from 3.256)

Approaches

4.18

- 1 **From south.** From a position E of Hutchison Shoal (26°57'S 153°29'E) (3.255), the N-most danger on the ridge extending N from Cape Moreton, the track leads NW to the pilot boarding position (26°43'S 153°11'E) (4.10) and towards Point Cartwright (26°41'S 153°08'E), 43 m in height; a light (4.16) and a water tower stand on the point. The track lies within the white sector (180°–307°) of Caloundra Head Light (26°48'S 153°09'E) (4.16) and passes NE of Hutchison Shoal.

- 2 For vessels not embarking a pilot off Point Cartwright the track then leads WNW directly to the NW Fairway Light-beacon (4.19), 1½ miles ESE of Caloundra Head (26°48'S 153°09'E), keeping within the white sector of Caloundra Head Light.

4.19

- 1 **From North.** From a position N of the latitude of Point Cartwright (26°41'S 153°08'E) the track leads SSE or SW to the pilot boarding position (3 miles SE of the point) (4.10), passing (positions from Point Cartwright):

- 2 Clear of Gneering Shoals, a rocky shoal area (centred 3 miles NE). A patch with a depth of 13.7 m over it and marked by a light-buoy (E cardinal) (4¼ miles ENE) is the E-most known danger, although broken water has been reported close SE; a shoal with a depth of 6.7 m over it (2½ miles NNE) is the W-most danger; a reef, with a depth of 10.1 m over it known locally as Leach Shoal, lies between. These dangers, which break in bad weather, are covered by the arc of visibility (202°–250°) of Point Cartwright red auxiliary Light and should be given a wide berth: see below for clearing marks. An artificial reef (the hull of HMAS *Brisbane*) (2¼ miles NNE) has been established (2005), and is marked by a light-buoy (N cardinal).

- 3 From the pilot boarding position (26°43'S 153°11'E) (4.10) the track leads initially SSE, passing (positions from Caloundra Head (26°48'S 153°09'E)):

ENE of Raper Shoal, which breaks, (2¾ miles N), lying W of the white sector (180°–345°) of Point Cartwright Light (7½ miles N) (4.16): see below for clearing marks. Thence:

- 4 Not less than 2½ miles ENE of Caloundra Head (26°48'S 153°09'E), 45 m in height; the town of

Caloundra and a light (4.16) stand on the head; a building (conspicuous; red obstruction light) stands 7 cable WNW of the light.



Caloundra Head from NE (4.19)

(Original dated 1999)

- 5 Thence the track leads SSW passing (positions from Caloundra Head):

Close either side of NW Fairway Light-beacon (safe water) (1½ miles ESE), the light-beacon lies within the white sector (243°–275°) of North West Channel front leading light (1¼ miles SW) (4.23), and:

ESE of Bray Rock (5 cables ESE) which breaks in any swell; a dangerous wreck lies close N; both are covered by the red sector (215°–243°) of North West Channel front leading light, see above.

4.20

- 1 **Clearing marks 1:**

Front mark, Point Cartwright (26°41'S 153°08'E) (4.18).

Rear mark, Caloundra Head (7½ miles S of the front mark) (4.19).

The rear mark on a S bearing and open just E of the front mark, passes W of Gneering Shoals (4.19).

- 2 **Clearing marks 2:**

Front mark, Point Cartwright summit (26°41'S 153°08'E) (4.18).

Rear mark, Mount Coolum (7½ miles NNW of the front mark), prominent; a red obstruction light is displayed from the hill.

- 3 The line of bearing less than 337° of Mount Coolum open E of Point Cartwright summit clears E of Raper Shoal (4½ miles SSE of Point Cartwright) (4.19).

4.21

- 1 **Useful marks:**

Beerburrum (26°57'S 152°57'E), the SE hill of Glass House Mountains.

Coonowrin (26°54'S 152°55'E), a hill known locally as Crookneck, the upper part being shaped like a cylinder.

Tibrogargan (26°56'S 152°57'E), a conspicuous hill.

North West Channel

4.22

- 1 North West Channel is the principal entrance channel to Moreton Bay. The channel has a dredged width of 305 m and lies close WSW of Hamilton Patches, 1¼ miles SSE of Caloundra Head, and of North Banks which extend 10 miles farther SE. The controlling depth for the principal channels is given at 4.66.

4.23

- 1 From the vicinity of NW Fairway Light-beacon (26°49'S 153°11'E) (4.19) the track leads WSW, passing (positions from Caloundra Head (26°48'S 153°09'E)):

2 cables N of NW2 Light-beacon (special) (1¼ miles S), standing at the NW extremity of Hamilton Patches and marking the entrance to the channel.

Thence the track leads 170°, passing:

W of NW2 Light-beacon, thence:

- 2 E of NW1 Light-beacon (starboard hand) (3 miles S), thence:

W of NW4 Light-beacon (port hand) (3½ miles S), thence:

North West Channel Leading Light-beacons:

Front light-beacon (white tower, 15 m in height) (26°50'S 153°08'E).

Rear light-beacon (similar mark, 19 m in height) (9 cables NNW of the front light-beacon).

- 3 The alignment, (328¼°) astern, of the above light-beacons (lights also displayed by day as the structures by themselves are not easily identified from SSE against the background of tall buildings of Caloundra), leads for 7¼ miles SSE, passing (positions from the front light-beacon):

WSW of NW6 Light-beacon (port hand) (4¾ miles SSE), and of NW8 Light-beacon (port hand), 2½ miles farther SSE; thence:

- 4 ENE of NW3 Light-beacon (starboard hand) (9½ miles SSE), marking a bend in the channel.

Thence the track leads 160°, passing (positions from NW3 Light-beacon (26°58'S 153°13'E)):

WSW of NW10 Light-beacon (port hand) (2½ miles SSE), thence:

WSW of NW12 Light-beacon (W cardinal) (5 miles SSE), marking the W extremity of Spitfire Banks and the entrance to Spitfire Channel.

Spitfire Channel

4.24

- 1 Spitfire Channel (27°03'S 153°17'E) leads ESE between Spitfire Banks close NNE, and Western Banks to S. The channel is dredged over a least width of 305 m: the controlling depth for the principal channels is given at 4.66

Spitfire Channel Leading Light-beacons:

Front light-beacon (14 m in height) (27°01'S 153°10'E), standing close to the foreshore of Bribie Island (4.4).

Rear light-beacon (19 m in height) (5 cables WNW of the front light-beacon).

- 2 **Main Channel M2 Light-beacon:**

Light-beacon (port hand with an additional direction light) (27°04'S 153°19'E).

The alignment (290°) of Spitfire Channel Leading Light-beacons astern and the line of bearing, 110° ahead, of the narrow white sector (109¾°–110¼°) of the direction light on M2 Light-beacon, lead through Spitfire Channel. The track passes (positions from M2 Light-beacon):

- 3 NNE of a light-beacon (isolated danger) (2½ miles WNW), thence:

NNE of a light-beacon (isolated danger) (1 mile W), marking the NE end of Western Banks at the entrance to Main Channel.

The fixed lights on Spitfire Leading Light-beacons and the direction light on M2 Light-beacon will be switched on for daylight transits of the channel on request to Brisbane Harbour Control.

North part of Main Channel

4.25

- 1 Main Channel is entered from the E end of Spitfire Channel and leads generally SE to the vicinity of Cowan Cowan Point (27°08'S 153°22'E), thence SW towards Brisbane Road. The N and deeper part of this channel as far as Cowan Cowan Point forms part of the principal route into Moreton Bay and leads SW of Salamander and Yule Banks and NE of Western and Central Banks. The controlling depth for the principal channels is given at 4.66.

The S part of Main Channel is described separately at 4.38.

4.26

- 1 From a position about 5 cables E of M2 Light-beacon the track leads S passing between M3 Light-beacon (starboard hand) (27°06'S 153°18'E) and M4 Light-beacon (port hand) (5½ cables NE of M3).

Thence the track leads SE in a white sector (132°–141°) of Cowan Cowan Point Light (square metal framework tower, 9 m in height; orange and yellow square daymarks on NW and SW faces) (27°09'S 153°22'E), passing (positions from Cowan Cowan Point Light):

- 2 SW of M6 Light-beacon (port hand) (2½ miles NW), thence:

NE of M5 Light-beacon (special) (1¾ miles NW).

Thence the track leads S passing between Cowan Cowan Point Light and M7 Light-beacon (E cardinal) (9 cables W), which marks East Knoll.

4.27

- 1 **Useful marks:**

Cone Hill (27°10'S 153°23'E).

Building 5 cables NNE of Cowan Cowan Point (27°08'S 153°22'E).

East Channel

4.28

- 1 East Channel is entered about 2 miles SSW of Cowan Cowan Point and leads S between Ridge Shoal (27°13'S 153°21'E) and Middle Bank, 7 cables farther W: the S end of the channel is dredged and is known as East Channel Cut. The controlling depth for the principal channels is given at 4.66.

4.29

- 1 From a position between Cowan Cowan Point Light and M7 Light-beacon (4.26) the track continues S into East Channel, passing (positions from Cowan Cowan Point Light (27°09'S 153°22'E)):

E of E1 Light-beacon (starboard hand) (2½ miles SSW), thence:

E of E3 Light-beacon (starboard hand) (4½ miles SSW); thence:

- 2 W of E2 Light-beacon (port hand) (5¼ miles SSW); thence:

Between E5 Light-beacon (E cardinal) (5¾ miles SSW) and E4 Light-beacon (port hand), 4½ cables E of E5.

Thence course may be directed WSW to Brisbane Road (27°17'S 153°14'E) (4.49), or as otherwise required.

4.30

- 1 **Useful marks:**

The NW fall of Diagram Hills (27°05'S 153°23'E) bearing about 013° astern.

Hill (about 100 m in height) 7 cables N of Tangalooma Point (27°12'S 153°22'E). The hill is prominent from N and separated from the central ridge of Moreton Island by a sandy plain known locally as The Desert; Ship Patch, a remarkable

white patch of sand like a sail, assists identification of the hill.

(Directions for entering harbour continue at 4.91)

Side channels

Passage between Cape Moreton and Roberts Shoal 4.31

- 1 A passage which may only be used in good weather, leads between Cape Moreton (27°02'S 153°28'E) (3.255) and Roberts Shoal (1 mile E) and the dangers extending from there N; see Caution at 3.255.

4.32

- 1 **Directions.** From a position SSE of Cape Moreton the track leads NNW, passing (positions from Cape Moreton Light (27°02'S 153°28'E) (3.254)):

WSW of Roberts Shoal (1 mile E), and:

7 cables ENE of Cape Moreton Light.

Thence the track leads 329°, passing:

WSW of Brennan Shoal (1¼ miles ENE) (3.255) and of Smith Rock, 1 mile farther N, thence:

- 2 To a position 030° distant about 1 mile from North Point (8 cables NW), formed with a hummock; a light (square concrete house with white lantern, 7 m in height) stands on the point and Rocky Hill stands 3 cables SSE.

- 3 Thence the track leads NW with Cape Moreton Light (3.254) bearing more than 132½° astern and kept open NE of North Point Light (8½ cables NW). The track leads to the pilot boarding position (24½ miles NW) (4.10) and towards Point Cartwright (27½ miles NW) (4.18), passing:

NE of East Bank (8 miles WNW) (4.36), thence:

- 4 NE of North Banks (14½ miles WNW) which are extensive. The outer edges of both these banks are usually marked by breakers, or by day in calm weather they may readily be seen as the water is clear and the bottom is white sand.

4.33

- 1 For vessels not embarking a pilot off Point Cartwright, the directions above should be followed until Caloundra Head (26°48'S 153°09'E) (4.19) bears 300° whence the track leads with the same head on that bearing direct to NW Fairway Light-buoy (26°49'S 153°11'E) (4.19).

Outer Freeman Channel

4.34

- 1 This channel (27°00'S 153°22'E), passing between Venus Banks (4.36), is closed to navigation.

Inner Freeman Channel

4.35

- 1 This channel (27°03'S 153°23'E), suitable for small craft, lying between the N coast of Moreton Island (4.3) and Venus Banks (4.36), has a least charted depth of 2.1 m and is unmarked. Breakers occur in mid-channel at its SW end.

North East Channel

4.36

- 1 North East Channel (27°02'S 153°20'E) is entered between East Bank and Venus Banks and leads W of the latter bank and of Comboyuro Point (27°04'S 153°22'E) and E of Hixson and Yule Banks, to join the central part of Main Channel off Cowan Cowan Point. A survey in 1990 covering the area of East Bank showed major differences from previously charted depths and the bank at that time to have virtually disappeared; the same survey showed that part of Venus Banks lying immediately E of North East

Channel to have extended about 8 cables N from its previously charted position.

- 2 Least depth in the channel was 3.7 m (2003) but is changeable: the available depth is promulgated at regular intervals by *Australian Temporary Notices to Mariners*.

4.37

- 1 **Directions.** From a position N of Moreton Island the track leads as required towards the entrance; keeping Cape Moreton Light (3.254) bearing more than $132\frac{1}{2}^\circ$ and open NE of North Point Light ($8\frac{1}{2}$ cables NW).

Thence the track leads WSW then S to pass close N and W of NE2 Light-buoy (port hand) ($26^\circ 58'S$ $153^\circ 21'E$).

- 2 Thence the track leads generally S requiring strict attention to the tidal stream likely to be setting across the channel (see Caution at 4.14); passing:

W of the numbered light-buoys (port hand) marking Venus Banks, thence:

W of Comboyuro Point ($27^\circ 04'S$ $153^\circ 22'E$), low and sandy but steep—to on its W side, thence:

- 3 E of NE1 Light-buoy (E cardinal) (1 mile SSW of Comboyuro Point), marking the E extremity of Yule Banks.

Thence course may be directed as required to join Main Channel (4.25), passing W of Cowan Cowan Point ($27^\circ 08'S$ $153^\circ 22'E$) (4.5); a fish haven (charted as obstructions; depth 11 m), lies $1\frac{1}{4}$ miles N of the point.

Useful mark:

Mount Campbell ($27^\circ 07'S$ $153^\circ 23'E$).

South part of Main Channel

4.38

- 1 The S part of Main Channel leads SW from the vicinity of Cowan Cowan Point ($27^\circ 08'S$ $153^\circ 22'E$) between Middle and Central Banks (4.25), and may be used by vessels of appropriate draught. There was a least depth of 10.0 m (1997) in the fairway: the available depth is promulgated regularly in *Australian Temporary Notices to Mariners*.

4.39

- 1 **Directions.** From the vicinity of Cowan Cowan Point the track leads SW in a white sector, ($048\frac{1}{2}^\circ$ – 055°) astern, of Cowan Cowan Point Light ($27^\circ 09'S$ $153^\circ 22'E$) (4.26), passing (positions from Cowan Cowan Point Light):

SE of M9 Light-beacon (S cardinal) ($1\frac{3}{4}$ miles SW), thence:

NW of Middle Banks ($3\frac{1}{2}$ miles SW), marked on its NW side by MB2 Light-buoy (port hand), thence:

- 2 NW of M8 Light-beacon (port hand) ($5\frac{1}{2}$ miles SW), marking the NW side of Four Fathom Bank.

Thence course may be directed for Brisbane Road (4.49) or as required.

Useful mark:

Hutchison Peak ($27^\circ 06'S$ $153^\circ 24'E$).

Caution. The out-going tidal stream in this channel sets strongly N onto Central Banks.

Pearl Channel

4.40

- 1 Pearl Channel ($27^\circ 09'S$ $153^\circ 16'E$) is entered from Main Channel in the vicinity of M3 Light-beacon ($27^\circ 06'S$ $153^\circ 18'E$) (4.26) and leads SW between Central and Western Banks (4.24). A least depth of 10.1 m is charted in the fairway, but the channel is unmarked except for a light-buoy (port hand) ($27^\circ 12'S$ $153^\circ 13'E$), marking South West Spit at the SW extremity of Central Banks.

East Knoll Bypass Channel

4.41

- 1 East Knoll Bypass Channel ($27^\circ 08'S$ $153^\circ 20'E$) is entered from Main Channel 7 cables W of M5 Light-buoy ($27^\circ 07'S$ $153^\circ 20'E$). The passage leads S passing between EK1 Light-buoy (starboard hand) and EK2 Light-buoy (port hand), thence rejoining Main Channel 5 cables SW of M9 Light-beacon ($27^\circ 09'S$ $153^\circ 20'E$). A least depth of 6.1 m is charted in the fairway.

Skirmish Passage

4.42

- 1 **Directions.** Skirmish Passage ($27^\circ 00'S$ $153^\circ 11'E$) is entered from the N end of North West Channel (4.22) and leads SSE, between the E coast of Bribie Island ($27^\circ 00'S$ $153^\circ 08'E$) (4.4) and the N end of Skirmish Banks, to pass close E of Skirmish Point ($27^\circ 05'S$ $153^\circ 12'E$), 3 m in height and sandy. From thence the passage leads generally WSW, between the S end of Bribie Island and the extensive SW part of Skirmish Banks, to Deception Bay, the shore of which is low, fringed by mangroves and fronted by a drying bank of sand and mud extending up to 1 mile offshore.

- 2 Skirmish Banks ($27^\circ 03'S$ $153^\circ 13'E$), which dry in places, are marked only by a light-beacon (port hand) standing $1\frac{1}{2}$ miles SSW of Skirmish Point and by a light-buoy (port hand) (4 miles farther WSW), moored at the W extremity of the banks.

4.43

- 1 **Depths.** Study of the chart suggests that the controlling depth for the passage, for which local advice should be sought, is likely to be found close S of Skirmish Point.

4.44

- 1 **Useful marks:**

Light-beacon (special), 2 miles NNW of Skirmish Point, standing close offshore.

Water tower (conspicuous), 1 mile NNW of Skirmish Point, in the village of Woorim; another water tower (conspicuous) stands $2\frac{1}{2}$ miles W of the same point.

Anchorage

General

4.45

- 1 Anchorage may be obtained in any part of Moreton Bay other than in the charted spoil grounds and in the areas detailed at 4.52, but it is advisable to anchor away from the main strength of the tidal stream: see 4.14. The bottom throughout the bay is predominantly sand.

Winds from N and NE can cause a heavy sea to set into the bay.

North Point

4.46

- 1 Anchorage in winds from NNW through SW to ESE may be obtained $1\frac{1}{2}$ miles WNW of North Point ($27^\circ 01'S$ $153^\circ 27'E$) (4.32) in a depth of 11 m.

Yule Road

4.47

- 1 Anchorage may be obtained in Yule Road ($27^\circ 05'S$ $153^\circ 20'E$) in fine weather in depths of 11 to 16 m, sand. The best berth, where tidal streams are weaker than those closer in, is found $1\frac{1}{2}$ miles SW of Comboyuro Point ($27^\circ 04'S$ $153^\circ 22'E$) (4.37) in a depth of 15 m.

Yule Road can only be recommended as a temporary anchorage, as a heavy sea sets in with E gales which has caused vessels to part their cables.

- 2 **Approach** to Yule Road is made through North East Channel (27°02'S 153°20'E) (4.36), either from seaward or from the vicinity of Cowan Cowan Point (27°08'S 153°22'E).

South Tangalooma Road

4.48

- 1 South Tangalooma Road (27°13'S 153°22'E) lies between Dring Bank, which dries, and the shore; it affords anchorage for vessels of appropriate size and draught in depths of 5 to 10 m, sheltered from NE winds and protected on the W side by the bank.

Brisbane Road

4.49

- 1 Brisbane Road (27°17'S 153°10'E) is a large area where anchorage may be obtained as convenient according to draught, but clear of the prohibited anchorage area (4.52). The road is exposed to NE and E gales which cause a heavy sea, dangerous to small craft. Mud Island (27°20'S 153°15'E) and St Helena Island, 2 miles farther SSW, afford some protection from SE gales.
- 2 Depths of less than 5 m extend up to 3½ miles from the coast SW of the road. An isolated patch with a depth of 5.3 m over it, marked by a light-buoy (isolated danger), lies 1¾ miles NNW of Outer Bar Reach No 1 Entrance W Light-beacon (27°19'S 153°12'E) (4.91).

Patches with least depths of 8.8 and 9.4 m over them (27°15'S 153°15'E), lying NE of the road, are marked by two light-beacons (4.91) which serve also to lead through Outer Bar Reach.

Cleveland Point

4.50

- 1 Anchorage in a depth of 11 m may be obtained by vessels of appropriate draught 1½ miles ENE of Cleveland Point (27°31'S 153°17'E), the N extremity of a narrow, rock-fringed tongue of land; Cleveland Point Light (exposed-aggregate prefabricated concrete tower) stands on the point. Smaller vessels can obtain good anchorage 5 cables NNE of the same point in a depth of 5 m. Both anchorages are exposed to N and SE gales.
- 2 **Limiting conditions.** Study of the chart suggests a controlling depth of about 6.9 m (2½ miles N of Cleveland Point) in the approach from N.

Approach. From a position E of Mud Island (27°20'S 153°15'E), the approach to the anchorage, for which the chart is the best guide, leads generally S passing E of St Helena Island (27°23'S 153°14'E) and Green Island (1½ miles farther S), and W of Moreton Banks (27°21'S 153°22'E) (3.257) and Hope Banks (27°26'S 153°17'E), marked on its W side by a light-beacon (isolated danger).

- 3 Moreton Banks should only be approached with caution as depths decrease suddenly.

Useful mark:

Radio tower (27°37'.3S 153°13'.3E), 53 m in height, standing near the summit of Mount Cotton (chart Aus 364).

Ship to ship transfers

4.51

- 1 Two anchor berths, designated STS 1 and STS 2, are charted 2¾ miles NNE and 4 miles NE, respectively, of the

N extremity of Mud Island (27°20'S 153°15'E). Ship to ship transfers are carried out at these anchorages.

Prohibited and unsafe anchorages

4.52

- 1 A prohibited anchorage is charted 3 miles S of Point Cartwright (26°41'S 153°08'E).

Anchoring and fishing are prohibited within an area NNW of Mud Island (27°20'S 153°15'E), as shown on the chart, in the approaches to Brisbane River.

- 2 Areas declared unsafe for anchoring, trawling, or seabed activities due to the presence of unexploded ordnance, are charted (chart Aus 235) 6½ miles S of Caloundra Head (26°48'S 153°09'E) and (chart Aus 236) 1½ miles NNW of Cowan Cowan Point (27°08'S 153°22'E).

Two similar areas are charted 6 miles WSW and 2½ miles SSW of Tangalooma Point (27°12'S 153°22'E) (chart Aus 236); the latter area, off Shark Spit, is a former mined area, see Appendix II.

Harbours

Mooloolaba Harbour

4.53

- 1 **General information.** Mooloolaba Harbour (26°41'S 153°08'E), lies at the mouth of Mooloolah River and is entered over a bar immediately W of Point Cartwright: the bar is subject to siltation and should be approached with caution. The village of Buddina fronts the SE shore of the harbour and the town of Alexandra-Mooloolaba stands 1 mile farther W. The pilot station for Port of Brisbane is located in the harbour, which is a local fishing and yachting centre also providing shelter in heavy weather for small craft of appropriate size and draught.

Mooloolah River is shallow from about 1 mile above its entrance.

4.54

- 1 **Limiting conditions:** depth over the entrance bar 2.2 m (2004); harbour basin fairways dredged to 2.1 m; maximum length of vessel about 30 m LOA.

Tidal levels: see *Admiralty Tide Tables*. Mean maximum range about 1.4 m; mean minimum range about 0.7 m.

4.55

- 1 **Directions.** From a position NW of Point Cartwright Light (26°41'S 153°08'E) (4.16) the track leads SE.

Leading light-beacons:

Front light (white triangle point up on white beacon) (2 cables SW of Point Cartwright Light).

Rear light (white triangle point down on similar beacon) (85 m SE of the front leading light-beacon).

- 2 The alignment (131¼°) of the above light-beacons (from which lights are also displayed by day) leads across the bar, lying outside the entrance, to the N end of the harbour basin passing (positions from Point Cartwright Light):

Between the heads of the two breakwaters (¾ cables W); a light-beacon (round structure) stands on each head; thence:

Between two pairs of light-beacons (lateral) (2½ cables WSW and 2¼ cables SW) marking a channel 46 m in width and dredged to 3 m.

- 3 Thence the track leads S then generally SW through the fairways of the basin for which the chart is the best guide. No 8 Light-beacon (port hand) (3 cables SW) marks the W extremity of a rock outcrop extending from shore. The



Point Cartwright Light

Mooloolaba Harbour from N (4.53)

(Original dated 1999)

channel for vessels proceeding beyond the immediate basin area follows the SE and S shores of the basin and is marked by light-beacons (lateral).

4.56

- 1 **Berths.** Pilot Station Jetty, a public jetty and the Fish Board jetty and wharves lie on the NW side of the basin; another wharf lies $\frac{1}{2}$ cable W. The chart indicates depths that may be expected alongside. A light is displayed from the end of Pilot Station Jetty.

Facilities. Comprehensive facilities, slipways and supplies to meet likely requirements of fishing vessels and recreational small craft.

Tangalooma Road

4.57

- 1 **General information.** Tangalooma Road ($27^{\circ}11'S$ $153^{\circ}22'E$) lies between the shore and Sholl Bank, with depths less than 1 m over it, extending $3\frac{1}{2}$ miles S from Cowan Cowan Point (4.5); a number of wrecks have been sunk on the bank to form an artificial reef providing some protection for the roads. The adjacent village of Tangalooma was formerly a whaling station but the original whaling jetty is derelict and mostly dismantled. The village is now a resort and the roads mainly used by recreational small craft.

- 2 **Limiting conditions.** Controlling depth is 5.5 m close S of the outer leading line between Sholl Bank and Ridge Shoal.

4.58

- 1 **Directions.** From a position in East Channel (4.28) W of Tangalooma Point ($27^{\circ}12'S$ $153^{\circ}22'E$) (4.5) the track leads ENE.

Outer leading light-beacons:

Front light (direction light; white triangle point up) ($27^{\circ}11'5S$ $153^{\circ}22'1E$).

Rear light (direction light; white triangle point down) (180 m ENE of the front light-beacon), standing higher on the N slope of a prominent hill (4.30).

- 2 The alignment ($072\frac{1}{4}^{\circ}$) in the visible sector ($070\frac{1}{4}^{\circ}$ – $074\frac{1}{4}^{\circ}$) of the above direction light-beacons leads across the bar between Sholl Bank and Ridge Shoal, which dries and is a continuation of Sholl Bank extending $2\frac{1}{2}$ miles farther SSW.

Inner leading light-beacons:

Front light (direction light; white triangle point up) ($27^{\circ}10'6S$ $153^{\circ}22'3E$).

- 3 Rear light (direction light; white triangle point down) (NNE of the front light-beacon).

The alignment ($030\frac{3}{4}^{\circ}$) of the above direction light-beacons leads through the road to the anchorage and the jetty.

4.59

- 1 **Anchorage,** limited to use by small craft because of lack of swinging room, may be obtained in the road in depths of 11 to 16 m. Tidal streams are strong and there have been numerous instances of vessels dragging in bad weather. Although some protection is afforded by Sholl Bank and the artificial reef, the anchorage is dangerous in strong W winds: in SE gales however it is the best anchorage on the W coast of Moreton Island.

Berths: one serviceable jetty. Local advice should be sought for information on depths alongside and facilities.

Redcliffe

4.60

- 1 **General information.** The suburb of Redcliffe ($27^{\circ}14'S$ $153^{\circ}07'E$) was the site of the first European settlement in Queensland in 1824. A jetty, protected by a detached breakwater close E, lies 5 cables N of Redcliffe Point ($27^{\circ}14'1S$ $153^{\circ}07'0E$). A light (E cardinal) is displayed from the middle of the breakwater and lights (red square on beacon) are displayed from both the N and the S ends of the breakwater.

- 2 **Directions.** The jetty may be approached from a position generally E of Redcliffe, passing clear of the following dangers immediately N and S (positions from the jetty): Osbourne Point (8 cables N); a drying reef extends 2 cables E of the point.

A rock which dries (3 cables N), marked on its E side by a light-buoy (starboard hand).

Garnet Rock (1 mile SSE), marked by a light-beacon (starboard hand); and:

- 3 Redcliffe Point (4 cables S); a drying reef, which extends nearly 2 cables E from the point, is marked on its E side by a light-buoy (starboard hand) and on its N side by a light-beacon (special).

Berth: concrete jetty; depth alongside 3 m.

Useful marks:

Chimney (red obstruction lights) (7 cables W).

Water tower (orange obstruction light) ($1\frac{1}{2}$ miles SW), in the suburb of Margate.

PORT OF BRISBANE

General information

Charts Aus 236, Aus 237, Aus 238

Position and function

4.61

- 1 The city of Brisbane (27°28'S 153°02'E) is the capital and principal port of Queensland and in 2004 had a population, of 1.6 million. The city straddles the lower reaches of Brisbane River and the port extends on both banks for a distance of about 9 miles upstream from the entrance. The city is well laid out with many parks and contains State and Municipal Buildings, the latter being an architectural feature. The climate is equable and the city is a sought-after winter resort.

A large number of fishing vessels operate from the port.

Topography

4.62

- 1 Inland from Juno Point (4.63) on the W side of the entrance to Brisbane River the land continues low and flat for several miles and is intersected by a number of creeks: Brisbane Airport is situated on this plain. An oil refinery with tank farms stands on the NE part of Bulwer Island (27°24'S 153°08'E).
- 2 Land on the E side of the entrance is similar except for Lytton Hill (27°24'8S 153°09'7E); there are more oil storage tanks on Whyte Island.

Upstream from the N end of Bulwer Island the river banks are fronted in places by training walls and intersected by drainage canals.

Approach and entry

4.63

- 1 Brisbane River is approached through Moreton Bay and entered between Juno Point (27°21'8S 153°09'7E), a mud and mangrove swamp, and the N extremity of Fisherman Islands (2 miles ENE). The dredged channels of Outer and Inner Bar Reaches lead from the bay into the river.

Traffic

4.64

- 1 In 2004 the port handled 1950 vessels totalling 58 650 944 dwt.

Port authority

4.65

- 1 The Port of Brisbane Corp., Locked Bag 1818, Wynnum, Queensland 4178.

Website: www.portbris.com.au

Email: portbris@portbris.com.au

Limiting conditions

Controlling depths from sea

4.66

- 1 Moreton Bay channels: North West and Spitfire Channels have maintained depths of 14.7 m.

Brisbane River Entrance Beacons to Fisherman Islands Swing Basin and East Channel (S end), have maintained depths of 14.0 m.

Manly Boat Harbour

Brisbane Airport



Fisherman Islands Wharves

Brisbane River entrance from NE (4.63)

(Original dated 2003)

(Photograph – Port of Brisbane Corporation)

Pelican Banks Reach to Hamilton Reach 9.1 m.
Bulimba Reach to Dalgety's Wharf (27°27'4S 153°03'0E) 7.0 m.

Dalgety's Wharf to Town Reach 6.4 m.

- 2 Town Reach to Victoria Bridge 5.5 m.

Available depths from sea to Bulimba Point are promulgated at regular intervals by *Australian Temporary Notice to Mariners*: the latest information for all channels and reaches may be obtained from the office of the Harbour Master.

Under-keel allowances

4.67

- 1 The allowances required for under-keel clearance vary in different channels and may be changed to meet circumstances: they are promulgated at regular intervals in *Australian Temporary Notices to Mariners*.

The following minimum under-keel allowances are required (2005):

North West Channel 1.6 m; increased to 1.8 m for vessels of beam 35 m or greater.

- 2 Spitfire Channel 1.2 m.

East Channel 1.2 m.

Brisbane River Entrance Beacons to Fisherman Islands Swing Basin 1.0 m.

Pelican Banks Reach to Hamilton Reach 0.6 to 0.9 m, depending on draught and tide.

A minimum under-keel clearance of 0.3 m is required alongside all berths.

Vertical clearances

4.68

- 1 Gateway Bridge (4.86): 53 m over the width of Quarries Reach, 57 m on the centreline of the channel.

Power cable (4.88): safe overhead clearance 43 m.

Story Bridge: 30 m but see 4.86 for further detail.

Captain Cook Bridge (4.86): 12.7 m.

Goodwill Bridge (4.86): 11.4 m.

Victoria Bridge (4.86): 11.4 m.

Deepest and longest berths

4.69

- 1 Deepest berths are at Fisherman Islands (4.117); longest berth is Hamilton Wharf (4.119).

Tidal levels

4.70

- 1 See information in *Admiralty Tide Tables*. At Caloundra Head: mean maximum range about 1.4 m, mean minimum range about 0.7 m; at Brisbane River Bar: mean maximum range about 1.9 m, mean minimum range about 1.1 m; Ranges at Brisbane city centre (Captain Cook Bridge) are similar to those at the river bar.

Density of water

4.71

- 1 Density: 1.025 gm/cm³, but may be less during cyclone conditions.

Maximum size of vessel handled

4.72

- 1 The largest vessel to have used the port has been of 148 160 dwt, the longest 294 m LOA, the widest 46 m beam and the deepest 13.22 m draught.

Arrival information

Vessel Traffic Service

4.73

- 1 See 4.12.

Outer anchorages

4.74

- 1 See 4.45.

Pilotage

4.75

- 1 Pilotage is compulsory for Australian registered vessels over 50 m LOA and all other vessels over 35 m LOA except for exempted vessels; see 4.10 for details. The limits of Brisbane Pilotage Area are shown on the charts.

Tugs

4.76

- 1 Privately owned tugs are available 24 hours a day and will join in the approach to the berth or as otherwise required. Line handling boats are available.

Traffic regulations

4.77

- 1 **General.** Regulations applicable to all Queensland ports and rivers are given at 1.60.

There are additional regulations for Port of Brisbane; applicable to all vessels 40 m or more in length and to vessels of any length engaged in towing. See below.

4.78

- 1 **Movements.** No vessel may pass Outer Bar Reach Entrance Light-beacons inward, or leave her berth in the river, except with the approval of the Harbour Master.

4.79

- 1 **Speed limits** for vessels of draught exceeding 3 m are 13 kn between the Entrance Beacons and Luggage Point and 8 kn from there upstream.

Additionally, speed should be reduced to the minimum consistent with safe navigation when passing wharves, moored vessels and dredgers or barges. Particular care must be taken when passing the harbour fuel lighters, whether moored or underway, and when approaching berths where containers are being handled; consideration should be given to stopping engines.

4.80

- 1 **Vessels carrying explosives** in excess of the quantity stipulated at 1.56 must not proceed SW of a line joining Woody Point (27°16'S 153°06'E), Outer Bar Entrance Light-beacons, St Helena Island and the N point of North Stradbroke Island (27°23'S 153°27'E).

4.81

- 1 **Passing vessels other than tankers.** Vessels (other than tankers: see below) with combined lengths totalling less than 370 m may pass each other in the bar channels.

4.82

- 1 **Additional regulations for tankers.** Loaded crude oil tankers will be given a clear river at all times.

A tanker may not pass any other vessel in the dredged channels upstream of Luggage Point.

No tanker carrying cargo with a flash point below 66°C may move in the river at night except by express permission of the Harbour Master.

Regulations concerning entry

4.83

- 1 **Draught and trim.** Vessels are required to have a forward draught not less than 2% of LOA and to be trimmed so that propellers are immersed.

Permissible heights. To pass under Gateway Bridge and Story Bridge (4.86), vessels with a masthead height exceeding 45 m and 28 m, respectively, must obtain the Harbour Master's permission.

Quarantine 4.84

- 1 Brisbane is a first port of entry. For extracts from the Quarantine Act see 1.64.

Vessels may be inspected in the approaches N of a line between Cowan Cowan Point (27°08'S 153°22'E) and Skirmish Point (9 miles WNW).

The quarantine station is located at Manly (27°27'S 153°11'E).

Harbour

General layout 4.85

- 1 The deep water terminal for Brisbane is situated on Fisherman Islands, originally covered in mangroves; now largely reclaimed and connected to the mainland S by a road and rail causeway.

Upstream of Fisherman Islands, the remaining principal berthing areas and facilities of the port are found on both banks as far as Bulimba Point (27°26'6S 153°03'0E). The centre of the city of Brisbane is situated farther upstream close N of Victoria Bridge.

Bridges 4.86

- 1 **Gateway Bridge** (27°26'7S 153°06'0E), spans Quarries Reach which passes between piers 6 and 7 of the bridge at an angle of about 80°. The effective width of the navigational span is the width of the channel (4.92): vertical clearances are given at 4.68. See diagram on chart Aus 238. Lights are displayed from the bridge.
- 2 **Story Bridge** (27°27'8S 153°02'1E) crosses the river at Kangaroo Point with a single central span 282 m in length: see 4.68 for the vertical clearance figure which requires a

travelling maintenance stage, 1.5 m below the span, to be clear of the channel.

Captain Cook Bridge (27°28'8S 153°01'7E) spans the river at Gardens Point: see 4.68 for vertical clearance.

- 3 **Goodwill Bridge** (27°29'S 153°02'E), which has a central supporting structure, spans the river about 1 cable W of Captain Cook Bridge: see 4.68 for vertical clearance.

Victoria Bridge (27°28'4S 153°01'3E), spans the river 7 cables upstream of Captain Cook Bridge: see 4.68 for vertical clearance.

Ferries 4.87

- 1 Ferries cross the river at the W end of Hamilton Reach (27°26'7S 153°04'5E) and at six other positions between there and Captain Cook Bridge (27°28'8S 153°01'7E). Crossing places are shown on chart Aus 238. See 1.62 for regulations in force at ferry crossings.

Submarine and overhead power cables 4.88

- 1 **Submarine power cables**, shown on chart Aus 238, cross the river at the S end of Bulimba Reach in two places (27°28'0S 153°03'3E); in Humbug Reach (27°28'4S 153°03'2E); 1½ cables W of Kinellan Point (27°28'5S 153°02'7E); at the S end of Shafston Reach (27°28'3S 153°02'4E); near the middle of Town Reach (27°28'4S 153°02'0E) and 1 cable downstream of Victoria Bridge (27°28'4S 153°01'3E). The landing places of these cables are marked by floodlit beacons.
- 2 **Power cable**, shown on chart Aus 238, spans the N end of Bulimba Reach, 2½ cables S of Bulimba Point (27°26'6S 153°03'0E): see 4.68 for safe overhead clearance.

Tidal streams 4.89

- 1 Between the entrance to Brisbane River and Forcacs Cairncross Dock (27°26'9S 153°04'5E), tidal streams attain spring rates up to 3 kn: above the dock, rates decrease to approximately 2 kn. The tidal influence extends

Hamilton Reach



Gateway Bridge from NE (4.86)
(Original dated 1999)

upstream as far as Ipswich (27°37'S 152°47'E) (chart Aus 424).

In Inner Bar Reach abreast the N extremity of Fisherman Islands (27°23'S 153°10'E) there is a cross-set N on the out-going tidal stream and S on the in-going stream.

- 2 Abreast Bulimba Point (27°26'6S 153°03'0E) there is a marked set towards the N bank during the out-going stream at spring tides and a similar set occurs when freshets run from Breakfast Creek opposite the point.

At Gardens Point (27°28'8S 153°01'8E) the in-going stream runs for 5 hours and the out-going stream for 7½ hours: slack water occurs between 15 and 30 minutes after HW and LW.

Local weather

4.90

- 1 Visibility is generally good. Very little fog is experienced except for some early morning patches over the river during the winter months.

Climatic table: see 1.192 and 1.197

Directions for entering harbour

(continued from 4.30)

Brisbane Road to Bulimba Point

4.91

- 1 **Outer and Inner Bar Reaches.** From a position in Brisbane Road NE of Outer Bar Reach Entrance Light-beacons (27°18'6S 153°12'5E) (see below) the track leads SSW.

Brisbane River outer leading light-beacons:

Front light-beacon (isolated danger; framework tower; sectorised lights) (27°15'9S 153°14'4E).

Rear light-beacon (isolated danger; framework tower; sectorised lights) (1 mile NNE of front mark).

- 2 **Bulwer Island Leading Lights:**

Front light (white tower, red top; shoulder lights offset 30 m each side; lights also displayed by day) (27°23'7S 153°09'0E), prominent.

Rear light (white tower, black stripe; shoulder lights offset 30 m each side; lights also displayed by day) (8 cables SSW of front light), prominent.

- 3 The alignment (032°), astern, of the above outer light-beacons in the isophase sector (026°–038°) of the rear light-beacon; and the reciprocal alignment (212°) of Bulwer Island Leading Lights, lead into and through Outer and Inner Bar Reaches, both with a dredged width of 180 m: see 4.66 for controlling depth. The channels are marked by pairs of light-beacons (lateral; variously synchronised), standing outside the limits of the dredged channel. See *Admiralty List of Lights* for details of synchronisation of lights. The track through the Bar Reaches leads SSW, passing:

- 4 Between No 1 Entrance Light-beacon (starboard hand) (27°18'6S 153°12'5E) and No 2 Entrance Light-beacon (special) (1½ cables ESE of No 1), at the seaward end of Outer Bar Reach; thence:

Between pairs of light-beacons (lateral, numbered 3 to 10); thence:

- 5 Between No 11 Coffee Pot W Light-beacon (starboard hand; framework tower on pile tripod) (27°20'0S 153°11'5E), and No 12 Coffee Pot E Light-beacon (port hand; similar structure)

(1½ cables ESE of No 11); a side channel (4.112) joins Outer Bar Reach here from SE; a wreck (submerged), marked by a light-buoy (isolated danger), lies 4 cables WSW of No 11 Coffee Pot W Light-beacon. Thence:

- 6 Between pairs of light-beacons (lateral, numbered 13 to 20); thence:

Between No 21 Inner Bar W Light-beacon (special; tide gauge) (27°21'6S 153°10'4E) and No 22 Inner Bar E Light-buoy (port hand;) (1½ cables E of No 21); a side channel, Old Bar Cutting (4.113), joins Inner Bar Reach close W of No 21 Inner Bar W Light-beacon. Thence:

- 7 WNW of Fisherman Islands (27°23'S 153°10'E); berths front the NW side of the island over a distance of about 1½ miles; a light-buoy (special) marks a shoal area NE of the dredged approach to the terminal, and the alignment (032°) of a pair of light-beacons standing close NW of the island indicates a distance of 183 m off the face of Fisherman Islands Container Terminal Berths 4 to 8. Thence:

- 8 ESE of a light-beacon (27°22'3S 153°09'8E) (4.94), a rear mark for Lytton Rocks Reach, standing on West Banks which dry; thence:

ESE of Luggage Point (27°22'7S 153°09'6E); a light-beacon (starboard hand) stands close S of the point; a pipeline from a sewage treatment works discharges at the point.

Thence the track continues SSW for 6 cables on the same alignment of Bulwer Island Leading Lights through Fisherman Islands Swing Basin.

4.92

- 1 From the S end of Swing Basin to Bulimba Point (27°26'6S 153°03'0E) there is a least width of 122 m in all channels: see 4.66 for controlling depth.

4.93

- 1 **Pelican Banks Reach Leading Lights:**

Front light (white triangle point up, red border) (27°24'5S 153°09'2E).

Rear light (red 'V') (230 m S of front light).

Luggage Point Leading Lights:

Front light (white triangle point up, red border) (2½ cables SW of Luggage Point).

Rear light (white triangle point down, red border) (125 m N of front light).

- 2 The alignment (185¾°) of Pelican Banks Reach Leading Lights (also displayed by day) and the reciprocal alignment (005¾°), astern, of Luggage Point Leading Lights (also displayed by day) lead through Pelican Banks Reach passing, (positions from Pelican Banks Reach front light):

W of a light-buoy (port hand) (1 mile N), marking the E entrance to the channel; thence:

W of a light-beacon (9 cables N) (4.94), a front mark for Lytton Rocks Reach (see below).

4.94

- 1 **Lytton Rocks Reach south leading lights:**

Front light (white triangle point up, red border) (27°25'0S 153°08'8E).

Rear light (white triangle point down, red border) (400 m SSW of front light).

Lytton Rocks Reach north leading lights:

Front light (white rectangular daymark with black stripe on pile beacon) (27°23'6S 153°09'3E), standing close E of Pelican Banks Reach.

Rear light (similar mark) (1.4 miles NNE of front light), standing on West Banks.

- 2 The alignment ($199\frac{1}{4}^\circ$) of Lytton Rocks Reach south lights (also displayed by day) and the reciprocal alignment ($019\frac{1}{4}^\circ$), astern, of the north lights lead through the channel, passing (positions from the front south light):

ESE of a light-beacon (E cardinal; buoyant beacon) ($1\frac{1}{4}$ miles NNE), marking the W side of the channel; a second similar light-beacon is moored $4\frac{1}{2}$ cables SSW of the first; a light-buoy (starboard hand) marks a rocky patch between. Thence:

- 3 WNW of a light-beacon (port hand) (1.2 miles NNE), marking the N side of the W entrance to Boat Passage; tug berths and the Port Authority's operations base are situated on the S side of the passage. Thence:

WNW of a light-beacon (port hand; pile) ($9\frac{1}{2}$ cables NNE), marking Clara Rock; thence:

WNW of Caltex Products Wharf (7 cables NNE).

4.95

- 1 Thence the track leads SSW in the dredged channel for about 7 cables to a position 8 cables NE of the front Lytton Reach Leading Light-beacon ($27^\circ 25' 6S$ $153^\circ 08' 1E$) (4.96), passing (positions from Lytton Reach front light-beacon):

WNW of a light-beacon (port hand) ($1\frac{1}{4}$ miles NE); thence:

ESE of Queensland Cement and Lime Company Wharf (8 cables NNE); lights in line mark the approach limits at each end of the wharf.

4.96

- 1 **Lytton Reach (Quarantine Flats Reach) Leading Light-beacons:**

Front light (white triangle point up; red border) ($27^\circ 25' 6S$ $153^\circ 08' 1E$).

Rear light (white triangle point down; red border) (268 m SW of the front light).

From the position 8 cables NE of the front light the alignment ($217\frac{1}{2}^\circ$) of the above lights (also displayed by day) leads through Lytton Reach.

4.97

- 1 **Upper Lytton Reach Leading Light-beacons:**

Front light (red ' $\wedge$ ') ($27^\circ 25' 2S$ $153^\circ 08' 7E$).

Rear light (red ' $\vee$ ') (650 m ENE of the front light-beacon).

The alignment ($066\frac{1}{4}^\circ$), astern, of the above lights (also displayed by day) leads through Upper Lytton Reach (Lytton Reach), passing NNW of the entrance to Aquarium Passage ($9\frac{1}{2}$ cables WSW of the front light-beacon) which is marked by a light-beacon (starboard hand). There are numerous pile moorings and some slips in the passage, which is used by small craft.

4.98

- 1 **Pinkenba Reach Leading Light-beacons:**

Front light (white triangle point up; red border) ($27^\circ 26' 0S$ $153^\circ 06' 9E$).

Rear light (white triangle point down; red border) (140 m SW of the front light).

The alignment ($236\frac{3}{4}^\circ$) of the above lights (also displayed by day) leads through Pinkenba Reach.

4.99

- 1 **Eagle Farm Flats Reach Leading Light-beacons:**

Front light (white triangle point up; red border) ($27^\circ 26' 7S$ $153^\circ 06' 5E$).

Rear light (red ' $\vee$ ') (200 m SW of the front light).

The alignment ($216\frac{1}{2}^\circ$) of the above lights (also displayed by day) leads through Eagle Farm Flats Reach, passing NW of a light-beacon (port hand; buoyant beacon), marking the NE entrance point of the channel.

4.100

- 1 **Parker Island Reach west leading lights:**

Front light (white triangle point up; red border) ($27^\circ 26' 9S$ $153^\circ 05' 8E$), standing on the N side of the Bulk Sugar Terminal building.

Rear light (white triangle point down; red border) (390 m WSW of the front light).

Parker Island Reach east leading lights:

- 2 Front light (white triangle point up; red border) ($27^\circ 26' 3S$ $153^\circ 07' 0E$), standing on Gibson Island.

Rear light (red ' $\vee$ ') (320 m ENE of the front light).

The alignment ($241\frac{3}{4}^\circ$) of the above Parker Island Reach west lights (also displayed by day) seen through the navigational span of Gateway Bridge; and the reciprocal alignment ($061\frac{3}{4}^\circ$), astern, of the east lights (also displayed by day) lead through Parker Island Reach.

4.101

- 1 **Quarries Reach west leading light-beacons:**

Front light (white triangle point up, red border; shoulder lights offset 30 m each side) ($27^\circ 27' 0S$ $153^\circ 04' 9E$).

Rear light (red ' $\vee$ '; shoulder lights offset 30 m each side) (225 m WSW of the front light).

Quarries Reach east leading light-beacons:

Front light (red ' $\wedge$ '; a pair of shoulder lights are aligned 30 m each side) ($27^\circ 26' 6S$ $153^\circ 06' 6E$).

Rear light (white triangle point down, red border) (880 m ENE of the front light).

- 2 The alignment ($255\frac{3}{4}^\circ$) of the above Quarries Reach west lights (also displayed by day) and the reciprocal alignment ($075\frac{3}{4}^\circ$), astern, of the east lights (also displayed by day) lead through Quarries Reach, passing beneath the centre of the navigational span of Gateway Bridge ($27^\circ 26' 7S$ $153^\circ 06' 0E$) (4.86); lights on the underside of the bridge mark the centreline (also displayed by day) and the shoulder lines 30 m each side of centre; red obstruction lights are displayed above the bridge; lights are displayed from the base of Pier 6 on the S side of the span.

4.102

- 1 **Hamilton Reach west leading light-beacons:**

Front light (white triangle point up; red border) (also displayed by day) ($27^\circ 26' 4S$ $153^\circ 03' 5E$).

Rear light (beacon) (400 m WNW of the front light).

Hamilton Reach east leading lights:

Front light (white triangle point up; red border) ($27^\circ 27' 0S$ $153^\circ 05' 6E$).

- 2 Rear light (white triangle point down; red border) (225 m ESE of the front light).

The alignment ($287\frac{3}{4}^\circ$) of the above Hamilton Reach west lights and the reciprocal alignment ($107\frac{3}{4}^\circ$), astern, of the east lights (also displayed by day) lead through Hamilton Reach.

- 3 **Hamilton Reach shoulder lights:**

Front light ($27^\circ 27' 0S$ $153^\circ 05' 4E$).

Rear light (150 m ESE of the front light).

The above shoulder lights (also displayed by day) in line ($107\frac{3}{4}^\circ$) indicate a line approximately 61 m S of the line of the Hamilton Reach east and west leads above.

Caution. A ferry crosses the W end of the reach: see 4.87.

4.103

- 1 From the W end of Hamilton Reach the track leads W following the N bank.

The track leads initially W through the first part of the river bend around Bulimba Point (27°26'·6S 153°03'·0E) towards Breakfast Creek (2 cables NW of the point); a monument stands on the S entrance point of the creek. The track passes (positions from Bulimba Point (27°26'·6S 153°03'·0E)):

- 2 S of Hamilton Reach west front leading light (5 cables ENE); thence:
S of Cameron Rocks (2 cables N); a light is displayed from the point on shore at the E end of the rocks; thence:
The track then leads SW passing:
NW of two light-buoys (port hand) (¾ cable NW), marking the channel limits off Bulimba Point.
Caution. See 4.89 for details of sets due to tidal stream.

Bulimba Point to Victoria Bridge**4.104**

- 1 From Bulimba Point (27°26'·6S 153°03'·0E) the track upstream follows the fairway of the river in depths as indicated on the chart. See 4.66 for controlling depths.

A number of submarine cable and ferry crossings are situated in this stretch of the river: see 4.88 and 4.87.

4.105

- 1 **Bulimba Reach.** From a position abreast the entrance to Breakfast Creek the track favours the W bank and leads generally S passing (positions from Bulimba Point (27°26'·6S 153°03'·0E)):

Beneath an overhead power cable (2½ cables S) (4.88), thence:

E of Mercantile Wharf (5 cables S).

Thence the track leads in mid-channel, passing:

E of Cutters Landing (1¼ miles S), thence:

E of Norris Point (1½ miles S).

4.106

- 1 **Humbug Reach.** From Norris Point the track favours the S bank and leads SW passing the entrance to Norman Creek (5 cables SSW of Norris Point), from where the track leads in mid-channel passing S of Kinellan Point (27°28'·5S 153°02'·7E).

4.107

- 1 **Shafston Reach.** From Kinellan Point the track leads generally NNW and continues initially in mid-channel. When about 3½ cables NW of Kinellan Point the track favours the E then N banks, passing through Petrie Bight and beneath the main span of Story Bridge (27°27'·8S 153°02'·1E) (4.86). A light is displayed from the S part of the span over the fairway.

4.108

- 1 **Town Reach.** From Story Bridge the track continues to favour the N then W banks and leads generally S passing E of a number of jetties (5 cables SW of Story Bridge) whence the track crosses to the E bank and leads S then W passing S of Gardens Point and beneath Captain Cook Bridge (27°28'·8S 153°01'·7E) (4.86); a light marks the centre of the navigational span of the bridge.

4.109

- 1 **South Brisbane Reach.** From Captain Cook Bridge the track favours the SW bank and leads beneath Goodwill Bridge (4.86), thence NW to Victoria Bridge (27°28'·4S 153°01'·3E) (4.86); a light marks the centre of the navigational span of each bridge; a light-buoy (starboard

hand) marking the NW side of a Heliport, lies 2 cables SE of Victoria Bridge.

Above Victoria Bridge**4.110**

- 1 Above Victoria Bridge the river is navigable by light-draught vessels to Ipswich (27°37'S 152°46'E) (chart Aus 424); the channels are marked and lights are displayed in places.

Local knowledge is required.

Useful marks**4.111**

- 1 Airport Control Tower (73 m in height) (27°23'·4S 153°06'·9E), conspicuous (chart Aus 236).
Power station (Visy Board Plant) (27°26'·4S 153°06'·9E), prominent, standing near the SW end of Gibson Island.
Silos (27°25'·6S 153°07'·2E), at the Globex Terminal (Pinkenba Wharf (4.118)).
Two tanks (67 and 31 m in height) (27°25'·9S 153°07'·6E), standing at the NE end of Gibson Island.

Side channels**Approach to Outer Bar Reach from south-east****4.112**

- 1 From a position SE of Mud Island (27°20'S 153°15'E) a channel, suitable for vessels of appropriate size and draught entering Brisbane River from the head of Moreton Bay, leads NW between Mud Island and St Helena Island (2 miles SSW) to join Outer Bar Reach in the vicinity of No 12 Coffee Pot E Light-beacon.

Leading light-beacons:

- Front, No 12 Coffee Pot E Light-beacon (27°20'·0S 153°11'·5E) (4.91).
2 Rear, No 11 Coffee Pot W Light-beacon (1½ cables NW of the front light-beacon).
The above light-beacons may be identified from others in their vicinity by day by their distinctive structures, and by night by their lights. The alignment (304°) of these lights (visible on the leading line only) leads NW, passing (positions from the front light-beacon):
3 NE of St Helena Island (¾ miles SE) and its surrounding reef; two radio masts, from which red obstruction lights are displayed, stand near the N end of the island and a jetty, on the head of which stands a light, lies at its SW end. A light-beacon (N cardinal) marks the extremity of shoal water N of the island. Thence:
NE of a light-beacon (port hand) (2¾ miles SE), and NE of the extremity of the coastal bank continuing from thence to a position between No 12 Coffee Pot E Light-beacon and No 14 Light-beacon (3¾ cables SSW); and:
4 SW of Mud Island (2½ miles E); the outer edges of the surrounding bank are marked by light-beacons (cardinal) and by beacons.
NE of Fisherman Islands (9 cables SSW), the NE part of which is under reclamation (2004) and is marked by two light-beacons (N and E cardinal).
Thence the track continues NW to join Outer Bar Reach in the vicinity of No 12 Coffee Pot E Light-beacon.

Old Bar Cutting

4.113

- 1 Old Bar Cutting (27°20'2S 153°10'2E), is entered from W of Brisbane Road and leads S to join Inner Bar Reach NW of Fisherman Islands. The channel is marked at its outer end by a light-buoy (port hand) and thence by numbered light-beacons (lateral).

- 2 **Local knowledge** is required: information on limiting conditions for this channel should be obtained from the Harbour Master.

The area of Brisbane Roads around Old Bar Cutting is inadequately surveyed

A dangerous wreck lies near the outer end of the channel 8 cables NNE of No 1 Light-beacon.

Francis Channel

4.114

- 1 This former channel (27°20'3S 153°09'5E) (chart Aus 237) is closed to navigation.

Boat Passage

4.115

- 1 **Boat Passage** (27°24'S 153°10'E) is a narrow channel between Fisherman Islands and Whyte Island which provides a short route between the head of Moreton Bay and Brisbane River and for which local knowledge is required.

Limiting conditions: depth 0.5 m; vertical clearance 2.8 m beneath the bridge carrying road and rail services to the Fisherman Islands berths.

- 2 From a position NE of Wellington Point (27°28'0S 153°14'3E), the approach to Boat Passage leads with Lytton Hill (27°25'2S 153°09'7E) bearing WNW, to D'Arcy Light-beacon (special) (2¼ miles ESE of the hill), passing between Wellington Point and Green Island (2 miles N of the point); shoal water off each is marked by light-beacons. A beacon (port hand) stands 1¾ cables WSW of D'Arcy Light-beacon and from these the channel, marked by light-beacons, leads NNW between drying banks of sand and mud; thence the channel, marked by light-beacons, leads W to the bridge and to Brisbane River beyond.

Berths

Depths

4.116

- 1 Depths alongside the wharves are subject to change and have to be maintained by dredging: bottom material is predominantly fine silt and mud. The latest information may be obtained from the office of the Harbour Master.

Fisherman Islands and Swing Basin

4.117

- 1 Total length of berths 2090 m; depths alongside 13.0 to 14.3 m. Largest wharves Container Terminal No 3 and 4 berths (27°22'5S 153°10'1E), each 300 m in length, depths alongside, 14.0 m and 13.0 m respectively. Deepest berth at Fisherman Islands is Caltex Crude Oil Wharf with a depth alongside of 14.3 m. Other wharves include Coal Wharf and Grain Wharf, each 240 m in length with depths

alongside of 13.5 m and 13.0 m respectively. There is a Ro-Ro quarter ramp at the SW end of No 4 berth and a Ro-Ro quarter ramp at No 3 berth immediately SW of No 4. BP Crude Oil Wharf (Luggage Point) which has a depth of 14.3 m, are on dolphins; tankers on these berths are normally secured port side to.

- 2 Explosives other than IMO Class 1.1A may be handled at No 3, 4 and 5 berths.

An additional container berth, 317 m in length, is planned for 2005. An area under reclamation extends about 9 cables NNE from the existing facilities, as shown on the chart.

Quarantine Flats Reach to Quarries Reach

4.118

- 1 Total length of berths 2309 m; depths alongside 9.8 m to 11.0 m. Largest wharf Pinkenba Wharf Grain Terminal (27°25'7S 153°07'3E), total length 365 m, depth alongside 10.5 m; oil products are also discharged by Esso at Pinkenba Wharf, Caltex Products Wharf, Lytton (27°24'4S 153°09'1E), BP Wharf Bulwer Island (27°25'3S 153°08'1E) and Shell Wharf Pinkenba (3 cables WSW of BP Wharf), are each T-headed berths with dolphins and are used for oil products.

Care is required when berthing at Shell Wharf, due to raked piles which protrude from the wharf face into the dredged berthing pocket.

Hamilton Reach

4.119

- 1 Total length of berths 2444 m; depths alongside 9.1 m to 10.4 m. Largest wharf Hamilton Wharf (27°26'6S 153°04'5E), total length 760 m, depth alongside 10.4 m. Mobil Oil Wharf, Colmslie (27°26'9S 153°05'1E), is a T-headed berth with dolphins which is now disused (2005). Maritime No 1 berth (27°26'6S 153°04'7E), is used for oil and chemicals; Maritime No 3 berth is a Ro-Ro terminal for angled ramp vessels.

Bulimba Reach

4.120

- 1 Total length of wharves 1129 m; depths alongside 6.1 to 8.8 m.

Above Bulimba Reach

4.121

- 1 Information on availability of wharves and depths alongside should be obtained from the Harbour Master's office.

Port services

Repairs

4.122

- 1 **Forgacs Cairncross graving dock**, (27°26'9S 153°04'5E) the largest commercial dock in Australia; extreme length at the blocks 263.2 m; breadth 38.9 m at coping, 33.5 m at the blocks, 30.8 m at floor; sill 1.22 m above dock bottom, depth over sill at MHWS 11.15 m.

- 2 **Sir Francis Nicklin dock**, (27°28'4S 153°02'3E), 244 m in length, is not suitable for ship repair.

Patent slips: Forgacs Cairncross Dockyard, 269.7 m in length with a declivity of 1 in 20; two section cradle,

overall length 90·0 m, width 15·2 m; draughts on keel blocks at MHWS 3·8 m forward and 8·3 m aft; lifting capacity 1200 tonnes. A slip at Colmslie (4.119) has a lifting capacity of 2500 tonnes.

Ship repairs of all kinds can be undertaken.

Other facilities

4.123

- / Customs board within 2½ miles NNE of Outer Bar Entrance Light—beacons.

Deratting can be carried out and certificates issued.

Several hospitals in the city.

Ocean-going salvage and fire-fighting tugs are available.

Facilities for the disposal of oily waste can be made

available by special arrangement at some wharves using road tankers.

Supplies

4.124

- / **Fuel oils** are available at all oil berths and at Hamilton, and can be delivered to other berths by road tanker. An oil bunkering service is also available by lighter throughout the harbour and in Brisbane Road.

Fresh water is available at all berths.

Fresh provisions are plentiful. A stores vessel is available.

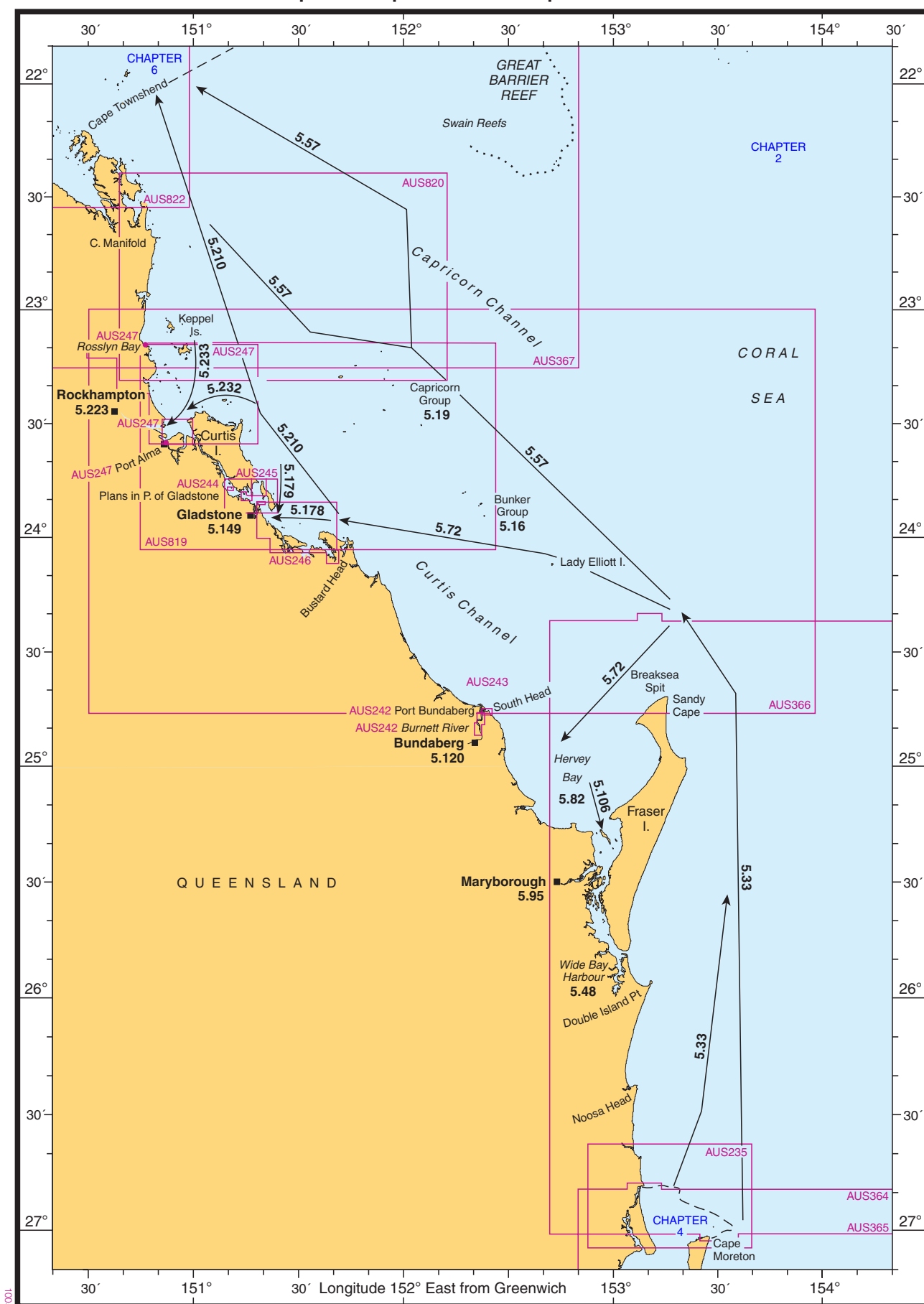
Communications

4.125

- / Brisbane airport 12 km from city.



Chapter 5 - Cape Moreton to Cape Townshend



CHAPTER 5

CAPE MORETON TO CAPE TOWNSHEND

GENERAL INFORMATION

General information

Charts Aus 424, Aus 426

Scope of chapter

5.1

- 1 This chapter covers the coastal route N from Cape Moreton (27°02'S 153°28'E) to Breaksea Spit and from thence entry to the Inner Route through Capricorn and Curtis Channels as far as the vicinity of Cape Townshend (22°12'S 150°29'E). The major port of Gladstone and the ports of Bundaberg and Rockhampton lie within these limits. Those parts of Great Barrier Reef which are significant to navigation in the area are also described.

Great Barrier Reef

5.2

- 1 For a general description of Great Barrier Reef see 1.73. Further information on coral reefs and guidance for navigating in their vicinity is given in *The Mariner's Handbook* and *Australian Seafarers Handbook*.
- 2 The SE extremity of Great Barrier Reef lies within the limits of this chapter and is formed by the S end of Swain Reefs (22°23'S 152°37'E): from there the reefs extend approximately 1000 miles NW. The inner edge of Swain Reefs which forms the NE boundary of Capricorn Channel is dangerous and unmarked, but the recommended routes through the channel pass well clear of the area.
- 3 Caradus Pass (21°58'S 152°40'E) (5.30) (chart Aus 367) is the only passage through Great Barrier Reef within the limits of this chapter but is not recommended for normal passage navigation.

Routes

5.3

- 1 The route from Cape Moreton (27°02'S 153°28'E) to Sandy Cape, 140 miles N, is that generally used by vessels N and W-bound round the Australian continent. At Sandy Cape the route divides into Outer and Inner Routes.

5.4

- 1 The **Outer Route** may be used by vessels bound for Torres Strait and, from a departure off Sandy Cape (24°42'S 153°16'E), leads through Coral Sea passing E of Great Barrier Reef. Due to strong and variable sets which may be experienced in Coral Sea, numerous large reefs must be given a wide berth, especially at night; for this reason and because of the additional distance involved the route, although safe if the recommended track is followed, is less frequently used than is the Inner Route.

The Outer Route is described at 2.92.

5.5

- 1 The **Inner Route** is of necessity used by vessels calling at ports on the E coast of Queensland lying behind Great Barrier Reef, and is also that usually used by vessels bound direct for Torres Strait. The route is entered from a position off Breaksea Spit, N of Sandy Cape (24°42'S 153°16'E), through either Capricorn Channel or Curtis Channel and leads thence between the coast and the off-lying Great Barrier Reef: it has the advantages over the Outer Route of generally smoother water and a saving in time. The route has been well surveyed in recent years, is well-marked and

is navigated by large vessels and considered to be one of the trade highways of the world.

Cautions. See 1.3 and 1.74 for other remarks appropriate to the Inner Route.

5.6

- 1 **Capricorn Channel** is bounded on the NE side by Swain Reefs and on the SW side by Bunker and Capricorn Groups of reefs. The channel is deeper, broader and more direct than Curtis Channel but see 5.2 for remarks on the inner edge of Swain Reefs.

5.7

- 1 **Curtis Channel** leads WNW from the position off Breaksea Spit, N of Sandy Cape (24°42'S 153°16'E), then passes SW of Bunker and Capricorn Groups of reefs to follow the mainland coast to the vicinity of Cape Capricorn (23°29'S 151°14'E). The route through Curtis Channel is about 11 miles longer than that through Capricorn Channel but leads to the approaches of the port of Gladstone and will need to be followed if a pilot for the Inner Route is to be embarked there.

- 2 Whether using Capricorn or Curtis Channel there is some choice, once N of latitude 23°07'S of the track to be followed when subsequently passing Northumberland Isles, N of Cape Townshend. The recommended main and alternative tracks are described in the appropriate parts of the text.

Depths

5.8

- 1 The controlling depth for vessels N and W-bound for Torres Strait through either the Inner or the Outer Route is found in Torres Strait: see 13.4.

Regulations

5.9

- 1 **Pilotage** is compulsory for the majority of vessels in the N section of the Inner Route, and is recommended to masters not familiar with other sections of the route or with entrances through Great Barrier Reef. See 1.26 for details.

5.10

- 1 **Great Barrier Reef Marine Park.** For the limits of the Mackay/Capricorn Management Area, part of which lies in this chapter, see *Great Barrier Reef Marine Park Zoning Plan 2003*. The area is subject to some restriction on use: see 1.73.

Designated Shipping Area

5.11

- 1 Within this chapter are Designated Shipping Areas as shown on the relevant charts, for further information see 1.74 and *Australian Seafarers Handbook*.

Area to be Avoided

5.12

- 1 The area in the vicinity of the Capricorn and Bunker Groups is an IMO adopted and designated Area to be Avoided. To avoid the risk of pollution and damage to the environment, all vessels carrying dangerous or toxic cargoes, or any other vessel exceeding 500 grt should avoid the area.

Particularly Sensitive Sea Area

5.13

- 1 Areas of this chapter are within Great Barrier Reef Marine Park which is an IMO approved Particularly Sensitive Sea Area (PSSA). These areas are shown on the relevant charts. For further details see 1.71 and *Australian Seafarers Handbook*.

Current

5.14

- 1 To seaward of the 200 m (100 fm) depth contour and S of latitude 22°00'S the current sets predominantly S with average rates between $\frac{3}{4}$ and $1\frac{1}{2}$ kn, although at times the rate has exceeded $2\frac{1}{2}$ kn. The strength of the current increases with S latitude.

Within the 200 m (100 fm) depth contour and in the Inner Route the currents are variable and imperfectly known.

A general description of the currents off the E coast of the Australian continent is given at 1.144.

Coast radio stations

5.15

- 1 There are coast radio stations at Fraser Island (25°10'S 153°13'E), Gladstone (24°11'S 151°39'E), and at Port Clinton (22°22'S 150°34'E): see *Admiralty List of Radio Signals Volume 1* (2) for details.

Principal groups of reefs

Charts Aus 366, Aus 819

Bunker Group

5.16

- 1 The group consists of those coral reefs and islets lying between Lady Musgrave Island (23°55'S 152°24'E) (5.80) and Boulton Reef, 11 miles NW, and lies within an area of Great Barrier Reef Marine Park (1.73) and an Area to be Avoided (5.12). The general area of the group has not been fully surveyed. The following lie within the group (positions from Lady Musgrave Island):

5.17

- 1 Stuart Shoal ($4\frac{1}{2}$ miles ENE), the E-most charted danger in the group.

Fairfax Islands (3 miles NNW) consist of two wooded islets to N which lies on a drying reef.

Hoskyn Islands (8 miles NW) consist of two wooded islets nearly joined at LW, and surrounded by a drying reef.

Boulton Reef (11 miles NW), which dries, has a sand cay on its SW end; heavy breakers occur on the NE end of the reef.

5.18

- 1 A lagoon, suitable for small craft and enclosed by the reef on which Lady Musgrave Island (5.80) lies, has a narrow boat entrance, with a depth of 11 m, at the N end of its NW side. There are general depths within of 5.5 m over a sand bottom, but with numerous coral heads. The tidal stream runs strongly through the entrance. There is a depth of 11 m close outside.

- 2 Lady Musgrave Island Light (5.80) marks the reef. The entrance to the lagoon is marked by beacons (lateral); a large coral head immediately inside is marked by a beacon (isolated danger).

The best holding ground is towards the S side of the lagoon. The coral heads are easily identified under suitable conditions: see 1.3.

Chart Aus 819

Capricorn Group

5.19

- 1 The group consists of those coral reefs and islets lying between Llewellyn Reef (23°42'S 152°11'E), at the SE extremity of the group; North Reef (34 miles NNW) (5.65) to N; and Irving Reef (23°33'S 151°38'E) at the W extremity. The whole group lies within an area of Great Barrier Reef Marine Park (1.73) and an Area to be Avoided (5.12). Most of the group has been incompletely surveyed.

5.20

- 1 Llewellyn Reef (23°42'S 152°11'E), Fitzroy Reef (4 miles NNW) and Lamont Reef (9 miles NW) all appear to be steep-to and dry; the sea breaks heavily over them, especially on their E or weather sides. Llewellyn and Lamont Reefs have sand cays on their SW ends. Depths of less than 10 m are found within $1\frac{1}{2}$ miles S and SSW of Fitzroy Reef.

- 2 A lagoon within Fitzroy Reef, is accessible only to small craft. The entrance to the lagoon lies on the N side of the reef and is marked by four metal tripod beacons with topmarks; a buoy (starboard hand with topmark) is moored within the entrance.

One Tree Island (23°30'S 152°06'E), lying at the SE end of a drying reef which breaks heavily on its N side, derives its name from a remarkable pandanus tree which formerly grew on it. The islet is formed of coral sand on which smaller pandanus trees now grow and coconuts have been planted; a 5.5 m patch lies 4 miles W of the islet.

5.21

- 1 Sykes Reef (23°26'S 152°03'E), which dries, breaks heavily on its E side; a below-water reef lies 1 mile SSW and there is extensive foul ground, with depths of 2.3 m over it, lying between Sykes Reef and the adjacent reef $2\frac{1}{2}$ miles WSW.

The water between Sykes Reef and Wreck Island, 7 miles NW, appears to be clear of dangers but has not yet been examined.

- 2 Heron Island (23°27'S 151°55'E), tree-covered, lies at the W end of a drying reef; a radio mast 30 m in height stands on the islet and a stranded wreck (1959), marked by a light, lies close W. The islet is used as a tourist resort and there is also a research and meteorological station. A boat channel, with a depth of 2 m, cut in the reefs W of the islet leads to a landing jetty.

- 3 Wistari Reef (23°28'S 151°53'E), which dries 0.6 m, is separated from Heron Island by a narrow channel and has a sand cay at its W end. A pontoon is moored on the reef and a lighted cyclone mooring buoy for it is moored close N of the reef.

- 4 Erskine Island (23°30'S 151°46'E) lies at the S end of a drying reef which in turn lies at the W end of a bank with depths less than 20 m over it; the E end of this bank has not yet been defined. Erskine Island is low, sandy and tree-covered to a height of 5 m.

Mast Head Island (23°32'S 151°44'E), tree-covered to a height of 24 m, lies near the NW end of a drying reef; shoal ground is charted $1\frac{1}{4}$ miles NNW of the islet.

- 5 Polmaise Reef (23°34'S 151°41'E) dries. The historic wrecks (1.70) *Polmaise*, *Deutschland*, *SS Tambaroora* and one other as yet unidentified, lie within protected areas on the S side of the reef. A bank with depths less than 20 m

over it extends 1 mile N and 3½ miles WNW from Polmaise Reef; Irving Reef, the W-most danger of Capricorn Group, lies on this bank.

5.22

- 1 Wreck Island (23°20'S 151°57'E) lies near the SW end of a drying reef and is formed by a narrow strip of sand, its centre part covered with thick vegetation and trees. See 5.21 for remarks on the water between the islet and the group of reefs lying 5½ miles S.

Wilson Island, 3 miles WNW of Wreck Island, is covered with dense vegetation: the sea breaks heavily over the drying reef on which the islet lies. Shoal patches lie 5 cables NW, 1½ miles WSW and 6 cables SW of the islet.

Broomfield Reef (23°16'S 151°57'E), a drying reef with a small cay near its NW end.

- 2 North West Island (23°18'S 151°43'E), tree-covered to a height of 15 m, is similar in appearance to Mast Head Island, 14½ miles S (5.21), but has a disused canning factory on it. A ridge, with depths less than 10 m over it, extends between the E end of the drying reef on which North West Island stands, and Broomfield Reef 12 miles E of the island.

- 3 Tryon Island (23°15'S 151°47'E) lies on the W end of a drying reef and is covered with thick vegetation; Brew Shoal lies on the outer end of a spit extending 1¾ miles WSW from the islet.

North Reef (23°11'S 151°54'E) (5.65) is the N-most danger of Capricorn Group; a 4.2 m coral patch lies 3 cables SSW of the reef. The water between North Reef and Broomfield Reef (4 miles SSE) has not been closely examined and should be avoided.

5.23

- 1 **Anchorage** amongst the reefs of Capricorn Group is limited to vessels of 500 grt or less, see 5.12.

Anchorage, with fair shelter from S and E winds, may be obtained in a depth of 27 m under the lee of North West Island (23°18'S 151°43'E) (5.22) distant 5 cables from the reef.

Good shelter may also be found, in all except N to E winds, in the lee of Tryon Island (23°15'S 151°47'E) (5.22). Anchorage may be obtained as required but keeping either N or S of the spit extending WSW from the islet.

Charts Aus 367, Aus 426

Swain Reefs

5.24

- 1 **General information.** This large group of reefs, forming the NE boundary to Capricorn Channel, lies between Howard Patch (22°24'S 152°36'E) to S, Herald's Reef Prong (21°30'S 151°24'E), which dries, to NW and Elusive Reef (21°07'S 152°46'E) to NE. The N-most reef in the group is charted in position 20°53'S 151°58'E, but this lies adjacent to a long stretch of unsurveyed water about which little is known. The reefs on the perimeter of Swain Reefs, which break heavily and may be seen in fine weather at a distance of 6 to 7 miles, appear from a distance as a continuous series of oval-shaped patches clustered together; but there are in fact clear openings between them.

- 2 The S end of Swain Reefs is a popular fishing ground. Numerous charter boats, mainly based on Gladstone, engage in recreational fishing and diving within the reefs.

5.25

- 1 **Tidal streams.** On the falling tide the stream sets E or NE across the E limits of Swain Reefs at rates of 1 to 2 kn at springs. The effect of this out-going stream against the prevailing E to SE winds is to form bands of disturbed water which are easily mistaken for reefs or shoals lying

between the actual reefs. Standing waves may occasionally be formed under the same conditions.

5.26

- 1 **The south-west edge** of the reefs extends NW from Howard Patch (22°24'S 152°36'E), a drying reef with discoloured water S of it, and consists of large and dangerous scattered reefs which are imperfectly known, with deep channels between. The reefs known as Herald No 1 (22°06'S 152°15'E), Herald's Prong No 2 (40 miles WNW) and Herald's Prong No 3, 5 miles farther NW, all of which dry, are considered as the approximate edge. Bell Cay (5.69), lying 13 miles SW of Herald's Prong No 3, is not considered to be a part of Swain Reefs.

5.27

- 1 **The south edge** of Swain Reefs consists of drying reefs extending from Howard Patch (22°24'S 152°36'E) for 5 miles ENE to that on which lies Hixson Cay. Another small cay lies 8 cables SSW of Hixson Cay and there is a clear opening with depths of 30 to 40 m between the two. These cays are bare and impermanent, both being previously reported to have disappeared (1977). Archer Shoal, with discoloured water SW of it, lies 13½ miles S of Howard Patch.

Caution is necessary in approaching Swain Reefs from S as the bottom is irregular.

5.28

- 1 **The east edge** of Swain Reefs extends 75 miles N from Hixson Cay (22°21'S 152°44'E) and consists generally of broad openings between the reefs with irregular depths to seaward as may be seen on the charts. Two of these openings which have been used, and with anchorage just within, are described at 5.31.

- 2 North Hixson Cay Light (piled structure, with red GRP cabinet 4 m in height within metal framework tower 10 m in height; helideck) (22°20'S 152°44'E) is displayed from a cay lying 1 mile N of Hixson Cay.

Zodiac Cay (21°07'S 152°40'E), lying at the centre of a drying reef near to the NE extremity of Swain Reefs, is 2.4 m in height and composed of sand and lumps of coral. There are also sand cays on Elusive Reef 7 miles farther E.

5.29

- 1 **The north edge** of Swain Reefs does not offer the clear and deep channels between reefs as occur on the E edge. From seaward, depths along the N edge shoal rapidly from greater than 200 m to a submerged fringing ridge which has less than 20 m over it and lies along the line of the N-most reefs in the group. On the falling tide the stream sets NE across this ridge causing tide-rips which extend E from the NW limit of the reefs for the entire length of the N edge. In 1992 the rate of the stream on the falling tide was observed to be 1 to 2 kn at springs. On the rising tide the stream sets SW across the ridge.

5.30

- 1 **Caradus Pass** (21°58'S 152°40'E) is entered 23½ miles N of Hixson Cay, but is unlikely to be of benefit or appropriate for use other than by vessels specifically working within the reefs. The chart is believed to be the sole published guide to the passage.

Local knowledge is required.

- 2 A tower (conspicuous visually and on radar) stands on Gannet Cay (21°59'S 152°29'E) N of the centre of the pass, and a number of stranded wrecks, of which at least one is a fishing vessel, lie on Horseshoe Reef 7½ miles ESE of the tower.

5.31

- 1 **Anchorage:** In 1967 HMAS *Teal* (425 tonnes) obtained anchorage in a depth of 64 m, coral, 1½ miles SE of

Hixson Cay (22°21'S 152°44'E) (5.27). In 1992 HMAS *Flinders* obtained anchorage, with good shelter from the prevailing SE swell, 5 cables SW of Hixson Cay in a depth of 36 m, coral and sand. The anchorage was approached from outside the reefs on a track leading WNW, passing 4 cables SSW of Hixson Cay.

- 2 Anchorage has been obtained just within an opening on the E edge of the reefs lying 10½ miles N of Hixson Cay; the opening, which is 7 cables in width, lies oblique to the general line of the reefs and is not easily seen until well open, but has depths of 46 to 55 m in mid-channel.

Anchorage has also been obtained on the E edge of the reefs just within an opening lying 31 miles N of Hixson Cay; this opening is 1 mile in width and has depths of 33 to 37 m in mid-channel.

- 3 In 1967 HMAS *Teal* obtained anchorage in a depth of 42 m (23 fm) approximately 1 mile NW of Zodiac Cay (21°07'S 152°40'E) (5.28). The approach was made from NW in depths of more than 55 m (30 fm) until within 4 miles of the cay when depths shoaled gradually to 37 m (20 fm). There are shoal patches in the area and extreme caution is necessary.

- 4 In 1992 HMAS *Flinders* approached the N edge of Swain Reefs from N and anchored midway between two reefs in a depth of 41 m, broken coral, in position 21°00'7S 152°31'2E. The anchorage provided satisfactory shelter from the prevailing E swell. Depths of 17 m were recorded in the approach over the ridge fringing the N edge of the reefs.

CAPE MORETON TO CAPE TOWNSHEND

GENERAL INFORMATION

Chart Aus 365

Scope of the section

5.32

- 1 This section describes the coastal route from Cape Moreton (27°02'S 153°28'E) to Breaksea Spit (24°30'S 153°14'E) and Capricorn Channel, also described are the anchorages and harbours associated with these areas.

CAPE MORETON TO BREAKSEA SPIT

General information

Chart Aus 365

Route

5.33

- 1 The coastal route from Cape Moreton (27°02'S 153°28'E) to Breaksea Spit (24°30'S 153°14'E) leads N for about 160 miles. Vessels N-bound from Brisbane (27°28'S 153°02'E) join the route as convenient.

Topography

5.34

- 1 The coast from Maroochy River (26°39'S 153°06'E) to Noosa Head (16 miles N) is mostly low and wooded, with short sandy beaches and bare rocky heads. Glasshouse Mountains (26°55'S 152°55'E) (4.3), visible in the background to S give way to the generally flat-topped Blackall Range (26°40'S 152°50'E); those summits of the range which are prominent are described in the text.
- 2 From Noosa Head to Sandy Cape, 101 miles farther N, the coast of the mainland and then of Fraser Island (25°15'S 153°10'E) is formed by a long and almost unbroken beach backed by sand hills generally devoid of vegetation: many of these sand hills are over 180 m (600 ft) in height but few are readily identifiable.

Depths

5.35

- 1 Dangers off this stretch of coast all lie within, but in some cases only closely so, the coastal 37 m (20 fm) depth contour: banks and patches with depths less than 37 m (20 fm) over them lying to seaward of this contour are mentioned in the text.

Exercise areas

5.36

- 1 Military exercise areas, exist offshore, between Cape Moreton (27°02'S 153°28'E) and Double Island Point (25°57'S 153°11'E), as indicated on the chart. See *Annual Australian Notices to Mariners* for details.

Natural conditions

5.37

- 1 **Local magnetic anomaly.** In 1975 a local magnetic anomaly, which decreased the normal E magnetic variation by 6°, was reported to occur in the vicinity of a position 20 miles NE of Sandy Cape Light (24°44'S 153°13'E).

Climatic table. For Sandy Cape, see 1.192 and 1.198

Principal marks

5.38

- 1 **Landmarks:**

Cape Moreton (27°02'S 153°28'E) (3.255).
Mount Beerwah (26°54'S 152°53'E) (4.15).
Sandy Cape (24°42'S 153°16'E) (5.41).

5.39

- 1 **Major lights:**

Cape Moreton Light (27°02'S 153°28'E) (3.254).
Caloundra Head Light (26°48'S 153°08'E) (4.16).
Point Cartwright Light (26°41'S 153°08'E) (4.16).
Double Island Point Light (white round metal tower, red cupola, 12 m in height) (25°56'S 153°11'E).
Sandy Cape Light (white round metal tower, red cupola; 33 m in height) (24°44'S 153°13'E).

Other aids to navigation

5.40

- 1 **Racons:**

Sandy Cape Light (24°44'S 153°13'E) (5.39).
Breaksea Spit Light-buoy (24°21'S 153°09'E) (5.41).
For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 3.256)

From Cape Moreton

5.41

- 1 From a position E of Hutchison Shoal (26°57'S 153°29'E) (3.255), the N-most danger on the ridge extending N from Cape Moreton, the track leads N, passing (positions from Noosa Head (26°23'S 153°07'E)):

Clear of Barwon Bank (24 miles ESE), as required by draught and weather, a buoy (special) is moored at the N end of the bank; thence:



Light
Double Island Point from ESE (5.41)

(Original dated 1999)

- 2 E of Noosa Head, bold and rocky, at the N end of a long ridge of sand hills partially covered in scrub; Noosa Hill (146 m (479 ft) in height), the highest summit of the ridge, stands 7 cables SW of the head; thence:
- 3 E of Double Island Point (27 miles N), a steep rocky head at the end of a neck of land extending 2 miles NNE from the coast and on which stand two hummocks. Double Island Point Light (5.39) stands on the point; a stranded wreck (conspicuous on radar) lies $2\frac{1}{4}$ miles SSW of the point and a dangerous wreck, position approximate, lies 8 cables farther S.
- 4 Thence the track continues leading N, passing (positions from Sandy Cape ($24^{\circ}42'S$ $153^{\circ}16'E$)):
 - Clear of Gardner Bank (23 miles SE) and of North Gardner Bank (16 miles SE), as required by draught and weather; two patches with depths of 25 and 30 m (14 and 17 fm) over them lie 3 miles NNW of the NW extremity of North Gardner Bank; and:
- 5 E of Indian Head (19 miles SSE), a steep, bluff promontory which from N or S appears as an island; Indian, a hill (182 m (596 ft) in height), stands 2 miles SW of the head; thence:
 - E of Waddy Point ($16\frac{1}{2}$ miles SSE), which appears similar to Indian Head; a radio tower (conspicuous) stands 2 miles W of Waddy Point; thence:
- 6 E of Sandy Cape, low but formed of irregular sand hills with scant vegetation and the appearance of white cliffs which give prominence to the cape and may be seen for a considerable distance; Sandy Cape Light (5.39) stands on a hill $3\frac{1}{2}$ miles SW of the cape. The cape is an excellent landmark for the Inner Route (5.5) and point of departure for the Outer Route (5.4). There is a meteorological station on the cape: (see 5.37).
- 7 Thence the track for the Inner Route leads NNW to a position 23 miles N of Sandy Cape, keeping at night in depths greater than 65 m (35 fm), passing:
 - ENE of a 19.2 m (63 ft) patch ($6\frac{1}{4}$ miles ENE); thence:
 - ENE of Sandy Cape Shoal (coral) (8 miles NNE); passage WSW of the shoal should only be made in cases of necessity; and:
- 8 ENE of Breaksea Spit (extending 19 miles NNW), which dries in places and over which the sea breaks heavily. Caution is required when approaching the spit as both in-going and out-going tidal streams set strongly across it: heavy overfalls occur near its N end on the out-going stream. The E side of the spit is steep-to and the broken water on its edge can be seen at a distance of 5 to 6 miles in fine weather by day. Thence:
- 9 ENE of a bank with general depths less than 15 m and a least depth of 9.0 m over it (20.5 miles NNW); heavy overfalls occur off the NW side of the bank on the out-going stream. Breaksea Spit Light-buoy (N cardinal) is moored on the NNW side of the bank and marks the outer limit of the dangers extending N from Sandy Cape.

From Brisbane 5.42

- 1 From the vicinity of the pilot boarding position for Brisbane (4.10), 3 miles SE of Point Cartwright ($26^{\circ}41'S$ $153^{\circ}08'E$) (4.18), the track leads either NNW or NE, passing (positions from Point Cartwright):
 - Clear of Gneering Shoals and adjacent dangers (centred 3 miles NE) (4.19).
 - Thence the track leads N as convenient to join the coastal route (5.41) from Cape Moreton to Sandy Cape, passing:
- 2 E of Mudjimba Islet (4 miles NNW); the islet and Arkwright and Hancock Shoals (see below) are covered by the red sector (088° – 180°) of Point Cartwright Main Light (4.16); thence:
 - E of Arkwright Shoal, rock ($7\frac{1}{4}$ miles N), lying on the outer end of a spit extending $1\frac{1}{4}$ miles E from Arkwright Point; thence:
 - E of Hancock Shoal, rock ($10\frac{1}{4}$ miles N).

Useful marks 5.43

- 1 Radio Masts (red obstruction lights) ($26^{\circ}37'S$ $153^{\circ}03'E$).
Mount Coolum ($26^{\circ}34'S$ $153^{\circ}05'E$) (4.20).
Mount Ninderry ($26^{\circ}33'S$ $153^{\circ}00'E$), prominent.
Point Glorious ($26^{\circ}30'S$ $152^{\circ}54'E$), a prominent mountain.

- 2 Water reservoir (26°28'S 153°06'E), white and conspicuous, standing on the summit of a hill 50 m (164 ft) in height.
Mount Cooroy (26°26'S 152°57'E), prominent.
Mount Tinbeerwah (26°23'S 152°58'E), prominent.
Cooloola, a large sand patch (224 m (735 ft) in height), (26°11'S 153°04'E).
- 3 Boomerang Hill (191 m (630 ft) in height) (25°17'S 153°11'E), one of the few hills easily identified on Fraser Island.
Radio tower (287 m (942 ft) elevation) (25°10'S 153°13'E), of Fraser Island coast radio station (5.15).
Bare Hill (24°50'S 153°14'E), prominent.
*(Directions continue for the
Inner Route via Capricorn Channel at 5.65,
for the Inner Route via Curtis Channel at 5.80,
for Hervey Bay at 5.90 and
for the Outer Route at 2.96)*

Anchorage and river

Laguna Bay 5.44

- 1 Laguna Bay, situated on the NW side of Noosa Head (26°23'S 153°07'E) (5.41), provides anchorage close in 1½ miles WNW of the head in depths of 11 to 13 m (36 to 43 ft). The anchorage is sheltered from S and SE gales but vessels must be ready to leave should the wind shift to E.
Noosa River, which enters the sea at the head of the bay, is navigable only by small craft: see 5.45.
- 2 **Tidal levels:** see information in *Admiralty Tide Tables*.
Mean maximum range at Noosa Head about 1.4 m; mean minimum range about 0.7 m.
Directions. Approach to the anchorage should be made clear of Jew Shoal, ¼ miles N of Noosa Head; the shoal only breaks in bad weather.
- 3 **Useful marks:**
Mount Cooroy (26°26'S 152°57'E) (5.43).
Mount Tinbeerwah (26°23'S 152°58'E) (5.43).
Mount Cooroora (26°22'S 152°50'E).

Noosa River 5.45

- 1 **General information.** Noosa River enters the sea over a shifting sand bar, with a depth of 0.4 m (1 ft) (1985) in the channel over it, at the head of Laguna Bay (5.44), 1¾ miles W of Noosa Head (26°23'S 153°07'E). The river leads to the towns of Noosaville and Tewantin standing on the S bank 1½ and 2½ miles within the entrance, and drains a chain of lagoons and lakes lying close behind the coast. Within the entrance the channel is marked by beacons and buoys.
- 2 **Power cables** with a safe overhead clearance of 11.6 m span the river at Tewantin.
Local knowledge is required.

Wide Bay 5.46

- 1 **General information.** Wide Bay lies between Double Island Point (25°56'S 153°11'E) (5.41) and Inskip Point, 10½ miles NW. The shore of the bay is formed by a sandy beach, backed by sandhills.
A sand spit, subject to change, extending SW from the NW extremity of Double Island Point, encloses a lagoon in the SE corner of the bay.

- 2 A heavy swell sets into the bay in bad weather from N of SE and vessels must be ready to leave at the onset if coupled with falling barometric pressure.
Directions. Approach to the anchorage passes N of Wolf Rock, ¼ miles NNE of Double Island Point; the rock, which covers and uncovers, may be safely approached to a distance of 1 cable but a rocky shoal with a depth of 3.7 m (12 ft) over it lies between it and the point.
- 3 **Anchorage,** sheltered from winds S of ESE, may be obtained in the S part of the bay in the charted berth 2½ miles W of Double Island Point in a depth of 11 m (36ft); good shelter is also obtained closer under the lee of the point in depths of 7.3 to 9.1 m (24 to 30 ft).
Small craft, with draught less than 1.5 m (5 ft), can anchor farther in under the lee of the spit, but local knowledge is required.

Fraser Island, north-east coast 5.47

- 1 **Description.** The NE coast of Fraser Island, between Waddy Point (24°58'S 153°21'E) (5.41) and Sandy Cape (5.41) 16½ miles NNW, is formed by a long sandy beach.
Anchorage in offshore winds may be obtained as required off this stretch of coast, except as indicated below.
Prohibited anchorage. An historic wreck (1.70), *Chang Chow*, within a protected area, lies 6 miles S of Sandy Cape.

Wide Bay Harbour

Chart Aus 365 (see 1.15)

General information 5.48

- 1 **Position and function.** Wide Bay Harbour (25°48'S 153°03'E) lies immediately within the S entrance to Great Sandy Strait, and between the S end of Fraser Island and the mainland. The harbour is of no commercial significance.
Access is limited to vessels of light draught able to cross the bar: see 5.49.
- 2 **Topography.** The mainland for about 6 miles S of the entrance is formed by low sandhills. Hook Point (25°48'S 153°05'E), on the N side of the entrance, is also low for about 1 mile but the land then rises to the generally higher ground of Fraser Island. Within the entrance the shores of the harbour to S and W are low and fronted by mangroves and drying mud flats; the N side of the harbour, W from Hook Point, is low but relatively steep-to and rises to The Bluff (63 m (207 ft) in height), close E of Elbow Point 3½ miles WNW; from there to Snout Point, 3¾ miles farther NNW, the shore is low and wooded, but backed by higher ground.
- 3 **Port limits.** The harbour lies within the limits of the port of Maryborough: see 5.97.
Approach and entry. The harbour is approached as required from seaward and entered over a bar.
Port authority. The port is administered by the Gladstone Port Authority: see 5.155.

Limiting conditions 5.49

- 1 **Controlling depth:** Entrance bar least depth on the leads has varied from 4 to 5 m in December 1991 to less than 2 m in 1993. The bar is subject to constant change and the latest information on depth and the track to be followed must be obtained before entry.
Tin Can Inlet (5.54) entrance bar: least depth 4 m (13 ft).

- 2 **Tidal levels:** see information in *Admiralty Tide Tables* and on the chart. Mean maximum range at Elbow Point (25°46'S 153°01'E) about 1.7 m; mean minimum range about 0.9 m.

Farther N in Great Sandy Strait the mean maximum and minimum ranges at Boonlye Point are about 2.5 and 1.3 m respectively.

Abnormal levels. Strong N winds raise water level by up to 0.5 m; W winds lower it.

5.50

- 1 **Local weather and sea state.** The state of the swell on the entrance bar is the primary limiting condition for entry to Wide Bay Harbour and to the S part of Great Sandy Strait. The bar is dangerous and should only be crossed in fine weather, at or near HW when the sea there always breaks less heavily; and preferably in daylight. The out-going tidal stream sets strongly over the outer part of the bar.

- 2 The most dangerous conditions are found with a combination of strong E or SE winds, which occur frequently in the summer months, and a heavy swell; these conditions cause seas to break very heavily on the bar which should not then be attempted. A light swell however, although still with breakers present, will allow the bar to be crossed inwards in safety.

- 3 Departure from Wide Bay Harbour must not be attempted if there are any breakers at all on the bar, on account of the short steep seas which come in with great velocity as rollers.

Proper assessment of conditions for entry or departure can only come from local knowledge.

Arrival information

5.51

- 1 **Port radio:** see 5.101. Tin Can Bay Coastguard maintain watch on VHF.

Notice of ETA. If taking a pilot see 5.101.

Pilotage. See 5.101.

Local knowledge is essential.

Harbour

5.52

- 1 **General layout.** From Inskip Point the main arm of the harbour, which is wide and deep, runs NW to the vicinity of Snout Point (25°43'S 153°59'E), from whence the channel through Great Sandy Strait becomes shallow and intricate. The other arm, Tin Can Inlet (5.54), is entered over a bar lying close W of Inskip Point, from which the inlet extends 12 miles S.

- 2 **Tidal streams** in the entrance to the harbour attain a rate of 3 to 4 kn at springs.

The in-going streams to Great Sandy Strait from N and S meet in the vicinity of Boonlye Point (25°34'S 152°56'E) where the maximum spring rate is about 2 kn and where the effect of the tides meeting can be seen in the mean ranges given at 5.49.

- 3 **Buoyage.** See 5.98 for direction of buoyage within the port limits of Maryborough. It should be noted that the direction of buoyage changes as the harbour is entered passing S of Hook Point.

Directions

5.53

- 1 From a position ESE of Hook Point (25°48'S 153°05'E), the SE extremity of Fraser Island, the track leads WNW to Wide Bay Bar which, when not marked by breakers, may be seen by the discolouration of the water; the bar is steep-to on its seaward side.

Hook Point Direction Light (25°47'S 153°05'E) (light also displayed by day). The white sector bearing 296° (2001) leads across the bar: see 5.49 for depths to be expected. The white sector is moved to meet changes on the bar.

- 2 **Inskip Point Leading Lights:**

Front light-beacon (25°49'S 153°04'E), standing on Inskip Point.

Rear light-beacon (155 m WSW of the front beacon).

The alignment (243°) of the above beacons then leads WSW towards Inskip Point.

Thence the track leads W, passing midway between Hook Point and Inskip Point (1¼ miles SSW).

- 3 Thence, from abreast the W extremity of Inskip Point, the track leads NW in the fairway of the main arm of the harbour to an anchor berth or as otherwise required. The channel is marked by beacons and leading lights.

(Directions continue for Maryborough at 5.110)

Tin Can Inlet

5.54

- 1 The inlet is entered over a bar (see 5.49 for depth), which extends W from Inskip Point and is marked by T2 Light-buoy (special). Within the bar there are depths of 5 to 13 m (16 to 42 ft) in the fairway for 7½ miles before the water shoals to the swampy ground at the head of the inlet. The channel is marked by leading light-beacons and light-beacons.

Anchorage and moorings

5.55

- 1 The anchorage, extending 6 miles NW in the main arm of the harbour from Inskip Point (25°49'S 153°04'E), has depths of 6.7 to 22.0 m (22 ft to 12 fm) and is one of the most commodious and sheltered on this part of the coast: the bottom is sand and mud. A convenient berth is 1¼ miles NW of the W extremity of Inskip Point.

- 2 Anchorage for small craft may also be obtained in Kauri Creek (25°48'S 152°59'E) and in Teebar Creek (25°52'S 153°02'E); the channels into both anchorages are marked by beacons.

There is a mooring area and adjacent boat ramp at Snapper Creek situated towards the S end of Tin Can Inlet (25°51'S 153°02'E).

Port services

5.56

- 1 A slipway in the harbour can take craft up to 16.1 m LOA and 5.2 m beam.

CAPRICORN CHANNEL

General Information

Chart Aus 426

Route

5.57

- 1 From a position off Breaksea Spit (24°30'S 153°14'E), the Inner Route through Capricorn Channel passes to seaward of Bunker and Capricorn Groups of reefs and leads NW for 85 miles to a position off North Reef Lighthouse (23°11'S 151°54'E). From thence the route continues 122 miles farther NW to a position off Cape Townshend (22°12'S 150°29'E); first passing E of the banks and shoals extending 40 miles NNW from North Reef Lighthouse then keeping well SW of Swain Reefs at the SE extremity of Great Barrier Reef. An alternative route from North Reef Lighthouse leads initially WNW to

close the mainland coast and then joins the route from Curtis Channel to Cape Townshend.

- 2 **Caution.** If joining the Inner Route from E, great care is necessary passing the S extremity of Swain Reefs (5.24) as the bottom is irregular with shoal patches and patches of discoloured water, yet with depths of 90 to 110 m (49 to 60 fm) close to the reefs. Archer Shoal (22°37'S 152°40'E) (5.27) should be avoided.

Topography 5.58

- 1 Descriptions of Bunker Group, Capricorn Group and Swain Reefs are given at 5.16, 5.19 and 5.24 respectively. Topography of the mainland, which is generally relevant only to the alternative route (5.66) closing the coast from the vicinity of North Reef Lighthouse (23°11'S 151°54'E), is described at 5.211.

Depths 5.59

- 1 The 200 m (100 fm) depth contour lies about 4 miles NE of the N extremity of Breaksea Spit (24°30'S 153°14'E). From there it extends nearly 90 miles NW, lying between 5 and 9 miles to seaward of the reefs of Lady Elliot Island and of Bunker and Capricorn Groups, before it turns abruptly NE to enclose the SE extremity of Great Barrier Reef. The major part of the passage between Breaksea Spit and North Reef Lighthouse (23°11'S 151°54'E) lies in depths greater than 200 m (100 fm).
- 2 From the vicinity of North Reef Lighthouse the route continues in general depths between 35 and 73 m (19 and 40 fm). The alternative route (5.66), which closes the mainland coast from the vicinity of North Reef Lighthouse, has a least depth of 24 m passing between Haberfield and Douglas Shoals and thereafter has depths greater than 37 m.

Exercise area 5.60

- 1 Shoalwater Bay Military Training Area extends offshore from the vicinity of Cape Manifold (22°41'S 150°50'E) to Cape Townshend, 40 miles NNW: see 5.214 for details of limits and restrictions on access.

Pilotage 5.61

- 1 See 5.9.

Natural conditions 5.62

- 1 **Tidal streams.** The general set of the stream is W on the rising tide and E on the falling tide at rates between 1 and 2 kn: the stream between Breaksea Spit (24°30'S 153°14'E) and Lady Elliot Island, 31 miles NW, however runs SW/NE in and out of Hervey Bay; and that in the NW part of Capricorn Channel approaching High Peak Island (21°57'S 150°41'E) runs WNW/ESE. The direction and rate of the stream is indicated in several positions on the charts, where predictions for further positions are also tabulated.
- 2 The rate of the W-going stream may be increased in SE winds and allowance for this should be made when approaching North Reef Lighthouse (23°11'S 151°54'E). In a position 20 miles E of Hixson Cay (22°21'S 152°44'E) the stream sets W at 1½ kn on the rising tide and E at ¾ kn on the falling tide. Slack water occurs rather less than 1½ hours before LW and rather more than 1½ hours before HW at Brisbane.

Current: see 5.14.

Climatic table: see 1.192 and 1.200.

Principal marks

5.63

Landmark:

Sandy Cape (24°42'S 153°16'E) (5.41).

Major lights:

Sandy Cape Light (24°44'S 153°13'E) (5.39).

Lady Elliot Island Light (24°07'S 152°43'E) (5.78).

North Reef Light (white round metal tower, red cupola, 24 m in height) (23°11'S 151°54'E).

High Peak Island Light (white square concrete tower, 3 m in height) (21°57'S 150°41'E).

Other aids to navigation

5.64

Racons:

Sandy Cape Light (24°44'S 153°13'E) (5.39).

Breaksea Spit Light-buoy (24°21'S 153°09'E) (5.41).

Lady Elliot Island Light (24°07'S 152°43'E) (5.78).

North Hixson Cay Light (22°20'S 152°44'E) (5.28).

For details see the relevant *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 2.25 or 5.43)

Charts Aus 366, Aus 367, Aus 820

5.65

- 1 From a position 23 miles N of Sandy Cape (24°42'S 153°16'E) (5.41) the track leads NW, passing:
NE of Lady Elliot Island (24°07'S 152°43'E) (5.80), thence:
NE of Stuart Shoal (23°52'S 152°28'E) (5.17); Lady Musgrave Island Light (5.80) stands 4½ miles WSW of the shoal; thence:
- 2 NE of Capricorn Group of reefs (23°30'S 152°00'E) (5.19); crossing the 200 m (100 fm) depth contour in the vicinity of overfalls charted 14 miles ESE of North Reef Lighthouse (23°11'S 151°54'E); thence:
To a position 5½ miles NE of North Reef Lighthouse (23°11'S 151°54'E) (5.63): the light stands on a sand cay, with some stunted bushes on it, situated towards the SW side of North Reef, which dries. An alternative track (5.66) from this position leads WNW.
- 3 **Caution** is necessary when approaching North Reef Lighthouse at night or in thick or bad weather, due to the possible effects of the tidal stream: see 5.62. Thence the track leads N, passing (positions from North Reef Lighthouse (23°11'S 151°54'E)):
E of Guthrie Shoal (8 miles NNW), thence:
E of Innamincka Shoal (11 miles NNW) and of Goodwin Shoal (19 miles NNW), thence:
- 4 E of Edgell Bank (19½ miles NNW), Moresby Bank (21½ miles NNW) and Barcoo Bank (24½ miles NNW), thence:
Well E of Karamea Bank (38 miles NNW); there is discoloured water 4 miles farther NW. This bank, and all the shoaler water between it and North Reef Lighthouse, breaks in heavy weather. As a general rule the bottom can be distinguished clearly on all these shoals and in very calm weather they are indicated by slight tide-rips. Thence:
- 5 To a position 40 miles N of the lighthouse. Thence the track leads WNW to a position 3½ miles NE of High Peak Island (21°57'S 150°41'E), with a prominent

peaked summit; the S and E sides of the island are formed by rocky cliffs whilst the W side slopes gradually to the sea and is thickly wooded; three rocks (two of them 6 m in height), lie 3 cables N of the island. High Peak Island Light (5.63) stands on the inner of two high, bare, conical rocks close E of the island.

(Directions continue at 6.54 or 6.56)

Side Channel

Between Haberfield and Douglas Shoals

5.66

- 1 From the position 5½ miles NE of North Reef Lighthouse (23°11'S 151°54'E) (5.63), an alternative track (see 5.59 for least depth), leads WNW for about 30 miles between Haberfield and Douglas Shoals before turning NW to converge with one of the routes from Curtis Channel. The track passes; (positions from North Reef Lighthouse): SSW of Guthrie Shoal (8 miles NNW) and of Haberfield Shoal (11 miles NW), thence:
 - 2 NNE of a shoal with a depth of 16.4 m over it (10 miles NW), lying at the E end of a bank; thence: NNE of Douglas Shoal (15 miles WNW), lying at the W end of the same bank; Johnson Patch lies 2½ miles WNW of Douglas Shoal and a patch, with a depth of 16.3 m over it, lies 2½ miles farther WSW. Thence:
 - 3 SSW of two patches with depths of 18 m and 27 m over them (23½ and 26 miles WNW respectively), the W-most of the charted dangers of this area of shoals and banks.
- Thence the track leads NW to join the main (5.219) or inshore route (5.220) leading NNW from Curtis Channel.

GENERAL INFORMATION

Chart Aus 426

Scope of the section

5.71

- 1 This section describes the coastal route through Curtis Channel from Breaksea Spit (24°30'S 153°14'E) to Cape Townshend (22°12'S 150°29'E) 214 miles NW. Also described is the major port of Gladstone (23°50'S 151°16'E), the port of Bundaberg (24°52'S 152°20'E), and several minor ports, harbours and anchorages along the coast in this section.

BREAKSEA SPIT TO GLADSTONE

Chart Aus 366, Aus 819 (see 1.15)

Routes

5.72

- 1 From the N end of Breaksea Spit routes lead WNW through Curtis Channel towards Gladstone (5.149); SW to Bundaberg (5.120), and SSW through Hervey Bay to the N entrance to Great Sandy Strait and the port of Maryborough (5.95).

Topography

5.73

- 1 The shores of Hervey Bay and the topography of Bundaberg are described in the relevant parts of the text.

Anchorages

Capricorn Group

5.67

- 1 Anchorages amongst the reefs of Capricorn Group, which are limited to vessels of 500 grt or less except in emergency, are described at 5.23.

Swain Reefs

5.68

- 1 Anchorages in the immediate vicinity of Swain Reefs (21°50'S 152°10'E) are described at 5.31 as it is not envisaged that these would be used other than by vessels specifically working within the reefs.

Bell Cay

5.69

- 1 Bell Cay (21°49'S 151°15'E) is a small sand cay lying near the N edge of an isolated drying reef. Anchorage may be obtained off the N side of the reef in a depth of 37 m; the bottom is hard and uneven. There are large boulders on the E end of the reef, on which the sea breaks heavily. The cay is covered with a sparse growth of bushes and frequented by large numbers of birds and, in season, turtles.

High Peak Island

5.70

- 1 Anchorage, sheltered from the SE winds which often prevail, may be obtained in depths of 27 to 33 m off a small sand and coral beach at the head of the S cove on the W side of High Peak Island (21°57'S 150°41'E) (5.65): depths less than 10 m extend 4 cables from the head of the cove.

Local knowledge is required.

CURTIS CHANNEL

From Burnett River (24°45'S 152°25'E) to the common entrance to Blackwater and Deepwater Creeks, 30 miles NW, the coast is low and marshy in places but mostly formed by a sandy ridge covered with stunted trees. Kolan River (5.147), Mullet Creek and Baffle Creek (5.145) also enter the sea on this stretch of coast. Double Sloping Hummock (24°43'S 151°58'E) is a good mark in the background. Moore Park (North Coast), the N suburb of Bundaberg, is situated midway between the entrances to Burnett and Kolan Rivers.

- 2 From the entrance to Blackwater and Deepwater Creeks (24°26'S 152°00'E) to Rodd Peninsula 32 miles NW, higher land; which includes Hacking Hill (24°25'S 151°52'E) in Matchbox Range, Round Hill 9¾ miles N, and Table Hill 19½ miles farther NW; is found nearer the coast.

Depths

5.74

- 1 The 200 m (100 fm) depth contour lies about 4 miles NE of the N extremity of Breaksea Spit (24°30'S 153°14'E) and is soon crossed by vessels W-bound into Curtis Channel; with depths then decreasing within a distance run of about 1½ miles to 50 m (27 fm). Thereafter depths decrease gradually towards the shore and, except for shoal patches which are mentioned where significant in the text, and in Hervey Bay, the 18 m (60 ft) depth contour is found between 4 cables offshore at Bustard Head (24°01'S

151°46'E) and 14 miles offshore at the entrance to the Burnett River (24°45'S 152°25'E).

Exercise area

5.75

- 1 A military exercise area extends from the vicinity of Curtis Channel (5.72) to Hervey Bay (5.82), 25 miles S. See *Annual Australian Notice to Mariners No 9* for details of limits and restrictions on access.

Pilotage

5.76

- 1 See 5.9.

Flow

5.77

- 1 **Tidal streams.** The general pattern of tidal streams between Sandy Cape and Cape Townshend is given at 5.62, which effectively also describes the pattern of streams in this section of Curtis Channel. Off Bustard Head (24°01'S 151°46'E) the stream sets NW on the rising, and SE on the falling tide.

Streams in Hervey Bay are given at 5.87.

Current: see 5.14.

Principal marks

5.78

- 1 **Landmark:**
Sandy Cape (24°42'S 153°16'E) (5.41).
- Major lights:**
Sandy Cape Light (24°44'S 153°13'E) (5.39).
Lady Elliot Island Light (white GRP hut on white metal framework tower; 32 m in height) (24°07'S 152°43'E). The structure of a former light, 17 m in height, stands 40 m farther NW.
Bustard Head Light (white round metal tower, red dome; 17 m in height) (24°02'S 151°46'E).

Other aids to navigation

5.79

- 1 **Racons:**
Sandy Cape Light (24°44'S 153°13'E) (5.39).
Breaksea Spit Light-buoy (24°21'S 153°09'E) (5.41).
Lady Elliot Island Light (24°07'S 152°43'E) (5.78).
For details see the relevant *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 2.25 or 5.43)

5.80

- 1 From a position 23 miles N of Sandy Cape (24°42'S 153°16'E) (5.41), the track leads WNW, passing (positions from Lady Elliot Island Light (24°07'S 152°43'E)):
NNE of Breaksea Spit Light-buoy (28 miles ESE) (5.41); a route to the port of Bundaberg (5.129) leads SW from this vicinity; thence:
NNE of a 10.2 m shoal (5¼ miles SE), thence:
- 2 Two miles NNE of Lady Elliot Island, composed of coral, scrub-covered with a few trees to a height of 15 m and with a light (5.78) standing on the SW side: a reef which extends 3 cables N and E, surrounds the island: an anchorage is described at

5.144. Herald Patches, coral and sand, are centred 6½ miles S of the light; a 10.2 m shoal is the least known depth over these patches.

- 3 Thence the track leads WNW to a position 7½ miles NNW of Bustard Head (24°01'S 151°46'E), passing (positions from Lady Elliot Island Light):
SSW of a coral patch with a depth of 19.5 m over it (11 miles NW), thence:
Clear of a coral patch with a depth of 19.3 m over it (13 miles WNW), thence:
- 4 NNE of a coral patch with a depth of 14.6 m over it (19 miles W), and:
SSW of Lady Musgrave Island (21½ miles NW), scrub-covered and with some trees to a height of 18 m, lying at the SW end of a drying reef enclosing a lagoon. The reef is the S-most danger of Bunker Group (5.16). A light (stainless steel framework tower, 17 m in height), stands on the islet.
- 5 Thence the track continues WNW, passing (positions from Bustard Head (24°01'S 151°46'E)):
SSW of a 16 m patch (15½ miles NE); a 18 m patch lies 1¾ miles farther ENE; thence:
- 6 NNE of Bustard Head, of moderate height; a light (5.78) stands on the head. Inner Rocks lie on a reef of above and below-water rocks extending 1½ miles NNE from the head; Middle Rocks lie at the seaward end of this reef; Outer Rocks, 1 mile farther N, are the N-most dangers off the head. The reef and Outer Rocks are covered by the arc of visibility (188°–220°) of Bustard Head red auxiliary light; Outer Rocks are also covered by a red sector (212°–242°) of Clews Point Light (see below). Thence:
NNE of Clews Point (1½ miles WNW), also of moderate height; a light (white metal framework tower, red lantern; 6 m in height), stands on the point; thence:
To a position 8 miles NNW of Bustard Head.

5.81

- 1 **Useful marks:**
Arthur's Seat (24°14'S 151°37'E).
Table Hill (24°00'S 151°40'E) (5.180).
Mount Stanley (24°12'S 151°22'E) (5.175).
Mount Larcom (23°48'S 151°05'E) (5.175).
(Directions continue for the port of Gladstone at 5.178 and for Curtis Channel at 5.219)

Hervey Bay

Charts Aus 365, Aus 426 (see 1.15)

General information

5.82

- 1 **Description.** Hervey Bay is entered between Sandy Cape (24°42'S 153°16'E) and South Head 47 miles W, which stands at the entrance to Burnett River and the port of Bundaberg. The bay gives access to the N entrance to Great Sandy Strait and the port of Maryborough and offers good anchorage in Platypus Bay on its E side.

5.83

- 1 **Topography.** The E side of the bay is formed by the W coast of Fraser Island between Sandy Cape and Moon Point, 35 miles SSW: the coast is generally low and sandy and backed by sand hills up to 91 m (300 ft) in height. The

few identifiable features are described in the relevant parts of the text.

- 2 The W shore of the bay from South Head (24°46'S 152°25'E) to Point Vernon 37 miles SE, is formed by sandy beaches interspersed with rocky points and the entrances to a number of small rivers and creeks. Apart from Sloping Hummock (24°51'S 152°26'E) (5.128) and some higher ground S and SW of Point Vernon, the coastal belt is generally low.

5.84

- 1 **Depths** in the mouth of the bay are generally less than 27 m (15 fm) and from there shoal gently to its head; but see below for caution required S of latitude 25°05'S. It should also be noted that large areas of the charts of the bay are based on early and possibly incomplete surveys.

5.85

- 1 **Fishing.** An artificial reef lies 1 mile offshore abreast Woodgate, 5 miles NW of Burrum Point (25°09'S 152°38'E), a fish haven, with a depth of 4 m, lies 15½ miles NNW of the artificial reef (chart Aus 426).

5.86

- 1 **Local knowledge** is desirable in conditions of poor visibility (see 5.88) and is essential S of latitude 25°05'S when approaching the N entrance to Great Sandy Strait: see Cautions at 5.106.

5.87

- 1 **Tidal streams.** The in-going stream to the N entrance to Great Sandy Strait sets generally S through the centre of the bay at rates between 1 and 1½ kn, but towards the E and W shores its direction tends to follow the coastline. The pattern of the out-going stream is similar but reversed. The direction and rate of the stream is indicated in several positions on the chart.

5.88

- 1 **Local weather.** The prevailing winds in the bay are from SE for 9 months of the year; being generally from S in the morning and backing SE later. Strong NW winds, which may occur at other times, are usually accompanied by hazy visibility.

5.89

- 1 **Major lights:**

Sandy Cape Light (24°44'S 153°13'E) (5.39).
South Head Light (24°46'S 152°25'E) (5.128).
Bundaberg Aero Light (24°54'S 152°19'E) (5.128).

Directions

(continued from 5.43)

5.90

- 1 From the vicinity of a position 23 miles N of Sandy Cape (24°42'S 153°16'E) (5.41) the track into Hervey Bay leads WSW, passing (positions from Sandy Cape):
NNW of the N extremity (18½ miles NNW) of Breaksea Spit (5.41) and of the area of overfalls to E, keeping in depths greater than 15 m (49 ft); and:
Clear of the bank (20 miles NNW) (5.41) marked by Breaksea Spit Light-buoy, thence:
- 2 NNW of Long Shoal (13 miles NNW), which breaks in bad weather, lying near the NE end of a 6 mile long bank with depths less than 11 m (36 ft) over it. A 16.4 m (54 ft) patch (16 miles WNW) is the W-most of a group of four patches with depths of 11 to 16.4 m (36 to 54 ft) over them lying about 4 miles generally SW of the same bank.
- 3 Thence the track to the N entrance to Great Sandy Strait and to the port of Maryborough leads SSW to a position 8 miles NE of Burrum Point (25°09'S 152°38'E) (chart

Aus 426), which from the vicinity of the Fairway Light-beacon 11 miles E, appears as a thickly wooded point. The entrance to the strait must be approached with caution: see 5.106. The track passes:

- 4 WNW of Sandy Cape Light (3½ miles WSW) (5.39), and:
WNW of a dangerous wreck (10 miles WSW), thence:
WNW of Rooney Point (10½ miles SW), low and sandy, backed by sand hills; Ferguson Spit, with depths between 1.8 and 11 m (6 and 36 ft) over it, extends 3½ miles NNW from the point.

5.91

- 1 **Useful marks** elsewhere in Hervey Bay:
Water Tower (conspicuous) (24°53'S 152°29'E) (chart Aus 243).
Sloping Hummock (24°51'S 152°26'E) (5.128).
Water Tower (conspicuous) (24°54'8S 152°29'4E) standing 6 cables N of the entrance to Elliott River; another conspicuous tower stands near the coast 2 miles farther N.
(Directions for port of Maryborough continue at 5.106)

Anchorage and river

5.92

- 1 **Sandy Cape.** Anchorage, with good holding ground and sheltered from winds between ENE and S may be obtained in a depth of 9 m (30 ft), sand, 1¼ miles NW of Sandy Cape Light (24°44'S 153°13'E) (5.39); Porpoise Shoal lies 6¼ miles NNW of the light.
Caution is necessary if landing from the anchorage as a heavy surf breaks occasionally on the beach.
- 2 **Clearing mark in the approach:**
Sandy Cape Light bearing less than 139° clears Long and Porpoise Shoals; a lesser bearing to clear the four patches, lying SW of Long Shoal, may be obtained if required from inspection of the chart.
Sandy Cape Light bearing more than 093° clears the dangerous wreck (5.90) and Ferguson Spit.

5.93

- 1 **Platypus Bay** lies between Rooney Point (24°49'S 153°07'E) (5.90) and Moon Point, 25½ miles SSW (5.96). The shore is formed by a sandy beach backed by wooded and moderately high land with several fresh water lagoons in its N part. The bay affords good anchorage with shelter from winds between N and SE, but there is a short sea with onshore winds.
- 2 Anchorage, except in the S part of the bay in the vicinity of Outer Banks (see caution at 5.106), may be obtained as convenient in depths between 13 and 24 m (42 ft and 13 fm), generally sand over blue mud. A 13.7 m (45 ft) rock patch lies 4½ miles S of Rooney Point.
- 3 Smaller vessels may anchor in Lagoon Anchorage 10½ miles SSE of Rooney Point, in depths of 5 to 11 m (18 to 36 ft), sand, between 5 cables and 1½ miles offshore.
Some shelter may be obtained from NW winds by anchoring 7½ cables offshore in a depth of 13 m (43 ft), sand and mud, midway between Rooney Point and Station Hill (4 miles ESE), a bare summit which becomes more easily seen on near approach.
- 4 **Useful marks:**
Triangle Cliffs (25°02'S 153°12'E) and Arch Cliff, 7 miles SW, the only two prominent features on the shore of Platypus Bay.

5.94

- 1 **Elliott River** (24°56'S 152°30'E) has a depth of 0.9 m (3 ft) over the bar; entry can be difficult in choppy conditions. Inside the bar there are patches of rock visible at LW, and from there on the channels of the river are liable to change after freshets.

Springfield, the SE suburb of Bundaberg, stands on Elliott Heads at the N side of the entrance.

Useful marks in the approach are described at 5.91.

Port of Maryborough

General information

5.95

- 1 **Position and function.** The town of Maryborough (25°32'S 152°43'E) lies 23 miles above the entrance of the Mary River but trade from the surrounding area is now carried through the more modern port of Bundaberg (24°45'S 152°24'E) (5.120), with easier access. The port of Maryborough, which includes the length of Great Sandy Strait, is no longer used commercially except for fishing.

The population of the district of Maryborough is about 25 000.

5.96

- 1 **Topography.** Approaching from Hervey Bay, both the mainland and Fraser Island are thickly wooded with but few distinguishing features.

The E shore of Great Sandy Strait from its NE entrance at Moon Point (25°13'S 153°00'E) which is low, marshy and wooded, is fronted by a drying mud bank fringed with mangroves and continues similarly to Snout Point 29 miles S; being broken only by North White Cliffs 9 miles SSE of Moon Point, and South White Cliffs, 7 miles farther SSW. Except at Boonlye Point (25°34'S 152°56'E) (5.110), the land behind the shoreline rises quickly to thickly wooded hills 60 to 90 m in height which then give way to a background of the higher but generally bare and featureless ridge of Fraser Island beyond; see 5.34.

- 2 On the W side of Great Sandy Strait the town of Pialba extends SSE from Point Vernon (25°15'S 152°49'E), the NW entrance point to the strait, and the town of Urangan stands on Dayman Point, 5 miles ESE. From there the W shore of the strait, which is higher than the E shore and also thickly wooded, extends 9 miles S to North Head, the N entrance point to Mary River; a drying bank of sand and mud, with Mangrove Islands on its S part, extends up to 5 miles E from this stretch of shore.

- 3 From Mary River entrance (25°26'S 152°55'E) to Wide Bay Harbour, 24 miles SSE, the W shore of the strait is fringed with mangroves and fronted by extensive drying flats of sand and mud with a number of low islands in the N part.

5.97

- 1 **Pilotage area limits.** The seaward limits of the Maryborough pilotage area in Hervey Bay are drawn from a position on the mainland at 25°07'S 152°34'E, thence NNE to 24°45'S 152°45'E, thence E to a position 24°45'S 153°11'E on Fraser Island. The pilotage area to the S extends about 5 miles seaward from Inskip Point (25°49'S 153°04'E) at the entrance to Wide Bay Harbour, as shown on chart Aus 365.

- 2 **Approach and entry.** Subject to draught the port may be approached and entered from S through Wide Bay

Harbour and Great Sandy Strait, or from N through Hervey Bay and the N part of the same strait.

Port authority. Ports Corporation of Queensland, PO Box 409, Brisbane, Queensland 4001.

5.98

- 1 **Buoyage.** The direction and numbering of buoyage throughout the port is from N to S and into port. Channel junctions are indicated by IALA system special marks.

Limiting conditions

5.99

- 1 **Controlling depths** (1985):
 Hervey Bay to Urangan Jetty (disused): 5.1 m (17 ft).
 Hervey Bay to Mary River entrance: 1.8 m (6 ft).
 Wide Bay Harbour to Mary River entrance: 1.2 m (4 ft).
 Mary River entrance to Maryborough: 0.9 m (3 ft).

Depths throughout the port are changeable and the latest information should be obtained from the port authority, or from the Department of Transport, Queensland, before entry. *Australian Temporary Notices to Mariners* and *Queensland Notices to Mariners* should also be consulted.

5.100

- 1 **Tidal levels:** see information in *Admiralty Tide Tables*. Mean maximum ranges at Urangan and South White Cliffs at Ungowa about 2.8 m and 3.1 m respectively; mean minimum ranges about 1.5 m at both stations.

Low water at Maryborough occurs after LW at the river entrance (North Head) by 2¾ hours at springs and by 2 hours at neaps. There are tide gauges at several places in the river.

- 2 Levels for Wide Bay Harbour and the central and S parts of Great Sandy Strait are given at 5.49.

See also 5.52 for remarks on the meeting of tides from N and S in the strait.

Arrival information

5.101

- 1 **Port radio station** is situated at Gladstone (23°52'S 151°16'E); see *Admiralty List of Radio Signals Volume 6(4)* for further details.

Notice of ETA: 24 hours notice is required for a pilot.

- 2 **Outer anchorage.** Vessels approaching through Hervey Bay and awaiting a pilot or the tide, may obtain anchorage in a depth of 11 m (36 ft) about 5 cables W of the Fairway Light-beacon (25°09'S 152°50'E), with the radio masts (25°16'S 152°50'E) (5.109) bearing 177° and the disused lighthouse on Woody Island (25°18'S 152°58'E) (5.106) bearing 138°.

- 3 **Pilotage** is compulsory other than for exempted vessels and is available from Gladstone during the hours of daylight, giving the notice required above and details of draught. The boarding place for the approach from S through Wide Bay Harbour (25°48'S 153°03'E) should be pre-arranged: pilots for the approach from N board 2 miles NNW of Fairway Light-beacon (25°09'S 152°50'E) in the S part of Hervey Bay.

Local knowledge is essential in all areas of the port.

- 4 **Regulations:**

Vessels carrying explosives in excess of the quantity stipulated at 1.56 must not proceed above the entrance to Mary River.

General regulations for Queensland ports and rivers are given at 1.60.

A speed limit of 10 kn is in force on Mary River from its entrance at North Head to Lower Town Reach at Maryborough; from there upstream the limit is 4 kn.

Harbour

5.102

- 1 **General layout.** The main berthing area is at Maryborough on Mary River, approached from S or N through Great Sandy Strait. The main anchorage areas are off Woody Island in the N part of the strait, in Tyroom Roads lying E of Mary River entrance, and in Wide Bay Harbour at the S end of the strait.

5.103

- 1 **Measured distance** is situated off the NE side of Woody Island (25°18'S 152°58'E):
 - NW front limit mark (yellow beacon; triangular topmark point up) (1.4 miles NW of the disused lighthouse), standing on the foreshore.
 - NW rear mark (yellow beacon; triangular topmark point down) (200 m SW of the front mark).
- 2 SE front limit mark (similar to NW front mark) (4 cables NW of the disused lighthouse), standing on the foreshore.
- SE rear mark (similar to NW rear mark) (160 m SW of the front mark).
- Distance 1853 m. Running track 144¼°/324¼° with Little Woody Island (25°19'S 153°01'E) (5.107) bearing 144¼°.

5.104

- 1 **Submarine power cables** cross Mary River close below the bridge at Maryborough; other submarine cables cross 2½ cables below a bridge to Granville on the N bank. A submarine power cable crosses Tyroom Roads close SW of the jetty (5.114) at North White Cliffs.

5.105

- 1 **Tidal streams.** Streams in the N entrance to Great Sandy Strait continue to run for 40 minutes after the times of local HW and LW, at spring rates of 2 to 3 kn. The strength of the in-going stream is accelerated by strong N winds and checked by SE winds, but the out-going stream does not appear to be effected. Tidal streams in the channels follow the direction of the deepest water except near the edges of banks where they invariably set across them.
- 2 Tidal streams in Wide Bay Harbour and the S part of Great Sandy Strait are described at 5.52.
 - In Mary River the stream runs at a rate of 3 to 4 kn at the entrance, reducing to 1½ to 2 kn farther upstream. Slack water occurs 15 to 30 minutes after the time of local HW and LW. The mean duration of the in-going stream is 6 hours at the entrance, and 4 hours 50 minutes at Maryborough; that of the out-going stream is 6 hours 25 minutes at the entrance and 7 hours 35 minutes at Maryborough.

Directions

5.106

- 1 **Approach from north** (*continued from 5.91*).
 - Leading mark:** Woody Island (25°18'S 152°58'E), 64 m in height and prominent, with grassy slopes descending from wooded summits; a disused lighthouse (white tower, 7 m in height; red dome) stands on Middle Bluff, the highest part, about midway along the length of the island.
- 2 From the vicinity of a position 8 miles NE of Burrum Point (25°09'S 152°38'E) (5.90) (chart Aus 426); the higher

of the two identifiable hummocks of Woody Island (above) bearing SE and open E of, and just touching, the lower, leads SE to the pilot boarding place and thence to Fairway Light-beacon (safe water; pile) (25°09'S 152°50'E).

Useful mark:

Arch Cliff (25°07'S 153°07'E) (5.93).

- 3 **Cautions.** The N entrance to Great Sandy Strait is partially obstructed by shifting sand banks, with blind channels between, and surrounded by breakers; from the entrance inwards the chart must be used with caution. See also 5.86. A vessel should be kept in depths greater than 13 m (43 ft) until an accurate position in relation to the entrance channel has been obtained. Outer Banks, which dry in places and extend between E and SE from the Fairway Light-beacon to the coast of Fraser Island, may be distinctly seen in fine weather by the colour of the water; and in bad weather by the breakers over them.
- 4 The banks and channels within Great Sandy Strait are also changeable: see 5.99 for controlling depths. The latest information must be obtained before entry.

5.107

- 1 **Great Sandy Strait northern entrance.**

From Fairway Light-beacon (25°09'S 152°50'E), the track leads SE across a bar into Ship Channel, passing (positions from the disused lighthouse (25°18'S 152°58'E) on Woody Island):

- SW of Fork Bank (10 miles NNW), which dries in patches; and:
- 2 NE of Pearl Bank, with depths less than 5.5 m (18 ft) over it, lying 7 cables SW of, and parallel to, Fork Bank; thence:
 - NE and round ENE of S1 Light-beacon (special; pile) (9 miles NW), marking the turning point on the NE side of Pearl Bank. An alternative track (5.108) continues SE from the beacon.
- 3 Thence the track leads SSE towards NU1 Light-beacon (starboard hand) (3¾ miles WNW), standing close off the head of Urangan disused jetty. The track crosses Pearl Bank and passes:
 - ENE of Dayman Spit (8 miles NW), which dries in parts and extends N to the entrance bar from the shore between Dayman Point (3½ miles W) and Point Vernon, 5½ miles farther WNW. Thence:
- 4 WSW of Middle Bank (5 miles NW), which continues SE from Pearl Bank and dries in parts; MBN Light-beacon (N cardinal; pile) stands at the N end of the bank; thence:
 - Clear of a foul area (5¼ miles NW), with a depth of 2.4 m (8 ft) over it; thence:
- 5 WSW and round SSW of NU2 Light-beacon (special; pile), marking the turning point SW of Middle Bank.
 - Thence the track leads ESE, passing:
 - SSW of MBS Light-beacon (S cardinal) (4 miles NNW), marking the S extremity of Middle Bank; thence:
- 6 NNE of BWN Light-beacon (N cardinal; pile) (3 miles NW), marking the N end of a drying bank extending 7 cables NNW from Datum Point at the N extremity of Woody Island; Datum Rock, which dries 1.5 m, lies midway between the point and the light-beacon. EU2 Light-beacon (port hand), 6 cables WSW of BWN, marks the NW extremity of the same drying bank and the NE approach to a marina at Urangan (5.96). Thence:
- 7 NNE of S5 Light-beacon (starboard hand) (2 miles N), marking the N end of Long Middle

Bank which extends from there $4\frac{1}{2}$ miles SSE to a point close E of South Point at the S extremity of Woody Island: the S part of the bank dries.

- 8 Thence the track passes E of Long Middle Bank and leads generally SSE, adjusting as necessary to pass:

ENE of S9 Light-beacon (starboard hand) (9 cables ENE), standing about midway along the E side of Long Middle Bank; thence:

- 9 7 cables WSW of Little Woody Island ($2\frac{3}{4}$ miles ESE), 9 m in height and wooded; S10 Light-beacon (port hand) stands $1\frac{1}{2}$ cables NW. The island, which from the vicinity of Fairway Light-beacon ($25^{\circ}09'S$ $152^{\circ}50'E$) appears as a hummock, lies on the SW side of a long drying bank extending generally NNW to a position 3 miles WNW of Moon Point ($25^{\circ}13'S$ $153^{\circ}00'E$): a number of fish havens lie in the channel between the bank and the adjacent coastline of Fraser Island to E. Thence:

- 10 1 mile WSW of S12 Light-beacon (port hand) ($3\frac{3}{4}$ miles SE), marking a drying patch; thence: ENE of Duck Islets ($3\frac{1}{2}$ miles SSE), 9 m in height and wooded; S13 Light-beacon (starboard hand) stands at the S end. The islets lie on the E extremity of the drying banks extending from the W shore: the SE edge of these banks is marked by S15 and S17 Light-beacons (see below). Thence: 5 cables ENE of S13 Light-beacon (4 miles SSE) (see above).

- 11 1.3 miles WSW of B1 Light-beacon (special) ($4\frac{3}{4}$ miles SE), marking Boon Boon rocks; and: Thence the track leads SSW into Tyroom Roads (5.113), passing:

WNW of New Grounds (5 miles SSE), which dry at their centre and are unmarked; thence:

3 cables ESE of S15 Light-beacon (starboard hand) ($5\frac{1}{2}$ miles SSE).

- 12 Thence the track leads SW, passing:

2 cables SE of S17 Light-beacon (starboard hand) ($6\frac{3}{4}$ miles S).

Thence the track leads WSW, passing:

2 cables NNW of S14 Light-beacon (special) ($7\frac{1}{4}$ miles S), marking the end of shoals extending ENE from shore and also the junction of approaches to Mary River from N and S.

5.108

- 1 An alternative track from Fairway Light-beacon ($25^{\circ}09'S$ $152^{\circ}50'E$) (5.106) passes through the length of Ship Channel and NE of Middle Bank to rejoin the main track E of the N end of Woody Island.

From Fairway Light-beacon the track leads SE, passing between Fork and Pearl Banks, thence (positions from the disused lighthouse ($25^{\circ}18'S$ $152^{\circ}58'E$) on Woody Island):

NE of S1 Light-beacon (9 miles NW) (5.107), thence:

- 2 NE of MBN Light-beacon (7 miles NW) (5.107) thence, adjusting course as necessary:

7 cables NE of MBS Light-beacon (4 miles NNW) (5.107), thence:

8 cables SW of S8 Light-beacon (port hand) ($3\frac{3}{4}$ miles N), marking Moon Point Bank, which dries; thence:

3 cables NE of S5 Light-beacon (2 miles N) (5.107), where the main track is rejoin.

5.109

- 1 **Useful marks:**

Radio masts (red obstruction lights) ($25^{\circ}16'S$ $152^{\circ}50'E$).

Leading Hill ($25^{\circ}24'S$ $153^{\circ}05'E$).

5.110

- 1 **Approach from south** (continued from 5.53).

From a position abreast the W extremity of Inskip Point ($25^{\circ}49'S$ $153^{\circ}04'E$) (5.53), the track leads NW in the fairway of the main arm of Wide Bay Harbour to S34 Light-buoy (port hand) (6 miles NW), also known as Southern Fairway Light-buoy, marking the S entrance to the shallow and intricate section of Great Sandy Strait: see 5.99 for controlling depth.

- 2 Thence the channel is marked by light-beacons and light-buoys which are moved as necessary to meet the frequent changes in the channel. The track leads generally N for 19 miles passing:

W of S34 Light-buoy, thence:

W of Snout Point ($25^{\circ}43'S$ $152^{\circ}59'E$) (5.48), thence:

W of Fig Tree Creek, 3 miles farther NNW, thence:

E of Moonboom Islands ($25^{\circ}36'S$ $152^{\circ}56'E$), thence:

- 3 W of Boonlye Point ($25^{\circ}34'S$ $152^{\circ}56'E$), low-lying; thence:

W of South White Cliffs ($25^{\circ}31'S$ $152^{\circ}59'E$) and of Ungowa, at the N end of South White Cliffs, thence:

E of Shoulder Point ($25^{\circ}26'S$ $152^{\circ}57'E$), the E extremity of land immediately S of the approach to the entrance to Mary River, thence:

E of S14 Light-beacon ($25^{\circ}25'S$ $152^{\circ}59'E$) (5.107)

5.111

- 1 **Entrance channel.** From the vicinity of a position 2 cables NNW of S14 Light-beacon ($25^{\circ}25'S$ $152^{\circ}59'E$) (5.107) the track into Mary River leads WSW, passing (positions from North Head ($25^{\circ}25'S$ $152^{\circ}55'E$), the N entrance point to the river):

$\frac{1}{2}$ cable NNW of M2 Light-beacon (port hand) ($1\frac{1}{4}$ miles ENE), thence:

NNW of South Head (1 mile E), thence:

$\frac{1}{4}$ cable SSE of M1 Light-beacon (starboard hand), standing close off North Head.

5.112

- 1 Upstream of its entrance Mary River is liable to considerable change caused by freshets; the channel to Maryborough is marked by leading lights, light-beacons and beacons, and by light-buoys. The controlling depth is given at 5.99.

Berths

5.113

- 1 **Woody Island anchorage.** Good anchorage may be obtained on the NE side of Woody Island ($25^{\circ}18'S$ $152^{\circ}58'E$) (5.106) in depths of 11 to 15 m (36 to 49 ft), 5 cables from the shore between Datum Rock and the disused lighthouse.

- 2 **Tyroom Roads,** off North White Cliffs ($25^{\circ}24'S$ $153^{\circ}02'E$), affords good anchorage in depths of 9 to 20 m (30 ft to 11 fm), sand, clear of a submarine power cable (5.104); it is considered the better anchorage for larger vessels.

A light is displayed from the head of the NE jetty at North White Cliffs. A ruined jetty lies 1 mile farther SW; a light-beacon (special) stands $1\frac{1}{2}$ cables SW of its outer end.

5.114

- 1 **Alongside berths:** two wharves at Maryborough with depths alongside of 2.4 to 7.3 m; Town Wharf has a length of 55 m and a depth alongside of 3.7 m (1985).

There is one serviceable jetty at North White Cliffs (25°24'S 153°02'E), and one at South White Cliffs, 7 miles SSW.

A former deep-water berth at the head of Urangan jetty (25°17'S 152°55'E) has been demolished; the wooden jetty remains.

Port services

5.115

- 1 **Repairs:** three slipways at Maryborough, the largest can accept vessels up to 300 grt; limited small repairs can be carried out.

Other facilities. Measured distance; see 5.103. Hospital at Maryborough.

Supplies: fuel oils are available at Maryborough; fresh water is laid on to Town Wharf; provisions are plentiful.

Anchorage, harbour and rivers

5.116

- 1 **Burrum River.** The entrance, 2 miles SSW of Burrum Point (25°09'S 152°38'E) (5.90), is easily recognised as it shows as a well-defined opening in the coast. Depths over the bar (0.5 m (2 ft) at LW (1994)) and in the channel are constantly changing, but the river is navigable by small craft of draught 1.8 m (6 ft) or less to Howard, a mining town, 14 miles upstream.

- 2 The channel over the bar is marked by a light-beacon (port hand), standing 1¼ miles SE of Burrum Point; the river channel beyond is marked by beacons.

Safe anchorage in all weathers may be obtained inside the bar in a depth of 5 m (16 ft).

Local knowledge is required.

5.117

- 1 **Beelbi Creek** (25°14'7S 152°39'7E), is entered 6 miles SSE of Burrum Point (5.90) and provides good anchorage and shelter off the township within the creek. There is a boat ramp 1½ miles upstream.

The entrance is marked by a beacon (port hand), and the channel upstream by beacons (port hand). The beacons may be altered without notice.

A tower 61 m in height, with an elevation of 132 m, stands SSE of the entrance to the creek and 8 miles WSW of Point Vernon (25°15'S 152°49'E).

5.118

- 1 **Tuan Creek** (25°41'S 152°54'E) lies W of the fairway of Great Sandy Strait and is approached from there through a narrow channel, with a depth of 0.6 m (2 ft) (1985), marked by beacons (lateral). The township of Tuan stands at the head of the creek.

5.119

- 1 **Gary's Anchorage**, situated between Stewart Island (25°38'S 152°57'E) and Fraser Island, and E of the fairway of Great Sandy Strait, is sheltered in all weathers and may be approached from either S or N through channels with depths of 1.4 and 0.5 m (4 and 1 ft) (1985) respectively. The entrances are marked by beacons (special) and the channels by beacons (lateral).

Port of Bundaberg

Charts Aus 242, Aus 243, Aus 366

General information

5.120

- 1 **Position and function.** The port of Bundaberg lies 2 miles within the entrance to Burnett River (24°45'S 152°25'E) and handles the trade for the large sugar growing industry of the surrounding area. A fishing fleet operates from the port.

The estimated population of the city area of Bundaberg in 2004 was 59 400.

5.121

- 1 **Topography.** Except for Sloping Hummock (24°51'S 152°26'E) (5.128), the land on both sides of the lower reaches of Burnett River is generally low and in some places swampy. The entrance to the river is recognisable by South Head Light (24°46'S 152°25'E) and adjacent features (5.128). Barubbra Island, on the N side of the entrance, is low and fringed with mangroves.

5.122

- 1 **Port limits** to seaward are drawn with radius 4 miles from South Head Light (24°46'S 152°25'E).

Approach and entry. The port is approached either from Curtis Channel or from Hervey Bay and is entered through a dredged channel at the mouth of Burnett River.

Traffic. In 2004 the port handled 20 vessels totalling 531 305 dwt.



South Head Light

Burnett River entrance from E (5.120)

(Original dated 1999)

Port authority: Bundaberg Port Authority, MS 108, Bundaberg, Queensland 4670.

Limiting conditions

5.123

1 Controlling depths:

Sea to Port Bundaberg Swing Basin 9.5 m.
Swing Basin to Bundaberg Town Reach 0.8 m.

Caution.

The harbour is subject to siltation which necessitates a dredging programme. Depths are promulgated regularly by *Australian Temporary Notices to Mariners* but the latest information should be obtained from the Harbour Master.

Under-keel clearance: a minimum allowance of 0.9 m is required for entry and departure.

Deepest and longest berth: is Sugar Berth; see 5.138. 5.124

1 Tidal levels:

mean maximum range at Burnett Heads about 2.4 m; mean minimum range about 1.2 m, see information in *Admiralty Tide Tables*.

Adnormal water levels: After bad weather depths in the entrance may be temporarily reduced by 0.3 to 0.6 m; however in 1971 severe floods caused a temporary reduction in depths of as much as 2.4 m.

2 Density of water:

average value 1.025 g/cm³.

Maximum size of vessel handled. The maximum length of vessel quoted for the port is 183 m. The longest vessel handled however has been of 189.9 m LOA; the greatest beam has been 32.3 m and the deepest has been at a draught of 9.6 m.

Arrival information

5.125

1 Port operations.

Vessels normally only berth in daylight on the out-going tidal stream; departures are made on the in-going stream.

Vessel Traffic Service. A VTS scheme is in operation for the control of shipping; for details see *Admiralty List of Radio Signals Volume 6(4)*.

Notice of ETA is required 24 hours in advance, together with draught; subsequent changes should be notified as they arise.

2 Anchorage 'A'

Anchorage may be obtained in a depth of 12.0 m 5 miles E of South Head (24°46'S 152°25'E) as shown on chart Aus 366.

Prohibited and unsafe anchorages. Anchorage in Sea Reach (24°45'3S 152°24'4E) is unsafe; see description at 5.133.

Pilotage is compulsory other than for exempted vessels and is available by pre-arrangement. The boarding ground, 4½ miles E of South Head, is shown on chart Aus 243.

3 Tug

and a work boat are available. Ship's or tug's lines may be used as arranged.

Traffic regulations

A speed limit of 8 kn is in force from the entrance of Burnett River to Bundaberg Creek at the E end of Town Reach (24°51'8S 152°21'2E); above Town Reach the speed limit is 4 kn.

Quarantine. Bundaberg is a first port of entry; see 1.64.

Harbour

5.126

1 General layout.

The principal facilities of the port are concentrated at Port Bundaberg on the E bank of Burnett

River, 2 miles above the entrance. Beyond the port area, the river winds 7 miles farther upstream to the city of Bundaberg where it is crossed by road and rail bridges. Above the bridges the river is navigable only by small craft.

2 Dredgers

and other plant operate over the bar and in the dredged channel.

Submarine power cable crosses the river near the S end of Long Reach (24°47'S 152°23'E); the landing places are marked by notices on shore.

Cable ferry (24°47'8S 152°22'9E) crosses the S end of Long Reach and may operate by day and night during the sugar handling season. Lights and sound signals are used to indicate operation of the ferry, which can be contacted on VHF. Caution is required when approaching the crossing, which is marked on the chart.

5.127

1 Tidal streams.

Between Channel Entrance No 1 Light-beacon (24°45'S 152°28'E) and Swing Basin the out-going stream may run at rates in excess of 4 kn and set across the channel, particularly in Sea Reach: a very strong N set is frequently experienced close seaward of South Head. The in-going stream is weaker and during freshets may be unable to reverse the flow except at the entrance.

5.128

1 Landmarks:

Sloping Hummock (24°51'S 152°26'E), a remarkable isolated hill; a radio tower (conspicuous) stands on the hill.

South Head Lighthouse (white concrete tower with red band, 17 m in height) (24°46'S 152°25'E); pilot station houses stand nearby; a conspicuous water tower stands 4 cables S and conspicuous Molasses tanks stand 1¼ miles WSW, respectively, from the light.

2 Major lights:

South Head Light (24°46'S 152°25'E) as above.
Bundaberg Aero Light (24°54'S 152°19'E) (chart Aus 426).

Directions

5.129

1 Approaches from Curtis Channel.

From a position to seaward, N of the latitude (24°45'S) of the entrance to Burnett River, the track leads as required between SE and SW to bring South Head Light (24°46'S 152°25'E) (5.128) bearing between 245° and 268°, distant more than 6 miles.

5.130

1 From NW

the track leads SE, keeping more than 6 miles offshore and clear of Drew Shoal (24°32'S 152°11'E). A large area of sand flats and shoals extend from the mouth of Burnett River, with patches of less than 10 m within 7½ miles NNW through to 6¼ miles ENE from South Head Light.

5.131

1 From NE

the track leads SW passing:
Clear of a wreck with a depth of 13.6 m over it (12¾ miles ENE); a patch with a depth of 11.7 m over it, lies 2 miles WNW of the wreck. Thence: SE of the outer patches described above.

Thence the track leads SW to the vicinity of the pilot boarding ground (4½ miles E).

5.132

1 Approach from Hervey Bay.

From a position SE of South Head (24°46'S 152°25'E) the track leads NNW, passing (positions from South Head):

Not less than $2\frac{3}{4}$ miles NE of Bargara ($4\frac{1}{2}$ miles SE).

Thence course may be directed to the vicinity of the pilot boarding ground ($4\frac{1}{2}$ miles E).

5.133

- 1 **Caution.** Extreme care is required in navigating Sea Reach as rocky pinnacles exist outside the limits of the cutting and the tidal stream may set strongly across the channel; see 5.127.

Entrance channel to Swing Basin. The channel from sea to Swing Basin is dredged over a least width of 76 m and marked by numbered and synchronised light-beacons. The controlling depth is given at 5.123. From the vicinity of the pilot boarding ground above, the track leads W through the entrance channel into Sea Reach and Burnett River.

- 2 **Sea Reach N Directional Light** (aluminium framework tower, 11 m in height) ($24^{\circ}45'3S$ $152^{\circ}23'5E$).

Sea Reach S Directional Light (similar structure) (close S of N light).

The line of bearing (270°) of the above lights (displayed on request to Gladstone Harbour Control via VHF) leads into the entrance channel and through Sea Reach, passing (positions from South Head Light ($24^{\circ}46'S$ $152^{\circ}25'E$):

- 3 Between Channel Entrance No 1 Light-beacon (E cardinal) (3 miles E) and No 2 Light-beacon (port hand), 1 cable S of No 1; these light-beacons mark the entrance to the maintained channel. Thence: Between No 3 and 4 Light-beacons (lateral) ($2\frac{1}{2}$ miles E), thence:
- 4 Between No 5 and 6 Light-beacons (lateral) ($6\frac{1}{2}$ cables ENE); these light-beacons mark the entrance to Sea Reach and the outer edge of the bar, which seldom breaks except in bad weather.

The channel then continues W between pairs of numbered light-beacons (lateral), passing (positions from Sea Reach N Directional Light-beacon ($24^{\circ}45'3S$ $152^{\circ}23'5E$):

- 5 N of South Head ($1\frac{1}{2}$ miles ESE); a training wall extends W from the head; thence:
S of the E extremity of the N training wall (9 cables E), which extends from there W and S to the Swing Basin; thence:
N of the entrance to Burnett Heads Boat Harbour (6 cables ESE), used by small craft.

5.134

- 1 Thence the track leads WSW through Middle Reach.

Middle Reach Directional Lights:

Inbound ($24^{\circ}45'6S$ $152^{\circ}23'0E$).

Outbound ($24^{\circ}45'2S$ $152^{\circ}24'1E$).

The line of bearing ($252\frac{1}{4}^{\circ}$) of the Inbound light-beacon and ($072\frac{1}{4}^{\circ}$), astern, of the Outbound light-beacon, (displayed on request), leads through Middle Reach passing between numbered light-beacons (lateral).

5.135

- 1 Thence the track leads SW through Inner Reach.

Inner Reach Directional Lights:

Inbound ($24^{\circ}45'9S$ $152^{\circ}22'7E$).

Outbound ($24^{\circ}45'3S$ $152^{\circ}23'5E$).

The line of bearing (229°) of the Inbound light-beacon, and (049°), astern, of the Outbound light-beacon (displayed on request), leads through Inner Reach, passing between numbered light-beacons (lateral) into Swing Basin.

5.136

- 1 Swing Basin, bottom sand and clay, and dredged over a width of 310 m abreast the Oil and Sugar Berths, is entered between No 24 Light-beacon (port hand) (9 cables SW), and No 25 Light-beacon (starboard hand), $1\frac{1}{4}$ cables WNW

of No 24. The dredged limits of the basin are marked on the W by light-buoys (special), continuing the numbering sequence from sea; on the E by the outer faces of the berths; the S limit is as shown on chart Aus 242. The E part of the basin, adjacent to the berths, has a maintained depth of 9.5 m; the remainder is maintained at 8.0 m, as shown on the chart.

- 2 From a position between No 24 and 25 Light-beacons the track leads generally S through the middle of Swing Basin and as required for berthing or for passage farther up-river.

Long Reach Leading Light-beacons:

Front light-beacon ($24^{\circ}47'6S$ $152^{\circ}23'0E$), standing on the E bank near the S end of Long Reach.

- 3 Rear light-beacon (100 m S of the front light-beacon).

The alignment ($169\frac{3}{4}^{\circ}$) of the above light-beacons, (lights may also be displayed by day), leads through the middle of Swing Basin, thence through the N part of Long Reach.

5.137

- 1 **Swing Basin to Town Reach.** The controlling depth upstream of Swing Basin is given at 5.123. The channel, which is liable to change, is marked by leading light-beacons, light-beacons and by light-buoys. The river banks are fronted in places by training walls.

Bridges



Town Reach (5.137)

(Original dated 1999)

Berths

5.138

- 1 **Port Bundaberg:** Oil Berth, also known as John T Fisher Wharf, has an overall length of 81 m including dolphins; depth alongside 9.6 m. Sugar Berth, also known as Sir Thomas Hiley Wharf, is 200 m in length with a dolphin connected by a catwalk at each end; depth alongside 11.0 m. The designed depth for both berths is 10.0 m.

- 2 A fishing harbour and marina are situated on the SE side of Inner Reach between No 18 and 20 Light-beacons.

Bundaberg: a Fish Board jetty, a public wharf and several small private wharves and jetties.

Other berths: buoy moorings in Burnett River and marina berths at Inner Reach and Town Reach. Anchorage for small craft may be obtained at the S end of Long Reach, in the vicinity of Long Reach Leading Light-beacons ($24^{\circ}47'6S$ $152^{\circ}23'0E$) (5.136).

- 3 **Burnett Heads Boat Harbour** lies 6 cables W of South Head ($24^{\circ}46'S$ $152^{\circ}25'E$), it is approached from Sea Reach and has its entrance between sections of the S training wall. The entrance channel, with depths between 1 and 2 m, is marked by light-beacons. There are buoy moorings within the harbour and a wharf and a ramp on the W side.

Port services**5.139**

- 1 **Repairs.** Limited repairs can be arranged at Port Bundaberg.

Other facilities: Customs board in Sea Reach; hospital in the city of Bundaberg; deratting can be carried out and certificates issued; garbage disposal facilities available on request; quarantine incineration available; limited facilities for disposal of oily waste by road tanker.

- 2 **Supplies:** Fresh provisions are plentiful; fresh water is laid on to all wharves at Port Bundaberg; normal grades of fuel oil are available at 24 hours notice.

Communications: Nearest airport Hinkler, 21 km.

Anchorage and harbours

Chart Aus 819

Pancake Creek**5.140**

- 1 **General information.** Pancake Creek lies between Clews Point (24°00'S 151°45'E) (5.80), and Pancake Point, 1½ miles SSW, the E extremity of Rodd Peninsula. The creek provides good shelter in anything other than NW winds for coasters and small craft.

Local knowledge is required.

Tidal streams in the creek run at 1½ to 2 kn.

- 2 **Directions.** The approach from N or NW passes clear of a 1.5 m shoal lying 7½ cables WNW of Clews Point and clear of Jansen Rock, which dries, lying 1 mile W of the same point.

The entrance fairway is narrow, restricted on the W side by Shelter Spit, which dries 0.6 m and extends 6 cables N from Pancake Point, and by a spit, which dries 0.6 m, and extends 4 cables W from the E bank of the creek. The edges of these spits are easily seen.

- 3 **Anchorage** may be obtained in depths between 3.7 and 4.6 m abreast the first sandy beach lying between two ledges of rock extending from the E shore, and with a boathouse bearing 121°.

Caution. A vessel should not be allowed to run too far beyond the above berth as there are rocks farther S abreast the same boathouse.

Chart Aus 246

Rodds Harbour**5.141**

- 1 **General information.** Rodds Harbour lies immediately SW of Rodds Peninsula (24°00'S 151°40'E) and affords shelter from all winds for vessels of moderate size.

Local knowledge is required.

- 2 **Directions.** The harbour is approached from N through the E side of the generally shallow and exposed Rodds Bay which lies between Richards Point (23°58'5S 151°37'5E) and Tiber Point, 10 miles WSW. Ethel Rocks and the dangerous wreck of a fishing vessel lie 3 cables NNW and 3½ cables WNW respectively of Richards Point. A number of patches, with a least depth of 4.2 m over them, lie 1¾ miles WNW of the same point in the approach to Rodds Harbour. The approach then passes between Spit End, wooded and lying 2½ miles SSW of Richards Point, and Tongue Spit, 1½ miles farther W, (5.143); from whence the harbour is entered passing S of a long drying spit extending S from Spit End.

- 3 The fairway is marked in places by light-buoys or light-beacons (lateral) as far as Turkey Beach (24°04'5S 151°39'1E), lying near the head of the harbour.

Tidal streams attain their maximum rates of 2 to 3 kn S of Spit End with lesser rates in the approaches and farther within the harbour as shown on the chart.

Anchorage may be obtained 9 cables S of Spit End (24°00'5S 151°36'3E) in a depth of about 5.5 m.

Chart Aus 366 (see 1.15)

Bustard Bay**5.142**

- 1 Bustard Bay extends 10 miles SE from Bustard Head (24°01'S 151°46'E) (5.80), but affords no shelter except in offshore winds, other than for small craft.

Round Hill Head (24°09'S 151°53'E), the S entrance point of Bustard Bay, from where a light is displayed; is a grass and wooded bluff sloping from Round Hill, 6 miles S. A white pyramidal monument, 3 m in height, commemorating Captain Cook's landing there, stands 6 cables from the head on its W side. A 5.5 m patch lies 2½ miles WNW of the head.

- 2 **Anchorage** may be obtained 1¾ miles W of Round Hill Head (24°09'S 151°53'E), sheltered from SE winds, in a depth of 5 m.

Round Hill Creek, entered about 5 cables SW of Round Hill Head, is obstructed by sand banks. The channel is marked by beacons and a buoy, but is subject to frequent change.

The village of Seventeen Seventy is situated on the E side of the creek.

- 3 **Eurimbula Creek**, entered 3 miles WSW of Round Hill Head, is obstructed by sandbanks which dry. The channel is subject to frequent change.

Middle Creek, which enters Bustard Bay 5¾ miles WNW of Round Hill Head, is obstructed by mangroves and not navigable (1985). The creek lies between the mainland and Middle Island and connects with Pancake Creek (24°03'S 151°43'E) (5.140).

Jenny Lind Creek, entered close S of Bustard Head (24°01'S 151°46'E), is obstructed by a shallow bar subject to frequent change and is exposed to weather from SE.

Chart Aus 246

Seven Mile Creek**5.143**

- 1 **General information.** Seven Mile Creek is entered between Innes Head (24°02'2S 151°34'0E) and Norton Point, 1 mile W, and provides anchorage for vessels of appropriate size and draught in its deeper E arm between Innes Head and Tongue Sand, 5 cables WNW.

Tongue Sand, which dries 1.5 m, originates from the shallow head of the creek, which it then divides before reaching seaward into Rodds Bay; Tongue Spit at its N extremity lies 2¼ miles NNE of Innes Head.

Local knowledge is required.

- 2 **Directions.** The approach is made as for Rodds Harbour (5.141) until between Spit End (24°00'5S 151°36'3E) and Tongue Spit; from whence Seven Mile Creek is then entered on a SSW heading, passing WNW of Innes Head.

Tidal streams run at a maximum rate of 2 kn as shown on the chart.

Anchorage may be obtained 5 cables SW of Innes Head in a depth of 8.5 m.

Chart Aus 366 (see 1.15)

Lady Elliot Island**5.144**

- 1 Anchorage may be obtained in SE winds under the lee of Lady Elliot Island (24°07'S 152°43'E) (5.80) 2½ cables from the reef in depths of 18 to 37 m.

Baffle Creek

5.145

- 1 The entrance to Baffle Creek (24°31'S 152°04'E) is unmarked and is obstructed by a bar which dries and is subject to frequent change and is unmarked. Vessels with a maximum draught of 2.1 m can navigate the creek for 6 miles above its entrance.

Local knowledge is required.

- 2 Good anchorage in offshore winds may be obtained 2 miles off the entrance to Baffle Creek (24°31'S 152°04'E), in depths of 9 to 11 m, sand. Access to the creek itself is limited to small craft.

Useful marks:

Double Sloping Hummock (24°43'S 151°58'E) (5.73).
Round Hill (24°16'S 151°53'E) (5.73).

Hervey Bay

5.146

- 1 Anchorages in Hervey Bay (24°50'S 152°50'E) are described at 5.92.

Other river and inlet

Chart Aus 366

Kolan River

5.147

- 1 **Description.** Kolan River (24°40'S 152°12'E) is entered over a bar which is subject to frequent change. Bar and river channels are unmarked.

Camp Island, low and sandy, lies close offshore on the NW side of the entrance; a lookout tower stands N of a village fronting the entrance.

Local knowledge is essential.

- 2 **Directions.** Approach from seaward, which is clear of danger outside the bar, may be made with Double Sloping Hummock (24°43'S 151°58'E) (5.73) bearing 254°. As the shore is approached, the entrance may be seen to the S, lying W of a dark clump of vegetation standing close to the beach.

Chart Aus 246

Colosseum Inlet

5.148

- 1 **Description.** Colosseum Inlet is entered between Tiber Point (23°59'·5S 151°26'·5E) the NW point of Hummock Hill Island, and the E side of Wild Cattle Island 5 cables W. Both sides of the entrance are low and densely wooded.

Although the approach is made from within the limits of the port of Gladstone, the inlet itself is not a part of the port.

- 2 **Approach** is obstructed by a sandy bar, which dries in places, lying 2 miles N of the entrance and which breaks in heavy E weather. Within the bar there are depths between 5 and 17.3 m over a distance of nearly 4 miles.

Tidal streams at various positions in the approaches and in the entrance are shown on the chart: the maximum rate is 3 kn.

PORT OF GLADSTONE

General information

Charts Aus 244, Aus 245, Aus 246, Aus 819, Aus 366

Position

5.149

- 1 The port of Gladstone (23°50'S 151°16'E) has a natural harbour with a large area of deep water and is one of the safest and most commodious ports in Queensland with prospects for continuing growth and development.

Function

5.150

- 1 The port is one of the major coal exporting ports of Australia and is centrally situated to serve the rich mining areas of Central Highlands and Callide and Dawson Valleys. Other main exports include alumina and cement clinker; main imports bauxite, caustic soda, petroleum products. A fishing fleet of about 40 trawlers operates from the port.

The town of Gladstone stands on the S side of the harbour. In 2004 the estimated population of the Gladstone district was 42 300.

Topography

5.151

- 1 The SW shore of the entrance through South Channel, from Tiber Point (23°59'·5S 151°26'·5E) (5.148) to South Trees Point 11 miles NW, is low, sandy and wooded, most of the N part of Boyne Island being covered with mangroves.
- 2 From South Trees Point to Barney Point (23°50'·2S 151°16'·3E) the shore continues low and is fronted by a drying mud bank. Barney Point is the NE extremity of an area of reclaimed land which extends 7 cables SSE from

Barney Point



Picnic I.

Clinton Wharf

Gladstone from N (5.149)

(Original dated 1999)

the point and 6 cables WNW to Auckland Point Wharves. Much of the development for the R G Tanna Coal Terminal (23°50'S 151°14'E) and the associated Clinton Wharf is also on reclaimed land.

- 3 The E side of the harbour is formed by Facing Island, which except at its S end, is low and thickly wooded. The W coast of the island, N from Observation Point (23°51'6S 151°21'8E), is fringed in places with mangroves and fronted by drying sand flats.

The N side of the harbour is formed by the S coast of Curtis Island which is moderately high and indented by shallow bays. The extent to which banks and islands encumber the N part of the harbour may be seen on the chart.

Pilotage area

5.152

- 1 The seaward limits of the Gladstone pilotage area are drawn from Connor Bluff (23°43'S 151°18'E) (chart Aus 819) bearing 113½° for 16.9 miles, thence 180° for 6.9 miles, thence 248½° for 8.1 miles to Tiber Point (23°59'5S 151°26'5E), thence W to the HW mark at Wild Cattle Island. The inner limit, in The Narrows between the mainland and Curtis Island, is drawn from Munduran Creek (23°39'S 151°05'E) (chart Aus 366) to Christo Creek, 1 mile ENE.

Approach and entry

5.153

- 1 The port is approached from that part of Curtis Channel abreast the coast between Rodds Peninsula (24°00'S 151°40'E) and Facing Island, 14 miles WNW. The deep-water entrance is through South Channel (5.181).

Traffic

5.154

- 1 In 2004 the port handled 1113 vessels of 74 574 261 dwt.

Port authority

5.155

- 1 The Gladstone Port Authority, PO Box 259, Yarroon Street, Gladstone, Queensland 4680.
Website: www.cqpa.com.au

Limiting conditions

Controlling depths

5.156

- 1 Sea to G4 Light-buoy (23°51'5S 151°19'9E) 16.3 m.
G4 Light-buoy to Clinton Wharf 15.8 m.
Clinton to Fishermans Landing Wharves 10.4 m.
A sailing draught of 16 m is guaranteed for any day of the year.

The latest information on depths in the channels and berths should be obtained from the Harbour Master. Depths are also promulgated regularly by *Australian Temporary Notices to Mariners*.

Under-keel clearance

5.157

- 1 Under-keel allowances of 1.5 m for vessels up to 85 000 dwt and 2.0 m for vessels over 85 000 dwt are required in South and Gatcombe Channels. Allowances required in the harbour channels are 0.7 and 1.2 m for the same sizes of vessel.
A minimum under-keel clearance of 0.5 m is required in all berths.

Deepest and longest berth

5.158

- 1 The deepest and longest berth is Clinton Coal Loader Wharf (5.197).

Tidal levels

5.159

- 1 See information in *Admiralty Tide Tables*. Mean spring range at Gatcombe Head about 2.9 m and at Gladstone about 3.2 m; mean neap ranges about 1.4 m and 1.6 m respectively.

Density of water

5.160

- 1 Variable between 1.024 and 1.028 gm/cm³.

Maximum size of vessel handled

5.161

- 1 The maximum allowable dimensions for using the port are 315 m LOA and 55 m beam.
The largest vessel handled has been of 231 850 dwt, 315 m LOA and 55 m beam; the deepest has had a draught of 17.9 m.

Arrival information

Vessel Traffic Service

5.162

- 1 A VTS scheme is in operation for the control of shipping; for details see *Admiralty List of Radio Signals Volume 6(4)*. Participation in the scheme is compulsory for all commercial (trading) vessels and voluntary for all other categories.

Port radio

5.163

- 1 The port radio station provides a 24 hour service and is located at Auckland Hill (23°50'1S 151°15'2E). See *Admiralty List of Radio Signals Volume 6(4)* for details.

Notice of ETA

5.164

- 1 ETA should be notified at least 24 hours in advance and confirmed 2 hours before arrival, stating whether or not the pilot can be accepted by helicopter transfer.

Outer anchorages

5.165

- 1 Vessels awaiting a pilot or the tide may obtain anchorage in depths between 15 and 23 m, good holding ground, N or E of the entrance (23°54'0S 151°30'5E) to Wild Cattle Cutting and South Channel in numbered anchorages as shown on the chart clear of the prohibited anchorage (see below).

Restricted area

5.166

- 1 Anchorage is prohibited in the restricted area extending 3 miles to seaward of the entrance to Wild Cattle Cutting, as shown on chart Aus 246. All vessels are required to remain outside the same area unless entering or leaving the dredged channel, or in the process of embarking or disembarking a pilot for the port.

Pilotage

5.167

- 1 Pilotage is compulsory for vessels over 35 m LOA except for exempted vessels, and is available 24 hours per day. The preferred means of boarding is by helicopter (see 1.29), with boarding by launch as the alternative, as arranged with Harbour Control. The pilot launch is orange

and displays the usual signals. The boarding place for the port of Gladstone lies 2 miles NE of Fairway Light–buoy (23°53′.1S 151°31′.1E).

- 2 Pilots for the Queensland coast and Torres Strait may also be embarked off Gladstone; the boarding place for this service is off North Point (23°45′.2S 151°20′.0E) as shown on chart Aus 366.

Tugs

5.168

- 1 Tugs are available and normally join off South Trees Point, or in the approach to the berth. Tug's wires are always used when a pilot is embarked.

Traffic regulations

5.169

- 1 **Vessels passing.** All vessels should normally avoid passing in the dredged cuttings, but may do so using the charted bypass channels where draught permits between Gatcombe Head and Clinton Wharf.

Deep-draught vessels and non-gas free tankers at any draught are not permitted to pass other such vessels except in Gatcombe Channel and Bypass, and then only if their draughts are suitable.

Regulations concerning entry

5.170

- 1 **Tankers** carrying petroleum products may only enter in daylight unless otherwise agreed with the Harbour Master.

Vessels carrying explosives in excess of the quantity stipulated at 1.56 may not proceed above Barney Point (23°50′.2S 151°16′.3E).

Vessels in ballast are required to be in seaworthy trim, with forward draught not less than 2% of LOA and with propellers submerged.

Quarantine

5.171

- 1 Gladstone is a first port of entry. For extracts from the Quarantine Act see 1.64.

Vessels granted radio pratique will be cleared on berthing unless otherwise advised.

Small craft arriving from overseas should proceed to O'Connell Wharf in Auckland Inlet (23°50′.0S 151°15′.1E) (5.205).

Harbour

General layout

5.172

- 1 The harbour is entered through South and Gatcombe Channels leading from sea to the outermost berths at South Trees Point (23°51′.2S 151°18′.7E). From thence Auckland, Clinton and Targinie Channels together lead 9 miles farther WNW giving access to the separate remaining berthing complexes at Barney Point, Auckland Point, Clinton Wharf and Fishermans Landing. All berthing areas are on the SW side of the harbour.

- 2 There are swinging basins off South Trees Point, off Clinton Coal Loader Wharf and off Fishermans Landing Wharves.

The inner anchorage areas for the harbour lie between Gatcombe Head (23°52′.9S 151°22′.5E) and a position 5 miles NW.

Visual signals

5.173

- 1 **Storm warning signals** (see 1.79) are displayed from the cyclone weather radar station and from the Customs

House, 4 cables S of Auckland Point (23°49′.9S 151°15′.2E).

Natural conditions

5.174

- 1 **Tidal streams.** In the outer approaches to South Channel the tidal stream sets NW on the rising tide and SE on the falling tide, across the Wild Cattle Cutting leading line. In Wild Cattle Cutting itself however, and across the E end of East Banks, the directions are WSW and NE at rates between 2 and 3 kn.

In the vicinity of S15 Light–beacon (23°55′.7S 151°26′.7E), at the junction of Boyne Cutting with Golding Cutting, the in–going stream sets strongly W.

- 2 Within South Channel and the harbour, tidal streams generally turn at the time of HW Gladstone, but streams can be much affected by the wind and may set very strongly through the channels. Predicted directions and rates are shown in numerous positions on the charts: rates up to 4 kn may be attained in Targinie Channel abreast Hamilton Point (23°48′.0S 151°13′.3E).

- 3 At Auckland Point Wharves (23°49′.9S 151°15′.5E) the in–going stream sets off the jetty and the out–going stream sets on to it.

Climatic table. See 1.192 and 1.199.

Principal marks

5.175

- 1 **Landmarks** shown on chart Aus 366 view C:
Mount Larcom (23°48′S 151°05′E), conspicuous, the highest summit of the sparsely wooded, granite mountains of Mount Larcom Range.
Mount Stanley (24°12′S 151°22′E), the prominent and highest summit of the sparsely wooded, granite mountains of Many Peaks Range.

5.176

- 1 **Major lights:**
Bustard Head Light (24°02′S 151°46′E) (5.78).
East Point Light (metal framework tower, 10 m in height) (23°51′.9S 151°23′.5E).

Other aid to navigation

5.177

- 1 **Racon:**
S1 Light–beacon (23°53′.9S 151°30′.4E) (5.181).
For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 5.81)

Approaches

5.178

- 1 **From east–south–east**, from the vicinity of a position 8 miles NNW of Bustard Head (24°01′S 151°46′E) (5.80) the approach leads to the boarding place for Gladstone pilots (23°51′.9S 151°32′.7E). The track leads between W and WNW for 9 miles with Mount Larcom (23°48′S 151°05′E) (5.175) bearing less than 283°, passing (positions from East Point Light (23°51′.9S 151°23′.5E)):
Clear of a wreck with a depth of 22.3 m over it (14 miles E), as required by draught; thence:
2 NNE of Richards Point (14½ miles ESE) (5.141) and of the shoal patches lying WNW of the point across the entrance to Rodds Bay; thence:
NNE of Jenny Lind Bank (8½ miles ESE), lying at the outer end of a ridge of sand and rocks, which dries in places, extending 5½ miles NE from Tiber Point. Seal Rocks, with a boulder 1 m in height near their centre, lie on this ridge.

5.179

- 1 **From north** the track from Curtis Channel to the boarding ground for Gladstone pilots (23°51'·9S 151°32'·7E) leads generally S as required, passing:

Not less than 1½ miles to seaward of Facing Island (23°51'S 151°23'E) which is fringed with rocks. Sable Chief Rocks, one of which does not cover, 4½ miles SE of North Point (23°45'·2S 151°20'·0E), and a bank with a depth of 3 m over it, 7 miles SE of the point, are the outermost dangers off the coast and lie within the red sector (313°–359°) of North Point Light, a white metal framework tower, standing on the same point. Thence:

- 2 To seaward of East Banks, extending 6 miles ESE from Gatcombe Head (23°52'·9S 151°22'·5E) (5.180). The banks dry in patches and break heavily in bad weather.

5.180

- 1 **Useful marks** shown on chart Aus 366 view C:
Table Hill (24°00'S 151°40'E), the highest point of Rodds Peninsula.
Hummock Hill (24°01'S 151°28'E).
Gatcombe Head (23°52'·9S 151°22'·5E), a bold and prominent bluff at the S extremity and highest part of Facing Island.

South Channel**5.181**

- 1 From the vicinity of the boarding place for Gladstone pilots (23°51'·9S 151°32'·7E) the track leads initially SW into South Channel which is formed by cuttings passing SW between Jenny Lind Bank (23°56'·5S 151°31'·3E) (5.178) and East Banks (2½ miles WNW) (5.179), thence S of East Banks, thence WNW between East Banks and West Banks which dry on their inner part and which extend 7 miles SE from South Trees Point (23°51'·2S 151°18'·7E). When abreast Gatcombe Head (23°52'·9S 151°22'·5E), South Channel leads into Gatcombe Channel. Each cutting is dredged over a minimum width of 183 m (see 5.156 for controlling depth) and is marked by leading light-beacons and by pairs of variously synchronised light-beacons (lateral or special), numbered from seaward, which stand outside the limits of dredging and are conspicuous on radar. See the relevant *Admiralty List of Lights* for details of the synchronisation of these lights.

- 2 **Caution.** The intersections at each end of Boyne Cutting (23°56'S 151°28'E) are widened on their N sides only to facilitate navigating the bends, which should be rounded by passing midway between each pair of light-beacons. A vessel holding too long to the leading lines in the approach to these bends risks swinging close to shoal ground at the S edge of the cuttings.

- 3 **Wild Cattle Cutting Leading Light-beacons:**

Front light-beacon (white triangle point up on framework tower) (23°58'·9S 151°25'·2E), standing close to the low-lying and wooded foreshore of Wild Cattle Island.

Rear light-beacon (white triangle point down on similar tower) (2·7 miles SW of the front beacon), standing on higher ground.

- 4 The alignment (224¼°) of the above light-beacons, which are difficult to see during the afternoon in summer, leads into and through Wild Cattle Cutting, making allowance for tidal streams (5.174). The lights can be displayed by day on request, but then extinguish automatically after 35 minutes. The track passes (positions

from Golding Cutting outer front light-beacon (23°56'·3S 151°27'·3E)):

- 5 SE of the Fairway Light-buoy (safe water) (4½ miles NE), thence:

Between S1 Light-beacon (starboard hand) (3¾ miles NE) and S2 Light-beacon (port hand) (370 m SE of S1), marking the entrance to South Channel; thence:

- 6 Between pairs of light-beacons numbered S3 to S8 (lateral), thence:

Midway between S9 Light-beacon (special) (1½ miles NE), marking the intersection with Boyne Cutting (see Caution above), and S10 Light-beacon (port hand) (490 m SE of S9); Curtis Rock lies 3 cables S of S10 Light-beacon. A channel, with a least charted depth of 9 m, leads into the E side of Wild Cattle Cutting between Light-beacons S8 and S10, as shown on chart Aus 246.

- 7 **Boyne Cutting Leading Light-beacons:**

Front light-beacon (white triangle point up on framework tower, 9 m in height) (23°56'·4S 151°21'·9E), standing close to Canoe Point; a red cliff, 27 m in height, stands 7½ cables SE of the point.

- 8 Rear light-beacon (white triangle point down on framework tower) (9½ cables W of the front beacon), standing on higher ground behind the village of Boyne Island.

The alignment (263¾°) of the above light-beacons (lights also displayed by day) leads through Boyne Cutting. The track passes (positions from the Golding Cutting outer front light-beacon):

- 9 Between pairs of light-beacons numbered S11 to S14 (lateral); thence, if joining Golding Cutting:

Midway between S15 Light-beacon (special) (8 cables NW), marking the intersection with Golding Cutting (see Caution above), and S16 Light-beacon (port hand) (460 m SSW of S15), making due allowance for tidal stream: see 5.174.

For Golding Bypass Cutting, the track continues along the 263¾° alignment (above), passing N of S16 Light-beacon, to the intersection with the Bypass.

- 10 **South Trees Point Leading Light-beacons:**

Front light-beacon (port hand) (23°51'·9S 151°19'·8E), standing 1·1 miles ESE of South Trees Point and on the edge of drying flats of mud and sand.

Rear light-beacon (metal framework tower), light also displayed by day (1·14 miles WNW of the front beacon), standing on South Trees Point. The point is low but identifiable by a conspicuous storage shed standing on it.

- 11 **Golding Cutting outer leading light-beacons:**

Front light-beacon (23°56'·3S 151°27'·3E), standing 4 cables S of the W end of Boyne Cutting.

Rear light-beacon (1·2 miles ESE of the front beacon).

The alignment (302½°) of the above South Trees Point Leading Light-beacons, which are difficult to see in the afternoon against the background of the storage shed, leads through Golding Cutting on the centreline of the cutting.

- 12 The alignment (122½°), astern, in the quick and isophase sectors (both 119°–125°) of the outer leading light-beacons (lights may also be displayed by day), leads on the centreline through Golding Cutting, passing (positions from South Trees Point front leading light-beacon):

- Between pairs of light-beacons numbered S17 to S28 (lateral); S28 Light-beacon marks the SE limit of Gatcombe Bypass (see below); thence:
- 13 SSW of S29 Light-beacon (starboard hand) (3½ miles ESE), thence:
SSW of S31 Light-beacon (special) (3 miles ESE), marking the junction with East Channel (5.189).
Golding Bypass Cutting Leading Light-beacons:
Front, G2 Light-beacon (special) (23°53'·3S 151°22'·0E).
Rear, Price Light-beacon (23°52'·8S 151°21'·0E).
- 14 The alignment (302½°) of the above light-beacons leads through Golding Bypass Cutting, which has a maintained depth of 7·3 m, to the junction with Gatcombe Channel, passing:
NNE of SB18, SB22 and SB26 Light-beacons (special) (respectively 6¾, 5¾ and 4¾ miles SE), and:
SSW of the light-beacons (port hand) marking the SSW limit of Golding Cutting, thence:
To the intersection with Gatcombe Channel (5.182).

Gatcombe Channel

5.182

- 1 From the inner end of South Channel abreast Gatcombe Head (23°52'·9S 151°22'·5E) (5.180), Gatcombe Channel leads 3½ miles NW between West Banks and Facing Island to join Auckland Channel in the swinging basin abreast South Trees Point. The channel has a dredged width of 183 m at the controlling depth given at 5.156.
- 2 Gatcombe Bypass (Bypass Cutting), with a maintained depth of 12·5 m, adjoins the SW side of Gatcombe Channel. Subject to there being sufficient water for safe navigation, passing is permitted between S27 and S28 Light-beacons (23°54'·1S 151°23'·6E) and South Trees Wharf 5¼ miles NW; see 5.169 for passing regulations.
- 3 **Gatcombe Channel Leading Light-beacons:**
Front light-beacon (white round tower, 2 m in height) (23°49'·1S 151°17'·2E), standing on Datum Point at the S extremity of Quoin Island. The summit of the island is wooded to a height of 44 m.
Rear light-beacon (white round tower, 2 m in height) (1·56 miles NW of the front beacon), standing near the S end of Turtle Island, which is wooded.
- 4 The alignment (312°) of the above light-beacons leads through Gatcombe Channel. The lights can be displayed by day on request, but then extinguish automatically after 35 minutes.
Gatcombe Bypass Leading Light-beacons:
Front, Q2 Light-beacon, (special) (2 miles SE of Datum Point (23°49'·1S 151°17'·2E) above). The beacon also marks the SE extremity of Middle Bank at the SW entrance point to Quoin Channel.
Rear, Gatcombe Channel front light-beacon on Datum Point.
- 5 The alignment (313½°) of the above light-beacons leads from G2 Light-beacon (see below) through Gatcombe Bypass. G4 Light-buoy (1½ miles SE of Q2 Light-beacon) (see below) is moored on the same alignment.
The tracks through Gatcombe Channel and Bypass lead NW, passing (positions from South Trees Point (23°51'·2S 151°18'·7E)):
- 6 NE of Gatcombe Emergency Anchorage (4 miles SE) (5.192), thence:
Clear of G2 Light-beacon (special) (3½ miles SE), which marks the SW limit of Gatcombe Bypass and may be passed on either side; and:

- 7 SW of E3 Light-beacon (starboard hand) (3¾ miles SE), marking the N side of the bar at the inner end of East Channel (5.189); thence:
SW of G1 Light-buoy (starboard hand) (3¼ miles SE), marking shoal and foul ground extending from shore between Gatcombe Head and Rocky Point, 6 cables NW; thence:
- 8 SW of South Trees Anchorage (2¼ miles ESE) (5.192), thence:
NE of G4 Light-buoy (special) (1 mile ESE), marking the N limit of Gatcombe Bypass.
Thence the track leads into South Trees swinging basin and Auckland Channel.

5.183

- 1 **Useful marks:**
Chimneys (23°51'·9S 151°17'·6E) of Queensland Alumina Refinery; the refinery lights are prominent at night.
Round Hill (133 m in height) (23°52'·2S 151°15'·3E).
View Hill (121 m in height) (23°47'·0S 151°16'·7E).
Ship Hill (23°46'·2S 151°13'·0E).

Auckland Channel

5.184

- 1 Auckland Channel leads WNW from the swinging basin abreast South Trees Point (23°51'·2S 151°18'·7E) to join Clinton Channel 3½ cables N of Auckland Point (23°49'·9S 151°15'·2E). The channel has a width of 180 m (see 5.156 for controlling depth) and passes between Auckland Point and Middle Bank, which dries in parts and extends 4½ miles ESE from Witt Island (23°48'·2S 151°14'·5E) to occupy much of the centre of the harbour. The centreline of Auckland Channel is marked at each end by leading lights. Light-beacons marking the sides of the channel are synchronised: see *Admiralty List of Lights*.
- 2 Auckland Bypass Channel, with a maintained depth of 6·8 m, lies on the NNE side of Auckland Channel between the swinging basin off South Trees Point and Rich Rocks abreast Barney Point, as shown on the charts.
Auckland Channel Direction Lights, (two horizontal lights 10 m apart; displayed by day and night) (23°49'·1S 151°14'·2E), standing on the causeway access to Clinton Wharf.
- 3 **Facing Island Leading Light-beacons:**
Front light-beacon (white round tower, 2 m in height) (23°52'·2S 151°22'·0E), standing on the island foreshore 9 cables NW of Gatcombe Head.
Rear light-beacon (similar beacon) (5½ cables ESE of the front beacon).
- 4 The line of bearing 293¼° in the 10 m width white sector of the above direction lights, and the alignment (113¼°), astern, of Facing Island Leading Light-beacons which are difficult to see by day, lead WNW through Auckland Channel. The Facing Island lights can be displayed by day on request but then extinguish automatically after 35 minutes. The track passes (positions from Barney Point (23°50'·2S 151°16'·3E)):
- 5 Through South Trees swinging basin (3 miles ESE), with a maintained depth of 15·8 m. The line of bearing 102½° of Manning Reef Light (4¾ miles ESE), astern, leads through the N side of the basin. The track continues:
NNE of Boyne Wharf (3 miles ESE); a light is displayed from a dolphin at the SE end of the wharf; thence:
- 6 NNE of South Trees Wharf (2½ miles ESE), thence:

Between A1 Light-beacon (starboard hand) (2 miles ESE) and A2 Light-beacon (port hand) 1½ cables SSW of A1. Parsons Point Light-buoy (special), marking shoal water W of the approaches to South Trees Wharf, is moored 1 cable farther SSE. Thence:

- 7 Between A3 and A4 Light-beacons (lateral) (1 mile ESE), thence:
NNE of A6 Light-buoy (port hand) (2¼ cables ENE), marking shoal depths S of the dredged approach to Barney Point Wharf; and:
SSW of A5 Light-beacon (starboard hand) (3½ cables NE), marking Rich Rocks; thence:
- 8 NNE of Barney Point Wharf (1 cable N); a light is displayed from the E end of the wharf. Clinton Bypass Channel (5.186) joins the channel in this vicinity from between WNW and NW; thence:
NNE of the Tug Berths (3 cables WNW), thence:
NNE of Auckland Point Wharves (6 cables WNW); a light is displayed from the E end of the wharves; conspicuous silos stand close S of the wharves with tank farms extending nearly 4 cables farther S. Thence:
- 9 NNE of Auckland Point (1 mile WNW); Auckland Hill (conspicuous) stands 1½ cables S; A8 Light-buoy (port hand) (2 cables NNE of the point) marks the NE side of a reef with a least depth of 1.8 m over it; Auckland Inlet (5.205), used by small craft, is entered immediately W of the point. Thence:
SSW of A7 Light-beacon (special) (1¼ miles NW), marking the junction with Clinton Channel.

Clinton Channel

5.185

- 1 Clinton Channel, which has a maintained depth of 16.0 m over a least width of 180 m, leads NW from its junction with Auckland Channel abreast Auckland Point (23°49'·9S 151°15'·2E), to Clinton Wharf and to the swinging basin which has a maintained depth of 10.4 m.

Barney Point Leading Light-beacons:

- 2 Front light-beacon (triangle point up on black pile) (23°50'·2S 151°16'·1E), standing a little offshore 1½ cables WNW of Barney Point.
Rear light-beacon (triangle point down on yellow framework tower) (320 m SE of the front beacon).
The alignment (126¾°), astern, of the above light-beacons (lights also displayed by day), leads NW through Clinton Channel, passing (positions from Permean Point (23°48'·8S 151°14'·7E), the S extremity of Picnic Island):
- 3 SW of C1 Light-beacon (starboard hand) (4 cables S), marking a bank with a least depth of 2.8 m over it; thence:
NE of Clinton Coal Loader Wharf (4 cables SW); a light is displayed from the SE end of the wharf; and:
SW of C3 Light-beacon (W cardinal) (2½ cables SSW).
Thence the track continues NW through Clinton swinging basin.

Clinton Bypass Channel

5.186

- 1 Clinton Bypass Channel is the alternative to Clinton Channel for lighter-draught vessels and leads from abreast Barney Point (23°50'·2S 151°16'·3E) to Clinton swinging

basin, 2 miles NW. The channel has a maintained depth of 10.6 m and passes between the shallow bank (5.185) on the NE side of Clinton Channel, and the W end of Middle Bank.

5.187

Directions.

Leading Light-beacons:

- 1 Front CB2 Light-beacon (port hand) (23°49'·2S 151°15'·1E).
Rear C3 Light-beacon (W cardinal) (835 m WNW of the front beacon) (5.185).
- 2 The alignment (302¾°) of the above light-beacons leads from a position in Auckland Channel abreast Barney Point (23°50'·2S 151°16'·3E) into Clinton Bypass Channel, to pass between A7 Light-beacon (5.184) (3¾ cables SE of CB2) and CB1 Light-beacon (starboard hand) (1½ cables NNE of A7).
- 3 **Leading Light-beacons:**
Front C5 Light-beacon (triangular topmark point up, on yellow beacon and direction light) (23°48'·4S 151°14'·2E), standing N of the dredged limits of Clinton swinging basin.
Rear light-beacon (direction light; triangular topmark, point down) (870 m NW of the front beacon), standing on Tide Island.
- 4 The alignment (314°) of the above light-beacons leads NW, passing (positions from the front light-beacon):
Between A7 and CB1 Light-beacons (1½ miles SE), thence:
NE of CB2 Light-beacon (1¼ miles SE), thence:
NE of CB4 Light-beacon (port hand) (1 mile SE), marking the NE side of the shallow bank (5.185).
- 5 Thence the track leads as required between WNW and NW into Clinton swinging basin, passing:
Between Permean Point (7 cables SE) and C3 Light-beacon (5.185), 2½ cables SSW of the point.

Targinie Channel

5.188

- 1 Targinie Channel leads WNW from Clinton swinging basin (23°48'·7S 151°14'·3E) to Fishermans Landing Wharves ¾ miles WNW; a conspicuous silo stands 1¼ miles WSW from the head of the wharf. The channel passes between extensive drying flats on the S shore lying W of Clinton Wharf (23°49'·0S 151°14'·4E), and Curtis Island with its off-lying islands and banks, to N. The channel has a maintained depth of 10.6 m over a width of 120 m. The channel is marked at its ESE end by leading lights, and on its sides by synchronised light-beacons and by light-buoys.
- 2 **Targinie Channel Leading Light-beacons:**
Front light-beacon (yellow St. George cross, on orange rectangle, yellow stripe on black pile) (23°48'·8S 151°14'·8E), standing about 1 cable SE of Permean Point.
Rear light-beacon (orange rectangle, yellow stripe on black pile) (7½ cables ESE of the front beacon), standing on Middle Bank.
- 3 The alignment (113½°), astern, of the above light-beacons leads WNW through Targinie Channel, passing (positions from Permean Point (23°48'·8S 151°14'·7E)):
SSW of C5 Light-beacon (7 cables NW) (5.187), thence:
- 4 SSW of Tide Island (1 mile NW); Ripple Rock (which dries 2.4 m), marked by a light-beacon (starboard hand), lies at the extremity of a drying

sandspit extending 1 cable WSW from the island. Thence:

NNE of T2 Light-buoy (port hand) (1¼ miles WNW), marking an isolated shoal patch close outside the channel; thence:

- 5 Between T1 Light-beacon (starboard hand) (2¼ miles WNW) and T4 Light-beacon (port hand) (1 cable SSW of T1). T1 Light-beacon marks the SE extremity of a bank extending about 3½ miles NW, large parts of which dry and on which stand South and North Passage Islands. Thence (positions from the head of Fishermans Landing No 4 Wharf (23°47'2S 151°10'6E)):

- 6 Between T3 Light-beacon (starboard hand) (1¼ miles ESE) and T6 Light-beacon (port hand) (1 cable SSW of T3), thence:

NNE of T8 Light-buoy (port hand) (8 cables ESE), marking the NE limit of a bank, with depths less than 5 m over it, extending from shore.

- 7 Thence the track leads into the dredged swinging basin abreast Fishermans Landing Wharves. The limits of the dredged area are marked by light-buoys (special).

Passage beyond Fishermans Landing Wharves through The Narrows to Keppel Bay is limited to small craft and is described at 5.209.

Side channels

East Channel

5.189

- 1 **General information.** East Channel lies between the SE side of Facing Island (23°52'S 151°23'E) and East Banks, 5 cables ESE. The channel, which is obstructed by a bar at its SW end joining East Banks with Gatcombe Head, provides a shorter and sheltered route into the port from N for small vessels of appropriate size and draught.

Controlling depth: 1.9 m at the inner bar.

Local knowledge is required.

5.190

- 1 **Directions.** The channel is approached from seaward between E and ENE of East Point (23°51'9S 151°23'5E), 40 m in height, cliff-faced and wooded; East Point Light (5.176) stands on the point; East Point Ledge, which dries, extends 8½ cables N from the point. The channel is then entered passing SSW between East Point and E2 Light-beacon (port hand) (4½ cables E), marking the N extremity of East Banks. E1 Light-beacon (starboard hand) (9 cables S of East Point) stands SE of foul ground, with a dangerous wreck at its seaward end, extending from Settlement Point. A beacon (starboard hand), 7 cables SW of Settlement Point, marks Oyster Rock, which dries and is connected to Gatcombe Head by a shingle ridge.

Quoin Channel

5.191

- 1 Quoin Channel lies between North Bank (23°49'0S 151°17'5E), which dries and on which stands Quoin Island, and Middle Bank 5 cables SW. From its entrance between the SE extremities of these two banks, the channel leads WNW before narrowing to its head between Turtle Island (23°47'8S 151°15'9E) and Diamantina Island 5 cables SW, where the least depth in the fairway of about 3 m is found and where it gives access to Compigne and North Channels.

The deeper SE part of Quoin Channel is marked by light-beacons (special and lateral) and is used as an anchorage (5.192).

Berths

Anchorage

5.192

- 1 Anchorage may be obtained inside the harbour in numbered berths shown on the charts clear of the main channels. Gatcombe Emergency Anchorage (23°53'5S 151°22'0E) and South Trees anchorages 2½ miles NW, in depths between 13 and 17 m, are suitable for deep-draught vessels. Quoin anchorages (23°50'0S 151°18'7E) are for vessels not exceeding 183 m LOA and 6.7 m draught.

A temporary anchorage between Barney Point Wharf (23°50'1S 151°16'3E) and Auckland Point Wharves, 4½ cables WNW, is not charted and is used only to hold vessels awaiting a change of tide before berthing.

Alongside berths

5.193

- 1 **Depths** in the berths and their approaches may vary from those charted and actual depths available are consequently promulgated at regular intervals by *Australian Temporary Notices to Mariners*. The depths given below are those promulgated in 2005 unless otherwise indicated, but the latest information should be obtained from the office of the Harbour Master before entry.

5.194

- 1 **South Trees Point.** The longer South Trees Wharf (23°51'1S 151°18'7E) has two berths with a total length of 483 m and depth alongside of 12.8 m. Boyne Wharf is 250 m in length; depth alongside 15.0 m. Fuel oil can be discharged at both berths on South Trees Wharf.

5.195

- 1 **Barney Point Wharf** (23°50'1S 151°16'3E), length 205 m; depth in approaches 13.5 m, alongside 15.0 m.

5.196

- 1 **Auckland Point Wharves** (23°49'9S 151°15'5E), four berths, total length 860 m; depth in approaches 11.5 m, depth alongside No 1 to 3 Berths 11.3 m, No 4 Berth 11.4 m. No 3 berth is the principal tanker discharge berth for the port. See 5.174 for the effects of tidal stream.

5.197

- 1 **Clinton Coal Loader Wharf** (23°49'0S 151°14'4E), three berths, total length 1090 m; depth alongside 18.8 m.

5.198

- 1 **Fishermans Landing Wharves**, also known as Targinie Berths (23°47'2S 151°10'6E). No 2 Berth, length 310 m; depth alongside 12.9 m. No 4 Berth, length 228 m; depth alongside 11.2 m. The berth is designed for vessels to berth bows SE. Bulk Liquids Berth (No 5), length 220 m; depth alongside 11.2 m.

Port services

Repairs

5.199

- 1 Minor repairs can be undertaken.

Other facilities

5.200

- 1 Customs board at the anchorage or at the berth.

A telephone service and garbage disposal facilities are available at all berths; facilities for the disposal of oily waste are available using road tankers; no tank cleaning facilities. Deratting can be carried out.

Hospital in Gladstone.



South Trees Point

Gladstone from SE (5.194)

(Original dated 1999)

Supplies

5.201

- 1 Fresh provisions and other stores are plentiful and can be delivered to anchorages by boat or helicopter if required; fresh water and electric power supplies are laid to the berths.

Oil bunkers are available by pipeline at South Trees Wharf; diesel and lubricating oils are available at all berths by road tanker.

- 2 A 60 m LOA self-propelled bunkering barge is available to supply Bunker C Fuel Oil and diesel to ships at all wharves and inner anchorages. The service is also available, weather permitting, at outer anchorages to vessels transiting the Inner Route that do not otherwise require to enter harbour. Fresh water and stores can also be supplied from the barge.

Rivers, channels and inlets

Boyne River

5.202

- 1 **Description.** Boyne River is entered 5 cables NW of Canoe Point (23°56'3S 151°22'0E) (5.181) but the approach to the river is obstructed by Entrance Ledge, a stony spit which dries, extending 8 cables N from the point. The village of Boyne Island lies on the W side of the entrance.

The approach channel, which dries, is marked by beacons.

A road bridge and an overhead power cable cross the river 7 cables SW and 2 miles SSW respectively of Canoe Point.

South Trees Inlet

5.203

- 1 **Description.** South Trees Inlet is entered between South Trees Point (23°51'2S 151°18'7E) and Parsons Point, a low, mangrove-covered point 9 cables W, with a disused jetty at its N extremity. The inlet is fringed with mangroves and has a least depth of 2.1 m in the fairway for a distance of 1½ miles, from where it is obstructed by islets and shallows.
- 2 A conveyor bridge, with a vertical clearance of 4.7m beneath its central part, crosses the inlet 3 cables within the

entrance. A gas pipeline (see 1.44) crosses the inlet close N of the bridge.

Local knowledge is required.

Tidal streams attain a rate of 1½ to 2 kn as shown on the chart.

Facing Channel

5.204

- 1 **Description.** Facing Channel leads from the vicinity of Bushy Islet (23°50'3S 151°20'2E) between North Bank and Pelican Banks to a position E of Tail Point, 3¾ miles NW, where it joins North Channel (5.207). The channel is narrow in its NW part and has a least depth of 2.0 m in the fairway.
- 2 Bushy Islet, at the SE entrance to the channel, lies on a drying reef at the S end of a drying spit of reefs and mangrove islands, which extends from Facing Island and forms the W side of Shoal Bay. A light-beacon stands 1 cable S of Bushy Islet and Q1 Light-beacon (starboard hand), marking Quoin Channel, stands 7 cables W. Apart from these lights, Facing Channel is unmarked.

Auckland Inlet and Boat Harbour

5.205

- 1 **Description.** Auckland Inlet lies close W of Auckland Point (23°49'9S 151°15'2E). Two light-buoys (lateral) mark the entrance to a dredged channel which leads to an extensive Boat Harbour 1½ cables within the entrance, and to the inlet itself, which continues generally SW.
 - 2 The Boat Harbour, with depths between 2.3 and 3.7 m, contains a marina, a ferry terminal, service and fuelling jetties, a trawler base and fish processing pontoon, and trots of small craft swinging moorings. A slip, the outer end of which is marked by two light-buoys (special), is situated in the NW corner of the harbour.
 - 3 Auckland Inlet contains a number of wharves with alongside depths between 1.2 and 3.5 m (1985); depths are taken at 1.5 m off the faces of the wharves. There are several boat ramps and numerous small craft moorings in the inlet.
 - 4 A bascule bridge, with a vertical clearance of 2.2 m, crosses the inlet upstream of O'Connell Wharf.
- Tidal streams** in the inlet are strong and great care is necessary.
- Speed limit** of 4 kn is in force in the inlet.

Facility. A small slipway situated on the E side, close to the mouth of the inlet, has a capacity of 100 tonnes and can take two vessels of maximum 30.5 m LOA and 6 m beam simultaneously.

Calliope River

5.206

- 1 **Description.** Calliope River enters the fairway of the port of Gladstone over a shallow bar, marked by buoys, 5 cables WNW of Clinton Coal Loader Wharf (23°49'0S 151°14'4E). The SE side of the river close within the entrance is formed by a bund wall retaining an extensive reclaimed area which is used to stockpile coal.

- 2 A road bridge with a vertical clearance of 7.9m crosses the river 2½ miles above the entrance: a number of overhead power cables and a rail bridge cross farther upstream.

Local knowledge is required.

North Channel

5.207

- 1 **Description.** North Channel, lying between Facing Island (23°49'S 151°21'E) and Curtis Island 1 mile NW, is obstructed by parts of Pelican Banks, which dry and across which the channel passes. The channel leads generally SW to a junction with Facing Channel E of Tail Point (23°47'8S 151°17'1E). Thence between Tail Point and Panorama Point on Quoin Island, 3 cables S to join the head of Quoin Channel between Turtle Island (1 mile W of Tail Point) and Roma Rock, 5½ cables farther SW.

- 2 **Tidal stream** runs strongly in the channel and over the banks.

Controlling depth. Information on the controlling depth should be obtained from the office of the Harbour Master.

Local knowledge is required.

5.208

- 1 **Directions.** The channel is approached from NNW of North Point (23°45'2S 151°20'0E) (5.179) on Facing Island, and entered between that point and the SE extremity of Curtis Island, 8½ cables W. The village of Southend, where there is a boat harbour, stands close W of the latter point.

North Channel Leading Light-beacons:

- Front light-beacon (triangle point up on yellow beacon) (9½ cables SSW of North Point Light).
- 2 Rear light-beacon (triangle point down on yellow beacon) (440 m SSE of the front beacon).

The alignment (168½°) in the intensified sector (166½°–170½°) of the above light-beacons marks the approach and the entrance channel and leads close WSW of North Channel Fairway Light-beacon (port hand) (3 cables NNW of the front beacon) to a position 1½ cables farther SSE.

- 3 **Farmers Reef Leading Light-beacons:**

Front light-beacon (triangle point up on white tripod) (1.3 miles SW of North Point Light), standing on Farmers Reef.

Rear light-beacon (triangle point down on white tripod) (125 m SW of front beacon).

- 4 The alignment (219½°) of the above light-beacons leads from the entrance channel towards Farmers Reef. Southend Channel, marked by four light-beacons (lateral), leads NW from this alignment to the boat harbour at Southend.

From the vicinity of Farmers Reef the channel, marked by numbered light-beacons (special and lateral), leads generally SW to Tail Point and thence to the head of Quoin Channel.

Charts Aus 366, Aus 819

The Narrows

5.209

- 1 **Description.** The Narrows, lying between Curtis Island (23°40'S 151°10'E) and the mainland, provides access for small craft from the port of Gladstone to Keppel Bay, 25 miles NW.

The channel is marked by leading lights and beacons, and by light-beacons (lateral). The direction of buoyage is from S to N.

- 2 **Limiting conditions.** The least depth in the channel is found over a 2 mile stretch abreast Munduran Creek (23°39'S 151°05'E), on the mainland side, where it dries 2.0 m (7 ft) (1992). Advice on the maximum draught for passage of the channel should be sought locally.

A **submarine cable** crosses the channel between Munduran Creek and Christo Creek, 1 mile ENE; the landing places are marked on shore by white huts with red stripes.

- 3 **Local knowledge** and great care are required.

Tidal streams. The in-going streams on the rising tide set S from Keppel Bay and initially N from Gladstone before meeting in the vicinity of Munduran Creek. Thereafter the stream from Keppel Bay exerts a stronger influence and gradually establishes a S-going stream throughout the length of the channel.

The S-going stream attains a rate of 3 kn at springs.

- 4 **Useful marks:**

Central Hill (23°38'8S 151°06'6E), 83 m in height, with a remarkable gap at the summit.

Red cliffs on the W side of the channel at Worthington Island (23°42'5S 151°08'4E), Redcliffe Island 5 cables NW, and at Blackswan Island 5 cables farther N.

GLADSTONE TO CAPE TOWNSHEND

General information

Charts Aus 366, Aus 367, Aus 819, Aus 820, Aus 822

Routes

5.210

- 1 From a position off Bustard Head (24°01'S 151°46'E) in the SE approaches to the port of Gladstone, the coastal route leads NNW for 130 miles to the vicinity of Cape Townshend. The route passes through the NW part of Curtis Channel, lying between the mainland and Capricorn Group of reefs, and rejoins the route through Capricorn Channel in the vicinity of High Peak Island (21°57'S 150°41'E).

An alternative route NNW which passes closer inshore off Cape Townshend is also described.

Topography

5.211

- 1 The E side of Curtis Island (23°40'S 151°10'E) is hilly with the coast itself being formed of sandy beaches broken by rocky points, except for a stretch of cliffs between Connor Bluff and Black Head. The N side of the island is moderately high and wooded but the coast lying at the foot of this higher ground is generally low and sandy or swampy with a shallow coastal bank extending some distance offshore. The W shore of Keppel Bay, from Cattle Point (23°29'S 150°52'E) to Emu Point 13½ miles N, is similarly low but ranges of mountains, wooded almost to their summits, rise behind: Mount Sleipner and Mount Archer, 15 and 19 miles NW of Cattle Point, are the highest of these summits.

Great Keppel I.



Corroboree I.

Pleasant I.

North Keppel I.

Keppel Isles from NW (5.211)

(Original dated 1999)

² Keppel Isles (23°08'S 150°55'E), standing on the N side of Keppel Bay, consist of many, mostly prominent, islands and bold rocks rising from an extensive shoal area. In the S group, Humpy, Halfway, Middle and Miall Islands stand adjacent to Great Keppel Island; and in the N group Sloping, Pumpkin, Corroboree and Pleasant Islands stand near North Keppel Island. Conical Rocks (23°02'S 150°53'E) are the N-most dangers of Keppel Isles: the outermost dangers S and E are described in the relevant parts of the text.

³ The S extremity of Coast Range of hills reaches the coast at Yeppoon (23°08'S 150°45'E), with Mount Barmoya rising 2 miles NW of the town. From Yeppoon to near Cape Manifold, 26½ miles N, the coast is again low and fronted by a sandy beach, except where this is broken by Corio Bay and Water Park Point: the background is formed by the same Coast Range with Mounts Ganter and Parnassus at the higher N end of the range, with a peak (711 m in height) between, and by the prominent Mount Atherton (22°46'S 150°45'E) nearer the coast. From 4 miles S of Cape Manifold the coast is rock-fringed and rises quickly to the Manifold Hills behind.

⁴ The E coast of Cape Clinton peninsula between Cliff Point (22°39'S 150°49'E) and Cape Clinton, 7 miles N, is formed mainly of sandy beach backed by a sparsely wooded sand ridge.

Between the entrance to Port Clinton (22°30'S 150°47'E) and Cape Townshend 24 miles NW, the coast, except in Pearl Bay, is generally cliffy and indented. Peninsula Range, with Mount Westall, forms the background.

Depths 5.212

¹ General depths of about 18 m are found in the S part of the coastal route off the port of Gladstone, but from there N depths gradually increase. From the latitude of Cape Manifold (22°41'S 150°50'E) NNW to Cape Townshend, the coastal 30 m depth contour lies 4 miles or less offshore.

5.213

¹ **Caution.** The colour of the water in Keppel Bay, entered NW of Cape Capricorn (23°29'S 151°14'E), can be deceptive. The shores of this generally shallow bay are soft and muddy and the water running through the deeper channels on the latter part of the out-going tidal stream is liable to be thick; whereas water over the shoals, where the stream no longer runs at that state of the tide, tends conversely to be clear.

Exercise area 5.214

¹ **Shoalwater Bay Military Training Area.** The limits of this area are shown on chart Aus 367 and extend along the coast from a position 5 miles S of Cape Manifold (22°41'S 150°50'E) to the vicinity of Cape Townshend, 38½ miles NNW; thence across the mouth of Shoalwater Bay to Macdonald Point (22°19'S 150°11'E). The waters within the area are closed to public access during the conduct of Defence Department practices. All creeks within the area are permanently closed to public access, except that shelter from heavy weather may be sought in Freshwater Bay,

3½ miles NW of Cape Manifold, Port Clinton (22°30'S 150°46'E), and Pearl Bay (22°25'S 150°42'E).

Pilotage

5.215

- 1 See 5.9.

Local knowledge

5.216

- 1 Local knowledge is required for inshore navigation amongst Keppel Isles (23°08'S 150°55'E) (5.211), but such passages are preferably avoided.

Flow

5.217

- 1 **Tidal streams.** The general set of the stream along this part of the coastal route is W and towards the shore on the rising tide; but, as may be seen from the tidal stream information given on the charts, direction is much influenced by the configuration of the coast.

Tidal streams in Keppel Bay, in the approaches to the port of Rockhampton, are described at 5.230: inshore streams elsewhere are described in other relevant parts of the text.

Current. See 5.14.

Major lights

5.218

- 1 Bustard Head Light (24°02'S 151°46'E) (5.78).
East Point Light (23°51'9S 151°23'5E) (5.176).
Cape Capricorn Light (white concrete tower, 7 m in height) (23°29'S 151°14'E), standing on the summit of the cape.
High Peak Island Light (21°57'S 150°41'E) (5.63).

Directions

(continued from 5.81)

Main route

5.219

- 1 From a position 8 miles NNW of Bustard Head (24°01'S 151°46'E) the track leads initially NW, passing (positions from Bustard Head):
NE of the approaches (15 miles WNW) to the port of Gladstone; (see view C on chart Aus 366). Thence:
2 To a position between Facing Island (22½ miles WNW) (5.179) and the W end of Rock Cod Shoal (21½ miles NNW), which has depths of less than 10 m over it. A bank with a least charted depth of 12.5 m, lies 7¼ miles ESE of Rock Cod Shoal. The water between these banks and Capricorn Group of reefs has been only incompletely surveyed.
3 Thence the track leads NNW to a position 5 miles NE of Cape Capricorn (23°29'S 151°14'E), passing (positions from Cape Capricorn):
ENE of North Point (17 miles SSE) (5.179), pilots may be embarked off the point (see 5.167); thence:
4 Clear of the wreck of a sailing vessel with a depth of 14.1 m over it (15 miles SE); thence:
ENE of a patch with a depth of 11.6 m over it (12 miles SSE); the dangerous wreck of a fishing vessel lies close NW of the patch, another patch of

10 m is charted 1½ miles W of the same patch. Thence:

- 5 NNE of the two Rundle Islands (3¾ miles SE), lying on a drying reef; the NE island is 20 m in height, the SW island is a low sand cay. Depths of less than 10 m extend to 8 cables around the SW island. The S group of Bass Shoals, with a depth of 3.6 m over them, and the W group with a depth of 4.6 m over them, lie 2 miles SSW and 1½ miles W respectively, of the NE island. Rundle Islands and Bass Shoals are covered by the red sector (307°–005°) of Cape Capricorn Light. Thence:
6 ENE of Cape Capricorn, so-named by Captain Cook for its latitude. The cape is bold, white and barren and is steep-to on its NE side; it is surmounted by Cape Capricorn Light (5.218). Depths less than 15 m extend NNW from Rundle Islands to 1¼ miles E of the cape; a 14.3 m patch lies 8 cables NE of the cape. An approach route to the port of Rockhampton (23°23'S 150°31'E) (5.223) leads WNW from the vicinity of the cape, and an alternative inshore route NNW (5.220) to Cape Townshend diverges from the same vicinity.
7 Thence the track continues NNW to a position 3½ miles NE of High Peak Island (21°57'S 150°41'E), passing (positions from Egg Rock (23°12'S 151°06'E)):
ENE of Hummocky Island (12½ miles SSE), covered with grass and a few trees and formed of three well-marked hummocks (see view B on chart Aus 366). A spit, with depths less than 10 m over it, extends 1 mile NW from the island and there are similar depths within 7 cables of the W extremity of the island. Ship Rock lies 1¼ miles ESE and Fairway Rock lies 1 mile SSE of the island. Thence:
8 ENE of Egg Rock, the E-most of the islands and rocks forming Keppel Isles (see view A on chart Aus 366) on the N side of Keppel Bay. The rock is steep-to on its S side but has two above-water rocks lying close off its E side. Thence:
9 ENE of Barren Island, also known as First Lump, (2½ miles NNW), precipitous. The Child, a cliffy rock 48 m in height, stands 2 cables NE of the island. Thence (positions from Clara Group (22°20'S 150°43'E)):
ENE of The Pinnacles (32½ miles SSE), a shoal with a depth of 19.6 m over it, thence:
ENE of Flat Island (28 miles SSE), steep-to and bare, thence:
10 ENE of Peak Island (23½ miles SE), (Peaked Island on chart Aus 367), steep-to and bare; part of its rock structure is perforated and light can be seen through it from SE; thence:
ENE of Clara Group, the N group of Hervey Islands. Clara Group consists of three islets and a number of rocks; a light (white GRP hut, 2 m in height), is displayed from Clara Islet, 62 m in height and the largest. Thence:
11 ENE of Cheviot Island (15 miles N), the SE-most of Northumberland Isles; a rock which dries 3 m lies off the N end and there are overfalls off the S end of the island. Rothbury and Berwick Islands, both rocky and bare except for a few bushes, lie 3½ miles NNW and 5½ miles N; Tweed Island, thickly wooded except at its SE extremity, lies 4½ miles NNW of Cheviot Island. Above-water rocks extend 3 cables SSE from Rothbury Island

with overfalls farther S; overfalls also occur N and S of Berwick Island. Thence:
ENE of High Peak Island (22 miles N) (5.65). Curtis and Capricorn Channels converge in this vicinity.
(*Directions continue at 6.54*)

Alternative route

5.220

- 1 From the vicinity of a position 5 miles NE of Cape Capricorn (23°29'0S 151°14'0E) (5.219), an alternative route leads generally NNW and inshore of the main route described above to pass between Cape Townshend (22°12'S 150°29'E) and High Peak Island, 18 miles NE. The route subsequently rejoins a continuation of the main route NE of Bailey Islet (21°02'S 149°33'E). The track leads initially NNW to a position 4 miles ENE of Clara Group (22°20'S 150°43'E), passing (positions from Egg Rock (23°12'S 151°06'E)):
- 2 ENE of Hummocky Island (12½ miles SSE) (5.219), thence:
ENE of Egg Rock (5.219), thence:
ENE of Barren Island (2½ miles NNW) (5.219), thence (positions from Clara Group):
ENE of The Pinnacles (32½ miles SSE) (5.219), thence:
WSW of Flat Island (28 miles SSE) (5.219), thence:
- 3 WSW of Peak Island (23½ miles SE), (Peaked Island on chart Aus 367) (5.219), and:
ENE of Cape Manifold (22 miles SSE), composed of rocky heads with sandy beaches between; the land behind rises quickly to the high, bold and wooded Manifold Hills. An islet, sparsely covered with vegetation, lies 3 cables E of the cape, with an above-water rock between; tide-rips occur N of the islet and rock. Thence:
- 4 ENE of Quoin Island (14½ miles SSE), a rocky patch, which dries 0.6 m lies 2 cables SSW of the island; thence:
ENE of the N end of Cape Clinton peninsula (12 miles SSE), identifiable by Mount Flinders, 152 m in height and well-defined, standing 1½ miles WSW of Cape Clinton. The peninsula is the S entrance point to Port Clinton. Thence:
- 5 ENE of Entrance Island (9 miles SSE), which is rocky and surmounted by stands of conifers. The island lies off the N entrance point to Port Clinton; thence:
ENE of Dome Island (4½ miles SSE) which together with Split Island, close N, and a number of rocks, forms the S group of Hervey Islands. Thence:
- 6 ENE of Clara Group (5.219).
Thence the track leads NW, adjusting course as necessary to pass:
NE of a bank with a least depth of 12.4 m over it (7 miles WNW), lying off the entrance to Strong Tide Passage, thence:
- 7 1 mile SW of Leake Rock with a least depth of 9.4 m over it (10 miles NNW), marked by overfalls; the rock lies close E of a sector (010°–012°) of High Peak Island Light (21°57'S 150°41'E) (5.63) which is obscured by Cheviot Island. Thence:
SW of Cheviot Island (15 miles N) (5.219), thence:
- 8 NE of Cape Townshend (15 miles WNW), the N extremity of Townshend Island which is high, level and sparsely wooded on its E and SE sides; cliffs 120 to 150 m in height extend 2½ miles SE from the cape. Cape Island, a rock, lies at the end of a

drying rock ledge extending 4 cables W from Cape Townshend.

Useful marks

5.221

- 1 Mount Atherton (22°46'S 150°45'E) (5.211).
Mount Westall (22°22'S 150°35'E), the highest and N summit of Peninsula Range; a radio tower (15 m in height; obstruction light) stands on the summit.
(*Directions continue at 6.57*)

Strong Tide Passage

Chart Aus 822 (see 1.15)

Strong Tide Passage

5.222

- 1 **General description.** Strong Tide Passage (22°20'S 150°32'E) is the SE entrance to Shoalwater Bay, which is described at 6.83. The passage and the bay lie within Shoalwater Bay Military Training Area and are subject to restriction of access; see 5.214.
- 2 The NE entrance between Reef Point (22°19'S 150°34'E) and the SE extremity of Townshend Island, 1 mile NW, has a rocky bottom and a depth in the fairway of about 2 m. Within the entrance there are depths of more than 5 m through the greater part of the length of the passage which is partially obstructed by rocks and shoals, some of which lie in mid-channel. Crane Island, 6 m in height, bare and rocky, lies on the N side of the fairway 2 miles WSW of Reef Point. A bar of sand and shell, over which there is a depth of about 2.9 m, extends across the SW entrance.
- 3 **Caution.** The passage is dangerous at all times and not recommended.
Local knowledge is essential.
Tidal streams set through the passage at rates of 5 to 6 kn. There are overfalls in the NE entrance on the out-going stream.

Port of Rockhampton

Charts Aus 247, Aus 366, Aus 819

General information

5.223

- 1 **Position and function.** The city of Rockhampton (23°23'S 150°31'E), with an estimated population in 2004 of 65 100, stands on Fitzroy River 35 miles above its entrance. The deep-water berths and principal facilities of the port are situated at Port Alma (23°35'S 150°52'E) which is a natural deep-water harbour offering security and shelter with a minimal requirement for dredging. Port Alma is able to handle larger explosive cargoes than any other port in Queensland.
A fishing fleet operates from the port.

5.224

- 1 **Topography.** The whole area of the extensive delta of Fitzroy River and its connecting creeks lying S of a line between Sea Hill Point (23°29'5S 150°58'7E) and Cattle Point, 6 miles W, is low and mangrove-covered except for low hills rising from some of the islands. The coastal belt on the NW side of Curtis Island is similar but rises inland to the moderately high and wooded ground of Ramsay Range.
- 2 There is also higher ground on the mainland N of Fitzroy River basin where Flat Top Range extends to Broadmount (23°28'S 150°46'E), its SE summit, and where Mount Berserker 13 miles farther WNW, the SW-most of Berserker Range, rises near the city of Rockhampton.

5.225

- 1 **Port limits.** The seaward limits of the Rockhampton pilotage area are drawn from Cape Keppel (23°26'8S 151°03'5E), NW to Arch Rock, thence SSW to Cattle Point as shown on the chart. The inner limits extend to include all navigable waters and creeks and adjoin the inner limit of the port of Gladstone in The Narrows; see 5.152.

5.226

- 1 **Approach and entry.** The port is approached through Keppel Bay and entered in the vicinity of Timandra Light-buoy (23°25'1S 151°00'2E).

Traffic. In 2004 Port Alma handled 23 vessels totalling 213 475 dwt.

Port authority: Rockhampton Port Authority, PO Box 9, Rockhampton, Queensland 4700.

Website: www.cqpa.com.au

Limiting conditions**5.227**

- 1 **Controlling depth:** 7.0 m in the entrance channels to Port Alma. Depths are promulgated regularly by *Australian Temporary Notices to Mariners* but the latest information should be obtained from the Harbour Master.

Under-keel allowances. A minimum allowance of 0.7 m is required underway and a minimum clearance of 0.3 m when berthed alongside.

- 2 **Deepest and longest berth:** Longest, Port Alma No 3 berth. Deepest, Port Alma No 1 and 2 berths. See 5.241.

Tidal levels: see information in *Admiralty Tide Tables*. Mean spring range at Port Alma about 4.0 m; mean neap range about 1.9 m.

Maximum size of vessel handled. The largest vessel to have used the port has been of 26 168 grt, the longest 182 m LOA and the deepest 10.4 m.

Arrival information**5.228**

- 1 **Notice of ETA.** The ETA and maximum draught should be advised at least 24 hours in advance of when a pilot is required; subsequent alterations should be sent immediately. For details, see *Admiralty List of Radio Signals Volume 6(4)*.

- 2 **Outer anchorage.** Anchorage may be obtained 5 cables or more to seaward of Timandra Light-buoy (23°25'1S 151°00'2E) (5.232) if required. Holding ground is good but it is recommended that a minimum of 110 m (4 shackles) of cable be veered to allow for wind and tidal stream: see 5.230 for details of tidal streams.

- 3 **Pilotage** is compulsory except for exempted vessels. The boarding ground lies 1 mile NE of Timandra Light-buoy, as shown on the charts. The pilot vessel is a white launch, 15 m LOA, fitted with VHF.

Tugs are not stationed at the port but may be made available from Gladstone by prior arrangement. A launch and linesmen are available at Port Alma to assist with mooring.

- 4 Vessels exceeding 173 m LOA are required to have a bow thruster or use tug assistance; for vessels 180 m LOA and over tug assistance is compulsory.

Regulations concerning entry. Vessels carrying explosive cargo or explosives in excess of the quantity stipulated at 1.56 may proceed to berth No 2 at Port Alma but are restricted to a draught which will permit departure at any time of the day.

Quarantine. Rockhampton is a first port of entry. For extracts from the Quarantine Act see 1.64.

*Chart Aus 247***Harbour****5.229**

- 1 **General layout.** The main berthing area is at Port Alma (23°35'S 150°52'E), sited in the mouth of Raglan Creek about 13 miles from Fairway Light-buoy and approached through marked channels continuing on from Sea Reach. Anchorage areas are available off Sea Hill Point and Shell Point, both situated along this approach.

5.230

- 1 **Tidal streams – Keppel Bay.** In the approaches to the port in the outer part of Keppel Bay, and also in the N part of the bay between Keppel Isles and the mainland, the tidal stream sets S on the in-going stream to Rockhampton and N on the out-going stream. From abreast Cape Capricorn (23°29'0S 151°14'0E) however, to Hummocky Island 6¼ miles NW, these directions are reversed, probably due to an eddy; and the in-going stream to the bay sets N in this area. Close E of Cape Capricorn the in-going stream runs N for approximately 7¼ hours from about 3 hours before LW at Mackay to about 1 hour before HW at the same port; the out-going stream then runs S for approximately 4¾ hours.

- 2 In the vicinity of Cottier Bank, 7½ miles WNW of Cape Capricorn, the in-going tidal stream sets W.

The rates of the above streams have seldom been found to exceed 1½ kn.

In the vicinity of the pilot boarding ground (23°24'4S 151°01'0E), the in-going stream sets strongly W on to East and Centre Banks at spring rates up to 3½ kn; the out-going stream sets E at similar rates.

- 3 **Fitzroy River.** Off Sea Hill Point (23°29'5S 150°58'7E), the tidal streams set fairly strongly SSE/NNW through The Narrows (5.209).

In the vicinity of Oswestry Rock (23°32'6S 150°55'5E), the in-going stream has a W component setting towards Haynes Spit and the out-going stream sets towards Cardigan Point.

At Port Alma (23°35'S 150°52'E), both in and out-going streams set parallel to the line of the berths.

5.231

- 1 **Major light:**

Cape Capricorn Light (23°29'2S 151°14'2E) (5.218).

Directions**5.232**

- 1 **Approaches from south and east** should be made from the vicinity of Cape Capricorn (23°29'0S 151°14'0E).

Caution. See 5.213.

Leading mark. Peak Island, also known as Second Lump (23°20'6S 150°56'2E) shaped like a sugar loaf, bearing 293°; with Mount Wheeler (16 miles WNW of the island), the N and highest summit of Ross Range, open N of it; leads to the approach to the port of Rockhampton. A rock (23 m in height) stands close N, and Split Rock, divided into two parts, lies 5 cables NW of Peak Island; Arch Rock, with a hole through it, stands at the outer end of a reef of above and below-water rocks extending 1 mile SSE from the island.

- 2 The track passes (positions from Cape Keppel (23°26'8S 151°03'5E)):

NNE of Cape Capricorn (10 miles ESE) (5.219), thence:

NNE of a patch with a depth of 8.2 m over it (6¾ miles E), the outermost danger on the edge of steep-to shoal ground extending up to 4 miles from the N coast of Curtis Island; a 1.8 m patch

lying 1½ miles SSE of the 8.2 m patch is the N—most of depths less than 2 m which extend from there S to shore. Thence:

- 3 SSW of Fairway and Ship Rocks and Hummocky Island (6 miles ENE) (5.219); there is deep water between them; thence:

NNE of Cottier Bank (2 miles ENE); Boat Rock and numerous patches with depths less than 2 m over them, lie between the bank and Curtis Island. Thence:

To a position NNE of Cape Keppel, a green headland rising to Bald Hill, 7 cables SSE.

- 4 Thence the track leads 270° for about 4 miles, with Hummocky Island bearing astern, to the vicinity of the pilot boarding ground (¾ miles NW), passing:

N of a patch with a depth of 3.6 m over it (¾ miles N), the shoalest danger N of Keppel Rocks which consist of a rocky ridge extending from the cape. The outermost above-water danger on this ridge is a rock (17 m in height). Thence:

- 5 N of an isolated patch with a depth of 7.9 m over it (¾ miles NNW); an 11 m patch lies 6 cables farther NW; and:

N of Timandra Bank (¼ miles NW) which dries in places and which extends ¾ miles W from the outer end of Keppel Rocks. Timandra Light-buoy, also known as Fairway Light-buoy, (safe water) (¾ miles WNW) is moored off the NW side of Timandra Bank and marks the start of the entrance channel into the port.

- 6 **Caution.** See 5.230 for details of tidal streams in the vicinity of the pilot boarding ground.

Clearing bearing. The line of bearing 121° of Cape Capricorn Light (23°29'2S 151°14'2E) (5.218) passes NE of Cottier Bank (8 miles WNW of the light).

Useful marks when entering Keppel Bay:

Fairway Rock (23°25'1S 151°10'1E) (5.219) and Ship Rock, 1 mile farther ENE.

Chart Aus 820

5.233

- 1 **Approach from north.** From a position N of Keppel Bay the track leads about S in approximate longitude 151°03'E towards Cape Keppel (23°26'8S 151°03'5E), passing (positions from Cape Keppel):

E of Outer Rock (23½ miles NNW), bold and steep-to. The rock is the E—most danger of the N group of Keppel Isles. Thence:

E of Man and Wife Rocks (20 miles NNW), steep-to and standing together, thence:

- 2 1 mile W of Barren Island (17 miles N) (5.219), and: E of Great Keppel Island (Wapparaburra) (16 miles NNW), the largest of Keppel Isles. It is inhabited and covered with grass and a few trees; (see view A on chart Aus 366). A light (white GRP hut, 2 m in height) is displayed from the E point of the island; Sykes Rock (below-water) and Hannah Rock, ¾ cables ENE and ¼ miles SSE respectively from the same E point, are the E—most dangers off the island. thence:

- 3 W of Egg Rock (15 miles N) (5.219), thence:

Chart Aus 247

W of Lisa Jane Shoals, three patches with depths of 7.6 to 11.9 m over them, (8½ miles N).

Thence with Sea Hill Point (5 miles WSW) (5.235) bearing SSW, the track leads SSW to the pilot boarding

ground (¾ miles NW) and towards Timandra Light-buoy (¾ miles WNW) (5.232), passing:

- 4 WNW of Jabiru Shoals (5½ miles NNE), patches with depths between 7.9 and 10 m over them, thence: ESE of East Bank (5 miles NW), the seaward end of an irregular spit known locally as Long Spit, with depths less than 5 m over it, extending 9 miles NE from Cattle Point (10¼ miles WSW).

Caution. See 5.230 for remarks on tidal streams in the vicinity of the pilot boarding ground.

5.234

- 1 **Useful mark:**

Mount Barker (23°31'6S 151°04'3E), rising from the moderately high and wooded N coast of Curtis Island.

5.235

- 1 **Entrance channel.** From the vicinity of the pilot boarding ground (23°24'4S 151°01'0E) the track leads SW in depths of more than 10 m between Timandra Bank (23°26'S 151°00'E) (5.232) and Centre Bank, 6 cables NW, which forms a part of Long Spit (5.233). The track passes (positions from Sea Hill Point (23°29'5S 150°58'7E)):

- 2 NW of Timandra Light-buoy (4½ miles NNE) (5.232), thence:

NW of No 2 Light-buoy (port hand) (¾ miles N), marking the W extremity of Timandra Bank.

Thence the track leads SSW passing:

WNW of No 4 Light-buoy (port hand) (2 miles N), marking the NW side of North West Bank, extending from the coast of Curtis Island.

- 3 **Balaclava Island Leading Lights:**

Front light-beacon (white triangle point up on white beacon) (4½ miles SW) standing on Balaclava Island, a mangrove-covered mud flat except where South Hill rises on its E side.

Rear light-beacon (white triangle point down on white beacon) (9 cables SSW of front beacon).

- 4 The alignment (205°) of the above light-beacons leads SSW from the outer edge of North West Bank through Sea Reach in a least depth of 7.6 m, between the drying mud flats in the N entrance to The Narrows to E and Wagtail Sands to W. The track passes:

- 5 WNW of Sea Hill Point, the NW extremity of Curtis Island and the N entrance point to The Narrows (5.209). Sea Hill Point Light (12 m in height) is displayed from the point; Sea Hill itself rises 1 mile ENE. See 5.240 for anchorage details. Thence:

ESE of Wagtail Sands (1½ miles W), about 4 miles in length and which dry; thence:

- 6 WNW of No 6 Light-buoy (port hand) (¾ miles SW), marking the NW edge of South Head Shoal which, with Curlew Spit, a drying mud flat, extends from the N end of Balaclava Island. Thence:

ESE of No 1 Light-buoy (starboard hand) (¾ miles SW), marking the SE edge of Wagtail Sands.

- 7 **Kazatch Point Leading Lights:**

Front light-beacon (white triangle point up, on beacon 7 m in height) (7¼ miles SW), standing close off the N side of Kazatch Point at the W extremity of Balaclava Island.

Rear light-beacon (white triangle point down, on beacon 15 m in height) (5 cables SW of front beacon).

- 8 The alignment (230¾°) of the above light-beacons leads SW in a least depth of 7.3 m between Balaclava Island and

Haynes Spit, a drying mud flat extending from the E end of Casuarina Island. Allowance must be made for the set of the tidal stream (see 5.230). The track passes (positions from Eupatoria Point (23°34'·5S 150°51'·9E)):

- 9 NW of a light-beacon (special) (4¾ miles ENE), marking the NW side of Curlew Spit; the track into South Channel and Fitzroy River (5.238) leads WSW from this vicinity. Thence:
NW of Cardigan Point (4¼ miles ENE); a beacon used as a leading mark for South Channel stands off the point; thence:
- 10 NW of No 8 Light-buoy (port hand) (3¾ miles ENE), marking Oswestry Rock.

Eupatoria Point Leading Lights:

Front light-beacon (white square topmark) standing on Eupatoria Point, the W entrance point to Raglan Creek.

Rear light-beacon (similar topmark) (295 m WSW of front beacon).

- 11 The alignment (248½°) of the above light-beacons leads WSW between Shell and Kazatch Points in a least depth of 10 m, passing:

SSE of Shell Point (1 mile NE), the SE extremity of Casuarina Island; leading lights (see below) stand on the point, off which there is an anchorage (5.240).

Shell Point Leading Lights:

Front light (9½ cables NE).

Rear light (2 cables NE of front light).

The alignment (038°), astern, of the above lights leads SW through a dredged channel 100 m in width to the berths at Port Alma: the depth in the channel is given at 5.227. The track passes:

- 13 NW of No 10 Light-buoy (port hand) (2 cables SSE), marking depths of less than 5 m extending from Chersonese Point, the S entrance point to Kamiesh Passage; thence:
NW of No 12 Light-buoy (port hand) (4½ cables S), marking the NE corner of the swing basin with a least depth of 6·1 m. The basin is dredged to a width of 240 m between the face of the wharves and No 12 Light-buoy, and to a width of 290 m from the S mooring dolphin of No 3 berth.

5.236

- 1 **Useful marks.** A fixed 25 tonne derrick crane at No 2 berth Port Alma (23°35'S 150°52'E) and a bulk salt loader at No 3 berth, both prominent above the surrounding mangroves, indicate the position of the wharves from a distance of many miles.

Fitzroy River

5.237

- 1 Fitzroy River is navigable for 35 miles from its entrance to the city of Rockhampton. The river has not however been used by commercial traffic for some years and its passage should not be attempted in vessels with a draught in excess of 2 m without first obtaining the most up to date information and advice. Road and rail bridges span the river at Rockhampton and a tidal barrage is constructed across the river on the upstream side of the city.

- 2 **Local knowledge** is essential on account of the shifting nature of the shoals, the frequently changing depths and the general intricacies of the river channels.

The river is entered from Sea Reach (23°30'S 150°57'E) (5.235) through South Channel. Middle Channel, lying between Middle Sand (23°31'S 150°55'E) which dries, and

Mackenzie Sand 6 cables NW, which extends NE from Mackenzie Island and also dries; is closed to navigation. North Passage, between Mackenzie Sand and Cattle Point (23°28'·8S 150°52'·4E), is unmarked and should not be used other than by small craft.

5.238

- 1 **Directions.** From a position at the S end of Sea Reach between Curlew Spit (23°32'S 150°57'E) and the SE edge of Wagtail Sands 6 cables NW, a track with a least depth of about 1 m leads WSW through South Channel, passing SSE of Wagtail and Middle Sands and NNW of Haynes Spit (5.235). The channel is marked by a light-buoy (special) (23°32'·1S 150°55'·4E) and a light-beacon (port hand), 1¼ miles farther WSW.

2 Useful mark:

Sandfly Hillock (23°33'·0S 150°52'·0E), the highest point of Casuarina Island which is otherwise low and mangrove-covered.

Charts Aus 247, Aus 819

5.239

- 1 Thence the channel leads W, passing S of Mud Island (23°32'S 150°51'E). A tower (23°32'·0S 150°49'·7E), 12·5 m in height and from which a light is displayed, on the foreshore of Casuarina Island, bearing 276°, mark this part of the channel.
- 2 Thence the channel follows the NE coast of Casuarina Island to Rocky Point (23°31'S 150°47'E); a light (white square beacon) stands on the point; below-water rocks extend 30 m from the point. Leading lights, standing on the N bank of the river 6 cables NW of Rocky Point and bearing 306°, and light-buoys mark this part of the channel.
- 3 Beyond Rocky Point the river is marked by white square steering marks, lights and light-buoys but, without local knowledge, these must not be relied upon to give anything more than a general indication of the route up-river.

Berths

5.240

- 1 **Anchorage** in a depth of about 12 m, with good shelter from all but N and NW winds, may be obtained 7 cables WNW of Sea Hill Point (23°29'·5S 150°58'·7E) (5.235) as indicated on the chart. It is recommended that a minimum of 110 m (4 shackles) of cable be veered on account of the tidal streams; see 5.230.
- 2 Small vessels of appropriate size and draught may obtain anchorage S of the same point in the N entrance to The Narrows (5.209).

Anchorage may also be obtained in a depth of 12 m between Shell Point (23°33'·9S 150°52'·7E) (5.235) and Kazatch Point, 7 cables SSW.

5.241

- 1 **Alongside berths.** Port Alma has three berths in line, total length 576 m. No 1 berth at the N end, and No 2, are on a continuous concrete breast wharf; total length 291 m with an additional mooring dolphin at each end; depth alongside to 40 m off 9·5 m, bottom mud. No 3 berth is on four berthing dolphins with a mooring dolphin both ends, length of berth 238 m; depth alongside to 40 m off 8·7 m, bottom mud.

- 2 Containers can be handled at No 2 berth; petroleum products are discharged at No 3.

At Rockhampton the principal berth is at Deepwater Wharf with depths of 3·7 to 5·2 m alongside (1969).

Port services**5.242**

- 1 **Repairs:** minor repairs can be undertaken. There is a small slipway at Nerimbera, on Fitzroy River 6 miles downstream of Rockhampton.

Other facilities. Customs facilities. Port Alma has a fire protection organisation to meet the requirements for handling explosive and other hazardous cargo. There are facilities for the disposal of oily waste; deratting can be carried out and certificates issued.

Large hospital at Rockhampton.

- 2 **Supplies.** Fresh provisions available. Fresh water laid on to Deepwater Wharf, Rockhampton, but only available at Port Alma by road tanker. Fuel oils available by road tanker.

Communications. Nearest airport to Port Alma is at Rockhampton, 67 km.

Raglan Creek**5.243**

- 1 **Description.** Raglan Creek is entered at Eupatoria Point (23°34'5S 150°51'9E). The creek is navigable for a considerable distance S of Port Alma in general depths of 3 to 5.5 m but is obstructed in places by bars with depths of about 0.9 m over them. The channels are unmarked and surveys are old.

- 2 **Local knowledge** is required.

Vertical clearance. Overhead power cables with a vertical clearance of 7 m span the creek and a bridge with a vertical clearance of 3 m crosses 2 miles farther upstream.

Regulation. A speed limit of 4 kn is in force in the creek.

Anchorage

Charts Aus 819, Aus 366

Capricorn Group**5.244**

- 1 Anchorages amongst the reefs of Capricorn Group, which are limited to vessels of 500 grt or less except in emergency, are described at 5.23.

Chart Aus 247

Emu Point**5.245**

- 1 Anchorage for small vessels of appropriate size and draught may be obtained about 7 cables ENE of Emu Point (23°15'2S 150°49'9E), which is low and rocky and extended N by a concrete breakwater; a reef of below-water rocks extends 4 cables NE from the point. Clearing marks, which may also be used for anchoring, are described below. The town of Emu Park, a seaside resort, stands behind the point, and Fishermans Beach extends along the shore of the bay between Emu Point and Tanby Point, a long narrow projection, 1¼ miles N.

It should be noted that charting of the area is based on old surveys which may be incomplete.

Local knowledge is required.

5.246

- 1 **Approaches.** Peak Island, (23°20'6S 150°56'2E) (5.232) with its off-lying dangers, lies in the approaches from SE. Divided Island, 2 miles farther NNW, is 35 m in height and cliffy; a rock, which dries 3.6 m, lies at the outer end of a reef extending 4 cables NNW from the island. Wedge Island, which is cliffy; and Pelican Island, cliffy, with Pelican Rock about 17 m in height close SW; stand 2 and 4½ miles respectively NW of Divided Island.

Banks in the vicinity of Pelican Island have depths of 2.7 and 3.9 m over them.

- 2 **Clearing marks:**

The alignment of the E edge of Mother Macgregor Island (23°17'2S 150°50'1E) with the E edge of Round Rock, above water, 7 cables SSW and standing on a drying reef, passes E of the dangers offlying Emu Point.

- 3 The alignment of the N edge of Pelican Island (23°14'5S 150°52'5E) with the S edge of Humpy Island 5 miles ENE, 67 m in height and steep-to on its SE side, passes clear of the dangers extending N from Emu Point.

5.247

- 1 **Anchorage** Small craft may obtain anchorage 2 cables NW of Emu Point in a depth of about 2 m. The alignment of the above Pelican and Humpy Island clearing marks astern leads WSW towards a pair of leading lights situated near the centre of Fishermans Beach. A second pair of leading lights standing on Emu Point leads S to the anchorage.

Charts Aus 367, Aus 820 (see 1.15)

Shoalwater Bay Military Training Area**5.248**

- 1 The anchorages listed below lie within the limits of Shoalwater Bay Military Training Area and are subject to restriction of access; see 5.214.

5.249

- 1 **Cliff Point** (22°39'S 150°48'E). Anchorage may be obtained in offshore winds 1 mile ESE of the point in depths of 11 to 15 m. There are tide-rips closer inshore off the point.

For landing place see below.

5.250

- 1 **Freshwater Bay**, lying immediately W of Cliff Point (22°39'S 150°48'E), affords shelter for vessels of appropriate size and draught in depths between 5 and 10 m. The immediate area of the bay and its approaches from E have been surveyed to modern standards.

Local knowledge or the national large scale chart is required.

- 2 **Approaches.** Double Rock, 1½ miles NNE of Cliff Point, and Single Rock (1 m in height), 1½ miles NW of the same point, lie in the approaches to the bay.

Landing. In S and SE winds good landing may be found at the head of the bay close W of Cliff Point; the shore is formed by a hard sandy beach.

5.251

- 1 **Double Rock** (22°38'S 150°49'E). Anchorage in depths of 12 to 17 m may be obtained during offshore winds 1 mile NW of Double Rock. The 1985 survey of Freshwater Bay (see above) does not however extend N of Double Rock.

5.252

- 1 **Quoin Island** (22°34'S 150°48'E) (5.220). Anchorage in depths of 15 to 18 m may be obtained during offshore winds 5 cables S of Quoin Island.

Chart Aus 822 (see 1.15)

5.253

- 1 **Pearl Bay** is entered between its S entrance point (136 m in height) (22°27'S 150°44'E), and a point 5 miles NW. A group of islets, rocks and drying reefs, with shallow water to SW, extends 1 mile NNW from the S entrance point. Depths of less than 5 m extend up to 1 mile offshore in the centre of the bay. A passage with depths of

more than 15 m separates Dome Island (22°25'S 150°45'E) (5.220) from the above dangers SW and W in the bay.

- 2 **Anchorage** in depths of 6 to 13 m may be obtained 1½ miles WSW of Dome Island.

Useful marks:

Prominent sand patches on the S shore of the bay
5 cables and 1½ miles W of the S entrance point.

5.254

- 1 **Island Head Creek.** Sheltered anchorage may be found in the mouth of Island Head Creek lying immediately SSE of Island Head (22°20'S 150°40'E). The creek itself extends 7 miles S but is obstructed by rocky shoals and is permanently closed to public access (see 5.214).

Brown Rock, (6 m in height), 1¾ miles SE of Island Head, stands on a patch, with a below-water rock off its N side, lying 5 cables offshore in the approaches from SE.

Local knowledge is required.

5.255

- 1 **Pinetrees Point** stands 1¾ miles W of Island Head (22°20'S 150°40'E), with depths of less than 5 m between. A pine-tree covered islet lies close off the point.

Secure anchorage in depths of 7 to 15 m, out of the tidal stream and sheltered from SE gales, may be obtained 1 mile NW of the point.

Port Clinton

Chart Aus 820 (see 1.15)

General information

5.256

- 1 **Position and function.** Port Clinton is entered between the N extremity of Cape Clinton peninsula (22°31'S 150°46'E) and Perforated Point, 2¾ miles N. The harbour, which lies within Shoalwater Bay Military Training Area (5.214), is not operated commercially but may be used by vessels of appropriate size and draught seeking shelter.

Caution. Charting of some parts of the harbour is based upon early lead line surveys; some other parts remain unsurveyed.

- 2 **Topography.** The W shore of the outer harbour is formed by a sandy beach backed by low wooded sand ridges; on the N side of the bay these ridges rise quickly to barren rocky hills up to 235 m in height.

The E shore of the inner harbour between Inner Head (22°31'S 150°45'E) and Mount Flinders, 1¼ miles SSE, is steep and indented; but from there on the land on both sides of South Arm is low and fringed with dense mangroves and extensive mud flats. The shores of West Water are mainly fringed with mangroves.

- 3 **Port limits** include all navigable waters and creeks W of a line joining the two entrance points.

Approach and entry. The harbour is approached as required from seaward and is entered over a crescent-shaped sand bar which encloses much of the outer part of the harbour.

Limiting conditions

5.257

- 1 **Controlling depth:** about 3 m over the bar on the track described at 5.261; however, a least depth of 4.7 m was reported (1976) on the same track by HMAS *Brunei*. In 1975 HMAS *Balikpapan* crossed the bar on a different track, with Black Rock bearing 234°, and found a least depth of 4.6 m.

Tidal levels: see *Admiralty Tide Tables*. Mean spring range about 3.7 m; mean neap range about 1.7 m.

Arrival information

5.258

- 1 **Outer anchorage.** Temporary anchorage in a depth of 13 m may be obtained 2 cables WNW of Round Island (22°31'S 150°46'E) (5.261).

In 1992 HMAS *Flinders* anchored 3 cables N of the same island in a depth of 15 m, fine sand. This berth is exposed to the prevailing swell which rounds Cape Clinton from SE.

- 2 **Pilotage:** no pilots available locally. Advice on the availability of a pilot may be sought from adjacent ports providing pilotage services; see *Admiralty List of Radio Signals Volume 6(4)*.

Local knowledge is essential.

Regulations. See 5.214 for restrictions on access.

Harbour

5.259

- 1 **General layout.** The outer part of the harbour is formed by a bay lying between the two entrance points and the inner part is entered on the S side of this bay. The inner harbour divides into South Arm and West Water.

South Arm is entered S of Mount Flinders (22°32'S 150°46'E) (5.220), and from there extends 6 miles SSW on the W side of Cape Clinton peninsula.

West Water is entered W of West Point (22°31'S 150°44'E) and extends 4 miles farther W; it is obstructed by drying sand banks and has not been surveyed.

5.260

- 1 **Tidal streams.** The general pattern of tidal stream in the offing, setting NNW on the rising tide, is felt off Cape Clinton (22°32'S 150°47'E) and also on the E and W sides of Entrance Island, 3½ miles NNW. Between these two features the same stream sweeps round the N side of Cape Clinton peninsula to become the in-going tidal stream to Port Clinton.

- 2 At Round Island, off the N extremity of the peninsula, the in-going stream sets W at rates between 1½ and 2 kn, and between Inner Head and Black Rock it sets SSW at between 2 and 3 kn: out-going streams set in the opposite directions at the same rates.

- 3 In the vicinity of Black Rock the in-going stream sets WSW across the drying bank extending from West Point as soon as this starts to cover. The main in-going stream to West Water runs S of this bank at between 1½ and 2 kn.

In South Arm the stream follows the channel at rates up to 2 kn.

Directions

5.261

- 1 From E the entrance may be identified as lying about midway between the N peaks of Coast Range to S and Mount Westall (22°22'S 150°35'E) (5.221) to N. The approach leads as required to a position 7 cables NE of Round Island (41 m in height) (22°31'S 150°46'E), cliffy with the summit covered with low scrub. The island is almost connected to Cape Clinton peninsula, 2 cables S by a reef of above and below-water rocks. The approaches from S and N pass respectively (positions from Round Island):

- 2 NE of Launch Rocks (1 mile ESE), which dry 4.4 m. SE of Entrance Island (2 miles N) (5.220).

Leading marks:

Front mark, Black Rock, (3 m in height) (1¼ miles WNW).

Rear mark, West Point, (1¼ miles W of the front mark), low and sandy. The point is reported to lie N of its charted position (1986).

- 3 The alignment (257°) of the above marks leads from the position 7 cables NE of Round Island across the bar, for which the controlling depth is given at 5.257. The shoaler parts of the bar can be identified in fresh winds by breaking seas, and in calm weather by tide-rips over them. The track passes:

- 4 S of a 2.4 m patch (7 cables N) which breaks at LW; overfalls occur over the bar close W and N of the patch.

Leading marks. The left hand edge of a remarkable white sandy cliff (4.4 miles bearing 215°) on the W shore of the entrance to South Arm bearing 203° ahead, and the left hand edge of Entrance Island (2¼ miles N) (5.220) bearing 023° astern; lead SSW passing:

- 5 ESE of Black Rock (1¼ miles WNW), thence:
Close ESE of a 3.6 m patch (1 mile W), thence:
WNW of Inner Head (9½ cables WSW), the steep NW extremity of Cape Clinton peninsula.

Leading marks:

- 6 Front mark, Black Rock, (22°31'S 150°45'E).
Rear mark, a hill (229 m in height) (3.4 miles N of the front mark).

The alignment (351°), astern, of the above marks leads SSE to the anchorage (5.263) off Holtness Point, passing: WSW of Bullock Rock (1¼ miles SW), steep-to on its W side and the W-most danger off Bullock Point, which is steep. Depths inshore between the rock and Holtness Point, 5½ cables SSE, are shoal and imperfectly known. Thence:

- 7 WSW of Fish Rock (1½ miles SW), the NW-most danger, with two heads awash, extending from Holtness Point. Creek Rock which dries, lies between Fish Rock and the point; the site of a former wharf lies close S of the point.

5.262

- 1 Thence for vessels proceeding up South Arm the track leads initially SE.

Leading mark. The right hand edge of Mount Flinders (1½ miles SSW) (5.220) bearing 127° leads SW of Holtness Point; thence:

Leading marks:

- Front mark, the gap between Bullock Rock (1¼ miles SW) and Bullock Point close E.
Rear mark, Black Rock (1¼ miles WNW).
2 The alignment (344°), astern, of the above marks leads SSE from a position S of Holtness Point between Mount Flinders, which is steep-to, and the shallow bank extending from West Flats; thence:

Leading marks. Colcarra Rock (10 miles SSW), a hill, bearing 213° and Mount Flinders (1½ miles SSW) bearing 033° astern, lead for nearly 3 miles through the N part of South Arm, passing ESE of the white sandy cliffs (4.4 miles bearing 215°) used previously.

- 3 Thence the track leads initially S before following the bend of South Arm to Sea Hound Hard (7.7 miles bearing 203°), on the S bank. The deeper water is found on the E side of the arm and then on the outer side of the bend, both being relatively steep-to.

Beyond Sea Hound Hard, the waters to the head of the arm are unsurveyed.

Anchorage

5.263

- 1 **Holtness Point.** Secure anchorage in a depth of about 10 m may be obtained 3 cables W of Holtness Point (22°32'.3S 150°45'.3E); the anchorage is sheltered from most winds and from the heavy swell which occasionally

sets in over the bar. However, in November 1975, HMAS *Balikpapan* found better protection from a SE gale and reasonable anchorage, subject to some ground swell, 2 cables SW of Inner Head, 9 cables N of Holtness Point.

5.264

- 1 **South Arm.** With local knowledge, anchorage may be found in depths between 5 and 7 m in the N section of South Arm.

There is anchorage in a depth of about 7.5 m towards the S end of the arm, near Sea Hound Hard (22°38'.2S 150°43'.0E), but there is insufficient swinging room to lie to single anchor.

Port services

5.265

- 1 No facilities are documented.

Other rivers, harbour and landing

Chart Aus 819

Black Head boat landing

5.266

- 1 Black Head (23°40'S 151°16'E), stands at the N end of a cliffy and rock-fringed stretch of coast extending 3½ miles NNW from Connor Bluff. The coast from Black Head to Cape Capricorn, 10½ miles N, is in contrast formed by a sandy beach broken by rocky points.

Landing from boats may be made at the E end of the sandy beach immediately W and in the lee of Black Head.

Chart Aus 247

Cawarral Creek

5.267

- 1 **Description.** Cawarral Creek (23°19'S 150°47'E) is almost blocked at its entrance by drying sandbanks which extend from both sides. The town of Keppel Sands is situated on the S entrance point of the creek, from where a light is displayed.

5.268

- 1 **Approaches.** From NE the approach is obstructed by a drying reef extending 6 cables SSE from Zilzie Point (23°16'.9S 150°49'.5E); Entrance Rock, which dries, 2 cables SSE of the reef; Mother Macgregor Island (6 cables SE of Zilzie Point) and Round Rock (1¼ miles SSE of the same point) (5.246).

Flat Rock (23°19'.0S 150°50'.9E), low and cliffy, and Girt Island, 3 miles farther SW, lie in the approaches from E and SE.

Rosslyn Bay Boat Harbour

5.269

- 1 **Description.** A boat harbour, protected from all but N swells by rock breakwaters, is situated in Rosslyn Bay on the W side of Double Head (23°09'.9'S 150°47'.7E). A channel with a depth of 2.0 m at LW leads between the breakwaters to a basin in which there are small craft moorings, pontoon berths and boat ramps. The NW breakwater is marked from its head inwards by light-beacons (starboard hand); a light stands on the head of the NE breakwater.

The village of Rosslyn stands S of the harbour and behind the sandy beach between Double Head and Bluff Point 8 cables SSE.

Local knowledge is required.

5.270

- 1 **Approaches** to the harbour are partially obstructed by banks with depths of less than 5 m over them which fill the greater part of the channel between Keppel Isles and the mainland.

Bluff Rock, above-water, lies $7\frac{1}{2}$ cables SE of Double Head. Dangers in the approaches farther SE are described at 5.246.

Chart Aus 820

Yeppoon Inlet **5.271**

- 1 **Description.** Yeppoon Inlet, which is only suitable for boats, lies on the S side of the town of Yeppoon ($23^{\circ}08'S$ $150^{\circ}45'E$) and is entered 7 cables WNW of Wreck Point, the S entrance point to the small Coeee Bay.

The entrance dries and is subject to change after bad weather. The fairway within the inlet is very restricted and tidal streams are strong.

Local knowledge is essential.

Overhead cables, with a vertical clearance of 11 m (36 ft), span the entrance and a road bridge crosses the inlet farther S.

- 2 **Directions.** The entrance is marked by a pair of small light-beacons (white triangles) standing on the W shore which, in line bearing 239° , lead close N of rocks and a breakwater, both extending from the E side of the entrance; a light is displayed from the head of the breakwater. Thence the fairway, which is marked by beacons, leads initially S passing close W of the breakwater and rocks on the E bank.

Berths. There are jetties in the inlet.

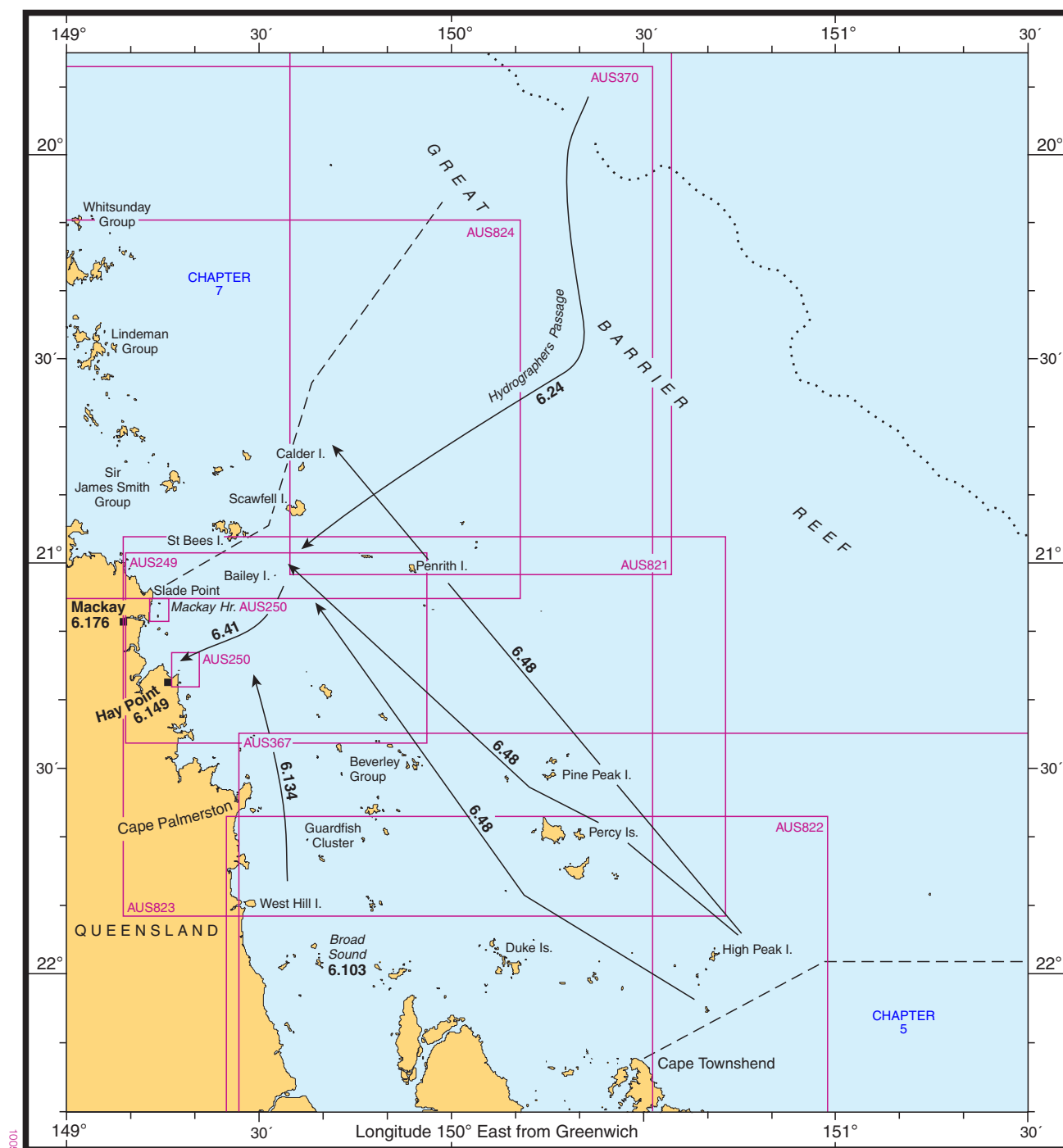
Corio Bay **5.272**

- 1 Corio Bay, which is only suitable for boats, is entered close S of the peninsula which has Water Park Point ($22^{\circ}56'S$ $150^{\circ}48'E$) as its E extremity. The entrance to the bay dries except for a narrow channel near its N entrance point which has probable depths of about 2 m.

Local knowledge is required.



Chapter 6 - Cape Townshend to Slade Point



CHAPTER 6

CAPE TOWNSHEND TO SLADE POINT

GENERAL INFORMATION

CAPE TOWNSHEND TO SLADE POINT

Charts Aus 367, Aus 370

Scope of chapter**6.1**

- 1 This chapter covers that part of the Inner Route leading from abreast Cape Townshend (22°12'S 150°29'E) to abreast Slade Point 98 miles NW; also included are those parts of Great Barrier Reef which are significant to navigation within the same area, Hydrographers Passage, the extensive Northumberland Isles, the inshore waters of Shoalwater Bay and Broad Sound and the ports of Hay Point and Mackay.

Routes**6.2**

- 1 This part of the Inner Route leads NW for about 98 miles with a choice of three tracks which are described at 6.48. The route is joined towards its NW end by that from Hydrographers Passage from NE; the approaches to the ports of Hay Point and Mackay lead SW from the same vicinity.

Topography**6.3**

- 1 The most significant features, common to most sections of this chapter, are those of the extensive Northumberland Isles, which are described in the appropriate parts of the text.

Depths**6.4**

- 1 Depths along the tracks of the Inner Route between the coastal shelf of the mainland and the inner edge of Great Barrier Reef are generally regular, with a choice of track which allows vessels to be navigated in depths greater than 37 m (20 fm) if required.

The inshore area SW of the 37 m (20 fm) depth contour is however partially obstructed not only with the extensive Northumberland Isles, but also with numerous shoals.

- 2 **Caution.** The configuration and general direction of the narrow sand and mud banks radiating from the entrance to Broad Sound (22°05'S 149°45'E) indicate their origins from silt deposits from that sound and the effect of the tidal streams on their formation and subsequent change. The area involved extends from Broad Sound to Viscount Shoals (21°25'S 149°35'E) in the N and to the various shoals extending NNE to Beverley Group and E to Duke Islands; the shoals in this area are believed to be in a state of constant change, have not generally been surveyed to modern standards and should not be approached without proper precautions being taken.

Ship reporting system**6.5**

- 1 For details of Torres Strait and Great Barrier Reef ship reporting system, see 1.89 and *Admiralty List of Radio Signals Volume 6(4)*.

Protected area**6.6**

- 1 The historic wreck of the *Llewellyn*, with a depth of 25.6 m (14 fm) over it, lies within a protected area 2¾ miles NW of Bailey Islet (21°02'S 149°33'E). See 1.70 for details of restrictions.

Designated Shipping Area**6.7**

- 1 Within this chapter are Designated Shipping Areas as shown on the relevant charts, for further information see 1.74 and *Australian Seafarers Handbook*.

Particularly Sensitive Sea Area**6.8**

- 1 The whole area of this chapter is within Great Barrier Reef Marine Park which is an IMO approved Particularly Sensitive Sea Area (PSSA). The area is shown on the relevant charts. For further details see 1.71 and *Australian Seafarers Handbook*.

GREAT BARRIER REEF

General information

Charts Aus 426, 4621

6.9

- 1 Little is known of Great Barrier Reef lying between the NW limit of Swain Reefs (21°30'S 151°24'E) and the reefs bordering Hydrographers Passage, about 75 miles NW. The reefs in the area are mainly detached, some are extensive and there are some deep channels between.

Hydrographers Passage is the only known navigable passage through the reefs within the scope of this chapter.

Flow**6.10**

- 1 A general description of the currents in Coral Sea and off the E coast of the Australian continent is given at 1.144. Currents in the immediate vicinity of Great Barrier Reef are variable and imperfectly known, but there is a general pattern of flow across the reefs and through the various openings. Attention is drawn to the well-documented detail of water movement through Hydrographers Passage given at 6.30.

Outer edge**6.11**

- 1 Except for the area adjacent to the N entrance to Hydrographers Passage, the outer edge of this section of Great Barrier Reef is unsurveyed and should be avoided. Reefs may exist in surrounding depths of more than 183 m (100 fm) up to 90 miles ENE from Chauvel Reefs (20°50'S 150°22'E).

Inner edge

Charts Aus 367, Aus 370, Aus 426

6.12

- 1 The inner edge of Great Barrier Reef between Herald's Reef Prong (21°30'S 151°24'E) (5.24) and Tern Island (20°55'S 150°02'E) (6.55) consists of large scattered reefs,

with deep channels between, and has not been fully defined.

Adroit Shoal (21°35'S 151°02'E) appears to be isolated from the inner edge.

Shoal patches exist between Tern Island and Chauvel Reefs 16 miles ENE, and the area should be avoided.

Tidal streams in this area attain rates of $\frac{3}{4}$ kn.

NORTHUMBERLAND ISLES

General information

Charts Aus 822, Aus 823

6.13

- 1 Northumberland Isles consist of a large number of islands and shoals, many of which are formed in distinct groups, which extend about 80 miles NW and 60 miles W from Cheviot Island (22°05'S 150°40'E), the SE-most of the isles. The islands and shoals fall naturally into three convenient areas.

Southern groups

6.14

- 1 The S groups of Northumberland Isles are bounded by Cheviot Island, High Peak Island 7 miles N, Sail Rock (21°48'S 150°09'E) and Lake Shoals 17 miles WSW. The islands and shoals within this area are described at 6.54 in the course of Directions for the tracks of the Inner Route between Cape Townshend and Slade Point, and at 6.74 in the appropriate parts of the text covering Broad Sound Channel.

North-east group

6.15

- 1 The NE group of Northumberland Isles consists of Percy Isles, which extend 22 miles NW from South East Islets (21°46'S 150°26'E), with the addition of Hannah Rock, $5\frac{1}{2}$ miles SSW.

The islands and dangers in the group are described at 6.54 in the course of Directions for the tracks of the Inner Route between Cape Townshend and Slade Point.

Western groups

6.16

- 1 The W groups of Northumberland Isles consist of all those groups, islands and shoals lying between Bedwell Group (21°50'S 149°48'E) and Prudhoe Island, 32 miles NNW; and between Beverley Group (21°29'S 149°51'E) and the mainland, about 23 miles W. Parts of the W groups are described variously at 6.57 in the course of detail given for the Inner Route, and at 6.59 and 6.134 in descriptions of Prudhoe and Coaster Channels.

Chart Aus 822, Aus 823

Bedwell Group

6.17

- 1 **Topography.** Bedwell Group (21°50'S 149°48'E) consists of a number of bare-topped islands with rocks and shoals in the N approach to Broad Sound. Poynter Island is the largest and highest of the group; Calliope Island (75 m in height) is joined to its S extremity by a drying reef. George Island lies 1 mile E of Poynter Island with foul ground between. Innes Island lies 1 mile NW of Poynter Island with Emily Patches $2\frac{3}{4}$ miles NE and Smythe Shoals extending 8 miles farther NE.

- 2 **Tidal streams** set obliquely across Smythe Shoals at rates of $1\frac{1}{2}$ to 2 kn. There are overfalls off the E side of Emily Patches.

Chart Aus 823

Dangers north-west of Bedwell Group

6.18

- 1 **Topography.** Connor Island (21°43'S 149°40'E), which is bare, lies 9 miles NW of Bedwell Group with Lower and Middle Rocks, which should both be given a wide berth, lying between. Connor Island is central to a number of other charted dangers in the vicinity; Ridge Island lies 3 miles farther NNW.

Guardfish Cluster

6.19

- 1 **Topography.** Guardfish Cluster consists of a number of islands, islets, rocks and shoals grouped around Curlew Island (21°36'S 149°48'E), the largest. Curlew Island is wooded in the lower sheltered parts and rises to a flat-topped ridge in the centre; Peak Head, close within its N extremity, is a remarkable conical hill 137 m in height, surmounted by a square boulder. The S coast of the island is rocky and cliffy, and indented by small sandy bights with offlying rocks and shoals around which there are overfalls; Dinner Islet (28 m in height) 1 mile SSE, a bare rock, and Slattery Shoal, with a least depth of 0.2 m over it, 1 mile SSW of the island, are the outermost of these dangers.

- 2 Tinonee Peak Island (6.21) lies $2\frac{1}{2}$ miles SSE of Curlew Island; Douglas Island lies 3 miles WSW of Tinonee Peak Island and is similar to it. Wallace Islet, which is bare, lies $7\frac{1}{2}$ cables W of Curlew Island and at the NE extremity of Pearl Shoal.

Henani Rock (dries 1.0 m) lies $2\frac{1}{4}$ miles N of Curlew Island. The rock is steep-to and should be given a wide berth as it is not marked by overfalls.

6.20

- 1 **Tidal streams** attain a considerable rate off the W side of Curlew Island and also in Garfish Bay on its NW side, where the in-going stream sets S and the out-going stream NE.

6.21

- 1 **Anchorage** may be obtained off Curlew Island in Davidson Bay midway between Peak Head and Treble Island, $1\frac{1}{4}$ miles ESE, in depths of about 10 m. The head of the bay is formed by a hard sandy beach. The anchorage is easy of access from SE, but recommended for temporary use only. Treble Island is a good mark.

- 2 **Directions.** Approach should be made from a position SE of Curlew Island (21°36'S 149°48'E). The track leads NW and midway between Tinonee Peak Island and Bluff Island, passing (positions from the E extremity of Curlew Island):

- 3 NE of Tinonee Peak Island ($2\frac{1}{2}$ miles SSE), the highest of the group and rising to a well-defined peak. The island is covered with grass and dense scrub and has a rugged cliffy coast, fringed by reefs, which is steep-to on all but its W side. Thence:

SW of Bluff Island ($2\frac{1}{2}$ miles E), with a rocky coast rising to a flat top. The NW extremity of the islet is formed by a remarkable overhanging cliff. Thence:

- 4 Either side of Treble Island (38 m in height) (5 cables E), jagged in outline and divided into two parts at HW; a drying reef lies close N. There is a least depth of 4.8 m in the fairway SW of the islet; the

deeper channel lies on the NE side of the islet between it and Planter Shoal, sand, with a least depth of 4.5 m over it, 5 cables farther NE.

Course may then be directed as required for anchoring.

6.22

- 1 **Anchorage** for small craft may also be obtained in Garfish Bay on the W side of Peak Head (21°35'6S 149°48'6E) (6.19). The bay is difficult of access and restricted, but affords good anchorage in depths of 1 to 2 m with shelter from E and SE winds; there is a hard sandy beach at its head. Partial protection from NW is afforded by Tinonee Bank, which extends NE from near the NW extremity of Curlew Island; the SW end of this bank dries 3.8 m and is otherwise usually marked by breakers. A narrow passage, with smooth water even in strong SE winds, lies between this and the NW extremity of Curlew Island.

- 2 Hirst Islet (47 m in height), 1 mile N of Peak Head and lying near the NE end of Tinonee Bank, appears divided at HW. Harry Shoal, with a least depth of 4.5 m over it, lies SSE of the islet, leaving only a narrow passage between the S edge and Peak Head.

Local knowledge is essential.

- 3 **Directions.** From a position in Davidson Bay, the track leads S of Harry Shoal and close N of Peak Head.

For coasters approaching from a position W of Garfish Bay, the track leads generally E, as dictated by local knowledge, passing (positions from the NW point of Curlew Island (21°36'0S 149°47'1E)):

- 4 N of a high rock (2 cables NW) distant 1 cable; the rock, which does not cover, marks the outer edge of a drying ledge extending from the point; thence: S of the SW end of Tinonee Bank (2½ cables N).

Beverley Group

6.23

- 1 **Topography.** Beverley Group extends 6½ miles NW from Digby Island (21°30'S 149°55'E) (6.58) and is formed of a chain of small, high and rocky islands, on some of which there are stunted pine trees.

Tupper Shoal, a narrow sand ridge with overfalls off its NW side, extends 5½ miles SW from the group.

HYDROGRAPHERS PASSAGE

General information

Chart Aus 821

Route

6.24

- 1 Hydrographers Passage is entered from Coral Sea between Blossom Bank (19°48'S 150°21'E) and Marilyn Shoal 2 miles ESE, and leads 70 miles SSW to the vicinity of Tern Island (20°55'S 150°02'E) where it crosses the Inner Route and gives direct access SW to the ports of Hay Point and Mackay.

The passage is the first navigable route through Great Barrier Reef NW of Capricorn Channel.

The only restriction on size of vessel is that of draught; see 6.26.

Topography

6.25

- 1 Most of the reefs in the vicinity of the N entrance to Hydrographers Passage are covered at all states of the tide but the sea usually breaks heavily on those to seaward.

Apart from the reefs and navigation marks described at 6.36, there are no significant features visible at HW until the SW end of Hydrographers Passage is approached, when some of the SE-most of Cumberland Islands may be raised; these are described at 6.55.

Depths

6.26

- 1 There is a controlling depth in the channel of 25 m, which is found 3 miles NE of Little Bugatti Reef (20°02'S 150°15'E); this is also the maximum draught that can be accepted for pilotage. The channel has been surveyed using sidescan sonar to a minimum width of 5 cables each side of the recommended track shown on the chart.

Pilotage

6.27

- 1 Pilotage is compulsory for vessels of 70 m LOA and over, and for all loaded oil tankers, chemical and liquefied gas carriers irrespective of size. Pilots are provided by the appropriate pilotage associations and are available 24 hours a day; see *Admiralty List of Radio Signals Volume 6(4)*.

- 2 The pilot boarding ground for vessels inbound from the Coral Sea is 6½ miles NE of Blossom Bank (19°48'S 150°21'E) as shown on the chart; boarding is by land-on helicopter only.

Vessels taking a pilot should not proceed inside the 200 m depth contour until direct communication has been established with the pilot joining.

Local knowledge

6.28

- 1 Local knowledge is required. Additionally, the passage should not be attempted unless the performance of a vessel's outfit of navigation aids, particularly radar, is known to be reliable.

Traffic regulations

6.29

- 1 **Great Barrier Reef Marine Park.** Hydrographers Passage lies within Great Barrier Reef Marine Park; see 1.73. Passage by vessels of all classes is permitted along the recommended track and preferred route, but all other restrictions and prohibitions in force within the Marine Park apply.

- 2 **Radio watch.** The requirement for all vessels to maintain a continuous listening watch on VHF channel 16 whilst navigating within Great Barrier Reef Pilotage District (see 1.26) extends to 40 miles to seaward of the N entrance to Hydrographers Passage.

Natural conditions

6.30

- 1 **Tidal streams.** Comprehensive tidal stream predictions, relative to HW at Bugatti Reef (20°06'S 150°17'E), are tabulated on the chart. Pilots have however reported sets in the area between White Tip and Little Bugatti Reefs which vary considerably in strength and direction from those predicted.

- 2 The tidal stream sets fair with the line of the recommended track for most of the time, with the in-going stream setting generally SSW and the out-going stream setting to seaward in a general NNE direction.

The maximum streams occur in Bond Entrance (19°54'S 150°18'E), where they may reach 6½ kn at springs and 3 kn at neaps.

6.31

- 1 Cross-sets should be expected at the turn of the tide. Between Blossom Bank and Marilyn Shoal the set swings through SE at rates in excess of 1½ kn during the period 1 hour either side of HW at Bugatti Reef.

The flow experienced between Blossom Bank and White Tip Reef is additionally influenced by the South Sub-tropical Current described at 1.147.

Slack water in Bond Entrance is very brief, especially at springs, and occurs shortly before the times of HW and LW. At about LW the stream sets W across the entrance at a spring rate of up to 1 kn.

- 2 Between White Tip and Little Bugatti Reefs a cross-set to SE may be experienced near HW and LW. A set NW may be experienced at the same times between Little Bugatti and Bugatti Reefs.

Through the remaining part of the passage, cross-sets are unlikely to exceed ½ kn except between Creal and Boulton Reefs, where up to 1 kn may be experienced.

6.32

- 1 **Overfalls** occur, particularly at springs, in Bond Entrance where the out-going tidal stream passes into deeper water and meets the sea generated by the SE Trade Wind. The overfalls are most pronounced and are hazardous to small craft.

Local weather. Weather effecting Hydrographers Passage conforms to the general pattern of climate and weather described in Chapter 1. An automatic weather station is situated on Creal Reef (20°32'S 150°23'E).

Major lights

6.33

- 1 White Tip Reef Rear Main Light (tower, rectangular orange daymark, 38 m in height) (19°56'S 150°16'E), standing on the SW part of White Tip Reef.
Little Bugatti Reef Light (metal framework tower on concrete pile structure, rectangular orange daymark; 24 m in height) (20°01'S 150°15'E), standing on the NE side of Little Bugatti Reef.
Creal Reef Light (metal framework tower on concrete pile structure 34 m in height; rectangular orange daymark on N and W face) (20°32'S 150°23'E), standing near the NW edge of Creal Reef.

Other aids to navigation

6.34

- 1 **Racons:**
White Tip Reef Rear Main Light (19°56'S 150°16'E) (6.33).
Creal Reef Light (20°32'S 150°23'E) (6.33).
For details see *Admiralty List of Radio Signals Volume 2*.

6.35

- 1 **Warning lights** may be fitted to some of the light-structures and are mentioned in the relevant descriptions. The warning light consists of a small quick amber light displayed from the top of the structure and is shown in the event of failure of the main and reserve

lights. Mariners observing the failure of a main light or the operation of a warning light should report the fact to "SEASAFETY CANBERRA".

Directions

Hydrographers Passage

6.36

- 1 From a position NE of White Tip Reef (19°56'S 150°16'E) the track leads SW, keeping in depths greater than 200 m and within the surveyed approaches to the N entrance to Hydrographers Passage as shown on the chart, until White Tip Reef Main Light (see below) can be positively identified visually or on radar.

- 2 **Caution.** Approaches to the undefined outer edge of Great Barrier Reef lying SE and NW of the above area are unsurveyed and should not be entered by large vessels.

Leading mark. White Tip Reef Main Light (19°56'S 150°16'E) (6.33) bearing 218° leads within the surveyed area from seaward to the pilot boarding ground (19°44'S 150°26'E) (6.27).

6.37

- 1 **White Tip Reef Leading Lights:**

Front light (orange rectangular daymark on concrete pile structure, 12 m in height; warning light) (19°55'S 150°17'E), standing on the NE side of White Tip Reef.

Rear Light (orange rectangular daymark on N face of tower, 38 m in height) (1.1 miles SW of the front light), a sector light displayed from the same structure as White Tip Reef Rear Main Light (6.33).

- 2 The alignment (218°) of the above lights, in the visible sector (214°–222°) of the rear sector leading light, leads SW from the vicinity of the pilot boarding ground along the recommended track shown on the chart, passing (position from the front light):

Midway between Blossom Bank (7¾ miles NNE) and Marilyn Shoal, 2 miles ESE of the bank; the shoal is covered by the adjacent red sector (222°–231°) of White Tip Reef Front Light. Thence:

- 3 NW of Ferris Shoal (4½ miles NE), lying in the same red sector of White Tip Reef Front Light and also covered by the red sector (204°–215°) of Little Bugatti Reef Light (6¾ miles SSW) (6.33).

When clear of the above red sector of Little Bugatti Reef Light and when White Tip Reef Front Light is distant 4½ miles, the track leads SSW. Careful attention should be paid to this alteration of course to avoid the possible dangerous effect of any cross-set: see 6.31 for details of tidal streams.

6.38

- 1 **Little Bugatti Reef Light.** The line of bearing 202° within a white sector (200°–204°) of Little Bugatti Reef Light (6¾ miles SSW) (6.33) leads SSW along the recommended track shown on the chart, passing:

- 2 ESE of Sharon Shoal (3 miles NNE); several shoals, some with depths of less than 2 m over them, lie between Sharon Shoal and White Tip Reef and not less than 4 cables WNW of the recommended track. These dangers are shown on the chart and are covered by the green sector (190°–200°) of Little Bugatti Reef Light.

- 3 Thence the track leads through Bond Entrance (1 mile ESE) where overfalls may occur; see 6.32. The track passes:

WNW of Tompson Shoal (1¼ miles E), thence:

- 4 WNW of Bond Reef (2 miles ESE), which dries; a beacon (W cardinal on tripod) stands on the reef. Bond Reef and Tompson Shoal also lie within the red sector of Little Bugatti Reef Light covering Ferris Shoal, described above. And:

ESE of White Tip Reef, an extensive drying reef with a large number of boulders visible at LW; White Tip Reef Main and Front Lights stand on the reef.

6.39

- 1 **White Tip Reef Front Light.** When Little Bugatti Reef Light is distant 3.3 miles the line of bearing 002° astern, within a white sector (231°–005°) of White Tip Reef Front Light, leads S passing:

E of Little Bugatti Reef (7 miles SSW), horseshoe-shaped; the E part of the reef is covered by the adjacent red sector (005°–019°) of White Tip Reef Front Light. Thence:

- 2 W of Bugatti Reef (10 miles S), an extensive drying reef; a light (white GRP hut on concrete column; 7 m in height) stands on a prominent rock, drying 2.7 m, on the W edge of the reef.

When Little Bugatti Reef Light bears 354° distant 8.35 miles, the track leads SSE.

6.40

- 1 **Creal Reef Light.** The line of bearing 165° on Creal Reef Light (20°32'S 150°23'E) (6.33) leads SSE along the recommended track shown on the chart, passing (positions from Creal Reef Light):

ENE of Bax Reef (11 miles NW), thence:

ENE of Boulton Reef (5½ miles NW).

When Creal Reef Light is distant 5 miles bearing 165°, the track leads SSW on 205°, passing:

- 2 ESE of Boulton Reef and:
WNW of Creal Reef Light distant 3.2 miles; an above-water sand cay lies at the NW end of the reef. A number of charted dangers lie between Creal Reef and Warland Reef about 3½ miles farther S.

- 3 When Creal Reef Light bears 061° distant 5.4 miles, the track leads WSW on 241° to a position 14 miles N of Penrith Island (21°01'S 149°54'E) (6.55), keeping Creal Reef Light bearing 061° astern and passing:

NNW of Cole Reefs (8 miles SW), which dry; and:
SSE of Stevens Reef (12 miles W), extensive and drying; thence:

- 4 NNW of a patch with a least depth of 7.6 m over it (20°48'S 150°02'E), the NNW—most danger on the S side of the SW entrance to Hydrographers Passage; thence:
NNW of Tern Island (20°55'S 150°02'E) (6.55).

Charts Aus 821, Aus 249

Hydrographers Passage to Hay Point and Mackay 6.41

- 1 From the SW entrance to Hydrographers Passage the route continues SW towards the approaches to the ports of Hay Point and Mackay. The route crosses the tracks of the Inner Route, which may then be joined if required; see 6.48 for detail.

6.42

- 1 From the vicinity of the position 14 miles N of Penrith Island (21°01'S 149°54'E) (6.55), the track leads SW on 233° along the preferred route shown on the chart towards Bailey Islet (21°02'S 149°33'E) (6.56), passing (positions from Three Rocks (20°57'S 149°44'E)):

- 2 Across a junction with the Inner Route (7½ miles NE); thence:

NW of Three Rocks distant 2¼ miles, and:

SE of Scawfell Island (7¾ miles WNW) (6.55).

When Bailey Islet Light is distant 10 miles bearing 233°, the track leads SW on 215°, passing (positions from Bailey Islet Light):

- 3 Across a junction with the Inner Route (4¼ miles E); thence:

SE of Bailey Islet distant 3 miles.

Thence the recommended track shown on the chart continues SW to a position 9½ miles SSW of Bailey Islet Light.

6.43

- 1 **Useful marks:**

Penrith Island Light (21°00'6S 149°54'3E) (6.55).

Bailey Islet Light (21°02'S 149°33'E) (6.56).

*(Directions continue for Hay Point at 6.171
and for Mackay at 6.199)*

Anchorage and lagoons

Hydrographers Passage

6.44

- 1 No anchorages suitable for large vessels are documented within the length of Hydrographers Passage. Anchorages within the Inner Route which may conveniently be reached from the passage are described at 6.61 and 7.43.

Little Bugatti Reef

6.45

- 1 A lagoon enclosed by Little Bugatti Reef (20°02'S 150°15'E) (6.39) contains a number of coral heads but can be entered by small craft through an opening on the NW side of the reef.

Local knowledge is required.

Bugatti Reef

6.46

- 1 A lagoon within Bugatti Reef (20°06'S 150°19'E) (6.39) has an entrance at its NW end. The lagoon was used as an anchorage in 1982 by HMAS *Flinders* (750 tonnes, 3.7 m draught), but is not recommended for vessels larger than small craft. Entry was made on a course of 128° and anchorage was obtained in a depth of 22 m, 8 cables within the entrance with the prominent drying rock, since marked by Bugatti Reef Light, bearing 220°. Strong sets were experienced across the entrance.

The lagoon has not been fully surveyed.

Local knowledge is required.

CAPE TOWNSHEND TO SLADE POINT

GENERAL INFORMATION

Charts Aus 367, Aus 370

Scope of the section

6.47

- 1 This section describes several routes from Cape Townshend (22°12'S 150°29'E) to Slade Point (21°04'S 149°13'E) 98 miles NW. Also described is the major port of Hay Point (21°16'S 149°13'E), the port of Mackay (21°06'S 149°13'E), and several minor harbours and anchorages along the coast in this section.

INNER ROUTE

General information

Charts Aus 822, Aus 823, Aus 824

Routes

6.48

- 1 From a position 3½ miles NE of High Peak Island (21°57'S 150°41'E) the recommended outer track leads directly NW to a position 5¾ miles ENE of Calder Island (20°46'S 149°37'E). The track, which is described at 6.54, is that usually followed by through traffic on the Inner Route and leads in generally deep and open water passing outside Northumberland Isles and the SE-most of Cumberland Isles, and SW of the inner edge of Great Barrier Reef (6.12). The least width is found between Sandpiper Reef (21°02'S 150°05'E) and Snare Rock 8 miles SW. There is a least depth of 34 m (20°49'S 149°48'E) adjacent to this track.
- 2 From the same position NE of High Peak Island, a second track leads generally NW but passes through Percy Isles before leading on to a position 3½ miles NE of Bailey Islet (21°02'S 149°33'E). Charted depths on this track are generally not less than the 35 m that may be found in several areas shown on the chart. Overfalls occur in the vicinity of Percy Isles. This track is the one usually followed by vessels from SE bound for the ports of Hay Point and Mackay, and is described at 6.56.
- 3 A third track from a position 4 miles SW of Cheviot Island (22°05'S 150°40'E) also leads NW but passes inshore of Percy Isles before joining the above second track NE of Bailey Islet. The least depth adjacent to this track is 16.4 m (21°25'S 149°57'E). The track is less well-marked for use in adverse weather than the other two, and may be more suitable for use by small vessels on regular coasting runs; it is described at 6.57.

Topography

6.49

- 1 The islands significant to navigation along the tracks of the Inner Route are described in the text.

Depths

6.50

- 1 Depths along the available tracks through this part of the Inner Route are for convenience described at 6.48 above.

Pilotage

6.51

- 1 See 1.26.

Tidal stream

6.52

- 1 Throughout this section of the Inner Route the general set of the in-going tidal stream is towards Broad Sound

(22°10'S 149°40'E) and that of the out-going stream away from it; see 6.108 and information on charts. Local variations occur between islands. In open waters the rate of the tidal stream is generally between 1½ and 2½ kn but in areas where the flow is restricted in any way, rates can be much greater and will usually be accompanied by the overfalls which are a feature of the area.

- 2 With strong SE winds the influence of the W or SW-going tidal stream in the area SW of Percy Isles has been felt for 2 hours after the time of HW.

Major lights

6.53

- 1 High Peak Island Light (21°57'S 150°42'E) (5.63). Pine Islet Light (white GRP tower, 6 m in height) (21°40'S 150°13'E), standing on the S summit of the SW of Pine Islets. A signal station equipped with radio telephone is maintained at the light. Pine Peak Island Light (white structure, 3 m in height, on white rock) (21°31'S 150°15'E).

Directions

(continued from 5.65 or 5.219)

High Peak Island to Calder Island

6.54

- 1 From a position 3½ miles NE of High Peak Island (21°57'S 150°41'E) (5.65) the track leads NW, passing: NE of South East Islets (21°46'S 150°26'E) (6.56) distant 9 miles. Thence the track follows the preferred route shown on the chart, passing (positions from Vernon Rocks (21°28'S 150°19'E)):
 - 2 NE of North East Island (12 miles S) (6.56), thence: NE of Vernon Rocks, four low rocky islets, being the NE-most danger of Percy Isles; a light (white GRP hut, 2 m in height) stands on the N and highest islet. Thence: SW of Alarm Reef, which dries 3.4 m, (21 miles N); Prince Reef, which also dries, lies 3 miles farther NNE.

6.55

- 1 Thence the preferred route continues NW, passing (positions from Penrith Island (21°01'S 149°54'E)):
 - NE of Snare Rocks (6 miles SSE) lying 1½ miles E of Snare Peak Island, the SE-most of Cumberland Islands; a rock drying 1.1 m lies 5 cables SW of Snare Rocks; and:
 - 2 SW of Sandpiper Reef (9½ miles E); a sand cay drying 4.5 m lies on the reef. Redbill Islet, a rock outcrop, and Bushy Islet, a cay well covered by vegetation, lie on the W side of a large reef 2 miles farther N which dries. Thence: SW of Tern Island (9 miles NE), standing on a drying reef; a tree on the summit resembles a black tower when seen from a distance; a rock 12 m in height stands close NE of the island. And:
 - 3 NE of Penrith Island distant 2¼ miles, sparsely wooded; a light (white square masonry tower; 4 m in height), stands on the summit. The NE side of the island is cliffy and steep-to; a drying reef extends up to 7 cables S and W. Landing is difficult. Overfalls occur off the SE side of the island. Thence:
 - 4 NE of Derwent Island (5½ miles WNW), hummocky and wooded; Skull Rock (37 m in height) stands off the E extremity, and a rock (dries 1.8 m) lies

5 cables NW of the island; Three Rocks stand 3 miles farther NW. Tracks converge in this area from Hydrographers Passage NE and from the ports of Hay Point and Mackay SW. Thence:

- 5 NE of Scawfell Island (17 miles WNW), conspicuous and wooded, rising to a peak 1 mile SE of Duddon Point, the N extremity. Except in Refuge Bay on the N side, the island is cliffy and steep-to with depths of more than 20 m 3 cables offshore.

Thence the track leads to a position $5\frac{3}{4}$ miles ENE of Calder Island (20½ miles NW), wooded near its S end and fringed with rocks out to 3 cables offshore; a 17.7 m patch lies 1½ miles W of the island. Calder Island is a National Park.

*(Directions continue at 7.33
and for Whitsunday Passage at 7.39)*

Charts Aus 822, Aus 249, Aus 823

High Peak Island to Bailey Islet

6.56

- 1 From the position $3\frac{1}{2}$ miles NE of High Peak Island ($21^{\circ}57'S$ $150^{\circ}41'E$) (5.65) the track leads NW passing:
NE of South East Islets ($21^{\circ}46'S$ $150^{\circ}26'E$) distant 4½ miles. The islets are rocky, bare and steep-to; Sullivan Rock, which dries 4 m and otherwise breaks, lying 7 cables N of the E-most and highest of the islets, is the NE-most danger. Overfalls and discoloured patches caused by irregular depths occur between the islets and South Island $3\frac{1}{2}$ miles W.
- 2 Thence the track continues NW, passing (positions from Sphinx Islet ($21^{\circ}32'S$ $150^{\circ}09'E$)):
NE of Chase Point ($16\frac{1}{2}$ miles SE), a narrow, hilly promontory forming the NE extremity of South

Island (6.57); a spit with depths of less than 2 m over it and marked at its outer end by overfalls, extends 1 cable N from the point. Strong overfalls occur generally in the E approach to the channel between South and Middle Islands. The E coast of South Island from Chase Point to Onslow Point, $3\frac{1}{2}$ miles SSW, is formed by high, rocky cliffs which rise to about 111 m near the S end. Thence:

- 3 NE of North East Island ($12\frac{1}{2}$ miles SE), wooded and rising to a well-defined summit near its centre. The coast on the E side of the island is bold and steep-to; elsewhere it consists of rocky bluffs broken by small beaches. Walter Island, on the N side, is distinguished by a remarkable quoin-shaped hill and is only separated from North East Island at HW. Graf Rock, which dries 1.0 m, lying at the outer end of a drying sand spit which extends 5 cables W from the W extremity of the island is the outermost danger W; two above-water rocks lie 5 cables apart off the S point; Boat Islet (9 m in height), $4\frac{1}{2}$ cables off the SE point, is the outermost danger SE and a rock which dries 1.3 m, lying close N of Walter Island, is the outermost danger N. Tidal streams run strongly and there are strong overfalls in the channel between the island and Middle Island, $1\frac{1}{2}$ miles W.

- 4 Thence the track leads WNW passing:
NNE of Middle Island (8 miles SE), formed of ridges of hills, many of which are covered by gum trees and scrub. Cockatoo Hill (219 m in height) rises 1 mile SSE of Howard Point, the N extremity of the island, with the highest summit 2 miles farther ESE. The NE coast of the island is bold and rugged, with cliffs in the N part, and clear of

Middle I.

South I.



Pine Islets

Light

Percy Isles from NW (6.57)
(Original dated 1999)

dangers; Owens Shoal, 1½ miles W of Howard Point, is the outermost danger NW of the island. A 16.3 m patch lies 1½ miles ENE of Howard Point. Thence:

- 5 SSW of Pine Peak Island (5¼ miles E); a prominent, steep, conical peak (226 m in height) covered with pine trees, stands at its NE end; a light (6.53) stands 5 cables SE of the W extremity of the island. The S side of the island is fronted by rocks; the N side is described at 6.66.
- 6 Thence the track leads NW passing:
NE of Sphinx Islet, a bare peak; a rock (15 m in height) (5 cables S) marks the limit of foul ground extending S from the islet. Overfalls occur W of the N end of the islet. Thence:
NE of the Beverley Group (12½ miles W) (6.23), thence:
- 7 NE of Double Island (19½ miles WNW) (6.60), thence:
NE of Prudhoe Island (28 miles WNW) (6.60), thence:
SW of Snare Peak, Penrith and Derwent Islands (27½, 33 and 38 miles NNW respectively) (6.55), thence:
- 8 NE of Bailey Islet (21°02'S 149°33'E) distant 3½ miles. The islet is rocky with a light (white square tower, 5 m in height) standing on the E summit; two rocks which dry lie off the NW extremity of the islet. Tracks converge in this area from Hydrographers Passage NE and from the ports of Hay Point and Mackay SW.

Cheviot Island to Bailey Islet

6.57

- 1 From a position 4 miles SW of Cheviot Island (22°05'S 150°40'E) (5.219), the track leads NW passing (positions from Pine Islet (21°40'S 150°13'E)):
SW of Rothbury and Tweed Islands (33 miles SE) (5.219), thence:
SW of Morpeth Islet (28½ miles SE), bare and composed of reddish-coloured rock; Barnett Rock (dries 4 m) lies 2 cables N of the islet; thence:
- 2 Midway between Steep Island (26½ miles SSE) and Low Rock 5½ miles N, noting that these and other features lie within a large obscured sector (037°–110°) of High Peak Island Light (21°57'S 150°41'E) (5.63). In thick weather or on a dark night the track should be adjusted to pass closer NE of Steep Island as Low Rock is difficult to detect. Steep Island, with a double summit and thickly wooded with pine trees, is an excellent landmark and may be easily distinguished at night in clear weather. A 17.4 m patch lies 8 cables SW of Low Rock. Thence:
- 3 NE of Alnwick Island (23 miles SSE), rocky and rising to a remarkable bare peak; some stunted pine trees grow on the W side and there are red cliffs on the SE side of the island. Hexham Island (105 m in height), 6 cables farther WSW, is rocky with bare summits; depths less than 10 m extend 5 cables SW and 1¼ miles NNW from the NW extremity of Hexham Island. Thence:
- 4 NE of Shields Island (22½ miles SSE), rocky with a bare summit; an islet, 53 m in height, lies on a below-water ledge extending from the S extremity of the island; depths less than 10 m extend 7 cables N and a similar distance SW from the

NW point of the island; an 11.6 m patch lies 1 mile ENE of the same point. Thence:

- 5 NE of Allandale Island (21 miles SSE), flat-topped; a rock which is just above water lies off the S end of the island; thence:
SW of Hannah Rock (16½ miles SE), steep-to. The rock lies just beyond the nominal ranges, and just outside the visible sectors, of both High Peak Island Light (21°57'S 150°41'E) (5.63) and Pine Islet Light (21°40'S 150°13'E) (6.53). Thence:
- 6 NE of Jeffreys Rocks (15½ miles S), two bare rocks with several smaller rocks in their close vicinity; a spit with depths less than 5 m extends 7 cables W from the rocks. Glasgow Rock, usually indicated by overfalls, and which breaks in bad weather, lies 3½ miles WNW of Jeffreys Rocks. These are the outermost dangers NE of Duke Islands. Thence:
- 7 SW of South Island (7 miles SE). Onslow Point, at the SW extremity, slopes gradually to the sea from the high cliffs of the E coast; the SW coast of the island is formed of rocky points interspersed with shingle beaches. Hixson Islet, with pine trees on it, lies off the end of a ledge of rocks and a rock awash extending 5 cables from the NW point of the island. The E coast is described at 6.56 and the N coast at 6.62. Thence:
- 8 NE of Sail Rock (9¼ miles SSW), just above water; Bates Rock lies ¾ miles farther W; these are the outermost dangers N of Duke Islands. South Sail Rock, with an 10.9 m patch marked by overfalls 7 cables NE, lies ¾ miles SSW of Sail Rock; there is otherwise a least depth of 13.9 m between the two. Thence:
- 9 SW of both Normanby Rock (1¼ miles S), steep-to and sometimes marked by an eddy, and Hixson Point 1½ miles farther E, the SW extremity of Middle Island, making due allowance for the tidal stream (6.52). Overfalls occur off Hixson Point. The S and W coasts of Middle Island are described at 6.63. Thence:
- 10 SW of Pine Islet Light (21°40'S 150°13'E) (6.53) distant 3½ miles. Pine Islets, the largest of which is 65 m in height, are rocky, covered with pine trees and interconnected at LW. Hildebrand Rock, a pinnacle with a depth of 0.8 m over it, lies 1 mile NNE of the light. A passage, 5 cables in width with depths of 9 to 15 m over a sandy bottom, lies between the islets and Middle Island.

6.58

- 1 Thence the track is adjusted to lead NW to the position 3½ miles NE of Bailey Islet (21°02'S 149°33'E), passing NE of Beverley Group (21°29'S 149°52'E) where allowance must be made for the tidal streams which set strongly SW through the islands on the rising tide and NE on the falling tide. The streams attain rates of 1½ to 3 kn at springs and cause heavy overfalls at each end of the group. The track passes (positions from Sphinx Islet (21°32'S 150°09'E)):
- 2 NE of Digby Island (13 miles W), bare and the S-most of Beverley Group; Penn Islet, a bare rock 6 cables farther E, stands on a bank with a depth of 3.9 m over it; Keelan Island (66 m in height), wooded, lies 3 cables NE of Digby Island. Henderson Island, 3 cables N of Digby Island, is wooded; Still Islet (47 m in height), a remarkable narrow, square rock, stands 7 cables farther ENE. A ledge with depths of 11 to 15 m over it, extends

1½ miles N from Still Islet. Penn and Still Islets mark the outermost dangers E of Beverley Group. Prudhoe Channel (6.59) leads WNW from this vicinity. Thence:

- 3 Clear of a 16.4 m patch (12½ miles WNW), as required by draught, thence:
NE of Double Island (19½ miles WNW) (6.60), thence:
NE of Prudhoe Island (28 miles WNW) (6.60), thence:
NE of Bailey Islet (21°02'S 149°33'E) (6.56) distant 3½ miles, where tracks converge.
(Directions continue for Cumberland Channel at 7.54 and for Hillsborough Channel at 7.59)

Prudhoe Channel

Charts Aus 249, Aus 823

Description 6.59

- 1 Prudhoe Channel is entered from E between Double Island (21°23'S 149°50'E) and Beverley Group 3½ miles SSE, and passes thence between Prudhoe Island (21°19'S 149°41'E) and Reid Islet, 2¾ miles SSW, at its W end, where the narrowest part is found. The channel has depths of more than 11 m in the fairway and a least width of 1½ miles; it is used by coasters.
- 2 **Tidal streams.** When passing Beverley Group allowance must be made for the tidal streams described at 6.58; elsewhere within Prudhoe Channel the stream sets similarly across the track at a rate of 1½ to 2 kn. There is a strong set along the E and W sides of Prudhoe Island, causing overfalls off the E end.

Local knowledge is required.

Directions 6.60

- 1 From a position E of Still Islet (21°29'S 149°55'E) the track leads generally WNW, passing (positions from Still Islet):
NNE of Still Islet (6.58), thence:
NNE of a 5.7 m patch (3 miles NW); Beverlac Island, wooded, lies 1 mile SSW of the patch; thence:
- 2 NNE of a depth of 7.4 m (5½ miles WNW) lying 9 cables NW of Minster Island; thence:
NNE of Renou Islet (6¼ miles WNW), round-topped and the NW-most of Beverley Group; Jack Rock, a pinnacle, lies 4 cables W of the islet. Thence:
- 3 SSW of the SW end of a bank (8 miles NW), with depths of less than 5 m over it, extending 2 miles SW from Double Island; Lloyd Shoal lies near the middle of the bank. Double Island, with a rocky coastline and steep-to except on its N and W sides; rises to a bare ridge near its SE extremity; Recife Point, the NW extremity, is low and almost detached at HW; a few trees stand on the neck of land joining the point to the island. Thence:
- 4 NNE of Knight Island (11¾ miles W), rising to a ridge with a remarkable bare summit at its centre; the coast is rugged and rocky except on the SW side where good landing may be made on a sandy beach; Charles Rock, a pinnacle which dries 2.4 m, lies close off the S extremity of the island. Thence:

NNE of Reid Islet (16 miles WNW), flat, with bushes at its centre; a rock, which dries 6.6 m, is the outermost of a number of rocks extending 5 cables SE from the islet. Thence:

- 5 SSW of the SW end of a bank (16½ miles WNW), with depths of less than 5 m over it, extending 2 miles SW from Prudhoe Island. The island is the NW-most and highest of Northumberland Isles, rising to a prominent peak near its centre; a grassy ridge 201 m in height, forming the W part of the island, is separated from the main part by a low neck of swampy ground; the hills are covered with scrub, with stunted pines in the gullies. Thence:
- 6 NNE of the N extremity of Viscount Shoals (19 miles WNW) (6.140). The shoals lie W of a line between Reid Islet and Elamang Islet (6.140) 6 miles farther S. Thence:
- 7 SSW of South Overfall Rock (19 miles NW), lying 1¼ miles WNW of Prudhoe Island; Overfall Rock lies 2¼ miles farther NNW. Tidal streams set strongly past these rocks and close along the W side of Prudhoe Island, attaining rates of 3 kn at springs; whirlpools and overfalls occur between the 2 rocks, neither of which should be approached within 5 cables.

Thence course may be directed as required.

Anchorage and harbour

Chart Aus 822 (see 1.15)

Shields Island 6.61

- 1 Anchorage, with some shelter but exposed to winds from SW through W to N, may be obtained SW of Shields Island (22°00'S 150°23'E) (6.57) in a depth of 10 to 15 m. The best approach is round the NE end of the island.

Charts Aus 822, Aus 823

South Island 6.62

- 1 The N coast of South Island (21°45'S 150°20'E) (6.57) is divided into two bays by Howard Islet (19 m in height), close N of a rocky projection lying 2¾ miles WSW of Chase Point. North West Bay in the W and Rocky Shelf Bay in the E have hard sandy beaches at their heads, backed by a low coastline rising gradually to rocky hills to S.
- 2 **North West Bay.** Depths of less than 10 m extend 2½ cables offshore in the bay, increasing rapidly to more than 15 m a short distance farther to seaward.
Anchorage in a depth of 20 m may be obtained 5 cables W of Howard Islet. The anchorage is indifferent but can be used in SE winds, although even then there is surf on the beach. Anchorage may also be obtained in a depth of 23.5 m 3½ cables farther to seaward.
- 3 **Rocky Shelf Bay.** Anchorage may be obtained in the middle of Rocky Shelf Bay during offshore winds, in depths of 15 to 20 m. A coral shelf, some heads of which are awash, extends up to 4 cables from shore. Chevy Shoal, with a depth of 3.6 m over it and usually marked by heavy overfalls, lies 3 cables W of Chase Point.
Anchorage for small craft may be obtained inside Chevy Shoal where tidal streams are not strong.

Local knowledge is required.

Middle Island

6.63

- 1 **Spur Bay** lies between East Spur and West Spur, 2 rocks (each 10 m in height), the former lying 1¼ miles SSE of the S summit of Middle Island (21°40'S 150°16'E) (6.56) and the latter 7 cables farther W.

Anchorage may be obtained midway between East and West Spurs in depths of 10 to 20 m but the bottom is irregular and care must be taken not to go close in as foul ground extends offshore. No tidal stream, except for a slight eddy, is felt at the anchorage, and even with a fresh E wind a vessel of moderate size may lie comfortably. The beach is well sheltered and boats may land at almost any time.

- 2 During the later months of the year winds are liable to shift suddenly to S or SE; berth must be shifted quickly when this occurs.

Whites Bay, entered about 5 cables NNE from East Spur, is partially obstructed by a drying reef; an islet (29 m in height) and some above-water rocks lie on the reef.

- 3 **Rescue Bay** lies between West Spur and Hixson Point (21°41'S 150°15'E) (6.57). Anchorage, with shelter from N and NW winds, may be obtained in the middle of the bay in a depth of 10 m, well out of the influence of the tidal stream.

- 4 **West Bay** is entered on the N side of Smith Bluff, 43 m in height, 1¼ miles N of Hixson Point. The anchorage off the bay in depths of 10 to 15 m is the best and most convenient of those off Middle Island. Shelter is good in E winds but the holding ground is not good. In S winds the sea is uncomfortable for small craft and a berth (6.64) under the lee of Pine Islets, 1 mile W, may be preferable.

- 5 Tidal streams in West Bay set N from 2 hours before until 4 hours after the time of HW at Mackay; S from 5 hours after until 4 hours before, and W at 3 hours before HW. The maximum rates of 1 kn at springs and ½ kn at neaps are reached about 15 minutes after the times of HW and LW Mackay.

Strong overfalls occur round Howard Point, 2 miles N of West Bay, where the stream sets SW on the rising tide.

Pine Islets

6.64

- 1 Anchorage may be obtained in N or NW winds off the S side of Pine Islets (21°40'S 150°13'E) (6.57) in depths of 11 to 16 m. Anchorage may also be obtained off the N side of the islets.

North East Island

6.65

- 1 **Blunt Bay**, between the NW extremity of North East Island (21°40'S 150°20'E) (6.56) and the W side of Walter Island, is easy of access and affords sheltered anchorage in depths of 10 to 25 m with protection from most winds experienced there. Depths in the bay are irregular but the anchorage is recommended as tidal streams there are weak.

Chart Aus 823

Pine Peak Island

6.66

- 1 Anchorage, with shelter from S and SE winds, may be obtained in depths of 10 to 15 m 7½ cables NNE of the light on Pine Peak Island (21°31'S 150°15'E) (6.56).

Battle Bay on the N side of the island is obstructed by a coral ledge extending 4 cables offshore. Shrewsbury Rock, which dries 3.1 m, lies 1½ miles NE of Pine Peak Island Light; a depth of 5.1 m and a below-water rock lie between Shrewsbury Rock and the island.

- 2 Hotspur Island, lying 1¼ miles NE of the anchorage, is steep-to, bold and rocky; an islet lies 3 cables WSW, connected to Hotspur Island by a drying reef.

Tidal streams set strongly through the passage between Pine Peak Island and Hotspur Island.

Boat harbour. There is a good boat harbour near the W end of the S side of Pine Peak Island.

Beverley Group

6.67

- 1 **Sappho Roads** lie between Noel Island (21°30'S 149°54'E), which is bare, and Henderson Island 1 mile NE (6.58), and are protected from SE by Digby Island. The best anchorage is close to Henderson Island in a depth of 20 m, as it is out of the strength of the tidal streams. Lesser depths of 9 to 15 m are found in the middle of the roads but tidal streams there attain a rate of 2½ to 3 kn and anchorage is not recommended.

- 2 Sappho Roads are easy of access and are recommended for coasters or small craft unable to proceed S against the strong SE winds often occurring in winter.

Chart Aus 249

Prudhoe Island

6.68

- 1 Anchorage may be obtained in a bay on the NE side of Prudhoe Island (21°19'S 149°41'E) (6.60) and off the W side of the island in a depth of about 20 m, but the strength of the tidal stream must be taken into account in the latter case.

- 2 Anchorage may also be obtained off the SW side of the island and E of Prudhoe Shoal, which has a least depth over it of 2.5 m; care must be exercised as the shoal is steep-to on both sides and soundings are not a safe guide. In 1926, HM Surveying Ship *Moresby* (1320 tonnes) found that Prudhoe Shoal could be seen from the bridge in good light conditions, and that a distinct ripple could be seen with the stream on the rising tide.

Landing may be made on a sandy beach on the SW side of the low middle part of the island.

Chart Aus 824 (see 1.15)

Scawfell Island

6.69

- 1 Anchorage with good shelter from SE winds may be obtained in a depth of 10 to 15 m in Refuge Bay on the N side of Scawfell Island (20°52'S 149°37'E) (6.55). Two sandy beaches at the head of the bay, separated by a small point, are fronted by reefs.

SHOALWATER BAY AND BROAD SOUND

General information

Charts Aus 820, Aus 822, (see 1.15)

Description

6.70

- 1 Shoalwater Bay (22°18'S 150°20'E) and Broad Sound 30 miles WNW, are two extensive inlets which may be

approached from S and E through Broad Sound Channel. The area is not commercially significant.

Depths

6.71

- 1 **Caution.** Large parts of the area have not been surveyed to modern standards. The largest scale national chart of Broad Sound Channel and Shoalwater Bay shows less water over some dangers than is indicated on the reference charts quoted.

Local knowledge

6.72

- 1 **Local knowledge** is desirable throughout the area and essential in confined waters.

Landmarks

6.73

- 1 Pine Mountain (22°26'S 150°12'E).
Double Mountain (22°33'S 150°18'E) (chart Aus 367), the highest summit of Normanby Range.

Broad Sound Channel

General information

6.74

- 1 Broad Sound Channel is entered from E between Cape Townshend (22°12'S 150°29'E) and Steep Island, 10 miles N. The channel, which gives access to Shoalwater Bay and to Broad Sound, is bounded to S by Shoalwater Bay, to N by the S group of Northumberland Isles and to SW by the dangers which extend 15½ miles NW from Arthur Point (22°07'S 150°03'E) and form part of the E side of Broad Sound. The W limit of the channel is effectively about 6 miles S of Bedwell Group (21°50'S 149°48'E), where it leads into Main Channel to Broad Sound.

6.75

- 1 **Topography.** The S side of the channel is formed by Shoalwater Bay and Broad Sound and is described under those parts of the text.

Duke Islands, on the N side of the channel, lie between 15 and 22 miles WNW of Steep Island (22°02'S 150°27'E) and are surrounded by rocks, shoals and sandbanks. The exposed parts and summits of these islands are nearly all bare of trees, but stunted pines and casuarinas grow in sheltered spots. The islands are mostly covered with luxuriant grass and the soil in many places is a rich dark mould; they are principally of limestone formation, and the rock abounds with veins of fine white marble. There is iron ore on Iron Islet. Individual islands are described in the appropriate parts of the text.

- 2 **Caution.** Due to the nature of Duke Islands, and to the strength of the tidal streams in their vicinity (see 6.77), the locality is not recommended and should preferably be avoided.

6.76

- 1 **Depths.** The E part of the channel is deep and clear of danger over a width of about 4½ miles but there are areas of sandwaves on the seabed in the quadrant S of Otterbourne Island (22°02'S 150°18'E). West of the meridian of Two Round Rocks (22°02'S 150°06'E) depths decrease gradually to about 11 m in the W end of the channel which becomes also more restricted in width.

6.77

- 1 **Tidal streams** in Broad Sound Channel are influenced primarily by those setting in and out of Broad Sound (see 6.108), and secondly by those in and out of Shoalwater Bay. The directions and rates of the stream shown in several places on the chart indicate the general pattern to be expected.
- 2 In confined channels, particularly in the vicinity of Duke Islands, the streams can attain a considerable rate; spring rates of 5 kn have been experienced off the S extremity of Marble Island (21°59'S 150°10'E) (6.78) and in Lola–Mantes Passage between the same island and Hunter Island, 3 cables W. Streams between the islets lying on a rocky ledge on the NE side of Crooked Sands between Hunter Island and Bamborough Island (21°56'S 150°07'E) are very strong and dangerous for boats.

Directions

6.78

- 1 From a position between Cape Townshend (22°12'S 150°29'E) (5.220) and Steep Island 10 miles N (6.57), the track leads generally WNW, passing (positions from Two Round Rocks (22°02'S 150°06'E)):
SSW of Alnwick and Hexham Islands (15 miles E) (6.57), thence:
- 2 NNE of Donovan Shoal (12 miles SE), marked by overfalls; depths less than 10 m extend 1¼ miles NNE and NE from the shoal; thence:
SSW of Table Rock (11 miles E), the SW–most of a group of three drying rocks lying in a dangerous area extending 8 cables SE from the E point of Otterbourne Island. The island rises abruptly to a central ridge. Thence:
- 3 NNE of a 4.2 m patch (charted as 4.3 m) (8 miles SE); patches with depths of 5.0 and 9.0 m (charted as 5.1 and 9.1 m) over them lie 1 mile WNW and 7 cables ESE. These patches and a bank, with irregular depths less than 15 m over it extending 2 miles farther E, are considered to be an area of sandwaves. Thence:
- 4 SSW of Danger Island (3½ miles ENE), the S–most of Duke Islands (see 6.75 for general description and Caution); Danger Shoal, with depths less than 5 m over it, extends 1 mile W from the islet; Long Shoal, a sandy ridge, lies between 5 cables and 4¼ miles ENE from Danger Island, with a channel between. Marble Island, the largest and highest of Duke Islands, lies with its S extremity 3 cables N of Danger Island, also with a channel between, and rises gradually to a range of rounded grassy hills; the coast of Marble Island is rocky with small sandy beaches in the bights and is fringed on its SW side by a drying coral reef. Thence:
- 5 SSW of Tynemouth Island (2¼ miles NE); a drying reef lies 5 cables NE of the SE point of the island, and a rock awash lies 2½ cables S of the same point; a spit, marked by overfalls and with a depth of 6.1 m (charted as 6.4 m) over it, extends 7½ cables SSW from the W end of the island. Thence:
- 6 Either side of Two Round Rocks and of Low Island (1 mile S); a third rock (4 cables W) lies towards the W end of the bank on which Two Round Rocks stand. A dangerous wreck lies 2½ miles SSW of Low Island. Thence:

- 7 SSW of Bellingham Sand (6 miles NNW), which dries; Boomerang Shoal (8 miles NW), a narrow ridge marked by strong overfalls; and Lake Shoals (13½ miles NW); all of which, separated by channels between, extend progressively W from the W side of Bamborough Island (6 miles N), the NW-most of Duke Islands and bare, with rich red soil. Coquet Island (12 m in height), sandy and with a few trees on it, stands near the SW extremity of the drying reefs off Bamborough Island; these reefs are separated from Bellingham Sand by Narrow Passage which is deep. Thence:
- 8 NNE of Barren Islet (7¼ miles W); Black Swan Rock, which dries 3 m, lies 1¼ miles E; Brooks Shoal lies at the W end of a spit extending 2½ miles WNW from the islet. Thence:
Clear of Half Tide Rock (9 miles WNW), which dries 2.1 m, a rock with a depth of 6.4 m over it lies 1¼ miles farther NNW; thence:
- 9 NNE of Channel Islet (12 m in height) (12 miles WNW), with overfalls off its W side and the N-most danger on Park Shoal, an extensive area of foul ground lying off the NE end of Wild Duck Island; Falcon Islet (30 m in height) lies 1 mile SW of Channel Islet on the same shoal. Thence:
- 10 NNE of Holt Shoal (16 miles W), which extends 2 miles NE from Turn Island. The shoal dries in places and is marked by overfalls at its outer end. And:
SSW of the W end of Lake Shoals (16 miles WNW), thence:
S of Bedwell Group (20 miles NW) (6.17).
Course may then be directed through Main Channel (6.114) to Broad Sound, or as otherwise required.

Chart Aus 822 (see 1.15)

Anchorage

6.79

- 1 Anchorages close W of Cape Townshend (22°12'S 150°29'E) and amongst Cannibal Group, 6 miles W, are described at 6.92 and the paragraphs following. An anchorage off Shields Island (22°00'S 150°23'E) is described at 6.61.

6.80

- 1 **Iron Islet**, a mass of iron ore, lies 7½ cables S of Quarry Point, the NW extremity of Marble Island (21°59'S 150°10'E) (6.78); and is connected to it by a drying sandbank.

Anchorage, which is the best amongst Duke Islands (see Caution at 6.75), may if necessary be obtained 4 cables S of Iron Islet, as shown on the chart, in depths of 10 to 11 m; the nearer the anchorage is to the shore, the less the tidal stream.

- 2 **Local knowledge** is required.

Directions. Approach to the anchorage should be made from a position in Broad Sound Channel SE of Marble Island. The track leads (positions from Danger Island (22°01'S 150°10'E)):

Between Danger Island (6.78) and the W end of Long Shoal (5 cables ENE), thence:

- 3 WNW between Danger Island and Marble Island (3 cables N), thence:

N between Marble Island and Tynemouth Island (1½ miles WNW) (6.78), taking care to avoid the dangers off the E side of the latter.

- 4 An approach from N through Lola-Mantes Passage should not be used if it can be avoided as there are depths of less than 5.0 m in the fairway and tidal streams (see 6.77) are strong. On the SE side of the passage Markar Islet, composed of white marble and covered with stunted pine trees, lies close NE of Quarry Point; a spit, with depths less than 5 m over it, extends 1 mile farther NE. On the NW side Till Shoal, with a depth of 2.3 m over it, extends to 1½ miles NE of the NE extremity of Hunter Island; Till Rock, which dries 1.5 m, lies between. Bamborough Shoal, with a depth of 2.7 m over it, lies 1¾ miles NW of Till Shoal in an area of general irregular depths.

- 5 From Quarry Point, Lola-Mantes Passage leads generally S between that point and the S part of Hunter Island, 3 cables W; thence W of Iron Islet.

6.81

- 1 **Tynemouth Island** (22°00'S 150°08'E) (6.78); see also Caution at 6.75. Anchorage may if necessary be obtained 1 mile WNW off the W side of the island which is formed by a sandy beach fronted by a coral ledge; the anchorage has depths of 7 to 10 m and is out of the strength of the tidal stream. Crooked Sands lie N of the anchorage; the sands, which have depths less than 10 m over them and which dry over their inner part, extend 4 miles W from Hunter Island; the S end of which lies 7 cables NE of Tynemouth Island.

- 2 **Local knowledge** is required.

Directions. Approach to the anchorage should be made from a position in Broad Sound Channel a little E of Two Round Rocks (22°02'S 150°06'E) (6.78). Bamborough Island, 6 miles farther N (6.78), bearing N and well open W of Tynemouth Island, leads to the anchorage.

6.82

- 1 **Thirsty Sound.** The NE entrance to Thirsty Sound (6.128) lies between Arthur Point (22°08'S 150°03'E) (6.84) and Pier Head, 7½ cables NNW, a bare round hill 101 m in height and the NE extremity of Quail Island to which it is connected by a low sandy neck of land.

- 2 **Anchorage** may be obtained in the sound 1 mile WSW of Arthur Point in a depth of 6 m. Beyond the anchorage the sound is navigable only by small craft; see 6.128. Strong NE and E winds send a heavy swell into the anchorage and cause short and steep seas there on the out-going tidal stream.

- 3 A rock awash lies 1 mile NE of Pier Head. A hard shingle bar, with reported depths of 1.8 to 3.6 m over it, extends across the entrance from Pier Head to the S shore; otherwise a 5.2 m patch (charted as 5.5 m), 5 cables E of Pier Head, is the least depth in the entrance.

Shoalwater Bay

General information

6.83

- 1 The entrance to Shoalwater Bay lies between Cape Townshend (22°12'S 150°29'E) and Arthur Point 25 miles WNW, but entry channels are restricted to North Channel and North West Channel passing either side of Cannibal Group of islands and reefs lying on a bank of foul ground in the middle. Strong Tide Passage (5.222), 7½ miles SSE of Cape Townshend, provides a third entrance to the bay but is not recommended. Shoalwater Bay extends 35 miles SE into Head Creek and also branches into East Creek which leads generally ESE in latitude 22°31'S.

6.84

1 **Topography.** Arthur Point (22°08'S 150°03'E), from which the land rises to 115 m in height 8 cables SSW, is the N extremity of an extensive ridge of wooded hills dividing Shoalwater Bay from Broad Sound. The ridge gives rise to a number of detached mountains, the most prominent of which are Pine Mountain (22°26'S 150°12'E) (6.73) and Double Mountain, 10 miles SE, (6.73). The W shore of the bay fronting these features consists of sandy beaches interspersed with rocky ledges which, SE from Macdonald Point, give way to drying mud flats extending from low swampy ground fringed with mangroves and intersected by creeks. ESE from Double Mountain there are more detached summits, including Hummock Mountain (22°39'S 150°32'E), behind which is a background of higher ground extending inland from Cape Manifold.

2 The background to the E side of the bay is dominated by Mount Westall (22°22'S 150°35'E) (5.221) and Peninsula Range, and by the moderately high ground of Townshend Island at the N end of the peninsula. The shoreline itself, which is mostly fringed with mangroves, is fronted by rocky ledges and narrow banks which partly dry and extend from 2 to 4 miles offshore.

3 In the upper parts of the bay the shore is low and covered with mangroves which extend some distance inland and make landing possible at only a few places.

6.85

1 **Depths.** North West Channel, leading into the bay, has depths not less than 11 m in the fairway; North Channel is the deeper, as may be seen from the chart, but is more obstructed by banks and shoals, particularly at its SW end. The two channels join in the vicinity of Edward Island (22°19'S 150°18'E) (6.87), from where the main navigable channel to the head of the bay leads SE for 15 miles with a least depth of 9 m in the fairway.

2 Depths in Head Creek at the head of the bay are irregular, but East Creek (22°31'S 150°35'E) has a least depth of 5.0 m for some distance in the fairway.

Caution: the soft mud in Shoalwater Bay is stirred up by the tidal streams, causing deceptive water conditions similar to those prevailing in Keppel Bay; see Caution at 5.213.

6.86

1 **Exercise area.** A large part of the bay is subject to restriction on access; see 5.214.

Pilotage. Not available.

Local knowledge is required.

Tidal streams. In the centre of North Channel the tidal stream sets SW/NE at a rate of 2 to 3 kn. On the NW side of the channel the stream is rather weaker, but on the SE it is stronger and sets through Ripple Islands at a rate of 3 to 4 kn with heavy overfalls.

2 In North West Channel the stream attains a rate of 2 to 2¾ kn. Between Akens Island (22°21'S 150°17'E) and Edward Island 2¾ miles NNE, the in-going stream sets SE and the out-going stream NW.

Elsewhere within the bay the tidal streams run at between 1½ and 2½ kn. The strength and direction of the streams are shown in several positions on the chart.

Directions**6.87**

1 **North Channel.** From a position N of Cape Townshend (22°12'S 150°29'E) (5.220) the track leads SW.

Leading marks:

Front mark, Edward Island (12 m in height) (22°19'S 150°18'E).

Rear mark, Pine Mountain (9¼ miles SW of the front mark) (6.73).

2 The SE tangent of Edward Island just open NW of the summit of Pine Mountain leads SW through North Channel, passing (positions from Edward Island):

NW of a bank with a least depth of 12.5 m over it (11½ miles NE), marked by overfalls, thence:

NW of the two E-most of Ripple Islands (9¾ miles NE), the N island is 46 m in height, and the other 30 m; both lie on a spit of foul ground extending 2 miles NW from Leicester Island, which is 38 m in height and wooded. Thence:

3 NW of Harrison Island (12 m in height) (8 miles NE), the NW-most of the four Ripple Islands; the fourth island lies 5 cables SSE, with a ledge of drying rocks between. Heavy overfalls occur in the vicinity of all Ripple Islands. Thence:

4 SE of a rock, 9 m in height (6½ miles NE); a 2.1 m patch lies 6 cables S. This rock, together with Holt Island (15 m in height) 5 cables N, Mumford Island (18 m in height) 1¾ miles NNW, and North Rock (2 m in height) 2¼ miles NNW, marks the E edge of the foul ground of Cannibal Group. Thence:

5 Just under 5 cables SE of Alert Ridge (5¾ miles NE), with a depth of 7.2 m (charted as 6.1 m) over it and marked by overfalls. The track here may be adjusted, to pass in the deeper water existing farther SE of the ridge if preferred, by temporarily opening the leading marks for this channel more than described above. Thence:

6 NW of a bank (4½ miles ENE) with a depth of 3.6 m over it and marked by overfalls; thence: SE of Collins Island (3½ miles N), wooded and the S-most and largest of Cannibal Group; thence: NW of a 3.4 m patch (charted as 3.3 m) (2 miles ENE) and of a 4.9 m patch (charted as 5.5 m) (1¼ miles ENE); thence:

7 SE of Blind Rock, which dries 0.9 m, (1½ miles NNW).

Thence the track leads S initially in depths of 20 m or more, to a junction SE of Edward Island with the E branch of North West Channel, passing:

Close E of Edward Island; Bryant Rock (dries 3.3 m) lies 2½ cables NNW; a spit with depths less than 10 m over it extends 5 cables S from the island.

6.88

1 **North West Channel.** From a position between Arthur Point (22°08'S 150°03'E) (6.84) and Cannibal Group 12½ miles ESE, the track leads generally SE keeping in depths greater than 10 m and passing (positions from Broome Head (22°16'S 150°09'E)):

2 NE of Stanage Point (7¾ miles NNW), the SE entrance point to Stanage Bay; the point rises to Bald Hill (76 m in height), 2 cables SW. Thence: NE of Broome Head, which is cliffy; foul ground extends up to 1 mile offshore between Stanage Point and the head; and:

3 SW of Turn Shoal (5½ miles ENE), with a depth of 4.2 m over it, which lies 1 mile WSW of White Rocks (9 m in height). From the shoal a ridge, with depths less than 10 m over it and a least

depth of 3.5 m, extends S then SSE for a total of 4 miles. Thence:

SW of Separation Banks (6 miles E), with a least depth of 0.6 m (charted as 0.9 m) over their NW part; and:

- 4 NE of Osborn Island (15 m in height) (4½ miles ESE), the N-most of the group of islands and rocks comprising Skull Islands; Clara Island (12 m in height) and Sun Island (11 m in height), both with bare tops, and Sunset Rock (dries 3 m), extend progressively 2 miles farther SSE, marking the approximate outer edge of the group. Swan Island (53 m in height), 2½ miles SSW of Osborn Island and standing off Macdonald Point, is the largest and SW-most of the group and has a round wooded summit. Thence:

SW of Edward Island (8¾ miles ESE) (6.87). Thence the channel divides.

6.89

- 1 The W branch of North West Channel extends 9 miles farther SE between West Ridge Banks (6.90) and the mainland shore SW; the branch offers good anchorage (6.98) off Akens Island, but is otherwise blind. The track leads SE, passing (positions from Edward Island (22°19'S 150°18'E)):
- 2 NE of Master Rocks (drying 4 m) (2 miles SSW), lying on the rock-fringed NE side of Akens Island between 5 cables NNE and 1 mile N of its NE extremity. Akens Island is 38 m in height and cliffy at this point, but is otherwise low and scrub-covered. And:
- 3 SW of Bay Island (26 m in height) (1½ miles SSE), prominent and standing on a spit, with depths less than 15 m over it, extending SSE from Edward Island; thence:
SW of Connor Rock, which dries 0.9 m, (¾ miles SSE); a depth of 6.1 m is found 3 cables NW of the rock; thence:
- 4 NE of Sabina Point (5½ miles S), rocky, with white clay cliffs on its S side; a number of dangers lie within the charted 10 m depth contour off the point and also ESE of it.

From thence the fairway is increasingly obstructed by West Ridge Banks on the NE side and by drying sandbanks on the other extending up to 1½ miles from the SW shore.

6.90

- 1 The E branch of North West Channel, from a position SW of Edward Island (22°19'S 150°18'E) (6.87), leads E over the spit between that island and Bay Island 1½ miles SSE (6.89) in a least depth of 12.8 m, to join the inner end of North Channel (6.87) SE of the same Edward Island.
- 2 Thence the channel to the head of the bay leads generally SE, passing:
NE of West Ridge Banks, which dry in parts and which, from the SW side of the entrance (22°33'S 150°34'E) to Head Creek, extend 17 miles NW; thence:
Clear of Passage Patch (22°22'S 150°23'E), with a least depth of 0.3 m, thence:
- 3 SW of East Ridge Banks, ¾ miles E of Passage Patch; the SE part of the ridge dries; thence:
Clear of a 5.2 m (charted as 5.5 m) patch (22°26'S 150°28'E); a 0.6 m (charted as 0.9 m) patch lies ¼ miles ESE.

Thence course may be directed as required for East Creek or for Head Creek, which should both only be navigated when the banks are uncovered.

6.91

- 1 **East Creek** is entered in the vicinity of 22°31'S 150°34'E, from whence a deep but narrow channel with depths from 5.0 to 11 m extends 5 miles ESE.

Head Creek is entered in the vicinity of 22°33'S 150°34'E, from whence it extends about 7 miles SE, gradually narrowing to its head.

Anchorage, passage and landing

6.92

- 1 **Supply Bay** (22°13'S 150°27'E) lies close W of Cape Townshend and is entered between the off-lying Cape Island (5.220) and foul ground extending E from the NE-most of Ripple Islands, ¼ miles W (6.87).

Anchorage for small vessels may be obtained in depths of 5 to 13 m in the bay, where moderate N winds do not send in a sea. Tidal streams set strongly across the entrance.

6.93

- 1 **Mumford Island** (22°12'S 150°22'E) (6.87). Anchorage in a depth of 16 m, sheltered from SE winds, may be obtained 5 cables W of the islet.

6.94

- 1 **Leicester Island** (22°15'S 150°27'E) (6.87). Anchorage, sheltered from SE winds and with easy access, may be obtained ¼ miles off the middle of the W side of Leicester Island in depths of 15 to 20 m; overfalls mark the outer edge of foul ground extending up to 1 mile offshore on this side of the island.

Caution. In 1984 it was reported that the tidal stream ran at 2 to 4 kn, and at times at 6 kn in this anchorage.

6.95

- 1 **Collins Island** (22°14'S 150°19'E) (6.87). Anchorage sheltered from N winds may be obtained 7½ cables S of the island in depths of 9 to 16 m.

6.96

- 1 **White Rocks** (22°12'S 150°15'E) (6.88). Anchorage in a depth of 16 m, with shelter and good holding ground, may be obtained 1½ miles N of the rocks and clear of a 4.2 m patch lying midway between them and Donovan Shoal, ¾ miles NNE.

A drying ledge extends 5 cables W from White Rocks; a bank, with depths of less than 10 m over it, which extends about 6 cables NW and N from White Rocks.

6.97

- 1 **Skull Islands.** Anchorage, sheltered from all but ESE winds, may be obtained S of Sunset Rock (22°19'S 150°15'E) (6.88) in depths of more than 9 m. Small craft may anchor 5 cables W of the rock, out of the strength of the tidal stream.

6.98

- 1 **Akens Island** (22°21'S 150°17'E) (6.89). Anchorage, in the W branch of North West Channel with good holding ground in depths of 10 to 15 m, may be obtained 2½ miles SE of the NE extremity of the island.

6.99

- 1 **Passage Patch** (22°22'S 150°23'E) (6.90). Anchorage with good holding ground in depths of 15 to 18 m may be obtained 1 mile N of the patch.

Anchorage may also be obtained 6½ miles SE of the same patch in a depth of 11 m.

6.100

- 1 **East and Head Creeks.** Anchorage, well sheltered but confined, may be obtained in East Creek (22°31'S 150°34'E) (6.91) and also in Head Creek, 2 miles farther S (6.91).

6.101

- 1 **Canoe Pass** separates Leicester Island (22°15'S 150°27'E) (6.87) from Townshend Island (5.220) immediately E, and has a least depth in the fairway of 0.6 m. The N entrance is only 2 cables in width and is obstructed by rocks.

The SE entrance to the pass lies between Dove Point (22°18'S 150°25'E) and Marquis Island, 38 m in height, 1½ miles SE.

Caution. This passage has not been completely surveyed.

6.102

- 1 **Stanage Bay** (22°09'S 150°04'E) (6.88), which has depths of less than 5 m, affords good landing for boats on a sandy beach at its S end.

Broad Sound

Chart Aus 822

General information**6.103**

- 1 **Broad Sound** lies S of a line drawn between Arthur Point (22°08'S 150°03'E) and West Hill Island 35 miles WNW and, from the latter, extends about 55 miles SSE. A chain of islands, islets and rocks lies across the entrance, through which North Point Passage and Main Channel are the principal channels.

6.104

- 1 **Topography.** The general topography of the mainland peninsula, of which Arthur Point (22°08'S 150°03'E) is the N point, lying between Shoalwater Bay and Broad Sound is described at 6.84. Quail Island, lying immediately NW of this peninsula, has a rocky coastline with sandy bights and is fringed in places with mangroves. The highest part of the island, near its centre, is 115 m in height, grassy and sparsely wooded; the S part of the island is low and thickly wooded.
- 2 Long Island, lying close W of Quail Island, is hilly in its N part rising to Southport Hill (192 m in height), 3½ miles S of North Point (22°03'S 149°54'E), but generally low in the S where the coast is extensively fringed with mangroves. There are red cliffs near the middle of the S part of the W coast.
- 3 Herbert Creek, entered between Island Bluff (22°19'S 149°55'E) and Charon Point 6¼ miles WSW, extends for about 20 miles SSE between low muddy banks, intersected by creeks and overgrown with mangroves. Charon Point is the N termination of a range of granite hills of which Mount Phillip, 8½ miles S is the highest.
- 4 The W shore of the sound between West Hill Island (21°50'S 149°29'E) and Clairview Bluff 21 miles SSE, is low and wooded and is intersected by several creeks. A moderately high range of hills lies close behind this stretch of coast; dropping from N first to Mount Upright near its S end, and thence to its termination at Clairview Bluff 4 miles SE.

Rock formations in the area change from porphyry in West Hill Island and in the N part of Long Island, to granite in the hills S of Charon Point.

6.105

- 1 **Depths.** There are depths of 18 m in the N part of the sound decreasing gradually towards its head. The shores are fronted by banks and flats which are particularly extensive on the E side and at the head of the sound.

6.106

- 1 **Quicksands.** The drying flats that fill Herbert Creek from about 4 miles above Charon Point (22°23'S 149°49'E) are of the quicksand variety.

6.107

- 1 **Local knowledge** is required in any area away from Main Channel and the open waters of the centre of the sound. The requirement is stressed where appropriate in the text.

6.108

- 1 **Tidal streams.** The range of the tide in Broad Sound is the greatest on the E coast of Australia; an unconfirmed spring range of 11 m in the entrance to Herbert Creek is recorded.

Tidal streams set from seaward directly towards and away from the entrance to the sound. In the principal entrance channels and generally within the sound the streams run at rates of 2½ to 3 kn as indicated on the chart; elsewhere, in shallow or narrow side channels such as Thirsty Sound and Waverley Creek, the rates can be considerably stronger.

- 2 In general the tidal streams turn approximately 30 minutes after the times of HW and LW at Mackay. In the offing however, strong SE winds have been known to cause the W-going stream to continue for nearly 2½ hours after the time of HW Mackay.

6.109

- 1 **Landmarks:**

Mount Funnel (21°38'S 149°23'E) (6.139).

West Hill Island (21°50'S 149°29'E), wooded and conspicuous. The seaward sides of the island are formed by rocky cliffs fronted by a stony beach; the W side slopes gently to its W extremity and is connected to the mainland by a drying sandspit.

Directions**6.110**

- 1 **North Point Passage** is the E-most entrance channel to the sound from Broad Sound Channel and passes between Wild Duck Island (22°00'S 149°52'E) and North Point on Long Island, 3½ miles SE. The channel, which is 5 cables in width and has a least depth of 7.9 m in the fairway, may be approached in open water from E, or from ESE through the more restricted waters of Pearl Pass (6.112).

6.111

- 1 From a position in Broad Sound Channel E of Wild Duck Island the track leads W, passing (positions from North Point (22°03'S 149°54'E)):
- Not less than 1 mile N of Barren Islet (3¾ miles ENE) (6.78), making due allowance for any in-going tidal stream which sets strongly onto the islet and onto Brooks Shoal, 2½ miles farther WNW; thence:
- 2 N of Brooks Shoal (2½ miles NE), distant 1 mile. When North Point, which is 78 m in height and cliffy, bears 216°, the track leads WSW, passing:
- NNW of Brooks Shoal, thence:
- SSE of Bush Islet (9 m in height) (3¼ miles N), the S-most danger on Park Shoal (6.78); thence:
- 3 SSE of Wild Duck Island (3½ miles NW), rock-fringed and the largest of North Point Islands. A neck of low land with a sandy beach on its N and S sides connects the hilly parts each end of the island; and:
- NNW of North Point, thence:

- 4 **Leading mark.** The line of bearing 024° astern of Channel Islet (5 miles N) (6.78), open its own width E of Wild Duck Island, leads SSW, passing:

More than 5 cables WNW of Gannet Rock, which dries 5.5 m (1¼ miles W); depths of less than 5 m extend 5 cables WNW and a similar distance NE from the rock; and:

- 5 ESE of the three Infelix Islets (3½ miles NW), lying on a drying reef on a spit, with depths of less than 5 m over it, extending 2¾ miles SW from Wild Duck Island. The islets, the middle one of which is 12 m in height and the highest, extend 1¾ miles NW. North Point Cays, which consist of a number of detached shoals of sand and stones, some of which dry, extend 2½ miles farther SW from Infelix Islets and are marked at their outer ends by overfalls; the cays are the SW-most dangers of North Point Islands.

- 6 Thence course may be directed as required, passing: Clear of a 5.8 m patch (5½ miles SW), marked by overfalls, and clear of the dangers lying between the patch and the W coast of Long Island, 2¾ miles E (6.117).

Caution should be exercised in the vicinity of Connor Banks (22°10'S 149°49'E) (6.117), Long Bank and Boyle Reef, as all are relatively steep-to.

6.112

- 1 **Pearl Pass** is an alternative approach to North Point Passage from Broad Sound Channel. The pass is bounded on its N side by Black Swan Rock, Barren Islet (22°02'S 149°58'E) (6.78) and Brooks Shoal; and on its S side by South Barren Islet (1¼ miles SE of Barren Islet) and the partly drying shoals which extend nearly to North Point, 4½ miles farther W; Obstruction Shoals are the W-most of these.

- 2 From a position in Broad Sound Channel E of the two Barren Islets a channel through Pearl Pass leads WNW in a least depth of 8.2 m into North Point Passage.

Tidal streams run through the pass at rates up to 3 kn. **6.113**

- 1 **Race Pass** is a deep and clear channel leading into Broad Sound from near the W end of Broad Sound Channel. The pass leads through North Point Islands between Wild Duck Island (22°00'S 149°52'E) (6.111) and Turn Island, 2 miles WNW.

From a position in Broad Sound Channel N of Wild Duck Island a channel through the pass leads generally SW, passing (positions from Turn Island (21°59'S 149°49'E)):

- 2 NW of Park Shoal (3 miles E) (6.78), thence: NW of Race Rocks (1¾ miles E), which dry 7 m and extend 1¼ miles N from Cliff Head (102 m in height), the W extremity of Wild Duck Island; and: SE of Holt Shoal (6.78) and Turn Island, which is wooded; overfalls occur off the SE extremity of the island; a rock which dries 2.1 m (4 cables S), is the S-most danger off the island. Thence:

- 3 NW of Infelix Islets (1½ miles SSE) (6.111); two rocks which dry 3 m lie 7½ cables W of the NW islet. Thence:

NW of North Point Cays (2 miles SSW) (6.111).

Tidal streams in the pass attain rates of 3 to 5 kn at springs.

6.114

- 1 **Main Channel**, which lies between North Point Islands (22°00'S 149°50'E) and Middle Shoal 4½ miles WNW, is the most direct and widest channel into Broad Sound and

has a width of 4½ miles. Except for two patches (22°56'S 149°47'E) on the N side of this entrance with depths of 7.9 and 8.2 m over them, there are depths of 11 to 18 m in the channel.

- 2 From a position at the W end of Broad Sound Channel, N of both Turn Island (21°59'S 149°49'E) (6.113) and Holt Shoal, a track through Main Channel leads SW, passing (positions from Turn Island):

NW of Holt Shoal (1¾ miles NE) (6.78) and of Turn Island, and:

SE of Middle Shoal (4½ miles WNW), marked on its E side by overfalls; thence:

- 3 SE of Avoid Isle (8 miles W) with its highest part near Red Point at its N end. The isle is wooded and the E-most of Flat Isles; foul ground extending 7½ cables S from the isle is marked by Little Islet, 6 m in height, which lies close SE of Avoid Isle and is joined to it by a drying ledge. West Reef, awash in places, extends 2¾ miles N from Little Islet.

6.115

- 1 **Flat Island Pass** lies between Gull Cay, which dries 7 m, situated at the NE end of Tornado Rocks (22°01'S 149°37'E); and Escape Cay, a ridge which dries 5.5 m in places and extends about 1½ miles S from a position 7½ cables W of Avoid Isle (21°59'S 149°40'E). There are depths of less than 10 m in the fairway.

Local knowledge is essential. The passage should not be attempted unless Alexander Reefs and Gull Cay can be identified before passing Red Clay Isle.

6.116

- 1 The pass may be approached from N, passing: Clear of Alexandra Reefs (21°51'S 149°37'E), two small heads which both dry 3 m; North Patch, with a depth of 1.2 m over it, lies 5 cables ENE; South Patch, with a depth of 4.9 m over it, lies 1 mile SW of the reefs.

- 2 The track then passes (positions from Alexandra Reefs): W of Drumfish Shoal (3½ miles SSE), thence:

W of Red Clay Isle (4½ miles SSE), which is wooded. Red Cliff Pass, a narrow channel with a least depth of 11 m in the fairway, lies between the isle and the N end of Beware Rocks, 8 cables farther SE, which dry 3 m. Thence:

- 3 E of Reef Islet (6½ miles SSW), 6 m in height and lying on a drying reef 1¼ miles NE of Aquila Islet, which is wooded.

Course may then be directed as required through the pass.

Anchorage

6.117

- 1 **Burkitt Roads** lie between the W coast of Long Island (22°10'S 149°54'E) and the off-lying Comet Ledge, 5 cables W. Anchorage may be obtained in the roads in depths of 7 to 10 m, but is not recommended elsewhere off the island, N of West Side Islet (see below), as the bottom is rocky.

Local knowledge is required.

- 2 The E shore of the roads is moderately high and formed by rocky points with mud flats and mangroves in the bights between.

Comet Rock (which dries 3.6 m) lies 2½ miles SW of North Point (22°03'S 149°54'E); Comet Ledge, a sand ridge drying 3.6 m and forming the W side of the roads,

extends 3¼ miles SSW from Comet Rock, with Tail Rock (also dries 3-6 m) midway along its length.

- 3 West Side Islet (4¼ miles SSW of Comet Rock), 25 m in height, lies on a drying reef with Coal Islet between it and Long Island. A drying reef lies at the S end of a drying sandspit extending 1 mile S from West Side Islet.

Boyle Reef, which dries, lies close NW of West Side Islet and has below-water rocks and a 2.1 m patch lying off its N end. Connor Banks, which dry 2.4 m, extend 3¾ miles SSW from close W of Boyle Reef; Long Bank, which dries 3.7 m, extends 5 miles farther SSE. See 6.111 for caution required in the vicinity of these dangers.

6.118

- 1 A narrow channel with a depth of 2.7 m leads between the S end of Comet Ledge and Boyle Reef, 2½ cables SSW, into Burkitt Roads.

The S entrance to the roads, lying between the reef 1 mile S of West Side Islet and the drying reefs close E extending from shore, is obstructed by rocks.

The N entrance to the roads with a least charted depth of 7.3 m, lies between Comet Rocks and the point 1¼ miles N of Burkitt Roads.

6.119

- 1 West Hill Island (21°50'S 149°29'E) (6.109). Anchorage in a depth of 7 m may be obtained 1 mile E or SE of the island. Small craft waiting for the tide to enter West Hill Creek or Carmila Creek, 4½ miles S (6.131), may anchor farther inshore with the summit of West Hill Island bearing NNW.

6.120

- 1 Aquila Islet (21°59'S 149°34'E) (6.116). The best anchorage on the W side of Broad Sound may be found 1 mile NW of Aquila Islet, out of the tidal stream and sheltered from all but N and NE winds.

6.121

- 1 Roundish Islet (37 m in height) (22°03'S 149°37'E) lies near the S end of a drying sandbank extending 2¾ miles S from the middle of Tornado Rocks. Anchorage may be obtained in a depth of about 5 m between the islet and Rat Tail Sand, 8 cables W (6.132).

The anchorage is confined, but tidal streams are weak. Some sea is raised by S and SE winds.

Local knowledge is required.

6.122

- 1 Flock Pigeon Islet (22°08'S 149°35'E) and an anchorage close NW are described at 6.132. Anchorage may also be obtained 1½ miles NE of the islet; tidal streams are weak but the position is exposed.

6.123

- 1 Upper Head lies 7½ cables SE of Charon Point (22°23'S 149°49'E). Anchorage with good shelter may be obtained 7½ cables off the head in depths of 5 to 7 m. Attention is drawn to a patch which dries, and another with a depth of 1.2 m over it, both lying 2 miles ESE of the head.

Landing at Upper Head is easy over the HW period between half tides. This is probably the only landing place in the upper part of the sound.

St Lawrence Harbour

6.124

- 1 The town of St Lawrence (22°21'S 149°32'E) may be reached from seaward through Waverley Creek which enters Broad Sound 7½ miles E of the town. The creek is only suitable for small boats and requires the greatest care.
- 2 St Lawrence Creek, entered close S of South Red Bluff (22°17'S 149°36'E), is filled with shifting sand and mud

banks which extend 2¼ miles E from the entrance; the creek is dangerous and is not navigable. The Hoogly and Styx River, which enter Broad Sound on either side of Rosewood Island (22°22'S 149°44'E), low and mangrove-covered, both have their entrances filled with mud flats.

- 3 **Port limits** are drawn from North Red Bluff (22°15'S 149°36'E) to the red cliffs 18¼ miles E (6.128).

Pilotage. Not available. Information should be obtained from the harbour office of an adjacent port (see *Admiralty List of Radio Signals Volume 6(4)*) before proceeding to Waverley Creek.

Local knowledge is essential.

6.125

- 1 **Limiting conditions.** A vessel of 61 m LOA can lie in the anchorage in Waverley Creek. Vessels with a maximum draught of 4 m can reach Gordon Head (6.126) at HW.

Tides in the entrances to St Lawrence and Waverley Creeks are considerably affected by winds; the rise is generally delayed and lessened by N winds, and advanced and increased by those from SE.

- 2 **Tidal streams** in the same creeks run very fast. The in-going stream runs for about 3½ hours, and the out-going stream for about 8½ hours. Rates can reach 6 kn at times. A tidal bore runs in St Lawrence Creek.

6.126

- 1 **Approach and entry.** Destinations within the port are approached as required from the open waters of Broad Sound, keeping clear of One Fathom Patch (22°16'S 149°45'E) and of Crocodile Banks 2½ miles farther SSE. The latter consists of two parallel sand ridges; the E ridge dries 1.8 m and the W is marked by overfalls; the sea breaks heavily at times over the banks.

- 2 Waverley Creek is entered over a bar with depths of 1.2 m over it; there are depths of 5 m within the bar.

Herbert Creek is navigable on its W side as far as Gordon Head, 9 miles SSE of Charon Point (22°23'S 149°49'E); there are depths of 1.2 to 4.6 m in the fairway.

6.127

- 1 **Anchorage** may be obtained in Waverley Creek in depths of 5 m inside, and sheltered by, the bar. Other anchorages off Upper Head (22°24'S 149°49'E) and Turtle Islet, 4 miles NW, are described at 6.123 and 6.133 respectively.

Anchorage and rivers

6.128

- 1 **Thirsty Sound** leads from Arthur Point (22°08'S 150°03'E) SW into Broad Sound; separating the mainland peninsula from Quail and Long Islands and providing small craft with a shorter route to Broad Sound than is otherwise available.

Local knowledge is essential.

- 2 Anchorage in the NE entrance to Thirsty Sound is described at 6.82. South-west of the anchorage the channel is narrow and the tidal stream 2½ miles within the entrance can attain rates of 4 to 6 kn. Beyond this point the channel is obstructed by rocks and by sand and mud flats. The SW entrance to the sound lies between some low red cliffs, 2½ miles N of Island Bluff (22°19'S 149°55'E) on the S side, and Mangrove Islands on the N side; these are six low and muddy, mangrove-covered islands separated by creeks and extending from the similar terrain of the S end of Long Island. On the S—most of Mangrove Islands there is a small hill which has been partially quarried. This entrance to Thirsty Sound is obstructed by shifting sandbanks, some of which dry.

- 3 Thirsty Sound is joined from N near its mid-point by Middle Pass, which is obstructed by rocks and shoals but leads from Sand Bank Bay and separates Quail Island from Long Island. Sand Bank Bay, which lies between North Point (22°03'S 149°54'E) and Lucy Ravel Point, the N extremity of Quail Island 6 miles ESE, is obstructed by shallow banks and extensive drying flats. Double Rocks, two rocks drying 6 m, lie 7½ cables NNW of Lucy Ravel Point.

6.129

- 1 **Island Bluff** (22°19'S 149°55'E), a clifly head, is the N entrance point to a shallow mangrove filled creek, 1 mile wide, which is only navigable by boats.

The approaches are much obstructed by drying sandbanks which extend, from N of the bluff, 1½ miles offshore, and from the S entrance point of the creek nearly 6 miles WNW.

6.130

- 1 **West Hill Creek** is entered close W of West Hill Island (21°50'S 149°29'E) (6.109) through a channel which dries. The creek is navigable at HW for a distance of 2½ miles by small craft with a draught of 1.5 m or less.

Local knowledge is required.

6.131

- 1 **Carmila Creek** enters the sea 4½ miles S of West Hill Island (21°50'S 149°29'E) (6.109) and is navigable at HW by small craft with a draught of 1.5 m or less. There is a landing stage on the S side of the creek 1½ cables within the entrance. A light-beacon (port hand) stands at the entrance to the creek.

6.132

- 1 **West Channel** lies between Aquila Isle (21°59'S 149°34'E) and Flock Pigeon Islet 7¾ miles S with their associated shoals, on the E side; and the shore banks off the mainland on the W side. The S end of the channel is obstructed by a bar, 3 miles SSE of Flock Pigeon Islet, with depths of less than 2 m over it.

Local knowledge is essential.

- 2 A track through the channel leads generally S passing (positions from Aquila Islet):

Between Aquila Islet (6.116) and Morning Cay (2 miles WNW), which dries 0.6 m and marks the outer edge of the shore flat; Fanning Shoal, which dries in its central part, lies 1½ miles farther NW. Thence:

- 3 W of Snake Cays (extending 2½ miles S), 2 drying sand ridges; thence:

W of Rat Tail Sand, a drying sand ridge extending from Tornado Rocks (3 miles SE) to Flock Pigeon Islet (7¾ miles S); thence:

W of Flock Pigeon Islet (7¾ miles S), 25 m in height; anchorage may be obtained in the channel off the NW side of the islet; thence:

- 4 W of McEwen Islet (9 miles SSE), 9 m in height, lying on a drying reef extending 1 mile SE from Flock Pigeon Islet; Pilot Reef, which dries 1.5 m, lies 5 cables farther SE. A drying sandbank extends from McEwen Islet to the bar 2 miles S. Thence:

- 5 E of Clairview Bluff (10¾ miles S) (6.104); a shallow opening to 3 creeks lies S of the bluff; drying sandbanks extend 2 miles E to the bar.

From the bar course may be directed as required.

6.133

- 1 **Turtle Islet** (22°22'S 149°47'E) is a mangrove islet in the entrance to Styx River. Anchorage for small craft may be obtained W of the islet in depths of 5 to 9 m.

Local knowledge is required.

COASTER CHANNEL**General information**

Charts Aus 822, Aus 249, Aus 823

Route**6.134**

- 1 Coaster Channel is an inshore passage leading 32 miles N from the vicinity of West Hill Island (21°50'S 149°29'E) to a position W of Prudhoe Island (21°19'S 149°41'E). The channel connects with the channels on the W side of the entrance to Broad Sound, and is sometimes used by coasters N-bound from the sound.

Topography**6.135**

- 1 From West Hill Island to Cape Palmerston, 17½ miles N, the coast consists of rocky points and sandy bays, the shores of which are low and fringed with mangroves. Some grassy hills rise near the coast, with Green Hill (21°41'S 149°27'E) the most prominent.
- 2 From Cape Palmerston (21°32'S 149°29'E) to Freshwater Point 10½ miles NW, the coast is indented by three bays which dry up to 2 miles offshore and have low mangrove shores intersected by creeks. Glendower Point, the NW entrance point to Ince Bay and lying midway between the above points, slopes gradually to the sea with a steep reddish-coloured islet (32 m in height) lying close NE; Taffy Island lies on the outer end of a spit with depths of 1.1 m over it extending 1¼ miles NNW from the point. Behind the coast open forest rises gradually to Connor Range. Black Mountain, one of the highest in the range, rises 17 miles W of Cape Palmerston.
- 3 From Freshwater Point to Point Victor, 6 miles NNW (6.150), the coast is intersected by Sarina Inlet and Cabbage Tree Creek and is otherwise rocky and indented.

Depths**6.136**

- 1 Study of the charts suggests that depths of more than 6.5 m are available in the channel S of Temple Island (21°36'S 149°30'E), and depths of more than 11 m from there N.

Attention is drawn to the Caution at 6.4.

Local knowledge**6.137**

- 1 **Local knowledge** is required.

Tidal stream**6.138**

- 1 The tidal stream sets generally S through the channel on the rising tide and N on the falling tide, as indicated on the charts and described at 6.108.

Principal marks**6.139**

- 1 **Landmark:**

Mount Funnel (21°38'S 149°23'E) (chart Aus 823), conspicuous and has been seen from a distance of 42 miles; the summit resembles an inverted funnel.



Mount Funnel (6.139)

(Original dated 1999)

Major light:

Hay Point Light (21°17'1S 149°16'6E) (6.170).

Directions**6.140**

- 1 From the vicinity of a position SE of West Hill Island (21°50'S 149°29'E), clear of Fanning Shoal 4¾ miles SSE (6.132), and of the dangers of Flat Isles 8½ miles SE (6.114), the track leads generally N, passing (positions from Cape Palmerston (21°32'S 149°29'E)):

W of Sandy Shoals (17½ miles SSE), consisting of two banks, and:

- 2 E of West Hill Island (17½ miles S) (6.109), thence:
E of a 3.0 m patch (15 miles S), the outermost danger of a shallow bight, with drying sandbanks extending 1½ miles offshore, lying NW of West Hill Island; and:

- 3 W of Stony Shoal (14 miles SSE); Shag Rock, which dries 7 m lies 7½ cables E of the N part of the shoal, and a 3.9 m patch lies 7½ cables N of the rock; thence:

E of Notch Point (11¾ miles S), the E extremity of a peninsula 30 m in height; thence:

W of Torch Shoal (8½ miles SSE), a 4.8 m patch lies between Torch and Stony Shoals; thence:

- 4 E of Marion Rock (8 miles S), which dries 3 m; a below-water rock lies close NE; a 4.3 m patch lying 1½ miles ENE of Marion Rock is the outermost of depths less than 6 m on the flats extending from shore between Notch Point and Temple Island, 7½ miles farther N. Thence:

- 5 E of Temple Island (4 miles S), 33 m in height, is wooded. Two outer islets are small and bare conical-shaped rocks, being 26 and 40 m in height. The drying reefs on which the islets stand are almost joined, by more drying reefs and below-water rocks, to Coconut Point, 1 mile farther W. Temple Shoal extends generally 3 miles N from the E islet. The track also passes:

- 6 E of Cape Palmerston, a bare, bluff and rocky headland at the N extremity of a peninsula extending 3½ miles N from Coconut Point; the E side of the peninsula is fringed with rocks. A drying reef with some mangroves on it and with below-water rocks close off its N extremity, extends 1½ miles NNW from the cape. Thence:

W of a narrow bank extending 4¾ miles SSW from Elamang Islet (10¾ miles ENE). The islet is bare, rocky and steep-to on its E side. Thence:

- 7 E of Phillips Reef (4 miles N), which dries; thence:
E of Cullen Islet (6¾ miles N), flat-topped and bare; Cullen Reef which dries, extends 4 cables SW, and a bank with a depth of 3 m over it extends 5 cables W from the islet. A 4.8 m patch and a 2.2 m patch lie respectively 4 cables N and 9 cables NW of the islet. The islet is the W entrance point to the N end of the channel. The track also passes:

- 8 W of Viscount Shoals (6½ miles NE), a number of narrow sandbanks orientated N/S with depths of less than 5 m over them and which are subject to change; see Caution at 6.4. Thence:

W of Prudhoe Island (16½ miles NE) (6.60), from whence course may be directed as required. The route through Prudhoe Channel converges in this vicinity from ESE.

6.141

- 1 **Useful marks:**

Green Hill (21°41'S 149°27'E) (6.135).

Irving Islet (21°27'S 149°28'E), 88 m in height, round-topped and thickly wooded; a drying sandspit extends 5 cables W from the islet.

Anchorage**6.142**

- 1 Anchorages off West Hill Island (21°50'S 149°29'E) and Prudhoe Island (21°19'S 149°41'E), at each end of the channel, are described at 6.119 and 6.68, respectively.

Inlets and small rivers**Gillibin Creek****6.143**

- 1 The entrance to Gillibin Creek (chart Aus 370) lies 5 miles NW of West Hill Island (21°50'S 149°29'E) and is approached across the drying sandbanks of the bight between the island and Notch Point, 5½ miles N. The creek is accessible at springs to small craft with a draught of less than 2.1 m.

Local knowledge is required.

Rocky Dam Creek**6.144**

- 1 The entrance to Rocky Dam Creek (chart Aus 370) lies in the S corner of Llewellyn Bay and 3 miles SW of Allom Point (21°29'S 149°21'E). The creek is navigable at HW to a landing place 5 miles above the entrance by vessels with draughts up to 3.7 m, but is little used other than by small fishing boats.

Local knowledge is required.

Tidal streams attain a rate of 4 to 5 kn in the entrance but are less at the landing.

6.145

- 1 **Approach and entry** is made across the drying banks of Llewellyn Bay. Depths of less than 5.0 m are found up to 4 miles to seaward of Allom Point and Freshwater Point, 3 miles N, the two entrance points to the bay. Freshwater Point is a grassy projection with a few scattered trees upon it, terminating in points, 1½ miles apart; the S of these points is 45 m in height and has drying rock ledges extending 4 cables offshore.

- 2 Drying banks and mangrove islands encumber the creek for nearly 2 miles within the entrance; but from there on the channel is well-defined with a width of 75 to 90 m between steep-to mud banks of dense mangrove; depths are

between 1.8 and 6.4 m until about 2½ cables downstream of the landing where a sand bar dries almost across the full width of the creek. Upstream of the bar there is again deeper water with between 5.5 and 7.3 m at the landing.

Sarina Inlet

6.146

- 1 Sarina Inlet is entered between the N extremity of Freshwater Point and Point Perpetua (21°23'7S 149°18'8E) 1 mile N, within which the inlet dries. Plane Creek, which enters the head of the inlet, is navigable by small craft over the HW period between half tides. The town of Sarina lies 4 miles above the entrance of the creek and at the foot of Mount Blarney.

Local knowledge is required.

Tidal streams attain a rate of 3 to 4 kn in the inlet.

6.147

- 1 **Approach and entry.** The entrance is plainly marked by the bold and grassy headland on each side, both 30 to 46 m in height and fringed with rocks. Vessels from N should keep well offshore to clear a 0.5 m patch (21°21'1S 149°19'9E) and also Leeper Reef, 1¼ miles S which dries 4.1 m and extends 8 cables E from midway between Point Perpetua and Coral Point. A light-buoy (E cardinal) marks the seaward limit of a shoal, with depths of less than 5 m, extending 5 cables SE from Leeper Reef. Local knowledge should assist in identifying marks to clear these dangers.
- 2 A small rock patch, which dries 1.6 m, lies 3½ cables N of the S entrance point and is marked by a light-buoy (port hand).

Castrades Inlet

6.148

- 1 Castrades Inlet which is entered on the W side of Coral Point (21°22'1S 149°19'0E), is shallow and marked by light-beacons.

Local knowledge is required. Visitors should obtain information from the Harbour Master at Mackay before attempting to enter the creek.

Overhead power cables with a vertical clearance of 12.2 m span the creek. Mariners are advised to allow a safe clearance of 2 m when passing beneath the cables and to avoid anchoring in their vicinity.

Tidal streams attain a great rate at springs.

Approaches. Dangers in the approaches are described at 6.147.

PORT OF HAY POINT

General information

Charts Aus 250 plan of Hay Point, Aus 249

Position and function

6.149

- 1 The port of Hay Point (21°16'S 149°18'E) operates solely for the export of coal.

Topography

6.150

- 1 The coast from Point Victor (21°20'1S 149°18'0E) to Hay Point, 3¾ miles N, is formed by a sandy beach. Mount Samourgassi (chart Aus 823), wooded and with a saddle-shaped summit, stands 2½ miles W of Point Victor; but from there on the hills behind the coast are lower and sparsely wooded. Victor Island, with a few mangroves on its S end and thick scrub on its N end, lies 1½ miles ENE of Point Victor.

- 2 Hay Point is 12 m in height, bare and rocky, with Mount Griffiths rising 1½ miles SW; the conveyor jetties and berths, described elsewhere in the text, are the most significant features of the point.

Dalrymple Bay, entered between Hay Point and Dudgeon Point (21°14'7S 149°15'3E), has a sandy beach with occasional rocky outcrops, and low thickly wooded ground behind. Mount Hector, at the head of the bay, is described at 6.171. Dudgeon Point, low and grassy, is similar to Hay Point; Dudgeon Ledge, which dries, extends 5 cables NNE from the point.

- 3 From Dudgeon Point to the entrance to the Pioneer River, 6 miles NNW, the coast is sandy and fringed with mangroves, particularly in Sandringham Bay which is entered immediately W of Dudgeon Point and is filled by drying and shifting sandbanks. The coast is backed by low wooded ground in the S part and by the suburbs of Mackay in the N part. Extensive drying sandbanks extending up to 2½ miles offshore front this stretch of coast.

Port limits

6.151

- 1 The limits of Hay Point Pilotage Area, which extend about 12 miles to seaward, are shown on the chart. The limits to NW adjoin the S limits of the port of Mackay.

Approach

6.152

- 1 The port may be approached from a general NE direction as required by draught. The recommended approach track for deep-draught vessels is shown on the chart.

Attention is drawn to the Zone of Confidence diagram shown on the chart.

Traffic

6.153

- 1 In 2004 the port handled 925 vessels totalling 89 384 363 dwt.

Port authority

6.154

- 1 The Ports Corporation of Queensland, PO Box 409, Brisbane, Queensland 4001. The authority is represented locally by the Regional Harbour Master at Mackay.

Website: www.pcq.com.au

Email: info@pcq.com.au

Limiting conditions

Controlling depth

6.155

- 1 Approach to DBCT berth (6.174): maintained depth 13.0 m.

Under-keel clearance

6.156

- 1 Under-keel allowances suitable for prevailing conditions are allowed for in the figures for maximum permissible draught given by the Harbour Master. For general guidance the allowance required when underway approximates to 5% of draught plus 1.0 m; the minimum clearance required when berthed alongside approximates to 10% of draught.

Deepest and longest berth

6.157

- 1 The deepest and longest berths are at Dalrymple Bay Coal Terminal (6.174).

Tidal levels**6.158**

- 1 See information in *Admiralty Tide Tables*. Mean spring range about 4.9 m; mean neap range about 2.3 m.

Maximum size of vessel handled**6.159**

- 1 The largest vessel handled has been of 118 491 grt, 231 851 dwt and 315 m LOA; the deepest has been of 17.47 m draught.

The berths are designed to accommodate vessels up to 200 000 dwt.

Local weather**6.160**

- 1 Vessels will not be berthed under circumstances in which the wind speed is considered excessive and the wave height is greater than 1.8 m.

Certain weather conditions can induce severe rolling at the wharves; deteriorating weather from SE can quickly make conditions unsafe for remaining alongside.

Arrival information**6.161**

- 1 Pilot boarding places are advised by Hay Point VTS to facilitate berthing operations. It also operates the Ship Reporting System for Torres Strait and the Inner Route of Great Barrier Reef which is mandatory for certain categories of vessels. For details see chart Aus 4620 and *Australian Seafarers Handbook*.

Notice of ETA**6.162**

- 1 Notice of ETA is required 7 days in advance, with confirmation 48 and 24 hours before arrival. The ETA message should state whether or not the pilot can board by helicopter; for details see *Admiralty List of Radio Signals Volume 6(4)*.

Anchorage**6.163**

- 1 Numbered anchor berths are situated N and S of the approach track from ENE; the positions of berths and depths available can be seen on the chart. Berths are allocated by Harbour Control.

A temporary anchorage area exists bounded by the following positions:

	21°13'·7S	149°32'·1E
	21°11'·9S	149°32'·1E
2	21°02'·6S	149°38'·9E
	21°02'·6S	149°41'·1E
	21°09'·8S	149°51'·1E
	21°13'·7S	149°51'·1E
	21°13'·7S	149°32'·1E

Vessels transiting the area are to remain outside the temporary offshore anchorage area, except as directed by the Regional Harbour Master, Mackay.

Prohibited anchorages**6.164**

- 1 The limits of a restricted area, covering the water immediately to seaward of the berths and the approach

from ENE from a distance of 5 miles off, are shown on the chart. Unauthorised vessels are prohibited from mooring, anchoring or manoeuvring in this area.

Pilotage**6.165**

- 1 Pilotage is compulsory and available 24 hours a day. The pilot will normally board by helicopter in the most convenient of three lettered boarding places about 2½ miles NNE, NE or E from the berths as shown on the chart. A pilot vessel may alternatively be used as arranged with Harbour Control; see *Admiralty List of Radio Signals Volume 6(4)*.

Vessels should not approach the berths closer than the charted pilot boarding places except under the direction of a pilot.

Tugs**6.166**

- 1 Tugs and mooring launches are available. Tugs will normally join at the pilot boarding place.

Quarantine**6.167**

- 1 The port is a first port of entry. For extracts from the Quarantine Act see 1.64.

Pratique may be granted alongside.

Harbour**General layout****6.168**

- 1 The berthing area of the port consists of two independently operated berthing complexes standing between 1 and 1½ miles offshore NE of Hay Point; each complex is serviced by its own conveyor jetty extending from shore.

A separate tug harbour is situated at Half Tide Island, 1 mile S of Hay Point. Light-beacons which mark the approach and entrance to the tug harbour lead clear of the dangers lying E of Hay Point. The tug harbour has been dredged to a depth of 5.1 m, as shown on the chart.

Natural conditions**6.169**

- 1 **Tidal stream** sets 160° through the port area on the rising tide and 340° on the falling tide with a maximum rate of 2 kn. Slack water occurs about 1½ hours before the times of HW and LW.

Climatic table for the adjacent port of Mackay is given at 1.192 and 1.201.

Principal marks**6.170**

- 1 **Landmarks:**

Hay Point Services wharf (21°16'S 149°19'E) and Dalrymple Bay Coal Terminal wharf (2 cables NNW), both conspicuous.

Major light:

Hay Point Light, also known as Mount Griffiths Light (21°17'·2S 149°16'·6E), displayed from the Harbour Master's office, a white brick building standing on Mount Griffiths.



HPS Terminal

DBCT Terminal

Hay Point from NNE (6.168)

(Original dated 1999)

Directions

(continued from 6.43)

6.171

- 1 **Caution.** See 6.163.

From a position 14 miles ENE of Hay Point Light the recommended track shown on the chart leads WSW towards Hay Point. Course may then be directed as required to the assigned anchorage or pilot boarding place.

- 2 **Useful marks:**

Mount Hector (21°16'S 149°16'E), round-topped, covered with grass and scrub and standing at the head of Dalrymple Bay; easily identified as rising from the otherwise flat land in its vicinity.

Round Top Island (21°11'S 149°16'E) (6.198).

Flat Top Island Light (21°09'·7S 149°14'·8E) (6.198), noting the obscured sector of the light.

Berths

6.172

- 1 Both berthing complexes have basins dredged alongside to a minimum width of 60 m as shown on the chart. The bottom consists of mud and silt. Depths alongside are liable to vary from those designed or charted, and are promulgated when necessary by *Australian Temporary Notices to Mariners*; the latest information should be obtained from the Harbour Master.

6.173

- 1 **Hay Point Services (HPS) berths** are situated at the head of the S conveyor jetty. Berth No 1 to S is 397 m in length and Berth No 2 is 408 m, both measurements between outer mooring dolphins; depths alongside are 16·6 m at Berth No 1 and 16·7 m at No 2. Lights indicating 15° approach angles to the berths are displayed from the centre of the wharf.

6.174

- 1 **Dalrymple Bay Coal Terminal**, is situated at the head of the N conveyor jetty and has three berths with a total length of 1215 m between outer mooring dolphins. Berth No 1 is the original berth and is 490 m in length with a depth alongside of 19·6 m. Berth No 2, of later construction, lying SSE from Berth No 1 has a depth of 19·6 m alongside. Berth No 3, constructed in 2003, lying NNW from Berth No 1 has a depth of 19·0 m alongside.

Port services

6.175

- 1 **General.** Port services at Hay Point listed here are minimal but those available at nearby Mackay can be provided where appropriate; see 6.205.

Repairs. No facilities.

Other facilities. Deratting can be carried out. No facilities for the discharge of oily waste.

Supplies. Fresh water and fuel oils not available.

Communications. Nearest airport Mackay 40 km.

PORT OF MACKAY

General information

Charts Aus 250 plan of Mackay Harbour, Aus 249

Position and function

6.176

- 1 The city of Mackay (21°09'S 149°11'E) stands on both sides of the Pioneer River about 2 miles within its entrance. The river is navigable by small craft and fishing vessels only.

- 2 Mackay Harbour, on the coast 3 miles NE of the city, is an artificial harbour formed by breakwaters. The harbour functions principally for the export of bulk sugar but significant tonnages of other commodities are also handled.

A fishing fleet operates from the port.

Population. In 2004 the estimated population of the district of Mackay was 71 700.

Topography

6.177

- 1 East Point, at the entrance to Pioneer River (21°09'S 149°13'E), is low, sandy and difficult to identify.

Between East Point and Slade Point, 5 miles N, the coast is sandy and backed by sandhills, behind which the ground is generally low. Mackay Harbour, with some conspicuous features, is situated midway along this stretch of coast.

Port limits

6.178

- 1 The limits of Mackay Pilotage Area extend about 8 miles seaward and are shown on the chart.



Pioneer River entrance from E (6.177)

(Original dated 1999)

Approach and entry

6.179

- 1 The port is approached from seaward as required by draught, the recommended track from the Inner Route or Hydrographers Passage being from ESE. The harbour is entered between the heads of the enclosing breakwaters.

Traffic

6.180

- 1 In 2004 the port handled 148 vessels totalling 3 905 454 dwt.

Port authority

6.181

- 1 Mackay Port Authority, PO Box 3340, North Mackay, Queensland 4740.
Website: www.mackayports.com

Limiting conditions

Controlling depth

6.182

- 1 Entrance channel 8.5 m.
Swinging Basin 8.5 m.
Changes to depths in the port are promulgated when necessary by *Australian Temporary Notices to Mariners*. The latest information may be obtained from the Harbour Master.

Deepest and longest berth

6.183

- 1 The deepest berth is No 3 and longest berth is No 5 Berth (see 6.204).

Tidal levels

6.184

- 1 See information in *Admiralty Tide Tables*. Mean spring range about 4.6 m; mean neap range about 2.2 m.

Maximum size of vessel handled

6.185

- 1 The largest vessel handled has been of 68 444 dwt, the longest of 230 m LOA and the deepest of 11.39 m draught.

Arrival information

Vessel Traffic Service

6.186

- 1 Mackay VTS operates the Ship Reporting System for Torres Strait and the Inner Route of Great Barrier Reef which is mandatory for certain categories of vessels. For details see chart Aus 4620 and *Australian Seafarers Handbook*.

Notice of ETA

6.187

- 1 A minimum of 48 hours notice of ETA is required. If requiring a pilot, the ETA message should also state whether or not boarding can be by helicopter.
Berthing instructions should be requested 2 hours before arrival.

Outer anchorages

6.188

- 1 **Slade Islet** (21°05'8S 149°14'6E) (6.198). Anchorage may be obtained in depths of 12 to 14 m between 1½ and 2 miles E of the islet. Attention is drawn to the spoil ground charted WNW of this anchorage.

6.189

- 1 **Round Top Island** (21°11'S 149°16'E) (6.198). Anchorage may be obtained in depths of 11 m, good holding ground, sand, 8 cables NW of the summit of the island. Tidal streams run at 1 to 1½ kn in the anchorage. Small craft can anchor safely under the lee of the island in SE gales.

- 2 **Directions.** The approach from N passes clear of (positions from Flat Top Island Lighthouse (21°09'7S 149°14'8E) (6.198)):

Downward Patches (3 miles NE) (6.199);
Dangerous Reef (1¼ miles N) (6.199);



Mackay Outer Harbour from E (6.195)

(Original dated 1999)

- 3 A 3-6 m patch (5 cables NNE); North End Reef, a drying rocky ledge, extends 1½ cables from Flat Top Island towards the patch;
- Taroba Rock (1½ miles ESE), composed of coral and boulders; the rock is covered by a red sector (277½°–284½°) of Flat Top Island Light.
- 4 In the approach from SE attention is drawn to the obscured sector (299°–308°) of Flat Top Island Light (6.198). This approach passes clear of:
- Reichelmann Rock (1½ miles S), covered by a red sector (347½°–004¼°) of the same light; Oyster Rock which dries, lies 1¼ miles W of Reichelmann Rock, with below-water and drying rocks extending 4 cables farther WNW. Another drying rock lies 4 cables SSW of Oyster Rock.

6.190

- 1 **Flat Top Island** (21°10'S 149°15'E) (6.198). Anchorage for vessels of less than 6 m draught may be obtained 8 cables NW of the lighthouse but the holding ground is not good and an uncomfortable swell sets in when any sea is running. Small craft may anchor safely under the lee of the island during SE gales.

Caution: shoaling has occurred in the past in the vicinity of this anchorage.

- 2 **Tidal streams** in the anchorage set N from about 1 hour before to about 5 hours after HW Mackay and S for the remainder of the time. The maximum spring and neap rates are ½ and ¼ kn.

Directions. By day the anchorage should be approached from NE passing midway between North End Reef (21°09'4S 149°14'9E) (6.189) and Dangerous Reef, 1½ miles N (6.199). Approach by night is inadvisable.

Prohibited anchorage**6.191**

- 1 Anchorage is prohibited in the area of the immediate approaches to the harbour, as shown on the charts.

Pilotage and tugs**6.192**

- 1 Pilotage is compulsory except for exempted vessels and is available 24 hours a day. The boarding place is 2 miles ESE of the harbour entrance as shown on the chart. The normal method of boarding is by helicopter; see *Admiralty List of Radio Signals Volume 6(4)* for details.

Tugs are available.

Regulations concerning entry**6.193**

- 1 **Explosives.** Vessels carrying explosives in excess of the quantity stipulated at 1.56 may not proceed W of the Slade Islet anchorage (6.188).

Quarantine**6.194**

- 1 Mackay is a first port of entry. For extracts from the Quarantine Act see 1.64.

Harbour**General layout****6.195**

- 1 The operations of the port are concentrated in the main harbour, where berths are conveniently dispersed around the swinging basin.

The bottom in the swinging basin is sand and mud; with clay and mud at the berths.

There are waiting anchorages offshore.

A small craft mooring area lies in the SW corner of the main harbour (6.203).

A basin S of the main harbour contains Mackay Marina.

- 2 **Traffic signals** (Diagram 6.195) visible only from within Mackay Marina, are displayed from the E end of the Molasses Terminal breakwater when shipping movements are taking place in the main harbour.

*Signal**Meaning*

(flashing)

Small craft may proceed out of the marina with caution. Larger vessels should wait until lights cease flashing or contact Mackay on VHF.

Mackay Marina – traffic signals (6.195)

Tidal streams**6.196**

- 1 The tidal stream sets S across the harbour entrance on the rising tide, and N on the falling tide.

Small vessels have no difficulty in entering at any time, but there are limitations for larger vessels which should not

attempt an entry when the rate of the stream is more than $\frac{1}{2}$ kn.

- 2 The maximum rates to be expected are 1 kn at neaps, $\frac{1}{2}$ kn for 3 days each side of neaps and $\frac{2}{2}$ kn at springs. The rate exceeds $\frac{1}{2}$ kn for a maximum of $\frac{3}{2}$ hours at springs.

Tidal stream predictions may be obtained from the Harbour Master. Streams inside the harbour are negligible.

Climatic table

6.197

- 1 There is a meteorological observation station close SW of the main harbour. See climatic table at 1.192 and 1.201.

Principal marks

6.198

- 1 **Landmarks:**

Round Top Island ($21^{\circ}11'S$ $149^{\circ}16'E$), easily identified by its round shape. The island is cliffy to seaward, bare of trees on its SE side and is fringed with rocks.

Flat Top Island Lighthouse (white round metal tower, 10 m in height) ($21^{\circ}09'.7S$ $149^{\circ}14'.8E$), prominent and standing on the summit of Flat Top Island which rises near its centre to a ridge 44 m in height.

- 2 Tower (elevation 73 m; red obstruction lights) ($21^{\circ}07'.0S$ $149^{\circ}10'.2E$), a conspicuous red and white metal framework structure standing on Mount Oscar.

Mount Basset ($21^{\circ}07'.0S$ $149^{\circ}12'.5E$), prominent.

Bulk Sugar Terminal sheds (three in number) ($21^{\circ}06'.3S$ $149^{\circ}13'.3E$) and a silo (62 m in height; red obstruction light), conspicuous visually and on radar.

- 3 Group of silos ($21^{\circ}06'.1S$ $149^{\circ}13'.3E$) at Mackay Grain Terminal.

Slade Islet ($21^{\circ}05'.8S$ $149^{\circ}14'.6E$), steep and one of the most prominent features off this stretch of coast; the islet can be identified from some distance to seaward.

Water tower (elevation 46 m) ($21^{\circ}04'.0S$ $149^{\circ}13'.5E$), standing near Slade Point (6.201).

Major light:

Hay Point Light ($21^{\circ}17'.1S$ $149^{\circ}16'.6E$) (6.170).

Directions

(continued from 6.43)

Approaches from south and east

6.199

- 1 **Outer Harbour Leading Light-beacons:**

Front beacon (yellow triangle point up; black stripe) ($21^{\circ}05'.9S$ $149^{\circ}13'.4E$), standing near the shore 2 cables N of the harbour.

Rear beacon (similar topmark, point down) (270 m WNW of the front beacon).

- 2 From a position about 10 miles E of Flat Top Island Lighthouse ($21^{\circ}09'.7S$ $149^{\circ}14'.8E$) (6.198) the alignment (288°) of the above light-beacons, which may be difficult to identify in late afternoon (lights also displayed by day), and which are known locally as the Sea Leads, leads WNW to a position off the harbour entrance. The least depth in this approach channel is 8.7 m. The track passes (positions from the front light-beacon):

SSW of an 11.6 m shoal (6 miles E), thence:

- 3 NNE of an 8.8 m shoal (4 miles ESE), the N-most of Downward Patches, a number of small rocky

shoals covered by a thin layer of sand; the patches extend $2\frac{1}{2}$ miles farther S and have a least depth of 8.1 m over them. Thence:

NNE of Dangerous Reef ($2\frac{1}{4}$ miles SSE), marked by a light-buoy (E cardinal); the reef lies within a red sector (170° – $187\frac{3}{4}^{\circ}$) of Flat Top Island Light; thence:

- 4 SSW of a spit ($1\frac{1}{2}$ miles E) with a depth of 4.4 m over its S end, the S-most danger off Slade Islet (6.198); the E extremity of the same dangers is marked by a light-buoy (E cardinal).

Masters of vessels awaiting a pilot, or holding off for any other reason, are advised not to manoeuvre W of a line between Slade Islet and Flat Top Island, $3\frac{1}{2}$ miles farther S.

Approach from north-east

6.200

- 1 From a position NE of Flat Top Island Lighthouse ($21^{\circ}09'.7S$ $149^{\circ}14'.8E$) (6.198), the track leads SW as required, passing (positions from Flat Top Island Light):

SE of a 8.4 m shoal ($9\frac{1}{2}$ miles NE), thence:

SE of Gould Shoal with a depth of 6 m over it (8 miles NE); Oom Shoal lies $1\frac{3}{4}$ miles farther W. These three features are the outermost dangers lying E of Slade Point (6 miles N) (6.201). Thence:

- 2 Clear of the 11.6 m shoal ($5\frac{1}{2}$ miles ENE) (6.199), as required by draught and weather.

Thence Outer Harbour Leading Light-beacons ($21^{\circ}05'.9S$ $149^{\circ}13'.4E$) may be brought into line and the directions at 6.199 followed.

Clearing bearing. Flat Top Island Lighthouse bearing more than 223° clears SE of the three outermost dangers lying E of Slade Point and described above.

Approach from north-north-east

6.201

- 1 **Leading lights:**

Front and rear lights ($21^{\circ}06'.8S$ $149^{\circ}13'.7E$) standing on Southern Breakwater.

From a position NE of Slade Rock ($21^{\circ}05'.2S$ $149^{\circ}14'.3E$), the alignment ($209\frac{3}{4}^{\circ}$) of the above lights leads SSW towards the harbour entrance and thence into Mackay Marina (6.195), passing (positions from the front light):

- 2 ESE of Slade Rock, marked by a light-buoy (port hand) on its NW side, thence; WNW of Slade Islet ($1\frac{1}{4}$ miles NE) (6.198), thence: Across a spit (1 mile NNE) with a depth of 4.2 m over its outer end, the W-most danger extending from Slade Islet, thence:

Through the harbour entrance (5 cables NNE).

Thence vessels may be manoeuvred as required for berthing.

Entrance channel

6.202

- 1 From a position ENE of the entrance on the alignment of Outer Harbour Leading Light-beacons (front light $21^{\circ}05'.9S$ $149^{\circ}13'.4E$) (6.199), the harbour can be entered using either of two sets of leading lights (positions from the front light-beacon).

Leading lights:

Front light (5 cables SSE), standing on Berth No 3. Rear light (200 m W of front light).

- 2 The alignment ($261\frac{1}{2}^{\circ}$) of the above lights (also displayed by day), known locally as the Sugar Terminal Leads, leads through the harbour entrance.

Leading light-beacons:

Front beacon (yellow triangle point up, black stripe; 12 m in height) (6½ cables S), standing in the SW corner of the harbour.

Rear beacon (similar beacon, triangle point down; 15 m in height) (435 m WSW of front beacon).

- 3 The alignment (248¼°) of the above light-beacons, which may be difficult to identify in late afternoon (lights also displayed by day), and which are known locally as the Harbour Leads, leads through the harbour entrance.

Both the above alignments pass:

- 4 N of the outer end of Southern Breakwater (7 cables SE), its head formed by a spur extending 1 cable E from Bagley Point; a light is displayed from the E end of the spur and a light-beacon (concrete tower, 5 m in height) stands on Bagley Point. Thence:

S of Forgan Smith Point (6 cables SE), the head of Lee Breakwater; a light-beacon (concrete tower, 5 m in height) stands on the point.

Thence vessels may be manoeuvred as required for berthing.

Berths**Moorings****6.203**

- 1 A number of buoy moorings are laid in the NE part of the harbour as shown on the chart.

A small craft mooring area with a depth of 1.8 m is established in the SW corner of the main harbour, where there is also a concrete boat ramp usable at all states of the tide.

Alongside berths**6.204**

- 1 Total length of cargo berths 755 m; depths alongside 10.6 to 13.0 m. No 1 Berth, also known as Breast Wharf, is used for oil products. No 3 Berth is 265 m long with a depth alongside of 13.0 m. No 4 Berth is the container terminal. No 5 bulk grain berth has length of 250 m and depth of 12.5 m; wharf length is 165 m with mooring dolphins each end.
- 2 Loves Jetty, situated ½ cable W of Breast Wharf, is now only used for port authority floating plant and the commercial fishing fleet (2005). The fishing fleet will move to purpose built facilities within Mackay marina when completed. Tourist vessels also use berths within the marina.

Demolition of the old No 2 and No 3 Wharves, situated 1½ cables NW of Breast Wharf, is continuing, with 85 m of the old wharf already removed (2005).

Port services**6.205**

- 1 **Repairs.** Small repairs and welding can be undertaken. There is an engineering foundry ashore. Commercial diving services are available.

A slipway, lifting capacity 600 tonnes, is situated at the root of the pier to No 2 Berth; vessels up to 35 m LOA, 11 m beam and 4.6 m draught can be accommodated.

- 2 **Other facilities.** Customs board alongside or off the harbour entrance. Deratting; hospitals; limited facilities available for the disposal of oily waste by road tanker.

Supplies. Fresh provisions are plentiful; fresh water and shore power are supplied to all berths. Fuel oil is supplied to Berth No 1 by pipeline; diesel can be supplied to all berths by road tanker.

Communications. Mackay Airport 6 km.

Pioneer River**General information****6.206**

- 1 Pioneer River is entered close SSW of East Point (21°09'S 149°13'E) (6.177) over a bar which dries and extends up to 9 cables SE towards Flat Top Island. Within the entrance the river is flanked by training walls marked by light-beacons (lateral); the S training wall covers; a light-beacon (special) on the N bank upstream of the entrance marks the junction with Bassett Basin.

- 2 Having crossed the bar, there are depths of 0.3 to 1.5 m in the channel to within 7½ cables of Mackay, where it dries then deepens before drying again abreast the city. The river is subject to change; strong freshets alter the formation of the banks, but not the general character of the channel which has widths of 90 to 135 m. The edges of the banks can generally be identified when the tidal stream is running.

- 3 The entrance should only be attempted in fair weather. **Local knowledge** is required.

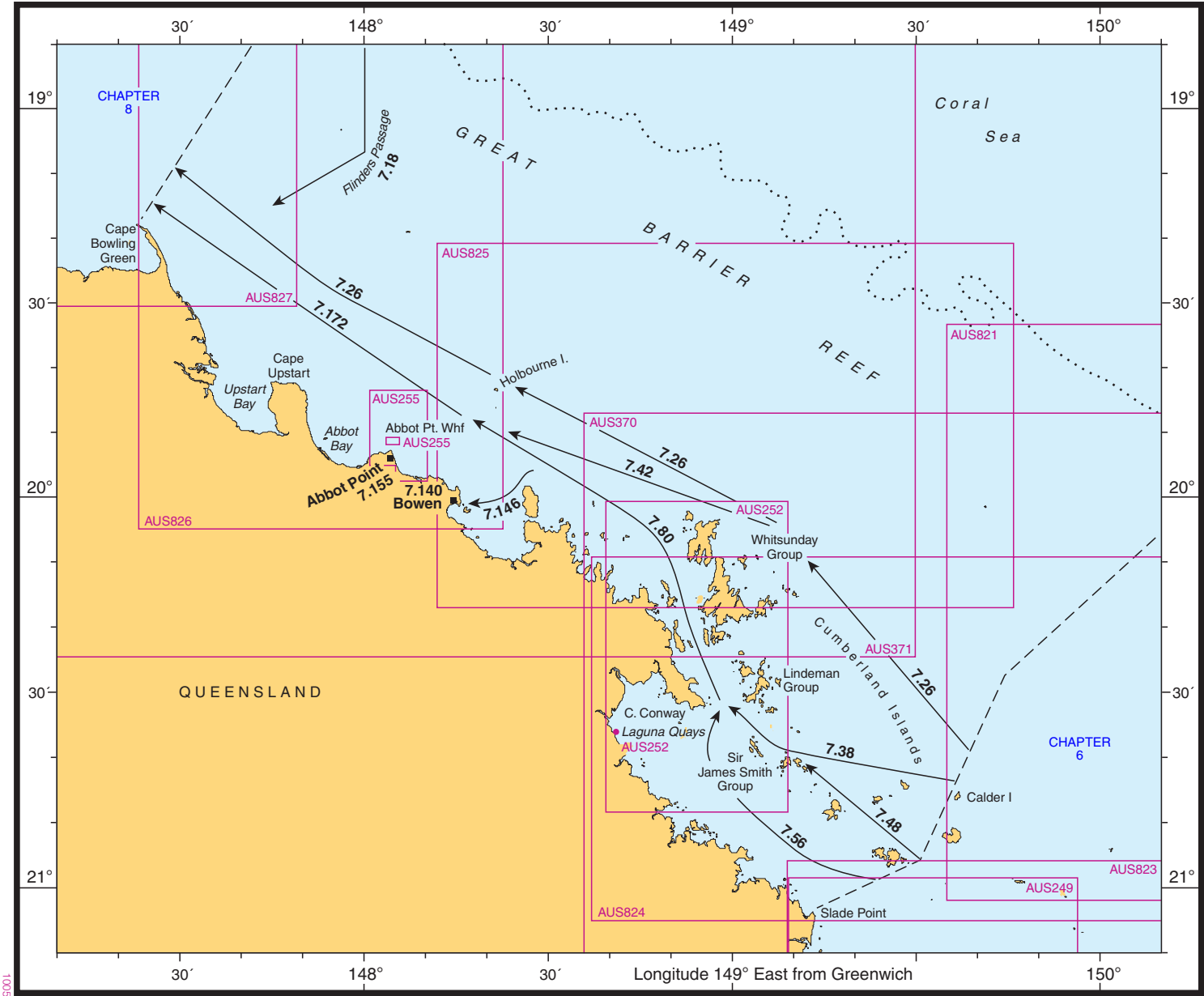
Tidal streams over the bar are strong and irregular. Slack water occurs about 1½ hours before the times of HW and LW at Mackay. The out-going stream increases rapidly to reach its maximum rate at HW, and eases thereafter. Within the river the stream sets strongly across the channel when the banks are covered.

- 4 **Bridges**, carrying road traffic and the railway, cross the river at Mackay.

Berths and facilities: Fish Board Wharf at Mackay, with another wharf extending 65 m up and downstream from it. There is a small slipway.



Chapter 7 - Slade Point to Cape Bowling Green



CHAPTER 7

SLADE POINT TO CAPE BOWLING GREEN

GENERAL INFORMATION

Charts Aus 370, Aus 371

Scope of chapter**7.1**

- 1 This chapter covers that part of the Inner Route leading from abreast Slade Point (21°04'S 149°14'E) to abreast Cape Bowling Green, 149 miles NW. The area covered includes the off-lying Great Barrier Reef between the NW sides of Hydrographers Passage and Flinders Passage, Cumberland Islands and the port of Abbot Point. Also included are the port of Bowen and numerous inshore minor harbours and anchorages in the area.

Routes**7.2**

- 1 From abreast Slade Point to Cape Bowling Green there is a choice of tracks. Passage may be taken either in the relatively deep and open waters outside Cumberland Islands and other coastal features, or in partially sheltered but more confined waters inshore. Least charted depths for these tracks are given at 7.5.

7.3

- 1 **Caution** is necessary when passing Cape Bowling Green (19°18'S 147°24'E) as it is low with dangerous off-lying banks. Cape Bowling Green Light should not be rounded within 5 miles nor the cape approached within depths of less than 22 m. Allowance must also be made for the tidal streams and the possibility of in-draughts into Upstart Bay (19°45'S 147°40'E) and into Bowling Green Bay immediately W of the cape.

In poor visibility it is wiser to use the outer recommended track.

Topography**7.4**

- 1 Topography of the SE part of the area is largely dominated by the chain of Cumberland Islands extending in groups from Snare Peak Island (21°06'S 149°56'E) to Hayman Island, 86 miles NW. These islands are mostly high, rocky and thickly wooded, particularly with pine trees which grow much bigger than those found on Percy Islands farther SE. The islands of Lindeman and Whitsunday Groups to N are generally higher and larger than the rest but are otherwise similar. The highest summit of Cumberland Islands is found at Hook Peak (20°06'S 148°56'E), near the centre of Hook Island.
- 2 The mainland coast, W of Cumberland Islands and thence to Cape Bowling Green, is described in the appropriate parts of the text. Conway Range, running NW from Cape Conway (20°32'S 148°56'E) and Clarke Range, farther inland, running NW from Pioneer River (21°09'S 149°13'E), provide a generally high background to the whole length of coast covered by this chapter.

Depths**7.5**

- 1 Inspection of the chart shows the coastal 37 m (20 fm) depth contour extending offshore to enclose most of Cumberland Islands and thence lying about 5 miles off

Gloucester Head and about 16 miles off Cape Bowling Green.

- 2 **Least charted depth** on the preferred outer route is 27 m (15 fm), as shown on the chart, in the area 16 miles E of Cape Bowling Green (19°18'S 147°24'E).

The least charted depth on the inshore track is 13.4 m and lies in Cumberland Channel, as shown on chart Aus 824, in position 1¼ miles WNW of Coppersmith Rock (20°36'S 149°07'E).

7.6

- 1 **Tidal levels.** Tidal ranges show a decrease from SE to NW; the mean spring range at Saint Bees Island (20°54'S 149°27'E) being 4.3 m, whilst that at Cape Bowling Green, 150 miles NW, is 2.3 m.

Pilotage**7.7**

- 1 See 1.26.

Ship reporting system**7.8**

- 1 For details of Torres Strait and Great Barrier Reef ship reporting system, see 1.89 and *Admiralty List of Radio Signals Volume 6(4)*.

Protected areas**7.9**

- 1 **Historic wrecks.** Two historic wrecks lie within protected areas; see 1.70 for details of restrictions. *Gothenburg* lies on the SW side of Old Reef (19°24'S 148°06'E) and *Yongala*, with a depth of 11.2 m over it and marked by a light-buoy (isolated danger), lies 13 miles E of Cape Bowling Green and midway between the two charted preferred routes in that vicinity.

7.10

- 1 **National Parks.** Many of the islands in Whitsunday Group are National Parks administered by the Queensland Parks and Wildlife Service (QPWS). Access to these islands for any purpose other than short day visits requires the prior approval of the QPWS.

Marine parks. White conical buoys, marking the seaward limits of marine parks, exist in the area covered by this chapter. Anchoring is prohibited inshore of the line of the buoys.

Designated Shipping Area**7.11**

- 1 Within this chapter are Designated Shipping Areas as shown on the relevant charts, for further information see 1.74 and *Australian Seafarers Handbook*.

Particularly Sensitive Sea Area**7.12**

- 1 The whole area of this chapter is within Great Barrier Reef Marine Park which is an IMO approved Particularly Sensitive Sea Area (PSSA). The area is shown on the relevant charts. For further details see 1.71 and *Australian Seafarers Handbook*.

Flow**7.13**

- 1 **Currents:** see 1.144 for a general description of currents in the area.

Tidal streams set generally SE on the rising tide and NW on the fall; directions and rates are well-documented on the charts.

GREAT BARRIER REEF**General information**

Charts Aus 370, Aus 371, 4621

7.14

- 1 Little is known of Great Barrier Reef between Hydrographers Passage (20°00'S 150°17'E) and Flinders Passage about 145 miles NW. Neither the outer nor the inner edge has been properly delineated by survey, but both consist mainly of detached reefs, some extensive, with deep channels between. Flinders Passage is the only navigable passage through the reefs within the scope of this chapter.
- 2 A general picture of the area, in which many of the drying reefs are named and with its features of lagoons, foul ground and boulders, is best obtained from inspection of the charts. Boulders, where charted, are in many cases known to be moved by heavy weather.

Flow**7.15**

- 1 **Current.** A general description of the currents in Coral Sea and off the E coast of the Australian continent is given at 1.144. Currents in the immediate vicinity of Great Barrier Reef are variable and imperfectly known, but there is a general pattern of flow across the reefs and through the various openings. Attention is drawn to the well-documented detail of water movement through Hydrographers Passage given at 6.30.
- 2 **Tidal streams.** Between Bait Reef (19°48'S 149°04'E) and Hook Reef 2 miles E, tidal streams attain a rate of 2 kn as shown on the charts; the streams setting S and N on the rising and falling tides.
In the vicinity of Net Reef (19°34'S 149°05'E), streams set through the channels and along the edges of shallow water at a considerable rate in the same N/S directions as above.

Overfalls and eddies are common throughout the barrier in any area where there are irregular depths or confined channels.

Outer edge**7.16**

- 1 The general line of the outer edge of the reefs is best seen on chart 4621, whilst taking note of the scarcity of regular and modern soundings thereon. Apart from the approach to the N entrance to Flinders Passage, the area should be avoided.

Inner edge**7.17**

- 1 The inner edge of this section of Great Barrier Reef runs from Credlin Reefs (20°33'S 149°56'E) to Parker Reef 9 miles W thence effectively for navigational purposes, to Bait Reef 58 miles NW. The barrier appears to recede NE between the two last-named reefs, but the large bight so formed is unexamined in the SE part. A 9.5 m patch lies 28 miles NNW of Parker Reef, about midway across this bight.

- 2 From Bait Reef the effective inner edge lies on a line WNW to the SE end of Old Reef (19°24'S 148°06'E) and then to Wilson Shoal, 11 miles farther WNW. The actual edge as depicted on the charts again extends in a shallow bight NNE but is not fully delineated and should be avoided. Reference to a larger scale Australian chart of the area shows the waters of this bight not to have been fully examined to modern standards.

Flinders Passage

Chart Aus 826

General information**7.18**

- 1 **Route.** The N and seaward entrance to Flinders Passage lies between the NW of two submerged reefs (18°49'S 148°01'E), the positions of which are approximate, and the E extremity of an area of drying reefs and dangerous water about 4 miles NW. The passage is approached from Coral Sea and from its N entrance leads S for 18 miles before turning SW in more open waters to join the Inner Route as required E of Cape Bowling Green (19°18'S 147°24'E).
- 2 Until the opening of Hydrographers Passage, this was the first navigable channel through Great Barrier Reef NW of Capricorn Channel. Although it has been used in the past and is said to present no difficulties, Flinders Passage has not been closely examined and is rarely used by commercial shipping.

7.19

- 1 **Depths** through the fairway vary between 70 m in the N entrance and 50 m in the S entrance, as shown on the chart.

7.20

- 1 **Pilotage** is not available.

7.21

- 1 **Former mined area.** The N and S entrances to the passage are former mined areas; see 1.5 for general remarks and Appendix II for details of the areas involved.

7.22

- 1 **Tidal streams** through the passage are not documented except on the chart, where, in mid passage where they are shown to run S at 1 kn on the rising tide and N at 1¾ kn on the falling tide. At about 7½ miles S of Bowden Reef (19°02'S 147°56'E), they are shown to run SSW at ½ kn and SSE at ¾ kn on the rising tide.

Directions**7.23**

- 1 Approach to Flinders Passage should be made passing: Well clear of a 15.4 m patch (18°45'S 148°06'E), coral, the N—most charted danger on the outer edge of the barrier E of the entrance, and: Well clear of a 16.7 m patch (18°39'S 147°54'E); a 13 m (41 ft) patch (chart Aus 372) lies 10 miles farther NNW with a 17.6 m (58 ft) patch and a submerged reef (which breaks) between. These are the outermost charted dangers on the outer edge of the barrier NW of the entrance.

7.24

- 1 From approximate position 18°47'S 148°00'E, in the entrance to the channel the track leads generally S following the charted line of soundings and passing (positions from Eagle Reef (18°51'S 148°05'E)): E of the area of drying reefs and dangerous water, the E edge of Anzac Reefs (9 miles NW), marking the NW entrance point to the passage; thence: Midway between the NW of the two reefs (4 miles NW) marking the E entrance point to the passage, and a drying reef (6 miles WNW). Thence:

W of Eagle Reef which dries; a shoal patch with a depth of 5.4 m over it lies 1 mile NNW from the reef; thence:

E of a drying reef (7 miles WSW) distant 1 mile; the reef extends 4½ miles NNW/SSE; thence:

- 3 W of an 14.7 m patch (7½ miles SSW); patches with depths of 21.9 m and 16.8 m lie 1 mile farther SSW and 2½ miles S respectively. These patches are the outermost known dangers W of Shrimp Reef (5 miles S) which dries. Thence:

W of Prawn Reef (8½ miles SSE) which dries; there is foul ground between this and Mid Reef, 2 miles farther SSW; thence:

- 4 E of the S end of Bowden Reef (12½ miles SW), distant 2 miles; the reef dries and there are boulders on it. Thence:

W of Mid Reef (12½ miles S), which dries and breaks. This and Bowden Reef together mark the S entrance to the confined section of Flinders Passage.

7.25

- 1 Course may then be directed SW as required to join the Inner Route, passing (positions from Wilson Shoal (19°22'S 147°57'E)):

NW of a number of drying reefs (13 miles NE) lying at the W end of a large area of reefs and foul ground; Darley Reef lies on the S side of this area. Thence:

- 2 NW of the W extremity of an area of drying reefs extending 5 miles W from Stanley Reef (7 miles ENE), which dries; thence:

Clear of Wilson Shoal, coral, marking the NW extremity of the inner edge of Great Barrier Reef in this vicinity: see 7.17. Thence:

SE of Morinda Shoal (22 miles NW) (7.36).

PASSAGE EAST AND NORTH OF WHITSUNDAY GROUP

General information

Charts Aus 371, Aus 824, Aus 825

Route

7.26

- 1 From a position abreast Slade Point and 5¾ miles ENE of Calder Island (20°46'S 149°37'E) the preferred outer track passes NE of Cumberland Islands and Holbourne Island (19°44'S 148°22'E) and leads to a position 10½ miles NE of Cape Bowling Green (19°18'S 147°24'E).

Topography

7.27

- 1 The general topography along this route is described at 7.4.

Depths

7.28

- 1 Except for the 35 m patch NE of Holbourne Island (19°44'S 148°22'E) (7.34), depths along this preferred route are in excess of 37 m until that depth contour is crossed in the vicinity of a line between Cape Upstart (19°42'S 147°45'E) and Old Reef 26 miles NE. The least charted depth is given at 7.5.

Tidal streams

7.29

- 1 Tidal streams, with their directions and rates, are tabulated on the charts.

National Parks

7.30

- 1 Some of the islands described in this sub-section are National Parks; see 7.10.

Landmarks

7.31

- 1 Whitsunday Craig (353 m in height) (20°18'S 149°01'E), standing on the S coast of Whitsunday Island.

Whitsunday Peak (434 m in height) (20°16'S 148°57'E), the highest summit on Whitsunday Island, wooded and conspicuous except from E.

Whitsunday Cairn (elevation 380 m) (20°10'S 148°58'E), a conspicuous boulder on the summit of a mountain close to the N extremity of the island.

Other aid to navigation

7.32

Racon:

- 1 Cape Bowling Green Light (19°20'S 147°26'E) (7.36). For details see the relevant *Admiralty List of Radio Signals* Volume 2.

Directions

(continued from 6.55)

7.33

- 1 From a position 5¾ miles ENE of Calder Island (20°46'S 149°37'E) (6.55), the preferred route shown on the chart leads NW on 320°, passing (positions from Edward Island (20°15'S 149°10'E)):

SW of Parker Reef (37 miles ESE); which dries 4.3 m. The reef marks the effective inner edge of this part of Great Barrier Reef (7.17). And:

- 2 NE of Edward Island, the E-most island of Whitsunday Group; a light (white hut 2 m in height) stands on the summit. Buddibuddi and Yiundalla Islands stand on a spit of foul ground extending 7 cables E from Edward Island. Thence: NE of Harold Island (1 mile WNW), the highest and largest of a small group of four: Sillago Island, 2½ cables ENE, Wirrainbeia Island, 5 cables WNW, 33 m in height and Ireby Island (50 m in height) 7 cables NW. All are steep-to. Thence:

- 3 NE of Petrel Islet (4½ miles NW), marking the S end of an area of foul ground; an above-water rock, 2 cables N, lies near the N end of the same foul ground. Overfalls occur between Ireby Island and Petrel Islet and also E and W of the latter. Thence:

- 4 NE of Leeper Shoal (8½ miles NW), the outermost danger. Overfalls occur in the vicinity of the shoal at all states of the tide. The shoal lies 1½ miles NNE of Deloraine Island, with Minstrel Rocks (drying 2.7 m) and Jester Rock (awash) lying between. The island is cliff-faced and steep-to on its E side, fronted by drying reefs on the N, S and W sides.

7.34

- 1 From a position 10½ miles NNW of Edward Island the preferred route shown on the chart then leads WNW on 297½°, passing (positions from Eshelby Island (20°01'S 148°38'E)):

NNE of Pinnacle Point (19½ miles E), from which a steep-to drying reef extends 2 cables NE; Double Rock, two steep-to drying rocks, lie close together 4 cables offshore 9 cables SE of the point. Pinnacle Point Light (white GRP hut, 2 m in height) stands on the point. Thence:



Light

Cape Bowling Green from E (7.36)

(Original dated 1999)

- 2 SSW of Bait Reef (27½ miles ENE) which dries and marks the inner edge of Great Barrier Reef in this vicinity (7.17). Thence:
- NNE of Dolphin Point (14½ miles E), the NW extremity of Hayman Island; an islet 31 m in height lies close off the point and a hill, 125 m in height and conspicuous except from S rises 3 cables ESE of the point. The NE side of Hayman Island is steep-to. Thence:
- 3 NNE of Eshelby Island (7.92), thence:
- NNE of Rattray Island (4 miles WNW) (7.92), thence:
- NNE of Gloucester Head (10 miles WNW), the N extremity of Gloucester Island; a wooded peak 536 m in height rises 1 mile S of the head. The island has a steep and rocky coast rising quickly to a ridge of wooded peaks, the highest of which is Mount Bertha. Thence:
- 4 NNE of Holbourne Island (23 miles NW), covered with grass and bushes on its S side; a drying reef fronted by below-water rocks extends 5 cables S from the S side of the island and is marked at its E end by a rock 18 m in height. The N side of the island is cliffy and steep-to; Holbourne Island Light (white hut, 2 m in height) stands on the summit.

Chart Aus 826

7.35

- 1 The preferred route continues WNW on 297½°, passing (positions from Cape Upstart (19°42'S 147°45'E)):
- NNE of the outer approaches to the port of Abbot Point (21½ miles ESE) (7.155), thence:
- SSW of Old Reef (26 miles NE) which dries and encloses a lagoon; there are drying boulders on its S side. The reef marks the inner edge of Great Barrier Reef in this vicinity (7.17). An historic wreck (7.9) lies on the SW side of the reef. Thence:
- 2 NNE of Cape Upstart, so-named from the abruptness with which it rises from the low land S. The promontory is composed of a mass of granite rocks, sparsely covered with stunted trees, grass and scrub, and rises to Station Hill 5¼ miles SE of the cape.

7.36

- 1 The preferred route shown on the chart is then adjusted to lead NW on 308½°, passing:

SW of Pakhoi Bank (17½ miles NNE) distant 5 cables. The bank is of coral and has a depth of 17.4 m over it. Thence:

SW of Tink Shoal (21 miles NE) distant 3¼ miles; the SW approach to Flinders Passage (7.18) lies between this and Morinda Shoal 17½ miles NW; thence:

- 2 NE of a light-buoy (isolated danger) marking an historic wreck site (25 miles NNW) (7.9), thence:
- SW of Morinda Shoal (34 miles NNW), coral, marking the start of the inner edge of Great Barrier Reef lying NW of Flinders Passage. Thence:

- 3 NE of Cape Bowling Green (31½ miles NW) distant 10½ miles; the cape is the NW extremity of a peninsula which extends for 8 miles NNW on the E side of Bowling Green Bay (8.68). Cape Bowling Green Light (white metal framework tower, red band, 32 m in height) stands on the peninsula, 2½ miles from the cape. The peninsula is low, sandy, fringed in places by mangroves and extends from a mangrove swamp on the mainland. The banks E of this peninsula and of Cape Bowling Green, which are best seen on the chart and over which the tidal streams set strongly and irregularly, are subject to change. See Caution at 7.3.

Useful mark

7.37

- 1 Eshelby Island Light (20°01'S 148°38'E) (7.92).
(Directions continue at 8.35)

Side channels

Chart Aus 824

Calder Island to Cumberland Channel

7.38

- 1 From the position 5¾ miles ENE of Calder Island (20°46'S 149°37'E) the track leads W to a position 1¼ miles ENE of Linne Island (20°41'S 149°11'E) where it joins Cumberland Channel for passage of the inshore route. The least charted depth for Cumberland Channel given at 7.5 applies.

Directions*(continued from 6.55)***7.39**

- 1 From the position given at 7.38, the track leads W on 279°, passing (positions from Linne Island):

N of Calder Island (24½ miles ESE) (6.55), thence:

N of Wigton Island (15½ miles ESE), wooded and cliff-faced on its NE side; a patch with a depth of 10.9 m 7 cables NE of the island is the outermost danger. Thence:

S of Geranium Shoal (2½ miles NE) (7.55).

(Directions for Cumberland Channel continue at 7.55)

Chart Aus 252

Solway Passage**7.40**

- 1 **General description.** Solway Passage lies between the W extremity of Haslewood Island (20°17'S 149°05'E) and the E extremity of Whitsunday Island 4½ cables W; the passage forms the S entrance to Whitehaven Bay (7.45).

Teague Island, with two above-water rocks close off its S extremity, lies in the S entrance to the passage. The channel between Teague and Haslewood Islands is obstructed by shoals extending NE from Teague Island and by drying rocks lying SW of Haslewood Island; this channel is not recommended.

- 2 Lying in the immediate approaches to the S entrance to the passage, positioned from Teague Island, are Frith Rock (4 cables SW); an islet (6 cables W), on the outer edge of a drying reef extending from Whitsunday Island, and another islet (23 m in height and reef-fringed) (1 mile WSW). A 4.9 m coral patch, known locally as Anzac Shoal, lies 6 cables ESE of Craig Point, cliff-faced on its W side, 2½ miles WSW of Teague Island. The bays lying within 1½ miles ENE of Craig Point are unsurveyed.

- 3 On the W side of the passage a spit, with a depth of 7.5 m over it, extends about 3 cables NE from the E extremity of Whitsunday Island. A 4.6 m shoal lies 3 cables farther NNW.

Martin Islet (20°17'S 149°04'E) marks the E side of the N entrance to the passage.

7.41

- 1 **Tidal streams** in Solway Passage turn at approximately the times of HW and LW, setting S on the rise and N on the fall. Rates of 5 kn, accompanied by overfalls, occur at springs.

Chart Aus 825

Pinnacle Point to Nares Rock**7.42**

- 1 From the position 10½ miles NNW of Edward Island (20°15'S 149°10'E) a track diverges from the outer preferred route and leads WNW on 290¼°, as shown on the chart, to join the inshore track 1¾ miles SW of Nares Rock (19°46'S 148°22'E).

Directions for the track between Pinnacle Point and Gloucester Head given at 7.34 may be used.

Anchorage

Chart Aus 252

Haslewood Island**7.43**

- 1 White Bay (20°17'S 149°06'E) is entered between Nicolson Island, steep-to and standing 2 cables off the SE extremity of Haslewood Island, and the S extremity of Lupton Island 1¼ miles NE. The head of the bay is formed by a drying reef up to 6 cables offshore which extends

from the N half of the E side of Haslewood Island, and on which stand Lupton Island and another smaller island close E. Workington Island, steep-to, stands 2 cables NE of the outer end of the reef; overfalls occur to seaward.

Anchorage may be obtained in a depth of 12.2 m close S of a steep-to 3.1 m bank lying across the middle of White Bay.

Border Island**7.44**

- 1 Anchorage sheltered from S winds may be obtained in Cateran Bay on the N side of Border Island (20°10'S 149°02'E) in depths of 15 to 20 m, mud, keeping to seaward of white conical buoys marking the limits of a marine park. The anchorage lies 5 cables W of the NE extremity of the island, which is cliff-faced and rises to Mosstrooper Peak, 4 cables S.

- 2 Two above-water rocks, connected at LW, lie on a coral bank which dries at LW and which extends 3 cables from the middle of the E side of the island; another above-water rock, about 1.5 m high, lies close off the S extremity.

Overfalls occur 1 cable E of the NE extremity of Border Island; they are most evident on a flood tide with N winds.

- 3 Dumbell Island, with a below-water rock close W of it, lies in the channel between Border and Whitsunday Islands, 1 mile WSW of the former. Overfalls occur between Dumbell Island and Whitsunday Island.

Visitor mooring buoys lay close off the NW coast of Dumbell Island and off the N coast of Border Island, as shown on the chart.

Islands and dangers in the approaches to Border Island from SE and E are described at 7.33.

Apostle Bay**7.45**

- 1 Anchorage with shelter from SE winds may be obtained in a depth of 8.2 m 4½ cables W of Tongue Point (20°14'S 149°01'E), the SE entrance point to Apostle Bay.

The berth lies in the mouth of the E-most of three rock-fringed coves which form the head of Apostle Bay. Peter Head, 2½ miles NW of Tongue Point, is a cliff-faced headland which rises to 391 m 5 cables SW and is the NW entrance point to the bay.

- 2 Anchorage is not recommended in Whitehaven Bay, lying between Tongue Point and Pallion Point, the NE extremity of Haslewood Island 4½ miles ESE. Apart from Lagoon Rock (20°16'S 149°02'E), marked by a light-beacon (W cardinal), and other charted dangers, there are numerous coral heads within the 5.0 m depth contour fronting the SW shore of the bay.

- 3 Esk Island, 8 cables E of Tongue Point, marks the N extremity of French Shoal which extends 2¾ miles SSE into Whitehaven Bay and dries near its mid-point and at its S end. The island also marks the NW end of a bar, with depths of not more than 11 m over it, lying between there and the NW extremity of Haslewood Island. A bank with a least charted depth of 11.5 m, extending 2 miles NW of Esk Island, lies partially across the approach to Apostle Bay.

Chart Aus 825

Holbourne Island**7.46**

- 1 Temporary anchorage with fair shelter from SE winds may be obtained in a depth of 16 m NW of a beach on the W side of Holbourne Island (19°44'S 148°22'E) (7.34). The bottom is foul and the anchorage is too close in for safety; tidal streams are strong.

Inshore anchorages**7.47**

- 1 A number of anchorages and harbours farther inshore, which may be reached if required, are described at 7.62 for waters adjacent to Cumberland Channel, at 7.106 for Whitsunday Passage and waters to Nares Rock and at 7.179 for waters between Nares Rock and Cape Bowling Green.

CUMBERLAND CHANNEL**General information**

Charts Aus 824, Aus 252 (see 1.14)

Route**7.48**

- 1 From the vicinity of Bailey Islet (21°02'S 149°33'E), Cumberland Channel leads NW through the SE group of Cumberland Islands and Sir James Smith Group to join the S end of Whitsunday Passage (7.80) abreast Cape Conway, 47 miles NW. The alternative route through Hillsborough Channel is also described.

Topography**7.49**

- 1 The topography of Cumberland and Hillsborough Channels is dominated by the adjacent Cumberland Islands which are described in the relevant parts of the text.
From Slade Point (21°04'S 149°14'E) (6.201) the mainland coast trends NW towards Repulse Bay and is generally low to Cape Hillsborough (20°54'S 149°03'E) (7.60) but backed by hills, some peaked and others saddle-shaped, which become higher and more isolated towards N. Mount Blackwood, 10 miles SW of Cape Hillsborough, and Mount Jukes (7.53), 2 miles farther N and separated from it by a steep and narrow gorge, form a part of this background.
- 2 From Cape Hillsborough to Stewart Peninsula 13½ miles WNW, which is wooded and separated from the mainland by a mangrove swamp, the coast is more varied in appearance than is the case farther SE; being low-lying with shallow bays and extensive mangrove swamps, lying between rocky points, fronted by numerous islets and rocks.
- 3 Repulse Bay is entered between an unnamed point (20°38'S 148°44'E) and Cape Conway 13 miles NE. High ground fronts the shores of the bay in the areas of the two entrance points and also in the vicinity of Mount Proserpine (20°26'S 148°43'E), but elsewhere the shores are low and flat, being fringed with mangroves and fronted by drying sandbanks extending to 1½ miles offshore.

Depths**7.50**

- 1 Along the track through Cumberland Channel, depths throughout are less than 37 m and are less than 15 m in places. The least charted depth for the channel is given at 7.5.

Tidal streams**7.51**

- 1 The general direction of the tidal stream on the rising tide is SW in Cumberland Channel and S in Hillsborough Channel, and on the falling tide is NNE in both cases; but see Caution below.
- 2 Tidal streams throughout the area usually turn at about the times of HW and LW Mackay, but they are much affected by the prevailing wind, and in strong S winds the

N-going stream has been observed to run from 1½ hours before HW and to continue for 9½ hours. Streams running between islands can attain rates that are considerably higher than those experienced in open waters. This is particularly evident amongst the islands SE of Shaw Island (20°30'S 149°05'E).

- 3 **Caution** is necessary in the vicinity of islands adjacent to Cumberland Channel as tidal streams are unpredictable and may set strongly across the track.

National Parks**7.52**

- 1 Some of the islands described in this sub-section are National Parks; see 7.10.

Landmark**7.53**

- 1 Mount Jukes (21°00'S 148°57'E) (charted on Aus 370).

Directions

(continued from 6.58)

Bailey Islet to Linne Island**7.54**

- 1 From a position 3½ miles NE of Bailey Islet (21°02'S 149°33'E) (6.56) the track leads NW to a position 1¼ miles ENE of Linne Island 30 miles NW, passing (positions from Linne Island (20°41'S 149°11'E):
SW of Scawfell Island (25 miles ESE) (6.55), thence:
NE of Saint Bees Island (19 miles SE), a tourist resort; the coves indenting the coast of the island are for the most part filled with drying reefs. Keswick Island (7.59) lies close W of Saint Bees and is separated from it by Egremont Passage. Aspatria Island, with an islet 24 m in height close E, lies 5 cables E of Saint Bees Island. Overfalls occur 1 mile E of the islet. Heskett Rock (3 m in height), with a below-water rock close SW of it, lies 5 cables SE of the islet and a patch, with a depth of 9.4 m over it and marked by eddies, lies 1 mile farther SSW; these are the outermost dangers SE of Saint Bees Island. Thence:
SW of an islet (12½ miles ESE) 53 m in height marking the extremity of foul ground extending 7 cables SW from Cockermouth Island, which is covered with scrub, casuarinas and coconut palms. Another islet, 25 m in height, lies close off the NW point of Cockermouth Island. Thence:
NE of Devereux Rock 0.7 m in height (10 miles SE), marked by overfalls; thence:
NE of Carlisle Island (7½ miles SE). The island is wooded and rises to Skiddaw Peak close within its N extremity; the SE part of the island, which rises to 115 m, is connected to the main part by a low neck of land with a sandy beach on each side. Thence;
NE of Maryport Island (6½ miles SE); Edgell Rock lies 3 cables SSW with an area of foul ground between; thence:
NE of Coffin Island (3¾ miles SE); Hempel Rock, with eddies occurring S of it, lies close W; thence:
NE of Tinsmith Island (5 cables SE), wooded; Solder Island lies close SE of its S extremity; an islet, with a below-water rock close NW of it, lies near the outer edge of a bank with depths of less than 5.0 m over it which extends 5 cables S from Tinsmith Island. Thence:

- 6 ENE of Linne Island, distant 1¼ miles. The island is wooded and the highest and most remarkable of the Sir James Smith Group; the S part of the island is joined to the main part by a low neck of land. A 15.2 m patch lies 7½ cables E of the island, with eddies occurring between. A side channel (7.38) joins the track in this vicinity from E.

Useful mark:

Finger and Thumb Islands (20°45'S 149°13'E) (7.60).

Linne Island to Shaw Island

7.55

- 1 The track then leads WNW to a position 4 miles E of Cape Conway (20°32'S 148°56'E), which is within a compulsory pilotage area (see 7.82), passing (positions from Coppersmith Rock (20°36'S 149°07'E)):
- SSW of Geranium Shoal (7 miles ESE), coral, thence: Across Ross Smith Bank (5 miles SE), with a least depth of 8.9 m over its SSW end; thence:
- 2 NNE of Goldsmith Island (4½ miles SSE); an islet (7.6 m in height) lies close E of its N extremity; thence:
- NNE of Locksmith Island (3¾ miles SSE); a rock which dries lies close NW. Overfalls occur between Locksmith and Goldsmith Islands. Also:
- 3 SSW of Carondelet Rock (4 miles ESE); Blackcombe Island, of volcanic origin, stands 1 mile NNE of the rock, with Dorsal Rock 1 mile farther WNW. Thence:
- SSW of Coppersmith Rock, lying at the SE end of a drying reef; a light (white GRP hut) stands on the summit; Silversmith Island (4 cables NW), is wooded and the N-most of the Sir James Smith Group. And:
- 4 NNE of Ladysmith Island (3¾ miles SSW), with some prominent white cliffs on its E side, thence: NNE of Blacksmith Island (3½ miles SW), the largest of Anchor Islands, nearly bare and fronted on its NE side by Anvil Island and Anchorsmith Island. A 9.1 m shoal patch lies 1½ miles NE of Blacksmith Island. Thence:
- 5 SSW of Saint Helen Rock (3½ miles NW), the W-most danger off Thomas Island 1 mile farther ENE (7.70) and lying on the W edge of the obscured sector of Coppersmith Rock Light; eddies occur E and overfalls N of the rock; thence:
- 6 Across the edge of a bank (5 miles NW), with a least depth of 11 m over it, which extends 3 miles S of Shaw Island. The island, which is a National Park (see 7.10), consists of densely wooded hills and rugged cliffs separated by low marsh and rock. Thence:
- SSW of Platypus Rock (6½ miles NW), lying 2½ cables off the SW extremity of Shaw Island and marked by a light-beacon (W cardinal). Eddies occur close SW and NW of the rock.

(Directions continue at 7.89)

Hillsborough Channel

Charts Aus 824, Aus 252 (see 1.14)

Route

7.56

- 1 Hillsborough Channel leads from the vicinity of Bailey Islet (21°02'S 149°33'E) inshore of the SE group and Sir James Smith Group of Cumberland Islands to the S

entrance to Whitsunday Passage abreast Cape Conway, 47 miles NW.

7.57

- 1 The SE end of the channel is much obstructed on its SW side by the extensive Blackwood Shoals which extend up to 9 miles from the mainland between Slade Point (21°04'S 149°14'E) and Shoal Point, 5½ miles NW. Blackwood Shoals are subject to general shoaling. The shoals consist mainly of rocky patches covered with light-coloured sand and, although deep channels exist in places between them, there are no leading marks.

Local knowledge. No attempt should be made to navigate the area without local knowledge.

Limiting conditions

7.58

- 1 The controlling depth of 8.7 m in the fairway is less than that available in Cumberland Channel and is found between Fantome Rocks (20°51'S 149°15'E) and the outer part of Blackwood Shoals SW. The least width of 1½ miles is found in the same general area.

Directions

(continued from 6.58)

7.59

- 1 From a position 3½ miles NE of Bailey Islet (21°02'S 149°33'E) (6.56) the track leads initially W, passing S of Saint Bees Island (8 miles NW) (7.54). The track then leads WNW, passing on the NNE side of the fairway (positions from Hyde Rock (20°55'S 149°21'E)):
- 2 SSW of Keswick Island (2 miles E), wooded and lying on the W side of Egremont Passage. The indentations on the SW side of the island are for the most part filled with drying reefs. Wheatley Shoal lies 5 cables SW of the island with Singapore Rock (drying 1.6 m and marked by overfalls) lying 4 cables N of the shoal; tidal streams in the vicinity of the rock are strong. Thence:
- 3 SSW of Hyde Rock, a pinnacle. On the SSW side of the fairway the same track leads clear of Blackwood Shoals, passing: NNE of Hunt Shoal (4¾ miles SSW) and of Llewellyn Shoal, 1¼ miles farther WSW; these are the outermost named dangers in an area of irregular depths lying immediately SE of Blackwood Shoals. Thence:
- 4 NNE of a 7.7 m patch (3½ miles WSW) which, together with a 4.2 m patch and a 6.4 m patch, 2 miles SE and 2½ miles SE, respectively, of the 7.7 m patch, are the outer dangers on the NE side of Blackwood Shoals. Thence: NNE of an 8.6 m patch (7¼ miles W), the outer danger on the N side of the shoals. Thence: Across a group of patches (7½ miles WNW) in the fairway, with a least depth of 8.7 m over them; and:
- 5 SSW of Fantome Rocks (7 miles WNW), 2 miles in extent N/S with a least depth of 7.5 m over the S part. Brampton Island, which lies 1 mile NE of the N end of the rocks, is wooded; a low neck of land connects the SE part to the rest of the island.

7.60

- 1 The track then leads NW as required in more open water, passing: NNE of Cape Hillsborough (17 miles W), a conspicuous bold headland with a bare summit

rising from much lower coastlines SE and NW. The cape, which is faced in places by steep sandstone cliffs and elsewhere is thickly wooded with large pine trees but with a bare summit, is connected to the mainland by a low, scrub-covered isthmus. Pinnacle Rock, 3 miles farther WSW and shaped like a sugarloaf, is one of a number of peaked hills which, seen from NE, are remarkable and curiously shaped. The SE extremity of the cape is formed by Andrews Point 1¼ miles SSE; Wedge Island and a smaller islet NW lie on a drying reef close N of the point. Thence:

- 2 SW of Finger and Thumb Islands (12½ miles NW), two islets, the E one 37 m in height; thence:

SW of Allonby Island (14½ miles NW), the S-most island of Sir James Smith Group.

The track then continues NW passing (positions from Pincer Island (20°41'S 149°06'E)):

- 3 SW of Bullion Rocks (4½ miles SE), four in number, the E-most and highest being 25 m in height. The rocks lie on a drying reef. Specie Shoal, with a charted depth of 4·6 m over it, lies 5 cables N of the W end of the reef. Thence:

- 4 SW of the two Ingot Islands (3 miles SE), lying on a spit, with depths of less than 10 m over it, which extends 1½ miles S from Goldsmith Island. No attempt should be made to pass between the Ingot Islands or between them and Goldsmith Island. To Reef lying 5 cables W of the SW extremity of Goldsmith Island is marked by a light-beacon (W cardinal); the NW side of the island is described at 7.68. Thence:

- 5 SW of Pincer Island, bare and the S-most of Anchor Islands; a rock (9·1 m in height) lies 4 cables NE; Forge Rocks, drying 1·2 m, lie on an area of foul ground 5 cables NW of the islet. Thence:

- 6 SW of Bellows Island (2 miles NW) and SW of Hammer Island, wooded, 7 cables farther NNW; a patch, with a least depth of 4·6 m over it, lies between; a bank with depths of less than 10 m over it extends 1 mile S from Hammer Island. Thence:

Clear of Bennett Rock (9 miles WNW), with a depth of 7·6 m over it.

7.61

- 1 The track then leads N as required to the junction between Cumberland Channel and Whitsunday Passage in the vicinity of a position 4½ miles E of Cape Conway (20°32'S 148°56'E), passing (positions from Cape Conway):

E of Repulse Islands (4½ miles SW) (7.69), thence:

E of Conway Shoal (1½ miles SSW) (7.89).

(Directions continue at 7.89)

Anchorage

Chart Aus 824 (see 1.15)

Egremont Passage

7.62

- 1 Egremont Passage, which lies between Saint Bees Island (20°55'S 149°27'E) (7.54) and Keswick Island close W, is restricted on both sides by shoals.

Anchorage may be obtained in the N entrance to the passage in a depth of 16 m, 5 cables W of Schooner Rock, which lies at the NW extremity of foul ground extending 3 cables from the N side of Saint Bees Island and is marked by a light-beacon (N cardinal). The anchorage lies

close W of a 9·4 m patch, but there is good holding ground out of the strength of the tidal stream, and shelter from SE winds.

- 2 Shelter might be found in Egremont Passage itself but care must be taken to avoid the dangers on each side. Flimby Shoal, with a depth of 5·1 m over it, lies on the W side of the S part of the passage. A light-beacon stands at the SE entrance point to the passage.

Local knowledge is required within the passage.

Tidal streams in Egremont Passage may attain a rate of 3 to 4 kn.

Keswick Island

7.63

- 1 Anchorage may be obtained off the NW side of Keswick Island (20°55'S 149°24'E) (7.59) but the holding ground is bad.

Cockermouth Island

7.64

- 1 Anchorage may be obtained in a depth of 27 m, 5 cables N of the NW extremity of Cockermouth Island (20°46'S 149°24'E) (7.54).

Carlisle Island

7.65

- 1 Anchorage, sheltered except from winds between W and NE, may be obtained in Maryport Bay on the W side of Carlisle Island (20°47'S 149°17'E) (7.54).

Pelican Island, a rock 16 m in height lying 6 cables SSE of the anchorage, marks the outer end of a drying reef extending 4 cables N from the N side of Brampton Island, which is a tourist resort. A jetty lies 3 cables SSW of Pelican Island.

7.66

- 1 **Approaches.** A light, displayed from the outer of two rocks standing on a drying reef extending 4 cables WSW from the W extremity of Brampton Island, marks the approach from SW. Overfalls occur off the reef and a shoal, with a least depth of 8·1 m over it, lies 6 cables NNW of the outer rock; Baxendell Shoal, with a least depth of 8·7 m, lies with its S extremity 1 mile NNE of the same rock and extends from there nearly 2¼ miles N. Approaches to the anchorage from NE or SW pass clear of the above shoals and of Maryport Island and Edgell Rock (20°46'S 149°16'E) (7.54).

- 2 **Tidal streams** in Maryport Bay attain a rate of 1¼ to 1½ kn setting SSW and NNE on the rising and falling tides respectively.

Charts Aus 252, Aus 824 (see 1.15)

Ingot Islands

7.67

- 1 Anchorage, with shelter from N winds, may be obtained 4 cables E of the N Ingot Island (20°42'S 149°09'E) (7.60). The holding ground is good; stiff mud.

Goldsmith Island

7.68

- 1 Anchorage, sheltered from SE gales, may be obtained off the NW side of Goldsmith Island (20°41'S 149°09'E).

The NW side of the island is divided into two bays by a rounded promontory with Farrier Island lying 2 cables farther W. The head of the N bay is fronted by a drying reef, and that of the S bay by a sandy beach fronted by a drying ledge. A bank, with a depth of 2·4 m, almost fills the entrance to the S bay between its S entrance point and Farrier Island.

Chart Aus 252

Repulse Islands

7.69

- 1 **General information.** Repulse Islands (20°36'S 148°52'E) are a group of small rocky islands covered with grass and a few trees, lying near the middle of the entrance to Repulse Bay.

South and East Repulse Islands lie on the S and NE sides, respectively, of a bank with depths of less than 5 m over it, the extent of which may be seen on the chart. A 4.9 m patch lies 1 mile W of East Repulse Island.

- 2 A drying reef, 4 cables E of South Repulse Island with drying and below-water rocks between, is the outermost danger E of that island. A dangerous wreck lies midway between the entrance points of the shallow bay on the W side of the island.

- 3 North Repulse Island lies 1 mile NW of East Repulse Island; a 4.6 m patch lying 7 cables SW of the island is the W-most danger of the group.

Anchorage may be obtained by small vessels amongst the islands, which afford good shelter if care is taken.

Local knowledge is required.

Thomas Island

7.70

- 1 **General information.** Thomas Island (20°33'S 149°07'E), wooded, is the S-most of Lindeman Group; Dead Dog Island, covered with a few bushes on its S end, lies close SE of the E extremity of Thomas Island and is connected to it by foul ground; Fairlight Rock, bare and conical with a rock (drying 1.2 m) close SSE, lies 3 cables farther E and is the E-most danger. Eddies occur S of the W extremity of Thomas Island; overfalls occur off the S side of the island and S of Dead Dog Island.

A rock (drying 1.6 m) lies 150 m off the NE point of Thomas Island. An islet lies midway between the entrance points of a bay on the N side of the island.

7.71

- 1 **Anchorage** may be obtained in a depth of 20 m to seaward of the above bay and 5 cables NE of the W extremity of the island. The berth is open to N winds.

Small craft may obtain anchorage in a depth of 4 m inside the bay on the N side of the island.

Caution. An unsurveyed area extends NW from Thomas Island to the shore of Shaw Island, 3 miles NW, as shown on the chart.

Local knowledge is required for these anchorages.

Harbours and rivers

Chart Aus 824 (see 1.15)

Constant Creek

7.72

- 1 Constant Creek (21°00'S 149°01'E), which is navigable only by small craft, enters the sea at the head of Sand Bay which lies between Andrews Point (20°56'S 149°04'E) (7.60) and a low point on the coast 3¼ miles SSE; a reef (drying 3 m) lies 5 cables N of the latter point. The shores of the bay are fronted by an extensive drying flat.

Local knowledge is required.

Tidal streams in Constant Creek attain a rate of 1½ to 2 kn.

Port Newry

7.73

- 1 **General information.** Port Newry is entered between Outer Newry Island (20°51'S 148°56'E), thickly wooded on its S side with pine trees, and Mausoleum Island, 4 cables

SE; a light (white beacon) stands on the N side of the latter island which is formed by a bluff 33 m in height. From the entrance a channel with depths of more than 5.0 m leads WSW for about 1 mile passing between Newry Island, also wooded, and lying 2 cables W of Outer Newry Island, and Acacia Island 2½ cables SSE. Anchorage in this channel is exposed to E winds.

- 2 A safe harbour for small craft lies between Outer Newry and Newry Islands; the fairway between these islands is narrow, and the bottom soft mud.

Acacia Island lies on the NE edge of a drying sandbank and has a white cliff on its N side; a light-beacon (starboard hand), close off the E side of the island, marks the entrance to a channel marked by light-beacons which leads S to Victor Creek where there is a boat ramp.

7.74

- 1 **Approaches** to Port Newry from E pass N of Red Cliff Islands which lie on a drying reef extending 1 mile NNE from Finlayson Point (20°53'S 148°57'E); the N of the two islands is prominent; other drying reefs and islets lie between these and Mausoleum Island 1¼ miles WNW.

The approach from N passes clear of Fish Reef, which lies at the outer end of a spit extending 4 cables NW from Outer Newry Island.

Saint Helens Creek

7.75

- 1 Saint Helens Creek and Murray Creek enter the sea together 3 miles SW of Rabbit Island (20°51'S 148°54'E) and open into a mangrove-fringed estuary between that island and Skull Knob, 2½ miles W. Croaker Rock, above water, lying on a drying reef 5 cables N of Rabbit Island, and Low Rock, which dries, 1 mile farther WSW, are the outer dangers on the N side of Rabbit Island.

- 2 Saint Helens Creek is navigable for a distance of 2 miles by small craft not exceeding 2.1 m draught.

Local knowledge is required.

Tidal streams attain a rate of 3 to 4 kn in the common entrance to the 2 creeks.

Charts Aus 252, Aus 824, Aus 370

Blackrock Creek

7.76

- 1 Blackrock Creek enters the sea at the head of Saint Helens Bay, which dries and is situated between Dewars Point, the SE extremity of Stewart Peninsula (20°47'S 148°49'E) (7.49), and Carpet Snake Point 1¼ miles S which rises to 92 m close SSW. Foul ground, which extends 1 mile E from Dewars Point, is marked by Brothers Islands consisting of The Brothers, two islets standing one on the E extremity and one on the N side of the foul ground; Cave Island which lies close NE; and Pigeon Island which lies between The Brothers and Cave Island. High Islands, two in number, lie 1 mile ESE of The Brothers.

- 2 There are a number of good landing places in Blackrock Creek, 3 miles above the entrance, which can be reached by small vessels with draughts of not more than 2.7 m. The creek is navigable for 5 miles farther upstream by craft not exceeding 18 m LOA and 1.8 m draught.

Local knowledge is required.

Laguna Quays

7.77

- 1 Laguna Quays (20°36'S 148°41'E) lies on the SW shore of Repulse Bay. The alignment (249½°) of a pair of leading lights (also displayed by day) leads from the bay through a channel, dredged to a depth of 3.2 m (1999), and

marked by pairs of light–beacons (lateral: pile). A marina lies within the SW part of the harbour. The channel is subject to siltation.

Local knowledge is required.

Thompson Creek

7.78

- 1 Thompson Creek, which is exposed to SE winds, enters the head of Repulse Bay 1 mile NNE of the drying entrance to O'Connell River (20°34'S 148°40'E); a drying sandbank extends 1 mile to seaward of the entrance to the creek.

The creek is navigable at HW springs by vessels of not more than 30 m LOA and 2.4 m draught. The town of Banana Pocket lies about 2 miles inland between O'Connell River and Thompson Creek. There is a landing place 4 miles above the entrance to the creek.

Local knowledge is required.

Proserpine River

7.79

- 1 Proserpine River enters the head of Repulse Bay 2½ miles S of Mount Proserpine (20°27'S 148°43'E) over a drying flat which extends 1½ miles offshore. The entrance, which is exposed to SE winds, lies between the low-lying coastline fringed with mangroves to SW and high rocky bluffs immediately NE rising to Mount Proserpine and Little Conway Mountain, 7½ cables SE.
- 2 Having entered the river, the channel becomes more defined, passing first the village of Wilson, on the NE bank 1¼ miles within the entrance, thence Flying Fox Islands farther upstream. At HW springs there are depths of 6.1 m in the fairway 9 miles above the entrance where the river is about ½ cable in width. The river continues to be navigable by small craft at HW springs for some distance farther upstream. The town of Proserpine (chart Aus 371) is situated on the S bank, 12 miles above the entrance.
- 3 **Local knowledge** is essential as the sandbanks in the river are subject to change. Entry should not be attempted without first obtaining the latest information from the Harbour Master at Mackay.

WHITSUNDAY PASSAGE AND WATERS TO NARES ROCK

General information

Charts Aus 252, Aus 824, Aus 825 (see 1.15)

Route

7.80

- 1 From a position abreast Cape Conway (20°32'S 148°56'E) the track leads NNW through Whitsunday Passage and thence to a position abreast Nares Rock, 56 miles NW of the cape.

Topography

7.81

- 1 Due to the peculiar formation of the hills on each side of Repulse Bay (20°34'S 148°46'E) (7.49), the aspect in the S approach to that bay is very similar to that in the S approach to Whitsunday Passage. Care should be taken to rule out any possibility of confusion.
- 2 The mainland coast on the W side of Whitsunday Passage between Cape Conway (20°32'S 148°56'E) and Pioneer Point 20½ miles NNW, is backed by the SE part of Conway Range, the higher mountains of which have a rugged appearance and are mostly densely wooded. High Mountain, 13 miles NW of Cape Conway, is the highest

summit bordering Whitsunday Passage but Mounts Sunter, Maclean and Hayward and The Hump, all standing within 1 mile of the coast and between 2 miles NNE and 4¾ miles NNW of High Mountain, are the more remarkable.

- 3 In the N part of Whitsunday Passage are the W–most islands of Whitsunday Group, consisting of Pine and Long Islands and Molle Islands, which lie between ½ and 2½ miles off the mainland coast.

Between Pioneer Point (20°14'S 148°46'E) and Gloucester Head 24 miles NW, the coast is indented by several bays and backed by the rest of Conway Range. Mount Dryander, 11 miles W of Pioneer Point, is the highest summit of the range, and from it a steep ridge extends 12½ miles NNW to Cape Gloucester. A number of islands, described in the appropriate parts of the text, lie within 5½ miles of this stretch of the coast.

- 4 Edgumbe Bay, lying between Cape Gloucester (20°04'S 148°27'E) and Cape Edgumbe 12 miles WNW, is backed on its S side by a number of peaks which include Mounts Pluto, Maguire and Challenger, and Roma Peak, all of which rise between 6 and 15 miles inland as may be seen on the chart.

Depths

7.82

- 1 The least charted depth, found in Cumberland Channel in the approach to Whitsunday Passage from SE, is given at 7.5.

Pilotage

7.83

- 1 Pilotage is compulsory in the Whitsunday Passage area for vessels of 70 m LOA and over, and for all loaded oil tankers, chemical and liquefied gas carriers irrespective of size. Pilots are provided by the appropriate pilotage associations.

Local magnetic anomaly

7.84

- 1 Local deflection of the compass of between 4° and 7° either side is reported to occur near the middle of Whitsunday Passage in the vicinity of 20°16'S 148°53'E.

Tidal streams

7.85

- 1 Tidal streams in Whitsunday Passage are strong, especially in narrow channels between islands where rates of 4 kn can be attained at springs. Rates of 3 kn are seldom exceeded in the middle of the passage. The general set of the stream is S on the rise and N on the falling tide. The S–going stream has been found to run for approximately 1 hour longer than the N–going stream; during the period of the SE Trade Winds, from April to November, the S–going stream is also the stronger.
- 2 Streams off the W coast of Lindeman Island (20°27'S 149°03'E) are strong and eddies can be seen to occur all round Boat Point at the W extremity of the island. Between Lindeman and Dent Island, 6 miles WNW, the streams can be very irregular but run equally strongly and with eddies.

Overfalls

7.86

- 1 Overfalls and eddies are common features of the area and are generally shown on the charts where they occur. A strong race and tide–rip not so shown, which is dangerous for boats, particularly with a S–going stream and swell from SE, occurs N of Perseverance Island (20°21'S 149°00'E).

National Parks

7.87

- 1 Many of the islands described in this sub-section are National Parks; see 7.10.

Landmarks

7.88

- 1 Described at 7.31:
 Whitsunday Craig (20°18'S 149°01'E).
 Whitsunday Peak (20°16'S 148°57'E).
 Whitsunday Cairn (20°10'S 148°58'E).

Directions

(continued from 7.55 or 7.61)

Chart Aus 252

Cape Conway to Pine Island

7.89

- 1 From a position 4 miles E of Cape Conway (20°32'S 148°56'E) the track leads NNW, passing (positions from Cape Conway):
 ENE of Conway Shoal (1½ miles SSW), marked NW by eddies and NE by overfalls, lying near the outer end of a spit, with depths of less than 20 m over it, which extends NE from the Repulse Islands (4½ miles SW) (7.69); thence:
 2 ENE of a rock (drying 1.2 m) (8 cables ENE) with Ripple Rocks, two in number, lying between it and the cape. Eddies and overfalls occur close to these dangers. Cape Conway, marks the W side of the S entrance to Whitsunday Passage and forms the SE extremity of a hilly promontory extending 8 miles SE from the mainland; Cape Rock lies close SW. Thence:
 3 ENE of Long Shoal, its S extremity 1½ miles NE, steep-to, composed of hard white sand and extending 4 miles NNW; the E side and N end are marked by overfalls and eddies. Round Head stands 1¼ miles W of the shoal. Tidal streams are strong in the channel inshore of Long Shoal, which should not be used without local knowledge.

7.90

- 1 The track continues NNW, passing:
 WSW of Spitfire Rock (6½ miles ENE), marked by a light-beacon (W cardinal) and with eddies on all but its S side; Seaforth Island, 3 cables farther NE, is cliff-faced except for a sandy beach on its E side. These are the outer dangers SW of Lindeman Island and are covered by a red sector (316°–025°) of Lindeman Island Light. Seaforth Island is a National Park; see 7.10. And:
 2 WSW of Lindeman Island (7½ miles NE), a National Park (see 7.10) and tourist resort. The island is wooded and divided into 2 ranges of hills, the E one rising to Mount Oldfield (209 m in height); its coast is formed of rocks, boulders and sandy bays fronted by drying coral reefs. Lindeman Island Light stands on Piccaninny Point, the SW extremity of the island, near which is a village. And:
 3 WSW of Sidney Island (6¾ miles NE), the outer danger W of Lindeman Island and covered by a red sector (110°–125°) of Lindeman Island Light; thence:
 WSW of Cole Island (8 miles NE), standing on a drying coral reef; a drying rock lies 2 cables N of the N extremity of Cole Island. Ann Island and a

rock which dries, lie at the NE and SW extremities of a reef midway between Cole Island and Cawarra Head, the N extremity of Little Lindeman Island, 1¼ miles E. Thence:

- 4 WSW of a rock (5 m in height) (9 miles NNE), resembling a submarine on the surface. Pentecost Island, 1 mile ENE of the rock, is the N-most of Lindeman Group and remarkable in appearance, resembling a tower, being cliff-faced on its E and NE sides; the W side of the island is wooded and the shores composed of boulders and stones. Thence:
 5 WSW of two patches, with depths of 8.6 and 10.5 m over them respectively (9 miles NNE), lying in the channel between Lindeman and Dent Islands; thence:
 WSW of Dent Island (9½ miles N), sparsely covered with vegetation and steep-to on its W side except in two bights, near the N end, which are reef-fringed; Dent Island Light (white round metal tower, red cupola, 10 m in height) stands 1 mile NW of the S extremity of the island. And:
 6 ENE of Pine Island (9½ miles NNW), rocky with shallow soil covered with grass and stunted trees; Pine Head, the S extremity, is a remarkable steep-to bluff covered with pine trees; the E side of the island is steep-to but depths of less than 10 m extend 1½ cables off the N side; there are two shingle beaches on the W side of the island.

Caution. Eddies occur off both S and N extremities of Pine Island and neither point should be approached within a distance of 5 cables.

Pine Island to Hook Island

7.91

- 1 The track then continues NNW, passing (positions from South Head (20°19'S 148°51'E)):
 2 ENE of Long Island, extending 5 miles S from South Head, its N extremity, which is fringed by a drying sandbank. The island is formed of densely wooded hills, the highest of which is Long Island Peak (269 m in height); an islet (5 m in height) lies close offshore ENE of the peak. The E coast is steep and composed of rocks and boulders except in the bay (1½ miles S), which is fringed by a drying sandbank and by mangroves in its N part where an islet, 13 m in height, also lies on a drying reef. East Rock (1¼ miles SSE) and a below-water rock 1 cable SE of it, lie close offshore on the N side of this bay on a bank with depths of less than 10 m; overfalls and eddies occur E of the rocks. Thence:
 3 WSW of Henning Island (4 miles E), wooded and partially cultivated; reefs and foul ground extend 6 cables E and the same distance SE from the S extremity of the island. The W side of the island is steep-to. A rock (9 m in height) marks the outer end of a spit, with depths of less than 5 m over it, extending 3 cables W from the N end of the island. Thence:
 WSW of Reef Point (3½ miles ENE), the W extremity of Whitsunday Island; a steep-to rocky ledge, off which is a tidal race, extends about 150 m from the point. A light-beacon (port hand) stands close W of the point; thence:
 4 WSW of Cid Island (4 miles NE), rising to Babiaca Summit (215 m in height) near its centre and to

- Bolton Hill (204 m) in height) near its NW end; a light stands on the SW point of the island. The bay on the W side of the island has a sandy beach fronted by a drying reef; Hill Rock marks the outer end of a drying reef extending 2 cables W from the N entrance point of the bay. Thence:
- 5 ENE of Denman Island (2 miles N), fringed by a reef; overfalls occur 5 cables E. Goat Island (42 m in height), lying 3 cables WNW of Denman Island, marks the outer end of a mangrove-covered drying ledge extending from the SE side of Molle Island. Thence:
- ENE of Planton Island (3 miles N), lying on the outer edge of a bank, with depths of less than 10 m over it, which extends 5 cables offshore from the E side of Molle Island; thence:
- 6 ENE of Deedes Point (3½ miles N), steep-to and the NE extremity of South Molle Island; overfalls and eddies occur off the point; The Horn (177 m in height) rises 2½ cables SSW of the point and is conspicuous; thence:
- ENE of Mid Molle Island (4 miles NNW), reef-fringed and connected to the NW extremity of South Molle Island by The Causeway, formed by a drying reef and boulders; thence:
- 7 ENE of North Molle Island (4¼ miles NNW), with a central ridge marked at its S end by Mount Chaine (233 m in height), the highest point, then by Bald Hill (196 m in height), 3½ cables NNW, and by Mount Sharp (171 m in height), 4½ cables farther NW. The island is fringed with drying reefs and below-water rocks except on the S part of the E coast where there is a narrow sandy beach. There are no dangers outside the 20 m depth contour, which lies up to 1 cable offshore, except in Unsafe Passage (7.152) between North and Mid Molle Islands, which should not be used other than by boats. Hannah Point is the N extremity of the island. Thence:
- 8 WSW of the SW extremity of Hook Island (9 miles NNE), the W entrance point to Nara Inlet (7.153); a spit, with a depth of 2.5 m over it, extends 2 cables SSW from the point. The bay lying between this and the next point 5½ cables NNW is fronted by a drying reef. From thence to Baird Point (7.127), 3 miles farther N, the W side of Hook Island is steep-to, the S part of it being cliff-faced.

Charts Aus252, Aus 825

Hook Island to Nares Rock

7.92

- 1 The track then leads NW, passing (positions from Double Cone Island (20°06'S 148°43'E)):
- SW of Bird Island (8¼ miles E) (7.127), thence:
- NE of Double Cone Island, two summits connected by a drying reef; a bank lying between 2 cables and 1½ miles NW of the island has a least depth of 14.5 m over it and is extending SW. Thence:
- NE of Armit Islands (3½ miles W) (7.103), thence:
- To a position 4¼ miles N of Double Cone Island.
- 2 The track then continues NW, passing:
- NE of Eshelby Island (7 miles NW). A rock 15 m in height lies close S; overfalls occur off the NE side of the island on the rising tide. A light (white hut, 4 m in height) stands on the island. Thence:

NE of Rattray Island (11 miles NW) which, from NE or SW, appears conical; tide-rips occur off the N extremity of the island on the rising tide; thence:

NE of Gloucester Head (17 miles WNW) (7.34), thence:

To a position 1¾ miles SW of Nares Rock (28½ miles NW), steep-to and marked by a light-beacon (isolated danger); Holbourne Island (7.34) lies 2½ miles N of the rock. Tracks between this and a preferred outer route converge in this vicinity.

(Directions continue at 7.177)

Side channels

Chart Aus 252 (see 1.15)

Dent Passage

7.93

- 1 **General description.** Dent Passage separates Dent Island (20°21'S 148°56'E) (7.90) from Hamilton Island 5 cables E. The passage has a least width of 2 cables and is deep except for patches (7.94) lying in mid-channel 1¼ and 2¾ miles N of the S extremity of Dent Island. The passage is used regularly by vessels of suitable size and draught. Hamilton Island is thickly wooded and has an airport and a marina on its W side.

The direction of buoyage in the passage is N to S.

- 2 **Prohibited anchorage** exists in the greater part of Dent Passage, an area in which seaplanes operate.

Submarine power cables are laid through the prohibited area, one continuing WNW across Whitsunday Passage.

Cautions. Tidal streams through the passage may be strong, see 7.85.

Vessels are advised to keep clear of the line of the airport runway when aircraft are landing or taking off.

7.94

- 1 **Directions.** From a position S of Dent Island (20°21'S 148°56'E), a track through the passage leads generally N, passing (positions from the S point of Dent Island):

E of a light-beacon (starboard hand; white beacon) (3 cables N), marking the W side of the entrance; and:

W of the S point of Hamilton Island (7 cables ENE); an aero light stands on high ground 3½ cables N of the point; thence:

- 2 Clear of the 5.5 m patch (1¼ miles N) as required by draught or prudence, thence:

E of a drying reef (1½ miles N), extending about 1½ cables E from the middle of the E side of Dent Island. Cowrie Island is the outer of two islands, both 10 m in height and wooded, standing on the reef; a light-beacon (white) stands on Cowrie Island. Thence:

- 3 W of the NW end of Hamilton Island airport runway (1¾ miles NNE), marked by a light-beacon (special); thence:

W of a bay (2 miles NNE) containing a marina. A conspicuous building stands at the head of the bay, with a conspicuous mast on a hill 4 cables N of it; thence:

E of Titan Island (7.6 m in height) (2¼ miles N), lying on a reef close off Dent Island; thence:

- 4 E of the NE extremity of Dent Island (2½ miles N); a light-beacon (starboard hand) stands on the point. Plum Pudding Island, a wooded islet 8 m in height, lies on a drying reef which is 3½ cables NE of the point and 2½ cables SE of the foul ground extending SE from Henning Island (3½ miles N)

(7.91). A 7.9 m patch lies in mid-channel 2 cables E of Plum Pudding Island.

Thence course may be directed as required clear of the above dangers.

7.95

- 1 Approach to the N entrance to Dent Passage from E, passing between Hamilton Island (20°21'S 148°58'E) and the S extremity of Whitsunday Island 6 cables NE, is obstructed by Fitzalan Island (20°20'S 148°58'E) lying in mid-channel. Shoal patches, with depths of 7.3 to 10.9 m over them, lie between SE and ESE from the island between 5 cables and 1 mile distant. A reef of above and below-water rocks extends 2 cables SW from the island. The channel NE of Fitzalan Island has depths of less than 5.0 m but that SW of the island is deep; both channels are dangerous owing to the strong tidal streams.

Long Island Sound

7.96

- 1 **General description.** Long Island Sound is a narrow and deep channel lying between Long Island (20°22'S 148°52'E) and the mainland close W. Subject to limitations noted below, the sound may be used as a S approach to Port Molle (20°19'S 148°51'E) (7.116).

- 2 **Limiting conditions.** Although there are depths of more than 18 m in the fairway throughout the length of the sound, there is a controlling depth of 7.7 m in the approach to the S entrance. This depth is found 7½ cables S of Three Fathom Patch (20°25'S 148°52'E).

Passage of the sound should only be undertaken in vessels with sufficient power for their safe handling in the strong tidal streams which prevail, see below.

- 3 **Tidal streams** in the sound attain rates of 2 kn abreast the S extremity of Long Island, 4 to 5 kn in The Narrows 3 miles NNW, and 3½ kn abreast Grants Bank 1 mile farther NNW. The stream sets S on the rising and N on the falling tide. Overfalls and eddies occur throughout the sound.

7.97

- 1 **Directions.** From a position about 4 miles W of Lindeman Island (20°27'S 149°03'E) (7.90) the alignment (102°), astern, of the SW extremity of the same island with Shaw Peak, 2¼ miles ESE (7.107), leads WNW towards the S entrance to Long Island Sound. Cow Island (37 m in height) (20°25'S 148°51'E) bearing 282° leads WNW on the same alignment. The island lies on the N side of a reef of drying and below-water rocks which extends up to 6 cables offshore; Calf Island, 2 cables SE, marks the E edge of the same reef. The track passes (positions from Cow Island):
 - 2 NNE of Long Shoal (5 miles ESE) (7.89), thence: NNE of the promontory of which Round Head (5 miles SE) is the SE extremity, thence: SSW of Three Fathom Patch (8 cables NE) distant 7½ cables. The channel between the patch and the S extremity of Long Island, 6 cables NE, has a least depth of 5.3 m, but is not recommended.
 - 3 When Cow Island is distant about 4 cables, the track then leads N, adjusting as necessary to pass:
 - W of Three Fathom Patch (8 cables NE), thence: W of the coast of Long Island (2 miles NNE), densely wooded but with some patches of cultivation, and steep-to between the small bays which are filled with drying coral ledges; and:
 - 4 E of a spit, marked by eddies and with depths of less than 10 m over it, which extends 1 mile N from the S entrance point to Woodcutter Bay (2¼ miles

N). This bay and Andersons Bay 1 mile farther N are both fringed with mangroves and filled with drying coral reefs. Thence:

- Midway through The Narrows (4 miles N), lying between Spit Point on the mainland and Fire Point, 3 cables E, on the coast of Long Island; a small village lies 5 cables NNE of Fire Point. Thence:
 - 5 E of Grants Bank (4¾ miles N), with a least depth of 4.4 m; the bank is part of a larger bank, with depths of less than 10 m over it, which extends 1¼ mile NNW from a position 3 cables N of Spit Point. The NW end of the same bank fronts Trammel Bay (5¼ miles NNW), which is fringed with mangroves and filled with drying mud flats. Thence:

W of Humpy Point (5¼ miles N) (7.116).

Course may then be directed to anchor in Port Molle (5¾ miles N) (7.116), or as otherwise required.

Charts Aus 252, Aus 825

Molle Channel to Nares Rock

7.98

- 1 **Route.** Molle Channel lies between the four Molle Islands (20°15'S 148°50'E) and that part of the mainland coast SW lying between Stripe Point (20°19'S 148°49'E) and Pioneer Point 6 miles NNW. The channel is deep and wide, with depths of more than 40 m in places in the fairway, and is used on a favourable tide by coasters which then continue NW on a route close inshore, passing SW of Armit Islands (20°06'S 148°39'E) and of Rattray Island, 8 miles farther NW. From thence the preferred route shown on the chart may be joined in the vicinity of Nares Rock (19°46'S 148°22'E), or as otherwise required.

Local knowledge is required.

7.99

- 1 **Submarine power cables** and a submarine pipeline are laid across Molle Channel from the mainland 8 cables W of The Beak (20°17'S 148°48'E); two power cables, a submarine cable, and the pipeline cross NE to West Molle Island from whence a cable continues SE to South Molle Island; a power cable also leads N landing at Hayman Island (7.128). Another power cable runs SE towards South Head and beyond as shown on the chart.

7.100

- 1 **Tidal streams** in Molle Channel are fairly regular, setting SSE on the rising and NNW on the falling tide, but with eddies close inshore. Both streams attain a rate of 4 kn at springs and about 1½ kn at neaps. From the S end of Molle Channel and SW of Alert Bank, streams set in similar directions, but at rates of about 2 kn, before running through Long Island Sound. In the approach E of Alert Bank the stream sets ESE on the rise and WNW on the falling tide.

From the N end of Molle Channel to Nares Rock the stream follows the general pattern described at 7.85.

7.101

- 1 **Directions.** From the vicinity of a position in Whitsunday Passage 5½ miles ESE of The Beak (20°17'S 148°48'E) the track leads W, passing (positions from The Beak):

Between South Head (3¾ miles SE) (7.91) and Denman Island, 2 miles N of the head (7.91); thence:

- 2 S of Alert Bank (2½ miles ESE), marked by eddies on all sides; discoloured water occurs over the bank at springs. Tidal streams in the vicinity are described above. Thence:

Leading marks by day:

Front mark, Almora Islet ($3\frac{3}{4}$ miles NNW), standing $1\frac{1}{2}$ cables clear NNE of the mainland, to which it is connected by a reef of above and below-water rocks; overfalls occur off the islet.

- 3 Rear mark, the peak of Armit Island (10 miles NW of the front mark) (chart Aus 371) (7.103).

The alignment (320°) of the above marks by day leads NW into Molle Channel, passing:

SW of Alert Bank ($2\frac{1}{2}$ miles ESE) distant 4 cables.

Leading marks by night:

Head mark, The Beak Light (red and yellow tower) (7.101).

Stern mark, South Head ($3\frac{3}{4}$ miles SE) (7.91).

- 4 When Dent Island Light (9 miles SE) (7.90) is just obscured by South Head bearing 127° , the track leads NW, with The Beak Light bearing 307° , passing 2 cables SW of Alert Bank ($2\frac{1}{2}$ miles ESE).

Thence the tracks by day or night pass:

NE of White Rock ($1\frac{1}{2}$ miles SSE), lying off Rooper Inlet and on the N end of a bank with depths of less than 11 m over it. White Rock, Shute Island and Low Rock (see below) are covered by a red sector (334° – 154°) of The Beak Light. Thence:

- 5 SW of Roma Point ($1\frac{1}{2}$ miles ESE), the S extremity of Molle Island; a rock which dries 0.9 m lies near the outer end of a reef extending 2 cables S from the point. Tide-rips, which may extend nearly halfway across the channel to The Beak, occur off the point and have been mistaken for shoal water. Thence:

- 6 NE of Shute Island ($7\frac{1}{2}$ cables S), wooded and fringed by a drying reef on its W and N sides. No 2 Light-beacon (port hand) lies on the edge of this reef on the N side of the island and marks the channel to Shute Harbour (7.118); the light-beacon is used by night in Molle Channel as a turning mark to NNW. Thence:

- 7 NE of Low Rock ($4\frac{1}{2}$ cables S), which dries 2.7 m and lies on a steep-to reef of below-water rocks with eddies occurring all round; the edges of the reef are marked by four light-beacons (N, S E and W cardinal). Thence:

- 8 NE of The Beak distant 4 cables, formed of a promontory, 68 m in height, connected to the mainland by a low, narrow neck of land; overfalls occur up to 4 cables E of the promontory. A light (red and yellow tower) stands at the E extremity of The Beak; a conspicuous tower, with an elevation of 237 m, stands 1 mile WSW of the light on the S slope of Mount Rooper.

7.102

- 1 The track then leads NNW, midway between West Molle Island and Haswell Patch $1\frac{1}{2}$ miles W. By night the turn to this track is made about 9 cables farther SSE when No 2 Light-beacon on Shute Island (7.101) bears 255° . The track passes:

ENE of a bank (5 cables NNW) with a least depth of 13.8 m over it; thence:

- 2 WSW of West Molle Island ($1\frac{1}{2}$ miles NNE), reef-fringed; a reef, with depths of less than 5 m over it and with overfalls over its outer part, extends 3 cables S from the island. A jetty, with a village behind, is situated in the SW part of the island. The E side of the island is fronted by a bank extending up to $3\frac{1}{2}$ cables offshore with a least depth over it of 4.4 m on a rock patch. The

channel E of the island should not be attempted in low-powered vessels as eddies occur there on both in and out-going tidal streams. West Molle Island, and adjacent dangers described above, lie within a red sector (198° – 225°) of The Beak Light. Thence: WSW of Firth Patch (2 miles NNE) with a depth of 9.9 m, lying on the SW edge of a spit, with depths of less than 20 m over it, extending $1\frac{1}{4}$ miles NW from West Molle Island; thence:

ENE of Haswell Patch ($1\frac{3}{4}$ miles NNW) with a depth of 7.4 m; the patch lies 4 cables E of Green Point and in a red sector (334° – 154°) of The Beak Light; thence:

WSW of North Molle Island ($2\frac{3}{4}$ miles NNE) (7.91), thence:

ENE of Almora Islet ($3\frac{3}{4}$ miles NNW) (7.101); the islet and foul ground fringing the mainland coast between it and Green Point, $1\frac{1}{2}$ miles SSE, lie within the same red sector of The Beak Light as does Haswell Patch; thence:

ENE of Pioneer Point ($3\frac{1}{2}$ miles NW), a rocky islet, covered with pine trees and connected to the mainland S at LW; Notch Hill, 346 m in height, rises 6 cables S of the point and Mount Merkara stands 4 cables farther S; thence:

ENE of Pioneer Rocks (4 miles NW), the N-most danger off this mainland point. A light-beacon (isolated danger) stands on the rocks; below-water rocks extend $1\frac{1}{2}$ cables S.

Charts Aus 252, Aus 825

7.103

- 1 Having cleared Molle Channel the track then leads NW, passing (positions from Double Cone Island ($20^\circ 06'S$ $148^\circ 43'E$)): NE of Roseric Shoal ($4\frac{1}{4}$ miles S), rock, thence:

NE of Grimston Point ($4\frac{1}{2}$ miles SSW), 84 m in height and steep-to on its E side; the point is the N extremity of a narrow peninsula, 24 m in height and covered with rocks and grass, extending $2\frac{3}{4}$ miles NNE from the mainland; thence:

- 2 SW of Armit Islands ($3\frac{1}{2}$ miles W). The largest of these three islands is wooded and steep-to outside 2 cables offshore except at its S end from which a drying reef extends 5 cables SE; the smallest islet, 6 m in height, lies 2 cables S of the largest and on the W edge of this reef; the third islet (56 m in height) lies at the SE end of the same reef with a rock, 29 m in height, 3 cables farther ENE. And: NE of Grassy Island ($5\frac{3}{4}$ miles WSW) (7.135); Edwin Rock, 2 m in height and lying $7\frac{1}{2}$ cables N of the island, is the outermost danger; thence:

NE of Gumbrell Island ($5\frac{1}{2}$ miles W), wooded; depths of less than 2 m lie within 2 cables offshore. A rock pinnacle, with a depth of 17.8 m over it, lies 6 cables E; a bank, with depths of less than 10 m, extends 4 cables SSW and 7 cables NW from the island. Overfalls occur on the rising tide S and N of the island and cause a steep sea, dangerous to boats, in SE winds. Thence:

- 4 SW of the rock lying close S of Eshelby Island (7 miles NW) (7.92), and:

NE of George Point ($8\frac{1}{2}$ miles WNW), the NE extremity of a cliffy promontory. A dangerous wreck, position approximate, lies close ENE of

- George Point. When more than 1 mile NE of the point, depths are greater than 20 m. Thence:
- 5 NE of Saddleback Island (9¾ miles WNW), a double-peaked island with a prominent boulder on the N and lower peak. The N side of the island is fairly steep-to; the SW extremity is formed of a low grassy spit of sand and fringed by a reef. There is a least depth of 5 m in the channel between the island and George Point SE. Thence:
 - 6 SW of Rattray Island (11 miles NW) (7.92); a spit with depths of less than 1 m, extends 4 cables SSW from the island; thence:
- NE of Gloucester Head (17 miles WNW) (7.34).
Course may then be directed as required.

Chart Aus 825 (see 1.15)

Gloucester Passage

7.104

- 1 **General description.** Gloucester Passage lies between Cape Gloucester (20°04'S 148°27'E) and Gloucester Island, 5 cables N, giving access from E to Edgumbe Bay. The passage has a least width of 1 cable and a least depth of 2 m in the fairway at its W end.
 - 2 The S and W shores of the bay on the E side of the passage, lying between Cape Gloucester and George Point 4½ miles E, are fronted by below-water rocks and a drying coral reef which extend in places to 7½ cables offshore. Manta Ray Islet, a wooded islet (13 m in height), on the S side of the bay, and Black Currant Islet 1 mile farther W, lie on the reef; a light-beacon (W cardinal) stands between the two islets.
 - 3 **Caution.** The passage should only be used by vessels of suitable draught and with great caution, especially at night.
- Local knowledge** is essential.
- Tidal streams** through the passage attain a spring rate of 2 kn, setting E and W on the rising and falling tides respectively.

7.105

- 1 **Directions.** From a position in open water ENE of Cape Gloucester (20°04'S 148°27'E), the approach track to the E end of the passage leads WSW towards that cape, passing (positions from the N extremity of Cape Gloucester):
NNW of the outer part of a drying reef of coral and sand which fronts all the N side of the cape and extends 5 cables farther NE from its NE extremity;
No 2 Light-buoy (port hand) (9 cables ENE) marks the N edge of the reef. Thence:
- 2 SSE of the SE extremity of Gloucester Island.
The track then leads W, passing:
N of No 2 Light-buoy (9 cables ENE), thence:
N of the N extremity of Cape Gloucester.
The track then leads SW, passing:
NW of No 4 Light-beacon (port hand) (1¾ cables NNW), marking the NW side of a drying patch, thence:
- 3 SE of No 1 Light-beacon (E cardinal) (2 cables WNW); No 3 Light-beacon (W cardinal) lies 4¾ cables farther W with depths of 0.4 m between.
The track then leads W, passing:
N of No 6 Light-beacon (port hand) (4 cables W), thence:
N of the drying reef and shoal which extend 4¼ cables NW from the mainland coast to Passage Islet, a light-buoy (W cardinal) marks the SW edge of the reef; thence:

- 4 S of No 3 Light-beacon (6½ cables WNW) (above), and:
N of Passage Islet (7 cables W), 30 m in height, lying near the outer end of the drying reef described above; thence:
N of No 8 Light-buoy (port hand) (9 cables W), moored clear of the outer end of the drying reef and of Passage Islet.
- The track then leads SW, passing:
- 5 SE of No 5 Light-beacon (starboard hand) (11½ cables W), marking the outer end of a spit of foul ground, with depths of less than 2 m over it, extending SW from the SW side of Gloucester Island and across the W end of Gloucester Passage; the W side of this spit is steep-to and should only be approached with caution.
Course may then be directed as required into Edgumbe Bay.

Anchorage and harbours

Chart Aus 252 (see 1.15)

Kennedy Sound

7.106

- 1 **General description.** Kennedy Sound lies between Shaw Island (20°29'S 149°05'E), which is uninhabited, and Lindeman Island 1 mile NW. The sound may be entered by any of three channels from SW, or by a single channel from N; there is a choice of anchorage within.
Seaplane operations take place E of Seaforth Island.
 - 2 **Tidal streams** run strongly through the sound, setting S on the rise and N on the falling tide. The full strength of the stream with rates of 3 to 4 kn is felt in the N entrance, which is made difficult thereby at spring tides, and also along the SE shore. In the middle of the SW part of the sound streams run at lesser rates of 1½ to 2 kn and in the channel between Lindeman and Seaforth Islands at 2½ kn.
- #### 7.107
- 1 **Directions, south-east channel.** From a position in the S end of Whitsunday Passage, WSW of Shaw Peak (20°28'S 149°05'E), the SE and deepest channel through the sound, with depths greater than 20 m throughout, leads E passing (positions from Shaw Peak):
N of Burning Point (3¼ miles SW), the NW extremity of Shaw Island, marking the S side of the entrance to the sound; overfalls occur off the W side of the point, and overfalls and eddies N of it. Thence:
 - 2 S of Venus Shoal (2¼ miles WSW), with a least depth of 5.4 m over its SW end.
The track then follows the deep water off the W coast of Shaw Island; the coast is formed by a series of sandy bays and rocky points fronted by drying coral reefs which, near the S end, extend up to 4 cables offshore. The track leads NE through the anchorage (7.110) in this vicinity and passes:
 - 3 SE of Brush Island (1¾ miles WSW), 15 m in height, with bushes on its summit; depths of less than 10 m extend 2 cables SSW from the island.
Thence the track leads NNE, passing:
ESE of Mars Shoal (1½ miles WSW), with a least depth of 1.7 m near the centre and 6½ cables in extent SW/NE; eddies occur off both ends of the SE side of the shoal. Thence:
 - 4 ESE of Yellow Rock (1¼ miles WSW), bare and lying near the S end of a rocky bank, with depths

of less than 5 m over it. Chrome Rock (awash), 2 cables farther N, lies near the N end of the same bank; eddies occur SE and E of Chrome Rock. Thence:

ESE of a 12.1 m patch (1 mile WNW).

Thence the track leads N, passing:

- 5 W of Neck Bay (8 cables NNW) (7.110), where anchorage may be obtained, thence:

E of a spit (1¼ miles NW), steep-to with depths of less than 5 m, marked by eddies and overfalls, extending 1¼ cables E from Dalwood Point. The point is 28 m in height, fringed close in by a drying reef, and the E extremity of Lindeman Island, to which it is joined by a low, narrow and sandy neck of land. Thence:

- 6 E of a bank (2 miles NW), with a least depth of 9 m; and:

W of a rock (1¾ miles NNW), with a depth of 10 m over it; eddies occur W and NW of the rock; thence:

- 7 E of Little Lindeman Island (3¾ miles NW), the E extremity of which forms the W entrance point to Kennedy Sound. The island is connected to Lindeman Island, 2 cables S by a drying ledge of coral and sand; depths of less than 10 m are found up to 9 cables E of Little Lindeman Island on a bank which extends NNE from the N side of the larger Lindeman Island. And:

- 8 W of Maher Island (2¼ miles N), connected to Shaw Island 1 cable S, by a drying reef. Jesuit Point, at the N extremity of the island forms the E entrance point to the sound. Maher Island is a National Park; see 7.10.

Course may then be directed as required into more open water.

7.108

- 1 **Directions, middle channel.** From the position in the S end of Whitsunday Passage, WSW of Shaw Peak (20°28'S 149°05'E), an alternative track leads NE through a middle channel in the SW part of Kennedy Sound with a least depth of 12.1 m in the fairway. The track passes on the one side NW of Burning Point (20°30'S 149°02'E) (7.107) and Chrome Rock, 2½ miles farther NNE, and of the intervening dangers described at the same reference, and on the other side (positions from Shaw Peak):

- 2 SE of Spitfire Rock (3 miles W) (7.90) and of Seaforth Island (2¾ miles W) (7.90), whence course may be directed NNE to the anchorages E of the latter island if required (see 7.110); thence: SE of a bank (1½ miles WNW), with depths of less than 10 m; Orion Shoal, with a least depth of 3.3 m, lies on the NE part of this bank.

Thence course may be directed as required to join the SE channel through the sound, passing clear of the patch (1 mile WNW) (7.107) as required by draught.

7.109

- 1 **Directions, north of Seaforth Island.** From a position in the S end of Whitsunday Passage, W of Lindeman Island Light (20°28'S 149°02'E) (7.90), the N-most of the channels into the sound from SW leads between Lindeman and Seaforth Islands where the fairway is restricted to 2 cables in width. The track, which lies initially in a white sector (025°–110°) of the light, leads E, passing (positions from Lindeman Island Light):

- 2 S of Sidney Island (1½ miles WNW) (7.90), thence: Across two banks (1 mile W), adjacent to each other and with a least depth of 14.1 m; thence:

N of Spitfire Rock (1 mile SSW), thence:

S of a 6 m patch (1 cable SW), marked by overfalls and eddies; thence:

- 3 N of Seaforth Island (4 cables S) (7.90), fronted by drying reefs on its N and E sides; thence:

S of a jetty (4 cables E), extending 78 m SE from the shore across a drying reef; depths of less than 5.0 m extend nearly 2 cables S of the head of the jetty; a boat channel, leading 1¼ cables bearing 298° to the head of the jetty, is marked by pairs of light-beacons (lateral).

- 4 Course may then be directed to the anchorages (7.110) E of Seaforth Island if required, or continued ENE through the sound, passing:

SSE of the S side of Lindeman Island and:

NNW of Orion Shoal (1 mile E) (7.108).

The track then leads E, passing:

S of Dalwood Point (1¾ miles ENE) (7.107), from whence the SE channel through the sound (7.107) may be joined, or course directed as otherwise required.

7.110

- 1 **Anchorages:**

Burning Point (20°30'S 149°02'E) (7.107). Anchorage may be obtained in a depth of 20 m 8 cables ENE of the point, but this berth lies in the stronger tidal streams of the sound.

- 2 Neck Bay, 8 cables NNW of Shaw Peak (20°28'S 149°05'E). Anchorage may be obtained in the bay in a depth of 13 m, noting a 9.3 m shoal farther S. The berth, which lies in the stronger tidal streams of the sound, is sheltered from all except N winds but is liable to squalls in SE winds, which render it uncomfortable for vessels in ballast.

- 3 Seaforth Island (20°28'S 149°02'E) (7.90). Anchorage may be obtained 4 cables E of the N extremity of the island in a depth of 13 m, grey mud. An alternative anchorage lies 3¾ cables SE of the same point, in a depth of 8 m. Both may be approached from either N or E of Seaforth Island, the latter being preferable. Tidal streams are weaker than in the anchorages off Burning Point and Neck Bay.

Chart Aus 252

Genesta Bay

7.111

- 1 Genesta Bay lies between Cape Conway (20°32'S 148°56'E) (7.89) and Round Head 3½ miles NNW (7.89). Anchorage out of the strength of the tidal stream may be obtained in the bay in depths of 5 to 10 m.

The S and N shores of the bay are rock-fringed and backed by densely wooded hills, but its head is fronted by a drying sandbank extending 2½ cables offshore. An islet, 2.7 m in height, lies near the S end of the head of the bay and a drying rock lies 3½ cables farther N.

- 2 **Local knowledge** is required in the approaches between Long Shoal (20°30'S 148°57'E) (7.89) and the mainland.

Tidal streams in the channel between Long Shoal and the mainland are considerably weaker N of Round Head.

Puritan Bay

7.112

- 1 Anchorage, except in winds between N and E, may be obtained in Puritan Bay (20°28'S 148°53'E) in depths of 5 to 10 m, mud.

Local knowledge is required.

Chart Aus 252 (see 1.15)

Hamilton Island

7.113

- 1 Anchorage may be obtained 7 cables SE of Hamilton Island (20°21'S 148°58'E), in a depth of about 13 m, as shown on the chart.

Henning Island

7.114

- 1 Well sheltered anchorage may be obtained in Fitzalan Passage, midway between Henning Island (20°19'S 148°56'E) (7.91) and Whitsunday Island 8 cables NE, in a depth of 27 m. A bank, with a least depth of 3.2 m marked by light-buoys (special) near each end, lies between the N point of Henning Island and Reef Point, 1¼ miles NNW. Visitor mooring buoys lie close E of the N extremity of the island.

Local knowledge is required.

- 2 Approach from SE is obstructed by Fitzalan Island (20°20'S 148°58'E) (7.95).

On the NE side of the anchorage, the entrance to Gulnare Inlet (20°18'S 148°57'E) is fronted by a steep-to bank, with depths of less than 10 m, extending up to 5 cables from the SW side of Whitsunday Island; a rocky patch drying 0.5 m on its S side lies 2½ cables E of the W entrance point to the inlet; a below-water rock lies near the edge of the bank, 8 cables SE of the same point. Gulnare Inlet itself is narrow and shallow.

Henning Island is a National Park; see 7.10.

Turtle Bay

7.115

- 1 Turtle Bay (20°19'S 149°00'E) lies on the S side of Whitsunday Island. Anchorage can be obtained in the bay in a depth of 13 m, mud and sand, good holding. The bay is exposed to the S and E, which can make for an uncomfortable anchorage in the prevailing SE winds.
- 2 The N shore of the bay is rocky and generally steep-to, and is backed by densely-wooded hills, the most prominent of which is Whitsunday Craig (7.31). Four smaller bays indent the N shore of Turtle Bay. The N-most of these (1½ miles W of Whitsunday Craig) is clear of off-lying dangers and provides good anchorage for small craft; the other three are obstructed by coral reefs, rocks and off-lying dangers.
- 3 **Tidal streams** set generally ESE on the flood tide and WNW on the ebb. Spring rate is 1 to 2 kn, but the streams become weaker towards the head of the bay.

Whitsunday Island is a National Park; see 7.10.

Port Molle

7.116

- 1 **General description.** Port Molle is a natural harbour off the NW coast of Long Island, lying between Base Point, the NW extremity of the island 5 cables WSW of South Head (20°19'S 148°51'E), and Humpy Point, a promontory 61 m in height, 1 mile farther S. Happy Bay lies between the two points with a tourist resort at its head and fronted by a drying coral reef which extends up to 2 cables offshore.
- 2 Anchorage, well sheltered from SE and SW gales and suitable for any vessel using Whitsunday Passage or Molle Channel, may be obtained out of the strength of the tidal

stream in depths of 13 to 15 m, mud, 6 cables N of Humpy Point.

An anchorage area lies at the centre of the N entrance to the harbour in depths of 16 to 37 m, which is subject to tidal streams setting NNW/SSE at 2½ kn.

- 3 The harbour may be approached from S or N. The approach from S through Long Island Sound (7.96) is subject to the limiting conditions described for that passage. The outer approaches from N are described in the directions given for Molle Channel at 7.101.

7.117

- 1 **Directions from north.** From a position not more than 5 cables N of South Head (20°19'S 148°51'E) (7.91), the track leads W in depths greater than 20 m, passing (positions from South Head):

S of Alert Bank (6 cables NW) (7.101).

Thence the centre of The Narrows (2¼ miles SSW) (7.97), which can be seen even on a dark night, bearing 176° or 164°, leads to the anchorages.

Shute Harbour

7.118

- 1 **General description.** Shute Harbour is situated towards the N side of Rooper Inlet, which lies between Stripe Point (20°19'S 148°49'E) and The Beak 2¾ miles NNW (7.101); berths and facilities in the harbour are centred at Shutehaven, 2½ miles NW of Stripe Point.

Port limits extend seaward to a line drawn from Stripe Point to White Rock 1¼ miles NNW, thence to The Beak, 1½ miles farther NNW.

- 2 Except for the channel into Shute Harbour described at Directions below (7.119), Rooper Inlet is generally shallow, with sand and mud banks extending from its shores which are fringed with mangroves and, other than in Shute Bay at its head, are fronted by drying coral reefs. Other channels between islands of the inlet should not be used, on account of the reefs extending some distance from them and the strong tidal streams setting between.
- 3 A channel, with a least depth of 3.8 m in the fairway, leading from seaward and passing S of Shute, Tancred and Repair Islands also gives access to the wharf at Shutehaven. This channel which leads between reefs on both sides, is unmarked until well within the inlet and should not be attempted without local knowledge.

Speed limit within Shute Harbour is 6 kn.

7.119

- 1 **Directions.** From a position in Molle Channel, E of Shute Island (20°18'S 148°48'E) (7.101) the track leads W, passing (positions from the N extremity of Shute Island):

S of the light-beacon (S cardinal) marking Low Rock (3 cables NNE) (7.101). The channel from NNE between Low Rock and Gunn Island, 3 cables W of the rock, is considered to be dangerous and should not be used. Thence:

- 2 N of No 2 Light-beacon (½ cable N) (7.101). The track then leads WSW, passing:
SSE of Gunn Island (3 cables NW), 27 m in height; thence:
NNW of the N edge of a drying reef extending 2½ cables N from Tancred Island (3½ cables SSW), 39 m in height; thence:
SSE of Coral Point (3½ cables W); No 1 Light-beacon (starboard hand) stands on the point.

- 3 **Leading lights.** The alignment (261°) of a pair of leading lights (displayed by day and night) (8 cables W),

standing about $\frac{3}{4}$ cable apart in the vicinity of the wharf at Shutehaven, then leads W towards the wharf, passing:

N of Repair Island (5 cables WSW), 21 m in height.

No 4 Light-beacon (port hand) stands on the edge of the reef extending N from the island; No 6 Beacon (port hand) stands close off the NW extremity of the island. Thence:

- 4 N of No 8 Light-buoy (port hand) (6 cables W).

Course may then be directed as required for berthing; No 10 Light-beacon (port hand), standing $\frac{1}{2}$ cable S of the wharf, marks depths of less than 2 m which extend between S and W from the beacon.

7.120

- 1 **Anchorage**, with restricted swinging room and for vessels of suitable size and draught only, may be obtained in the channel about 2 cables SSE of the wharf at Shutehaven and W of Repair Island.

An anchorage area for visiting small craft is centred 3 cables SW of the wharf.

Prohibited anchorage exists within 200 m of the wharf, and in the approach channel to it.

- 2 **Berths**: small concrete wharf about 50 m in length at Shutehaven; depth alongside 3-4 m. There are jetties for small craft in the vicinity.

Facilities: fuel and supplies can be arranged subject to adequate notice being given. There are several boat ramps in the vicinity of the wharf at Shutehaven.

South Molle Island

7.121

- 1 South Molle Island is a National Park; see 7.10.

Anchorage may be obtained in depths of 18 to 24 m, sand and mud, off a small boulder-fringed bay on the W side of South Molle Island between Roma Point (20°17'S 148°50'E) (7.101) and Ker Point 8 cables N. The anchorage is well sheltered, with good holding ground, but it is necessary to moor ship as tidal streams are strong and an eddy sets S from Ker Point during the falling tide.

- 2 A jetty lies at the head of Bauer Bay, a rock-fringed bay on the N side of South Molle Island between Deedes Point (20°16'S 148°51'E) (7.91) and the NW extremity of the island 1 mile W, which rises to Lamond Hill, 104 m in height, 3 cables S. A village, from where water may be obtained, lies S of the jetty. Depths of less than 5 m extend up to 3 cables offshore.

Cid Harbour

7.122

- 1 **General description**. Cid Harbour lies between Cid Island (20°16'S 148°55'E) (7.91) and part of the W side of Whitsunday Island about 8 cables E. The harbour is open from NW but affords anchorage with shelter from all but strong N winds in depths of 11 to 15 m with good holding ground, mud.

- 2 The land enclosing the harbour is high, steep and densely wooded with pines and tropical shrubs. Ross Islet, 7 m in height, lies on the N end of a drying reef 2 cables off the middle of the E side of Cid Island, which is fringed with reefs. Hughes Point, 7 cables ESE of Ross Islet, is the S entrance point to Dugong Inlet which occupies the NE corner of the harbour and is filled with foul ground and numerous coral heads; a line between Hughes Point and

Daniel Point, $1\frac{1}{4}$ miles N, marks the 10 m depth contour and the outer limit of the dangers of Dugong Inlet.

- 3 The N entrance to the harbour is that normally used.

Hunt Channel, the S entrance, which is not recommended because of its narrowness and the eddies therein, is entered between Gilling Point (20°17'S 148°55'E), the S extremity of Cid Island, and Loriard Point 4 cables S. This entrance is partially obstructed by Pear Shoals, with a least depth of 6-9 m (charted as 7-4 m), which extend to 5 cables SSW from Gilling Point and are marked by eddies. Entry through Hunt Channel should not in any case be attempted on the in-going tidal stream.

- 4 **Tidal streams** in the S entrance to the harbour in the vicinity of Pear Shoals are very strong and uncertain. In the approach from NW, and in the N entrance, streams are considerably weaker in depths of less than 20 m than they are in greater depths.

Inside the harbour there is a maximum rate of $1\frac{1}{2}$ kn; the stream on the rising tide, which sets S being the stronger.

7.123

- 1 **Directions**. From the vicinity of a position in Whitsunday Passage, 3 miles NW of Hill Rock (20°16'S 148°54'E) (7.91), the approach track for the N entrance leads ESE in a least depth of 11 m.

Leading marks:

Front mark, Daniel Point ($2\frac{1}{4}$ miles ENE of Hill Rock), the S end of a wooded peninsula of which Lion Point, 1 mile farther N, is the N extremity.

- 2 Rear mark, the summit of Mount Robison (2 miles ESE of the front mark), 389 m in height.

The alignment (105°) of the above marks passes (positions from Hill Rock):

NNE of Conder Shoal (1 mile N) distant 3 cables.

The coral bottom may be seen over this shoal at LW; slight eddies occur when the tidal stream runs strongly; thence:

- 3 NNE of Katoomba Bank (1 mile NE), with depths of less than 5 m over it, extending $3\frac{1}{2}$ cables N from Cid Island; depths of less than 10 m extend 6 cables farther N.

From there course may be directed S to anchor as convenient.

Pioneer Bay

7.124

- 1 **Anchorage** may be obtained in Pioneer Bay (20°14'S 148°44'E) in a depths of 6 to 20 m, as shown on the chart.

Stonehaven Anchorage and Hayman Channel

7.125

- 1 **General description**. Stonehaven Anchorage is situated in the bay on the NW side of Hook Island and is bounded by a line drawn from Cockatoo Point, 7 cables W of Mount Sydney (20°05'S 148°55'E), to the drying reef 1 mile farther WSW, on the W points of which lie Langford and Bird Islands; thence to Baird Point, 2 miles SSW of Cockatoo Point. The land adjoining the anchorage is mountainous, rugged and thickly wooded, but with large patches of bare rock and cliffs. Squalls are experienced during strong S or SE winds.

- 2 The S and E shores of the anchorage consist of bold points which are fairly steep-to and fringed with drying

coral reefs which also front the bays between the points. Landing is easy.

Approach may be made from S or NW from Whitsunday Passage, and from NE through The Narrows. There are depths of more than 20 m in all of these approaches.

Hook Island is a National Park; see 7.10.

7.126

- 1 **Tidal streams** are weak, except in The Narrows between Hook and Hayman Islands and in the narrow parts of the channel N and W of Black Island, lying midway between Cockatoo Point and Langford Island, where they attain a rate of 1½ kn. At the anchorage the stream sets S on the rising, and NW on the falling tide.

7.127

- 1 **Directions from south.** From a position in Whitsunday Passage, S of Bird Island (20°05'S 148°52'E), the track leads initially N then NE through South Channel to the anchorage.

Leading marks:

- Front mark, Bird Island, wooded and cliffy, lying at the SW extremity of a drying coral reef; Bird Island Light stands on the island; an islet lies close SW.
- 2 Centre mark, Langford Island (5½ cables N of the front mark), also wooded and cliffy, lying at the NW extremity of the same drying reef; an islet lies close W.
- Rear mark, Arkhurst Island (1¾ miles N of the front mark), wooded and lying on the outer edge of a reef extending 3½ cables W from the SW extremity of Hayman Island.
- 3 The alignment (007°) of the W edges of Bird and Langford Islands, above, with the E edge of Arkhurst Island, leads to the outer end of South Channel.
- Leading mark:** Mount Sydney (20°05'S 148°55'E) bearing 045° leads from thence NE through South Channel to the anchorage, passing (positions from Mount Sydney, 387 m in height, not named on chart Aus 252):

- 4 SE of the S extremity of a bank (2½ miles SW), with depths of less than 20 m over it, which extends 8 cables SSE from the drying reef on which Bird and Langford Islands lie. The S edge of the drying reef is marked by a light-beacon (S cardinal).
Thence:
- 5 NW of Baird Point (2½ miles SSW), thence:
NW of Ian Point (2 miles SSW); a rock, with a depth of 4.3 m over it, lies 1½ cables N of the point. Drying coral reefs front a sandy beach extending up to 2½ cables offshore in the bay between Ian Point and Anchor Point 7 cables farther NE.
Thence:
- 6 SE of a light-beacon (starboard hand) (1¾ miles WSW), marking the E edge of the drying reef; thence:
NW of Six Fathom Bank (1¼ miles SSW), with least depths of 9.8 m, lying across the entrance of the bay between Ian and Anchor Points; a dangerous wreck, position approximate, lies near the NE edge of the bank. Thence:
- 7 SE of Black Island (1¼ miles WSW), wooded and lying on a drying reef; numerous rocks, drying up to 2.1 m lie on the same reef which extends 7½ cables N/S. The S and N ends of the reef are each marked by a light-beacon (special); a 4.9 m shoal patch lies close E of the S end of the reef.
Thence:

NW of Anchor Point (1¼ miles SSW), and:

SE of Sealark Patch (1 mile WSW), coral, with a least depth of 4.6 m, and difficult to see even in good light conditions.

7.128

- 1 **Caution.** See 7.132.

Directions from north-west. From a position in the N end of Whitsunday Passage, W of Hayman Island (20°03'S 148°53'E), the track leads SE through Hayman Channel between Hayman and Langford Islands. This approach is less easy to navigate than the other two channels unless the edges of the coral reefs on both sides can be clearly seen. At its SE end the channel is divided by the reef on which Black Island lies. The track passes (positions from Mount Sydney (20°05'S 148°55'E)):

- 2 SW of Arkhurst Island (2¾ miles WNW) (7.127), thence:
SW of light-beacons (2 miles WNW) marking the entrance channel to Hayman Island Marina, and:
SW of Hayman Island (1½ miles NW), wooded and the N-most of Cumberland Islands. Groper Point, at the S extremity of the island is grass-covered; a coral reef, which dries in places, extends from the whole of the S part of the island, stretching from Arkhurst Island to points 5½ cables S and E of Groper Point. And:
- 3 NE of Langford Island (2½ miles W) (7.127) and NE of the reef on which this island and Bird Island (7.127) both lie.

Useful mark.

Radio mast (20°04'S 148°53'E), a metal framework structure 18 m in height, standing near to the SW point of Hayman Island and close N of the harbour. The mast is prominent from S and SW in sunlight but is obscured from N of Arkhurst Island.

7.129

- 1 The channel then divides. The track through the N arm leads ESE to join the track through The Narrows (7.131), passing:
SSW of the drying reef extending S from Groper Point; the SW edge of the reef is marked by a light-beacon (starboard hand) (1½ miles WNW). A coral outcrop, (charted as an obstruction, position approximate) (just over 1 mile WNW), lies close S of the S extremity of the same reef and is marked by another light-beacon (starboard hand). And:
- 2 NNE of the light-beacon (special) (1¼ miles W) (7.127); depths of less than 10 m extend about 1½ cables NNW from the light-beacon into the fairway.
Course may then be directed as required to follow the track described for The Narrows (7.131).

7.130

- 1 The track through the S arm of Hayman Channel leads SSE, passing:
WSW of Black Island (1¼ miles WSW) (7.127) and its drying reef, and:
ENE of the light-beacon (1¾ miles WSW), marking the E extremity of the drying reef on which Langford and Bird Islands (7.127) lie.
Course may then be directed as required to join the track described for South Channel (7.127).

7.131

- 1 **Directions from north-east.** From a position NE of Hayman Island (20°03'S 148°53'E), the track leads SW through The Narrows between Hayman and Hook Islands.

Leading marks:

Front mark, the N end of Black Island (20°05'S 148°54'E) (7.127).

Rear mark, a gap in the hills on the mainland SW of Mount Merkara (12 miles SW of the front mark).

- 2 The alignment (219°) of the above marks leads SW, passing (positions from Mount Sydney (20°05'S 148°55'E)): SE of the SE edge of the drying reef extending from Groper Point (1½ miles NW) (7.128). A light-beacon (starboard hand) marks the E extremity of the reef; another light-beacon (7.129) marks the S extremity. And:
- 3 NW of Stanley Point (7 cables NW), closely fringed by a drying coral reef which also fronts the bays on both sides of the point; a light-beacon (port hand) stands close off the point.

Leading marks:

Front mark, Anchor Point (1¼ miles SSW) (7.127).

Rear mark, Rocky Hill (405 m in height, not named on chart Aus 252) (9 cables SSE of the front mark).

- 4 The alignment (158°) of the above marks then leads SSE from the SW end of The Narrows to the anchorage, passing:
 - ENE of Black Island (1¼ miles WSW) (7.127) and its drying reef, which is marked by a light-beacon at its N end and by a buoy (starboard hand) which is moored off its E edge; and:
 - WSW of Cockatoo Point (7 cables W); a light-beacon, which stands close W of the point marks the edge of the drying reef extending from the point; thence:
 - ENE of Sealark Patch (1 mile WSW) (7.127).

7.132

- 1 **Anchorage.** Good shelter from S and SE winds and good holding ground, may be obtained in depths of 10 to 27 m under the lee of Hook Island, as convenient between Baird and Cockatoo Points.

Care must be taken to avoid visitor moorings which are laid in the area E of Six Fathom Bank.

An anchorage area also exists in Hayman Channel, centred on 20°04'2S 148°52'6E, as shown on the chart, with several visitor moorings lying 2 cables S. Seaplane operations also take place in this area.

Charts Aus 252, Aus 825

Grimston Point**7.133**

- 1 **Anchorage** may be obtained in the lee on the E side of Grimston Point (20°11'S 148°41'E) (7.103) during SW gales.

Chart Aus 825

Woodwark Bay**7.134**

- 1 Woodwark Bay lies between Grimston Point (20°11'S 148°41'E) (7.103) and a promontory (227 m in height at its N end) 1½ miles W of the point. Depths of less than 10 m extend from the head of the bay to a line joining the two entrance points.

Anchorage, with shelter from S winds, may be obtained in depths of 7 to 9 m close inside the entrance to the bay.

Grassy Island**7.135**

- 1 Grassy Island (20°09'S 148°37'E) is reef-fringed on its S side and has on its N side a spit, with depths of less than 5 m over it, which extends 6 cables N; a wooded islet, 14 m in height, lies on the outer end of this spit and Edwin Rock (7.103) lies 4 cables farther NE. Double Bay, divided by a promontory, lies 1½ miles S of the island.

Anchorage may be obtained in a depth of 7 m, thick mud, 1 mile S of Grassy Island. This anchorage is the only one on this stretch of coast with shelter from N winds.

Chart Aus 252

Double Cone Island**7.136**

- 1 **Anchorage** may be obtained in depths of 24 m, mud, NW of Double Cone Island (20°06'S 148°43'E) (7.92).

Chart Aus 825

George Point**7.137**

- 1 **Anchorage** may be obtained in SW winds in the lee on the E side of George Point (20°04'S 148°34'E) (7.103). Olden Island (85 m in height), 2 miles SSE of George Point, lies on the outer edge of the coastal bank with depths of less than 10 m; a rock, 6 m in height, marks the outer end of a coral reef extending 3 cables SE from the island.

Rattray Island**7.138**

- 1 **Anchorage** may be obtained in a depth of 18 m, mud, off the W side of Rattray Island (20°00'S 148°33'E) (7.92). Good anchorage may also be found off the S side of the island in depths of 20 to 30 m, mud, clear of a 0.9 m patch 3 cables SW of the S extremity of the island.

Gloucester Island**7.139**

- 1 **Anchorage**, with shelter from S and E winds, may be obtained in Bona Bay on the SW side of Gloucester Island (20°01'S 148°27'E) (7.34) in depths of 7 to 8 m between Roundhill Point, 1 mile W of Mount Bertha, and Bluff Point, the SW extremity of the island, 1½ miles SSE. This is a good anchorage for vessels waiting to enter the port of Bowen on the far side of Edgumbe Bay, 10 miles W.
- 2 **Caution.** Violent squalls occur off the W side of Gloucester Island during SE winds. These squalls pass over vessels lying close under the lee of the island and are scarcely felt, but at distances of 1 to 3 miles offshore they can make the anchorage uncomfortable.

Anchorage may also be obtained under the lee of Cape Gloucester (20°04'S 148°27'E) in depths of 5 to 7 m. The waters adjacent to the cape are described at 7.104 and the paragraphs following.

Port of Bowen

Chart Aus 825 (see 1.15)

General information**7.140**

- 1 **Position and function.** The port of Bowen (20°02'S 148°15'E) is centred on the town of the same name, which

has a population of about 10 200 and stands on the NW side of the bay forming the natural harbour of Port Denison.

The trade routed through Bowen in more prosperous times has now gone elsewhere and commercial cargoes are no longer handled there. The port functions to service the local fishing industry and small craft, and to provide berths and supporting facilities for tugs working at Abbot Point.

7.141

- 1 **Topography.** Edgumbe Bay, within which the port of Bowen lies, shoals gently towards its head from which depths of less than 5 m extend up to 3½ miles offshore. The E side of the bay is formed by the high ground of Gloucester Island and Cape Gloucester. Ben Lomond (20°10'S 148°27'E) lies farther S a remarkable sugarloaf hill on a promontory forming the S side of Sinclair Bay which is shallow and filled with mangroves at its head. Gregory River and several creeks, all fronted by mudbanks drying up to 1 mile offshore, enter the sea in the area S and W of Ben Lomond; the S and SW shores of Edgumbe Bay from there to Adelaide Point, 10 miles WNW, are low and partly covered by mangroves. Brisk Bay (20°06'S 148°18'E) lies 1½ miles SE of Adelaide Point and is formed on its S side by Poole Island (7 min height), fringed on its S side with mangroves and lying near the outer end of a drying spit of coral grit extending 1 mile NE from the coast. A small drying reef, not shown on the reference chart, lies close within the 5 m depth contour, 9 cables SE of Poole Island.

- 2 Adelaide Point (20°04'S 148°16'E), situated at the entrance to Duck Creek, is 9 m in height and has a small jetty on its N side. From thence to the entrance to Doughty Creek, 3½ miles NNW, the shore of Port Denison is formed by drying sand and mud flats which extend up to 6 cables offshore and are fronted in the S part by rocks below-water and awash; the shoreline itself is lined with mangroves.

- 3 Port Denison is fronted by Stone Island (20°02'S 148°17'E). Three small hillocks on the SE side of the island are separated from South Head, the grassy N extremity, by a low neck of land at the head of Shoal Water Bay.

- 4 The approaches to Bowen may be identified by the higher ground standing behind the low shoreline described above. Mount Bramston (20°04'S 148°15'E) stands close to the coast, Middle Hill 1½ miles W, and Mount Gordon (169 m in height) 1 mile farther NW. Middle Hill, although the lowest, is the most remarkable when seen from N as it rises to a conical, tree-covered summit from the tableland connecting it to Mounts Bramston and Gordon. The two latter hills are covered with trees and scrub.

7.142

- 1 **Port limits.** Bowen and its approaches are included within the Abbot Point pilotage area; see 7.157.

Approach and entry. The harbour is approached through Edgumbe Bay and entered by passing either S or N of Stone Island (20°02'S 148°17'E). South Entrance is the main entrance.

Port authority: Queensland Transport, Marine and Ports Division, PO Box 889, Bowen, Queensland 4805.

Limiting conditions

7.143

- 1 **Controlling depths:**

From South Entrance to swinging basin: 5.2 m.

Swinging basin: 5 to 7 m depending on extent of basin used.

Caution. The channels are reported to have been last sounded in 1988.

- 2 **Tidal levels:** see information in *Admiralty Tide Tables*. Mean spring range about 2.2 m; mean neap range about 0.8 m.

Abnormal levels. The height of tide is much affected by wind strength and direction and, with strong SE winds, has been observed to rise as high at neaps as at springs. With N winds the tide can be 0.3 m lower than predicted.

Arrival information

7.144

- 1 **Outer anchorages.** (See 7.139). Anchorage may be obtained 5 cables S of Dalrymple Point (20°02'S 148°16'E) in depths of 5 to 7 m.

Vessels requiring greater anchoring depths than are available in Port Denison are recommended to anchor in depths of 12 m or more at the seaward end of the line of bearing of Mount Bramston Leading Light (20°04'S 148°15'E) (7.146).

- 2 **Pilotage** is not normally available. The pilot boarding ground, 1¼ miles S of Sinclair Head (20°02'S 148°18'E), is shown on the chart for use when appropriate arrangements have been made.

Tugs. Abbot Point tugs are based at Bowen.

Harbour

7.145

- 1 **General layout.** A long wooden jetty, with its outer end demolished and a concrete outer arm on its SW side, extends SSE from the town foreshore to the swinging basin. The basin is approached from seaward through a marked channel.

There is a boat harbour and marina in the NE corner of the harbour. The approach to the harbour is made through a channel marked by pairs of light-beacons (lateral); the boat harbour may then be entered between Magazine Island (20°01'S 148°15'E) and the SW entrance point to Saltwater Creek.

- 2 In the boat harbour there are pile moorings, boat ramps, and a slipway with a capacity of 20 tonnes.

Tidal streams. In the vicinity of the jetty, the in-going stream sets parallel with it, and the out-going stream sets NE across its head; the effects being more noticeable at springs. After heavy rains the NE-going stream may start 2 hours before HW.

Landmarks. Mainly, there are no documented features which can be classified as landmarks for the port, with the exception of a conspicuous boulder (19°59'3S 148°16'8E) (7.147). Other features which may assist in identification from the approaches are described at 7.141.

Directions

7.146

- 1 **From east.** From a position a convenient distance N of Gloucester Head (19°58'S 148°27'E) (7.34) the track leads SW on 231°, passing (positions from Stone Island Light on Sinclair Head (20°02'S 148°18'E)):

SE of a sector (about 232°–236°) in which Stone Island Light is obscured by Middle Island (4¾ miles NE), thence:

- 2 SE of Middle Island (4¾ miles NE), distant 7½ cables, lying in the middle of the entrance to Edgumbe Bay. The island is rocky, reddish in colour, rather flat-topped, sparsely wooded and steep-to on its N side. The S side should only be approached with caution as a drying reef extending 2½ cables from it is steep-to. Thence:

NW of Chyebassa Shoal (3½ miles SE), rock, with a depth of 3·5 m over it.

- 3 Thence, with Mount Bramston Light (orange triangle, point up) (20°04'S 148°15'E) bearing 246¾°, the track leads WSW, passing:

SSE of Stone Island (7.141); Stone Island Light (white beacon) stands on Sinclair Head at the E extremity of the island. A drying sandbank, fringed with drying and below-water rocks, extends up to 3 cables from the S side of the island; below-water rocks extend 3 cables farther S. And:

- 4 NNW of Thomas Island (2¾ miles S), mangrove-covered except at its E end, lying at the outer end of a partly drying spit of rock, sand and coral grit extending from the mainland and forming the N entrance point to Brisk Bay. Winter Shoal lies 4 cables NE of the island. Thence:
SSE of M1 Light-buoy (starboard hand) (1½ miles SSW), moored S of the dangers extending S from Stone Island and marking the outer end of South Entrance.

5 Fairway Leading Lights:

Front light (white triangle point up) (3 miles WNW), standing near the SW end of the town foreshore.
Rear light (white triangle point down; black stripe) (5¼ cables NW of the front light).

The alignment (315½°) of the above lights (which may also be lit by day), leads NW from the vicinity of M1 Light-buoy, passing:

- 6 SW of M3 Light-buoy (starboard hand) (1½ miles SW), marking a 5·5 m patch; thence:
SW of a very narrow above-water sandspit (1¼ miles WSW), extending 4 cables from the W side of Stone Island; thence:
Between M5 Light-buoy (starboard hand) (1¾ miles WSW) and M2 Light-buoy (port hand), 130 m farther WSW.

7 Bowen Leading Light-beacons:

Front light-beacon (2½ miles WNW), standing at the outer end of Bowen wooden jetty.
Rear light-beacon (785 m NNW of the front light), standing near the root of the same pier.

The alignment (329°) of the above light-beacons, which may also be lit by day and are otherwise difficult to identify, leads NNW from M5 Light-buoy through the entrance channel, 60 m in width, to the swinging basin (see 7.143 for controlling depth). The track passes:

- 8 Between M7 Light-buoy (starboard hand) (2¼ miles W) and M4 Light-buoy (port hand) 75 m SSW, which together mark the entrance to the swinging basin. A light-buoy (special), ¾ cable SSE of the above front leading light-beacon, marks the outer end of shoal depths where the demolished head of the jetty formerly stood. A rock awash, marked by a buoy (isolated danger), lies 2 cables WSW of the same front leading light-beacon and outside the swinging basin.

- 9 Course may then be directed as required for berthing.

Useful mark:

Monument (20°01'S 148°15'E), standing 1 cable NE of the root of Bowen jetty.

7.147

- 1 **From north-west.** From a position at least 1½ miles N of Cape Edgumbe (19°59'S 148°16'E) the track leads SSE, passing (positions from Sinclair Head (20°02'S 148°18'E)):

Clear of foul ground (6 miles NNW) and a wreck with a depth of 14·6 m over it (5¼ miles N), thence:

- 2 ENE of North Rock (4 miles NNW), marked by a light-beacon (E cardinal). A similar rock and a drying rock lie between North Rock and Cape Edgumbe, ¾ cables SSW; a below-water rock lies 2 cables W of North Rock. Thence:

ENE of Cape Edgumbe (4 miles NNW); Edgumbe Heights rise from surrounding low-lying land to their summit, marked by a conspicuous boulder, 8½ cables S of the cape. Thence:

- 3 ENE of a bank, part of which dries, with depths of less than 5 m over it (2¼ miles NNW) extending 8 cables E from Kings Beach; irregular depths and rock patches, with depths of less than 2 m over them, are found on the bank. A dangerous wreck lies 6½ cables E from the N end of Kings Beach. Thence:

- 4 ENE of North Head (1¼ miles NW), a conical peaked islet lying at the outer end of a drying reef and sand ridge extending 6½ cables ENE from Dalrymple Point. A disused lighthouse, consisting of a white six-sided wooden tower 9 m in height with red cupola standing on the head, is more easily identifiable by day than the light-structure on Sinclair Head and is visible from NW over the low land lying between Edgumbe Heights and Flagstaff Hill, 1½ miles farther S. Thence:

- 5 ENE of Sinclair Head distant 3 cables.

The track then leads WSW on the alignment of Mount Bramston Leading Light (2¾ miles SW) (7.146) and as described thereafter.

North Entrance

7.148

- 1 North Entrance is the alternative entrance channel to Bowen and lies between Stone Island (20°02'S 148°17'E) and North Head, 5 cables NW. The entrance has a least depth of 3·8 m in the fairway and offers a saving of distance into harbour for vessels of appropriate draught. Tugs with a draught of 4 m working at Abbot Point make regular use (1992) of this entrance provided that a tidal height of at least 1 m is available.

North Entrance is not recommended for use at night.

7.149

- 1 **Directions.** From the vicinity of a position about 1 mile N of Sinclair Head (20°02'S 148°18'E) the line of bearing 232° of Middle Hill, (20°03'·8S 148°13'·5E) (7.141), leads SW through North Entrance, passing (positions from Sinclair Head):

Either side of N2 Light-beacon (safe water) (9 cables NNW), marking the centreline of the channel; thence:

- 2 NW of South Head (6 cables WNW) (7.141), thence: SE of N1 Light-buoy (starboard hand) (1¼ miles WNW), moored 1 cable SE of North Head (7.147) and close NE of Wentworth Rocks (awash); thence:

SE of N3 Light-buoy (starboard hand) (1½ miles W), marking the S extremity of the drying ridge between Dalrymple Point and North Head; thence:

- 3 SE of an unmarked 2·2 m patch (1¾ miles W), the S-most charted danger off Dalrymple Point.

Course may then be directed as required to enter the swinging basin (2¼ miles WNW) (7.146), passing between M4 and M7 Light-buoys.

Berths

7.150

- 1 **Moorings.** Two pairs of lit mooring buoys, about 1 mile SW of Stone Island (20°02'S 148°17'E), lie adjacent to South Entrance fairway and are used as cyclone moorings for the tugs.

Alongside berth. No 3, which is the only serviceable berth, is reserved for tugs and not available for general use (1992); length 168 m, concrete structure, clay bottom; depth alongside 9.0 m (1983) but confirmation should be sought locally. The berth is exposed to SE winds and small vessels may surge.

Port services

7.151

- 1 **Repairs:** minor repair facilities are available.
- Other facilities:** hospital; no facilities for the disposal of oily waste.
- Supplies:** fresh provisions available; fresh water laid to No 3 berth.

Other inlets and passage

Chart Aus 252

Unsafe Passage

7.152

- 1 Unsafe Passage lies between Mid Molle Island (20°15'S 148°50'E) (7.91) and North Molle Island 2 cables N (7.91). There is a tidal race through the passage on both streams and it should not be used other than by boats.
- The alignment (240½°) of leading light-beacons standing at the N end of West Molle Island, 1 mile SW of Mid Molle Island, leads through the passage.

Macona and Nara Inlets

7.153

- 1 Macona and Nara Inlets, which indent the S coast of Hook Island (20°10'S 148°55'E) to a distance of 2¾ miles, are fringed with drying banks and coral reefs and separated by a high peninsula.
- Macona Inlet** is fronted by a bar with a depth of 3.7 m in the fairway. The inlet is marked at its E entrance point by a light-beacon (S cardinal) standing close off the S extremity of Hook Island; a rock (awash), 4½ cables WNW of the point, and a 1.2 m patch, 6 cables NW of the same point, lie on the bar. A light-beacon (starboard hand) stands 9 cables NW of the E entrance point.
- 2 A bank, steep-to and with depths of less than 5 m over it, lies close S of the entrance to Macona Inlet and extends between E and SSE to the coast of Whitsunday Island. The narrow channel which skirts the N edge of this bank separates Whitsunday and Hook Islands and has a least depth of 10.8 m in the fairway.

Local knowledge is essential in the above channel.

Nara Inlet has depths of 6.1 to 7.9 m but the entrance is obstructed by a shelf of below-water rocks on the W side; the entrance fairway, which has a width of 1 cable, is marked on each side by a light-beacon (lateral).

Chart Aus 252 (see 1.15)

Off Abel Point

7.154

- 1 Small craft mooring areas lie close W of the marina at Abel Point (20°16'S 148°43'E), and in Muddy Bay between Abel Point and Mandalay Point, 11 cables ENE.

The village of Cannonvale, where there is a small jetty, and Pigeon Islet, lie 1 mile SW and W respectively from Abel Point. A light-beacon (special) standing 1¼ miles W of Abel Point marks the seaward end of an outfall.

PORT OF ABBOT POINT

General information

Charts Aus 255, Aus 826

Position and function

7.155

- 1 The port of Abbot Point (19°53'S 148°05'E) consists of an offshore berthing facility which functions solely as a coal exporting terminal.

Topography

7.156

- 1 The coast in the vicinity of Abbot Point (19°53'S 148°05'E) is generally low, flat and sandy except where the land rises to Mount Luce (19°54'S 148°02'E), Mount Little 6½ miles SE, and to Mount Curlewis (221 m in height) 5 miles WSW. Mount Roundback, 7 miles SSW of Abbot Point, stands in the background.

A sandy beach extends 3½ miles SSE from Abbot Point. From thence the coast towards Bowen, as far as the Don River, is intersected by creeks and fringed with mangroves. During fresh SE winds a heavy surf sets in on the whole of this stretch of coast.

Pilotage area limits

7.157

- 1 Abbot Point pilotage area, which also includes the port of Bowen, is defined to N by latitude 19°48'S, to W by the meridian 147°59'E, and to E by Gloucester Island (7.139), as shown on the charts.

Approach

7.158

- 1 The coal terminal may be approached from the Inner Route as required from NE or NNW.

Traffic

7.159

- 1 In 2004 the port handled 33 vessels totalling 3 329 923 dwt.

Port authority

7.160

- 1 The Ports Corporation of Queensland, PO Box 409, Brisbane, Queensland 4001. The authority is represented locally by the Regional Harbour Master at Townsville.
Website: www.pcq.com.au
Email: info@pcq.com.au

Limiting conditions

7.161

- 1 **Controlling depth.** Least depth in the approaches 17.1 m. Available depths are promulgated at regular intervals by *Australian Temporary Notices to Mariners*.
- Under-keel clearance.** An allowance of 10% of maximum draught plus 0.61 m is required.
- Tidal levels.** See information in *Admiralty Tide Tables*. Mean spring range about 2.0 m; mean neap range about 0.8 m.
- Density of water:** 1026.5 g/cm³.
- 2 **Maximum size of vessel handled.** The largest vessel to have used the berth has been of 194 226 dwt, 17.54 m draught, 300 m LOA and 48 m beam.
- Local weather.** Winds from between NE and SE average 15 to 20 kn for much of the year and those from

SE can average 20 to 30 kn continuously for periods of up to 2 weeks. Berthing in adverse weather conditions is at the discretion of the Harbour Master.

Arrival information

Port radio

7.162

- 1 Radio watch is not kept at the coal terminal, but pilot vessel and tugs may be contacted on VHF: see *Admiralty List of Radio Signals Volume 6(4)*.

Notice of ETA

7.163

- 1 At least 7 days notice of arrival is required with confirmation 5 days, 2 days and 24 hours before arrival. See *Admiralty List of Radio Signals Volume 6(4)*.

Anchorage

7.164

- 1 **Abbot Point.** Vessels awaiting a pilot should anchor within 1 mile of the pilot boarding place (7.165).
Abbot Bay. Anchorage for small vessels may be obtained in a depth of 5 m at a distance of 4 to 5 cables offshore in Abbot Bay W of Mount Luce (19°54'S 148°02'E); swell at the anchorage frequently causes heavy rolling.

Local knowledge is required.

Pilotage and tugs

7.165

- 1 **Pilotage** is compulsory. The boarding ground is 5 miles NNW of Abbot Point as shown on the charts.
Tugs, based at Bowen, are available. Tugs' lines are used.

Quarantine

7.166

- 1 Abbot Point is a first port of entry: for extracts from the Quarantine Act see 1.64. Radio pratique may be granted.

Harbour

7.167

- 1 **General layout.** The terminal consists of a single offshore berth at the head of a trestle jetty and coal conveyor which extends 1½ miles NNE from Abbot Point.
Tidal stream sets parallel with the berth at a rate of 1 to 2 kn.

Landmarks:

Abbot Point Wharf (19°52'S 148°05'E), reported conspicuous on radar.
Mount Roundback (20°00'S 148°02'E), prominent and rarely obscured by cloud.

Directions

From north-east

7.168

- 1 From a position a convenient distance NE of Abbot Point (19°53'S 148°05'E), and subject to any arrangements made with the pilot (see 7.165 for pilot boarding ground); the track leads SW towards the point.

Leading lights:

Front light (19°53'S 148°05'E), standing on Abbot Point and 1 cable E of the root of the jetty. The light is a common mark also used in the approach from NNW.

2

Rear Light (3 cables SW of the front light), standing on Bald Hill, smooth and rounded and the summit of Abbot Point.

The alignment (225¼°) of the above lights (also displayed by day) leads SW in open water to a position 2 miles distant from the point.

Wharf Approach Leading lights:

3

Front light (19°52'S 148°05'E), standing nearly midway along the length of the wharf. The light is a common front mark for both wharf approaches.
Rear light (100 m W of the front light).

The alignment (273°) of the above lights (also displayed by day) leads into the berth in depths not less than the controlling depth (7.161).

From north-north-west

7.169

1

From a position a convenient distance NNW of Abbot Point (19°53'S 148°05'E), the track leads SSE towards the point.

Leading lights:

Front light (19°53'S 148°05'E), standing on the jetty near its inshore end.

Rear light (1½ cables SSE of the front light), a common light also used in the approach from NE (see 7.168).

2

The alignment (163½°) of the above lights (also displayed by day) leads SSE, passing (positions from Abbot Point):

ENE of a light-beacon (E cardinal) (2 miles NNW), marking the NE edge of Clark Shoal, sand and rock with depths of less than 5 m over it, extending 3½ miles NW from the point.

3

Wharf Approach leading lights:

Front light (1½ miles NNE), a common front mark for both wharf approaches (see 7.168).

Rear light (100 m SE of the front light).

The alignment (124°) of the above lights (also displayed by day) leads into the berth in depths not less than the controlling depth (7.161).

Berth

7.170

1

The wharf is 264 m in length, with two mooring dolphins at each end, and 466 m between outer dolphins. Depth alongside 18.5 m over an area 512 m in length and 70 m in width.

Port services

7.171

1

Repairs. Light engineering and welding services are available.

Other facilities. Hospital: at Bowen, 40 km. Garbage disposal available; no facilities for the disposal of oily waste.

Supplies. Fresh water and bunkers not available; provisions by arrangement.

Communications. Nearest airport at Proserpine, 70 km.

NARES ROCK TO CAPE BOWLING GREEN

General information

Chart Aus 826

Route

7.172

1

From a position 1¾ miles SW of Nares Rock (19°46'S 148°22'E), the route leads 59 miles NW to a position

5½ miles ENE of Cape Bowling Green. The preferred route shown on the chart lies between 2½ and 6 miles inshore of the track between Holbourne Island (19°44'S 148°22'E) and Cape Bowling Green described at 7.34 and the paragraphs following.

Topography

7.173

- 1 Between Cape Edgecumbe (19°59'S 148°16'E) and Cape Bowling Green, 64 miles NW, the coast is indented by three large bays and is generally low except in the vicinity of Cape Upstart (19°42'S 147°45'E).
- 2 Don River enters the sea 2 miles WNW of Cape Edgecumbe; Elliot and Burdekin Rivers enter 13 miles SE and 9 miles W respectively of Cape Upstart (19°42'S 147°45'E). Numerous mangrove-fringed creeks also indent the coast and there are large areas of tidal mangrove flats and salt pans. The root of the mainland peninsula extending NNW to Cape Bowling Green is particularly low and swampy; it is probable that the sea floods through this area to Bowling Green Bay during spring tides with strong E winds.
- 3 A number of generally isolated hills which rise from the low ground of the coastal belt are mentioned where appropriate in the text. The most significant of these are Mount Roundback (20°00'S 148°02'E) (7.167) and the high ground of Cape Upstart peninsula 20 miles farther NW. Mount Mackenzie, 8½ miles SSW of Mount Roundback, is a long saddle-backed mountain. Behind the whole of this stretch of coast is a general background of mountain ranges well inland.

Depths

7.174

- 1 The coastal 20 m depth contour generally lies between 3 and 6 miles offshore, except off Cape Upstart, which is steep-to, and off Cape Bowling Green (19°18'S 147°24'E) (7.36). Dangers lying outside this depth contour are described in the text.

Landmark

7.175

- 1 Mount Roundback (20°00'S 148°02'E) (7.167).

Other aid to navigation

7.176

- 1 **Racon:**
Cape Bowling Green Light (19°20'S 147°26'E) (7.36).
For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 7.92)

7.177

- 1 From a position 1¾ miles SW of Nares Rock (19°46'S 148°22'E) (7.92), the preferred route shown on the chart leads NW on 303½°. Tracks between this and the outer preferred route converge in this vicinity. The track passes (positions from Cape Upstart (19°42'S 147°45'E)):
SW of Holbourne Island (34 miles E) (7.34), thence:
NE of the outer approaches to the port of Abbot Point (21½ miles ESE) (7.155), thence:
NE of Cape Upstart (7.35), thence:
SW of Pakhoi Bank (17½ miles NNE) (7.36), thence:
SW of a light-buoy (isolated danger) marking an historic wreck site (25 miles NNW) (7.9), thence:
- 2

NE of Cape Bowling Green (31½ miles NW) distant 5½ miles, and clear of the off-lying dangers; see description at 7.36 and Caution at 7.3.
(*Directions continue, for the Inner Route at 8.35 and for Port of Townsville at 8.109*)

Anchorage and rivers

General information

7.178

- 1 All rivers and creeks on this stretch of coast are restricted for access by shallow sand bars. Aids to inshore navigation are very limited.
Local knowledge, which must be recent, is essential.
Caution. The rivers and creeks in the vicinity of the mouth of Burdekin River swarm with alligators.

Abbot Bay

7.179

- 1 **Anchorage** may be obtained on the E side of the bay; see 7.164.
The SW side of the bay is shoal, with depths of less than 5 m over a bank extending up to 2 miles offshore from the mouth of Elliot River. Camp Island (19°51'S 147°54'E), grass-covered, and a below-water coral reef 1½ miles farther ESE with a 1.1 m patch between; lie on the edge of this bank.
A **submarine power cable** is laid between Camp Island and the shore.

Upstart Bay

7.180

- 1 Anchorage may be obtained in depths of 7 to 13 m, sand and mud, off a small sandy beach with good landing, close S of Cape Upstart (19°42'S 147°45'E). In strong SE winds a swell sometimes sets in round the cape.
Depths of less than 5 m extend up to 1¼ mile offshore for a distance of 2½ miles farther S. A light is displayed from the S headland of Flagstaff Bay, 3 miles S of the cape.
- 2 The SE corner of the bay is formed by Nobbies Inlet which extends inland midway across the low-lying ground S of Station Hill. The mouth of the inlet and adjacent shores of the bay are fronted by mud banks drying up to 1 mile offshore, with depths of less than 5 m extending 2½ miles farther into the bay.
Molongle Creek (19°50'S 147°42'E), on the S shore of Upstart Bay, is marked by a light-buoy (port hand) in the approach and a light, visible 167°–173°, on shore.
Local knowledge is required.

Burdekin River

7.181

- 1 Burdekin River, entered 9 miles W of Cape Upstart (19°42'S 147°45'E), is approximately 440 miles in length and is one of the longest rivers in Queensland. Entry is made through the S channel; the middle and N of the three entrances are obstructed by bars of drying sand which break in E winds and can only be crossed in boats. Within the river there are depths of 0.9 m for a distance of about 6 miles. The towns of Home Hill and Ayr lie near the S and N banks about 11 miles upstream.
- 1 **7.182**
Mount Inkerman (19°45'S 147°30'E), conical and prominent, standing SW of the river mouth, and Beach Hill (148 m in height), prominent from E, standing 5½ miles farther E, are the only natural features of any height rising above the river delta and above the low, swampy and

mangrove-covered coastal belt extending NNW from there to Cape Bowling Green.

- 2 In 1978 it was reported that all entrance channels to the river had changed considerably from those shown on the chart. A sector light, 1¼ miles SE of Beach Hill, marks the present navigable S entrance to the river through Groper Creek; Saltwater Creek joins Groper Creek in the vicinity of Beach Hill. Peters Channel, the charted middle channel entered 4¼ miles NNE of Beach Hill and passing N of Peters Island, should be disregarded. The entrance to Ana Branch, the N channel passing N of Rita Island, is charted 7½ miles N of Beach Hill.

- 3 There are two concrete ramps, a concrete jetty and pile moorings for ten small craft up to 15 m LOA on the S shore of Groper Creek about 5 miles above its entrance.

Plantation Creek

7.183

- 1 Plantation Creek (19°31'S 147°32'E) is navigable by

small craft drawing less than 2.1 m, but sandbanks fronting the entrance are subject to frequent change, especially after SE winds. A light (19°29'S 147°31'E) (7.184) stands on the coast in the vicinity.

Ocean, Kalamia and Alva Creeks

7.184

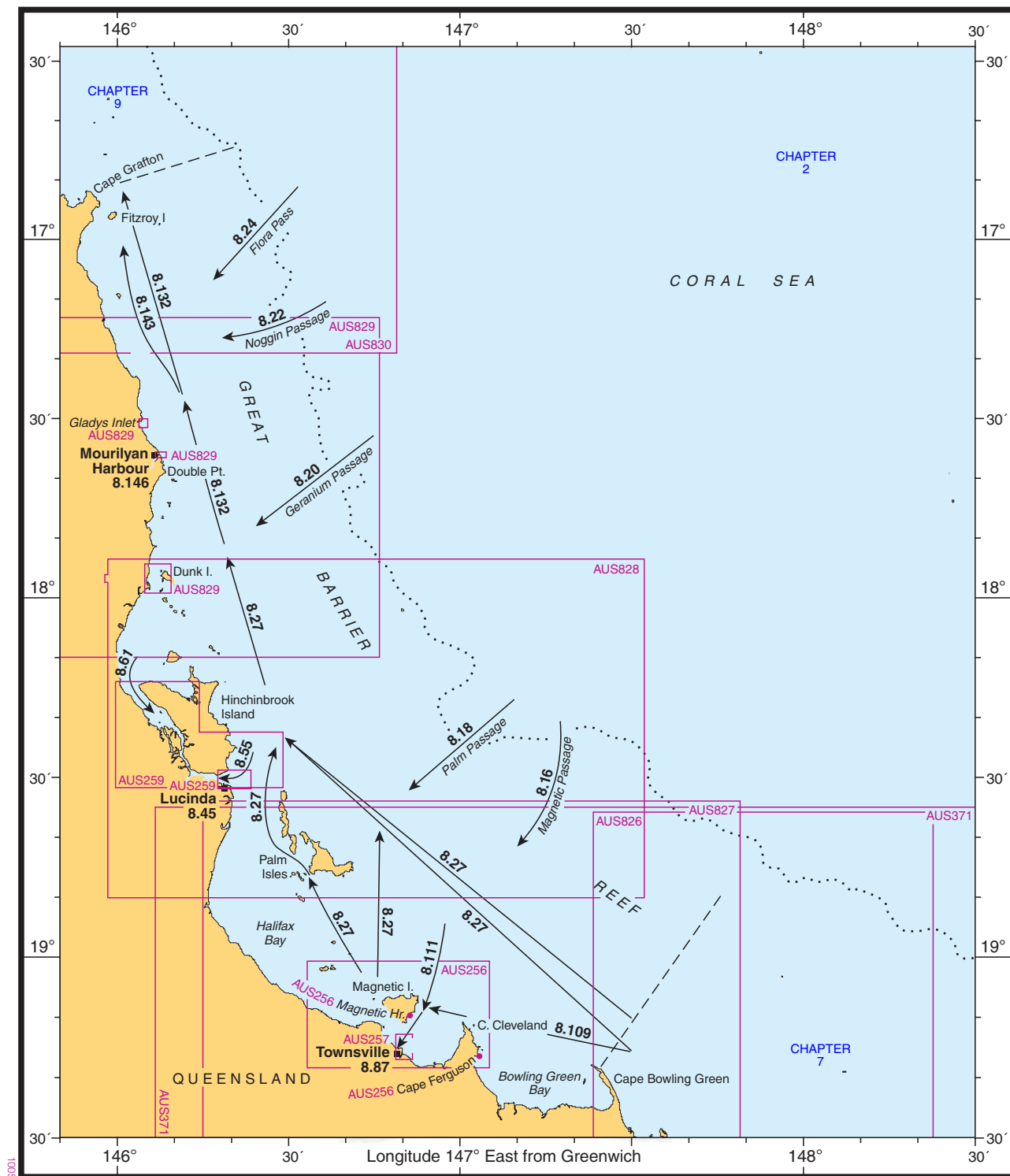
- 1 Ocean and Alva Creeks enter the sea about 2 miles SE and 1½ miles NNW respectively of the entrance to Kalamia Creek (19°29'S 147°30'E). A light is displayed from the coast at the N entrance to Ocean Creek. The village of Lynch's Beach stands close N of the entrance to Alva Creek.

All three creeks are fronted by drying sandbanks, intersected by intricate channels through which boats can pass at half tide in fine weather. Winds from E cause the sea to break heavily over the banks, with breakers extending 1 mile offshore and blind rollers beyond.





Chapter 8 - Cape Bowling Green to Cape Grafton



CHAPTER 8

CAPE BOWLING GREEN TO CAPE GRAFTON

GENERAL INFORMATION

*Chart Aus 4620***Scope of chapter****8.1**

- 1 This chapter covers that part of the Inner Route leading from Cape Bowling Green (19°18'S 147°24'E) to Cape Grafton (16°52'S 145°55'E). The area covered includes the off-lying Great Barrier Reef from the N side of Flinders Passage to Flora Pass, the major port of Townsville, the ports of Lucinda and Mourilyan Harbour.

Routes**8.2**

- 1 From Cape Bowling Green, where there is a choice of distance at which that cape should be passed, the Inner Route leads generally NNW for 170 miles through relatively open waters between the mainland and off-lying islands on the one side, and the inner edge of Great Barrier Reef on the other. There is a succession of good marks to assist navigation. Attention is drawn to 7.3 advising caution in the vicinity of Cape Bowling Green.

Several passages through Great Barrier Reef give access from Coral Sea to the Inner Route.

Topography**8.3**

- 1 From abreast Cape Bowling Green the mainland coast recedes W into Bowling Green, Cleveland and Halifax Bays until abreast Lucinda (18°32'S 146°20'E), from whence to Cape Grafton its features become more relevant to navigation of the Inner Route. The general pattern throughout the area covered by this chapter is of a low coastal belt broken irregularly by high promontories and backed by almost continuous ranges of hills and mountains which rise variously from between the coast itself to about 15 miles inland. There are higher summits in the N part than in the S.
- 2 Magnetic Island, Palm Isles and Hinchinbrook Island are the largest and highest of the islands and island groups lying offshore which, with the exception of Fitzroy Island

(16°56'S 146°00'E), all lie within the 20 m coastal depth contour.

Pilotage**8.4**

- 1 See 1.26.

Ship reporting system**8.5**

- 1 For details of Torres Strait and Great Barrier Reef ship reporting system, see 1.89 and *Admiralty List of Radio Signals Volume 6(4)*.

Marine protected area**8.6**

- 1 The whole area covered by this chapter is a part of Great Barrier Reef Marine Park, which is itself a Marine Protected Area. Some restrictions on access and use may apply: see 1.72 and 1.74.

Designated Shipping Area**8.7**

- 1 Within this chapter are Designated Shipping Areas, for further information see 1.74 and *Australian Seafarers Handbook*.

Particularly Sensitive Sea Area**8.8**

- 1 The whole area of this chapter is within Great Barrier Reef Marine Park which is an IMO approved Particularly Sensitive Sea Area (PSSA). The area is shown on the relevant charts. For further details see 1.71 and *Australian Seafarers Handbook*.

Flow**8.9**

- 1 **Tidal streams** set generally S through the area on the rising tide and N on the falling tide; local variations to the general pattern are described in the appropriate parts of the text.

Currents: see 1.144 for a general description of currents in the area.

GREAT BARRIER REEF

GENERAL INFORMATION

*Charts Aus 371, Aus 372***Scope of the section****8.10**

- 1 Several passages through the barrier exist within the coverage of this section; they are described individually in succeeding paragraphs.

Outer edge**8.11**

- 1 The outer edge of Great Barrier Reef between the N entrance to Flinders Passage (18°45'S 147°59'E) and Flora Pass, 150 miles NW, is not fully known and has been examined only in places and to varying standards.

Inner edge**8.12**

- 1 The inner edge of the barrier is shown on the charts and has been surveyed to the standards required for safe navigation of the Inner Route. Navigation away from the Inner Route and across the barrier reef requires careful consideration of the reliability of surveys of the area, as shown in diagrams on the larger scale reference charts quoted or detailed in descriptions of recognised passages through the reefs.

Pilotage**8.13**

- 1 Pilotage is available only for Palm Passage.

Former mined areas

8.14

- 1 All the recognised passages from seaward through the reefs are former mined areas: see 1.5 for general remarks and Appendix II for details of the areas involved.

Currents

8.15

- 1 Guidance on currents to be expected inside Great Barrier Reef is given as a note on chart Aus 372. A general description of the currents in Coral Sea and off the E coast of the Australian continent is given at 1.144. Currents over the barrier are variable and imperfectly known, but there is a general pattern of flow which conforms to the direction of channels between the reefs.

PASSAGES THROUGH THE REEFS

Magnetic Passage

Chart Aus 828

General information

8.16

- 1 **Route.** Magnetic Passage is entered between Myrmidon Reef (18°16'S 147°23'E) and Needle Reef, 11 miles WSW, and from there leads generally S for 26 miles. The passage is only partially marked and requires great care. In 1927 it was used by HMAS *Sydney* (6830 tonnes) and reported to be preferable to Flinders Passage.

Unexploded ordnance on the seabed is charted in an area adjacent to Myrmidon Reef and also in the vicinities of Keeper Reef (18°45'S 147°16'E) and John Brewer Reef near the SW end of the passage. The significance of these areas is explained in a note on the chart.

- 2 **Historic wreck** (1.70), within a protected area, lies towards the SW end of Myrmidon Reef (18°16'S 147°23'E).

Currents set ESE between the outer reefs but their influence is generally lost after passing S of the latitude of Needle Reef.

Other aid to navigation

Racon: Pith Reef Light (18°13'S 147°01'E).

Directions

8.17

- 1 From a position in the approaches, a safe distance NW of Myrmidon Reef (18°16'S 147°23'E) and N of the 200 m depth contour, the track leads S passing (positions from Glow Reef (18°31'S 147°24'E)):

W of Myrmidon Reef (14½ miles N); an automatic weather station (black metal tower, 10 m in height) stands on the S part of the reef. Thence:

- 2 E of Thimble Shoal (12 miles NW). Needle Reef, the W entrance point to the passage and lying 3 miles farther WNW, is difficult to see; thence:

W of Faraday Reef (6 miles NNW). An unexamined shoal with a depth of 12 m over it, 2 miles farther N, is the N-most danger in an area of irregular depths extending from the N side of the reef; thence:

- 3 W of Glow Reef. Cotton Shoal, with a least depth of 2.3 m over it, lies 2 miles N of the reef.

The track then leads SSW, passing:

ESE of French Reef (9½ miles W), marked by a rock awash (charted as a small drying reef); the reef is the E-most danger of The Slashers Reefs, so-named after three troopships, carrying a regiment popularly known as The Slashers,

stranded on them in 1842. Large boulders (drying 2.7 m) on Hopkinson Reef (11 miles W), make a good mark. Thence:

- 4 WNW of Helix Reef (7½ miles SW), thence: Between Keeper Reef (14 miles SSW) and Lodestone Reef, 8½ miles farther WNW (8.35); these reefs together mark the S entrance to the passage.

Course may then be directed to join the Inner Route, or as otherwise required.

Useful mark:

Pith Reef Light (18°13'S 147°01'E) (8.19). Light may be out of range on some approaches.

Palm Passage

General information

8.18

- 1 **Route.** Palm Passage is entered between Thread Shoal (18°20'S 147°11'E) and Pith Reef 11 miles NW, and from there leads SW for 21 miles towards Palm Isles. The passage is marked at each end by a light and is reported to be simple to navigate and safe in reduced visibility.

Depths in the fairway are well in excess of any controlling depths for the Inner Route or Queensland ports.

- 2 **Pilotage** is available but is not compulsory. It is only provided in daylight hours by land-on helicopter, subject to aircraft availability. There are no other restrictions. The boarding ground is 5 miles E of Pith Reef (18°13'S 147°01'E) as shown on the chart. See *Admiralty List of Radio Signals Volume 6(4)* for further details. Alternative pilotage services are available at Grafton Passage (16°39'S 146°15'E) (9.22).

- 3 **Tidal streams.** Within the passage the stream, if any, follows the direction of the channel.

Other aid to navigation

Racon: Pith Reef Light (18°13'S 147°01'E).

Directions

8.19

- 1 From seaward the 200 m depth contour should be crossed in the vicinity of a position 9 miles ENE of Pith Reef (18°13'S 147°01'E). The track then leads SW, passing (positions from Urchin Shoal (18°21'S 147°05'E)):

SE of Pith Reef (8 miles NNW), lying on an area of foul ground; Pith Reef Light (stainless steel framework tower on concrete piles; 28 m in height) stands on the reef; thence:

- 2 NW of Urchin Shoal, thence:

NW of Kelso Reef (6½ miles SW), the NW-most danger of The Slashers Reefs; thence:

SE of Trunk Reef (12 miles W), well-defined on its E side and easily seen except at the SW end; thence:

- 3 NW of Rib Reef (14 miles SW) distant 1½ miles. The reef lies in the middle of the SW end of the passage; the channel between it and Little Kelso Reef, 6 miles farther E, is also navigable. Rib Reef Light (white GRP hut on concrete column; 9 m in height) stands on the reef.

- 4 **Leading mark:**

Mount Bentley (18°45'S 146°37'E) (8.36) bearing 217° then leads SW to join the Inner Route, passing SE of Bramble Reef (18°26'S 146°44'E) which marks the N side of the SW entrance to Palm Passage.

Useful mark:

- 5 Fantome Island S summit (201 m in height) (18°42'S 146°31'E), bearing 230° astern, was reported to be

a useful mark for maintaining track and visible for 30 miles during an outbound transit of the passage by HMAS *Duchess* (2610 tonnes) in 1972.

Geranium Passage

Chart Aus 829

General information

8.20

- 1 Geranium Passage is entered between Armistice Reef (17°40'S 146°43'E) and Sharon Shoal 5½ miles NNW, from where it leads W then SW for a total of 20 miles. The passage has been surveyed to standards compatible with those of the Inner Route to which it leads, and is shown on the chart as an area preferred for navigation.

Directions

8.21

- 1 From a position E of the seaward entrance to the passage, the track leads W, passing (positions from Gilbey Reef (17°35'S 146°35'E)):
 - Between Armistice Reef (8½ miles SE) and Sharon Shoal (4½ miles E), thence:
 - N of a 15 m patch (4½ miles SSE), the N-most charted danger in an area of irregular depths lying between Armistice Reef and Potter Reef, 8 miles farther W; thence:
- 2 S of Gilbey Reef.
The track then leads SW, passing:
 - NW of Potter Reef (4½ miles S), and;
 - SE of Adelaide Reef, thence:
 - Between Eddy Reef (12 miles SW) and Ellison Reef 2½ miles farther NW, which together mark the SW entrance to the passage.
 Course may then be directed to join the Inner Route, or as otherwise required.

Noggin Passage

Chart Aus 830

General information

8.22

- 1 Noggin Passage is entered between Raaf Shoals (17°11'S 146°33'E) and Noggin Reef 4½ miles NW and leads WSW for 15 miles towards the Inner Route. The passage has been surveyed to standards compatible with those of the Inner Route.

Directions

8.23

- 1 From a position E of Noggin Reef (17°08'S 146°28'E) and to seaward of the 100 m depth contour, the track leads generally WSW, passing (positions from Coates Reef (17°12'S 146°22'E)):
 - Clear of a 7.8 m shoal (11½ miles ENE), thence:
 - NNW of Raaf Shoals (9½ miles E), thence:

- 2 SSE of a 6.2 m shoal (7 miles ENE), the outermost charted danger SE of Noggin Reef; thence:
 - NNW of a 9.3 m patch (7 miles E), the N-most charted danger off Hedley Reef, thence:
 - SSE of an 6.8 m patch (4 miles ENE), thence:
 - Clear of a 16.5 m patch (3 miles E) lying in mid-channel, as required by draught or prudence; thence:
 - SSE of Coates Reef, and:
 - 3 NNW of an isolated 16.4 m patch (2 miles SSE), thence:
 - NNW of Gibson Reef (2½ miles S), thence:
 - Between Jackson Patches (4¾ miles SW), difficult to see unless the light is good, and Flora Reef (3 miles W); these features mark the W entrance to Noggin Passage.
 - 4 Course may then be directed to join the Inner Route, or as otherwise required.
- Useful marks:**
- Peaks in Bellenden Ker Range (17°15'S 145°50'E) (8.142) (also on charts Aus 829, Aus 372).
 - Russell Island (17°14'S 146°06'E) (8.140).

Flora Pass

General information

8.24

- 1 Flora Pass is entered between Channel Reef (16°56'S 146°27'E) and North West Reef 4¼ miles NW, from where it leads SW for 19 miles to join the Inner Route. The pass has been surveyed to standards compatible with those of the Inner Route.
 - 2 **Caution** is necessary approaching the pass from E as the mainland, although high, is often obscured by haze. The passage should not be attempted unless a vessel's position is known beyond doubt.
- Exercise area.** A military exercise area exists close S of the SW entrance to Flora Pass.

Directions

8.25

- 1 From a position midway between Channel and North West Reefs, the track leads 220° towards a position 2 miles SE of Russell Island Light (17°14'S 146°06'E) (8.140). The track passes (positions from the E extremity of Sudbury Reef (17°00'S 146°17'E)):
 - SE of the SE edge of Sudbury Reef, and:
 - NW of a 9.1 m patch (5½ miles SE), the N-most charted danger off Maori Reef, thence:
 - 2 NW of Maori Reef (6 miles SSE), thence:
 - NW of Flora Reef (10 miles S) (8.23), marking the SE side of the SW entrance to the pass; and:
 - SE of Scott Reef (6 miles SW), marking the NW side of the entrance. A deep channel, 1 mile in width, separates Scott and Sudbury Reefs.
- Course may then be continued SW towards the position SE of Russell Island Light, within the charted two way route, or as otherwise required.

INNER ROUTE FROM CAPE BOWLING GREEN TO CAPE GRAFTON

GENERAL INFORMATION

Charts Aus 371, Aus 372, Aus 373

Scope of the section

8.26

- 1 This section describes several routes from Cape Bowling Green (19°18'S 147°24'E) to Cape Grafton (16°52'S 145°55'E) 172 miles NW. Also described are the ports of Lucinda (18°32'S 146°22'E), Townsville (19°15'S 146°50'E), and Mourilyan Harbour (17°36'S 146°08'E), together with several minor harbours and anchorages along the coast in this section.

CAPE BOWLING GREEN TO DUNK ISLAND

General information

Charts Aus 827, Aus 828

Route

8.27

- 1 From the vicinity of Cape Bowling Green (19°18'S 147°24'E) the route leads through relatively open water to a position abreast Dunk Island, 107 miles NW. The least navigable width lies between Brook Islands (18°09'S 146°17'E) and Kennedy Shoal, 8½ miles ENE. The tracks shown on chart Aus 827 are for preferred routes which have not been surveyed to the IMO/IHO standards required for their classification as recommended tracks; see note on the chart. On chart Aus 828 the two way route shown indicates the best and safest route for all vessels having regard to charted depths and dangers. Its use is not mandatory, see note on the chart.

Topography

8.28

- 1 The mainland coast between Cape Bowling Green and Lucinda Point, 76 miles NW, is shaped by the bights of Bowling Green Bay, Cleveland Bay and Halifax Bay. The land adjacent to Cape Bowling Green is low, flat and swampy, but this gives way S of Cape Cleveland (19°11'S 147°01'E) to Saddle Mountain, 15½ miles S of the cape, which is saddle-shaped; Mount Eliot 4 miles farther SW, which has a level summit 1 mile in length; and Sharp Eliot, 4 miles farther SSE, with a remarkable sharp top. These distinctive features mark the SE end of high ground, which includes Hervey and Paluma Ranges, stretching NW and rising abruptly from the coastal belt adjoining Cleveland and Halifax Bays. The coast itself is generally low and sandy, or in places fringed with mangroves. The NW end of this high ground is marked by Mount Houston (18°55'S 146°12'E); from there to Lucinda Point is an extensive coastal plain.
- 2 Magnetic Island, fronting Cleveland Bay, and Palm Isles, fronting the N part of Halifax Bay, are the outer and most significant of the offshore islands.
From Lucinda Point (18°32'S 146°20'E) the high ground of Hinchinbrook Island (8.33), 2½ miles farther N, is prominent.
- 3 On the mainland, immediately W of Hinchinbrook Island, Mount Leach, Mac Allister and Cardwell Ranges

rise close to the coast and extend NW as far as Mount Carruchan (18°11'S 145°53'E), which stands on an E spur of Cardwell Range. From there on an extensive plain, mostly marshy, stretches behind the sandy shore of Rockingham Bay until the land rises again N of the Tully River (18°02'S 146°03'E).

Between Hinchinbrook Island and Dunk Island, 14 miles N, Brook Islands and Family Islands lie offshore, fronting Rockingham Bay.

Unexploded ordnance

8.29

- 1 See 8.16.

Exercise area

8.30

- 1 A military exercise area exists in the S part of Halifax Bay (19°00'S 146°35'E) (see 1.9).

Historic wreck

8.31

- 1 An historic wreck (1.70), within a protected area, lies 2½ miles NNW of Kennedy Shoal (18°04'6S 146°30'0E).

Tidal stream

8.32

- 1 The general pattern of tidal stream in the area is described at 8.9. On each side of and between Palm Isles the stream sets between S and SW on the rising tide at spring rates of up to 3 kn. These rates can be exceeded in the narrow parts of channels between islands.

Landmark

8.33

- 1 Hinchinbrook Island (18°20'S 146°15'E), easily distinguished by its height and bold appearance. The island is mountainous and rugged, the summits and sides of the mountains being bare, with numerous small waterfalls, and the valleys thickly wooded. Descriptions of the most prominent peaks are given in the appropriate part of Directions below.

Other aid to navigation

8.34

- 1 **Racon:**
Cape Bowling Green Light (19°20'S 147°26'E) (7.36).
For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 7.37 or 7.177)

8.35

- 1 From positions abreast Cape Bowling Green (19°18'S 147°24'E) (7.36), the two preferred routes shown on the chart lead NW and slowly converge, passing (positions from the NE extremity of Magnetic Island (19°07'S 146°53'E)):
NE of Cape Cleveland (8½ miles ESE) (8.109),
thence:
NE of Magnetic Island (8.88), thence:

- 2 SW of Lodestone Reef (27½ miles NNE), lying on the W side of the S entrance to Magnetic Passage (8.16); several rocks on the reef show up well at LW, appearing from a distance like beacons; thence:

SW of John Brewer Reef (29 miles NNE), named after a fourth troopship to strand on The Slashers Reefs (8.17), 5 miles farther N, in 1842.

Useful mark:

Cape Cleveland Light (19°11'0S 147°00'9E) (8.107).

8.36

- 1 From the position SW of John Brewer Reef the preferred routes continue NW, passing (positions from Pelorus Island (18°33'S 146°30'E)):

NE of Albino Rock (17½ miles SE); a light (white square concrete tower; 5 m in height) stands on the rock. Chilcott Rocks, 1 mile farther S are two rocks close together and steep-to. Thence:

- 2 NE of South East Cape (16 miles SE) at the extremity of Great Palm Island, the largest of Palm Isles. The coast of the island is for the most part fringed with drying reefs; the interior is thickly wooded and rises to its highest point at Mount Bentley, 5 miles WNW of the cape. An ill-defined peak (444 m in height) stands on a ridge between the two. Thence:

- 3 NE of Electra Head (15 miles SE), a bold and steep headland. Hayman Rock, 4 cables E of the head, dries but does not always break when covered; thence:

NE of Sinballa Point (Elk Cliff) (9 miles SE), 76 m in height; a summit (294 m in height) 1 mile SSW of the point, is the highest on the ridge extending N from Mount Bentley; thence:

- 4 NE of Wallaby (Nullaree) Point (8 miles SSE), cliff-faced and steep-to, the N extremity of Great Palm Island; thence:

NE of Curacoa (Noogoo) Island (6 miles SSE), its NE side steep-to with a narrow fringing reef and cliffs rising to a grassy table-topped summit; thence:

SW of Bramble Reef (12 miles NE) (8.19), thence:

- 5 NE of Pelorus Island, wooded and steep-to.

The track then continues to the vicinity of a position 7½ miles N of Pelorus Island.

Useful mark:

Rib Reef Light (18°29'S 146°53'E) (8.19).

8.37

- 1 The track then leads NNW as a two-way route, the use of which is not mandatory (see note on the chart), passing (positions from Cape Sandwich (18°14'S 146°18'E)):

ENE of Hillock Point (12 miles SSE), the E extremity of Hinchinbrook Island and connected to it by a narrow sandbank; thence:

- 2 ENE of Eva Island (1¼ miles E), wooded, the E-most danger off Cape Sandwich. Channel Rock (2 m in height), lies 3 cables W of the island. A second ridge rising to a summit (334 m in height) 2 miles WSW of the extremity of the cape gives it the appearance, from a distance SE or NNW, of two wedge-shaped hills with a gap between. Thence:

- 3 ENE of South Island (4½ miles N), cliff-faced and steep-to on its E side; South Island Light (white framework tower, 18 m in height) stands on the island. The island is the SE-most of the four Brook Islands, all lying on a drying coral reef, extending 1¼ miles farther NW. Tween Island, the

smallest, lies between Middle and North Islands. And:

WSW of Kennedy Shoal (12½ miles NE) and the historic wreck site (8.31), thence:

- 4 ENE of Hudson Island (12 miles NNW), reef-fringed, cliffy and wooded, the SE-most of Family Islands, seven in number and all rocky. Budg-Joo (Bowden) Island and Smith Island, both wooded, lie on a drying reef 3 cables N of Hudson Island; the remaining islands of the group which comprise Coombe, Wheeler, Richards and Thorpe Islands, form a chain extending 5½ miles NW. Thence:

- 5 ENE of Woln Garin Island (17 miles NNW), the outer danger SE of Dunk Island. The SE extremity of the latter island, 1½ cables NW, is cliff-faced and rises to Poie-Koo-Kee, a hill 80 m in height, connected to the main part of the island by a low neck of land. Thence:

- 6 ENE of Dunk (Coonanglebah) Island (also 17 miles NNW), wooded, with two peaks and its E and NE coasts steep and rocky; the higher N peak (243 m in height) rises near Toogan-Toogan Point, the N extremity of the island.

Useful marks:

- 7 Mount Straloch (18°27'S 146°17'E), the S peak on Hinchinbrook Island which, being slightly lower than the mountains N, is more frequently clear of cloud and a good mark from seaward.

Mount Diamantina (18°26'S 146°18'E), a smooth round-topped mountain; a prominent boulder, 20 m in height, stands near the summit.

Mount Bowen (18°22'S 146°16'E), the highest point on Hinchinbrook Island.

- 8 Nina Peak (18°20'S 146°17'E), the most remarkable of three well-defined peaks on a spur extending NNE from Mount Bowen.

Barra Castle Hill (18°18'S 146°11'E), an unmistakable square-topped hill.

Mount Pitt (18°16'S 146°08'E), well-defined and the NW peak of Hinchinbrook Island.

(Directions continue at 8.139)

Side channels

Charts Aus 827, Aus 828

Inshore of Palm Isles

8.38

- 1 **General information.** Coasters N-bound from Townsville make regular use of an inshore route across Halifax Bay passing inshore of Palm Isles. The S part of the track passes through an exercise area (8.30).

8.39

- 1 **Directions. Bay Rock to Steamer Passage.** From a position 2½ cables E of Bay Rock (19°07'0S 146°45'2E) (8.121), in the N entrance to West Channel, the track leads NNW, passing (positions from Miranda Point (18°46'S 146°35'E)):

- 2 ENE of Cordelia Rocks (14¾ miles SSE), distant 1½ miles. Little Cordelia Rock, 5.5 m in height, lies close NE of Big Cordelia Rock (24 m in height) and cliff-faced, to which it is joined by a reef; a below-water rock lies about ½ cable ESE of the former. The rocks should not be approached within 5 cables on their W sides. Herald Island, 3 miles SW of Cordelia Rocks, is relatively

- steep—to on its NE side; a rounded grassy hill rises near each of the S and N ends of the island.
- 3 The track is then adjusted to pass through Steamer Passage (1 mile W), passing:

ENE of a 3.9 m patch (13 miles SSE), thence;
ENE of Acheron Island (12 miles SSE), steep—to at its E end only; a grassy hill rises near each of the E and W ends of the island, with a hillock in the valley between; thence:

- 4 ENE of Havannah Island (4½ miles SSW), with two peaks on it of a similar height, separated by a low gap; the SE peak is well-defined, the NW one has a flattish top and slopes to a sandy point at the NW end of the island. A drying coral reef extends up to 2½ cables from both NE and SW sides of the island. Thence:

- 5 ENE of Fly Island (4½ miles SW), covered with low scrub; there are below-water rocks within 4 cables of the W end of the islet.

The same track then leads through Steamer Passage, passing:

WSW of Miranda Point, formed by two round-topped wooded hills and marking the SW side of Great Palm Island (8.36); and:

- 6 ENE of Eclipse (Garoogubbee) Island (1½ miles W), flat-topped and sloping to a sandy point at its NW end. The island is fringed by a drying reef which is steep—to on all but its N side. Brisk (Culgarool), Falcon (Carboorool) and Esk (Soopun) Islands, lying within 2 miles W of Eclipse Island, are all wooded.

- 7 **Useful marks:**

Mount Frederick (19°24'S 146°38'E) (chart Aus 371) and South Pinnacle 8 cables SSE, two well-defined, white-topped mountains.

Mount Black (19°17'S 146°34'E).

Albino Rock Light (18°46'S 146°43'E) (8.36).

- 8 Two remarkable conical peaks on a ridge extending SW from Mount Bentley (18°45'S 146°37'E) (8.36); the E peak, 514 m in height, rises 1 mile W of Mount Bentley; the W peak (410 m in height), known as Mount Lindsay, stands 7 cables farther SW. Both can be readily identified from the offing.

8.40

- 1 **Directions. Steamer Passage to Hillock Point.** The track then leads NW, passing (positions from Pelorus Island (18°33'S 146°30'E)):

NE of a below-water rock (11¾ miles S), the outermost charted danger lying N of Falcon and Esk Islands; thence:

- 2 SW of Fantome (Eumilli) Island (6 miles S), with two wooded summits separated by a low, narrow neck of land; thence:

SW of Harrier Point (6¼ miles S) distant about 1½ miles. The point is the S extremity of Orpheus Island.

The track then leads NNW, passing:

- 3 WSW of Orpheus (Goolboddi) Island (5 cables S), formed of three wooded summits with low, narrow necks of land between. Iris Point is the N extremity of the island. Thence:

WSW of Pelorus Island (8.36) distant about 2½ miles. Tidal streams runs strongly between Orpheus and Pelorus Islands, usually setting NW on the rising tide, contrary to expectation.

The track then leads N, passing:

4

E of Lucinda offshore berth (6 miles WNW) (8.64), thence:

E of Hillock Point (10½ miles NW) (8.37) from whence course may adjusted to join the Inner Route as required.

Useful marks:

Mount Cordelia (18°37'S 146°14'E) (8.54).

Lucinda bulk storage sheds (18°31'6S 146°19'8E) (8.53).

Chart Aus 827

From Bay Rock east of Palm Isles

8.41

- 1 **Directions.** From a position 2½ cables E of Bay Rock (19°07'0S 146°45'2E) (8.121), in the N entrance to West Channel, the track leads N, clear of an exercise area (8.30) and passing (positions from Albino Rock (18°46'S 146°43'E)):

E of Cordelia Rocks (13½ miles S) (8.39), thence:

E of Chilcott Rocks (1 mile S) (8.36), thence:

E of Albino Rock (8.36) distant 3 miles.

Course may then be directed as required to join the Inner Route.

Useful marks are described at 8.39.

Calliope Channel

8.42

- 1 **General information.** Calliope (Bulgoomin) Channel lies between Wallaby Point (18°41'S 146°34'E) (8.36) and Curacoa Island 4½ cables WNW. The channel is navigable but not recommended.

Local knowledge is required.

Natural conditions.

Tidal streams in the channel are strong as indicated on the chart.

Winds are squally.

8.43

- 1 **Directions.** From a position a convenient and safe distance N of Wallaby Point, the track leads generally SSW, favouring the WNW side of the channel, and passing (positions from Wallaby Point):

ESE of the narrow and steep—to drying reef fringing the E side of Curacoa Island (4½ cables WNW) (8.36), and:

WNW of Wallaby Point (8.36), and:

Clear WNW of rocks (below water and awash) (1 mile SSW), lying up to 1 mile off the W side of Great Palm Island.

Curacoa Channel

8.44

- 1 **General information.** Curacoa Channel lies between Curacoa Island (18°40'S 146°33'E) (8.36) and Fantome Island 1 mile W (8.40). The E side of the latter is partly fringed by a narrow drying reef, and steep—to.

Tidal streams in the channel are strong, as indicated on the chart.

Port of Lucinda

Charts Aus 259, Aus 828

General information

8.45

- 1 **Position and function.** The port of Lucinda is centred on Lucinda Point (18°32'S 146°20'E) and functions primarily for the export of bulk raw sugar through an offshore terminal.

Sugar Terminal berth

Molasses Terminal
(disused)

Sheds

Port of Lucinda from NNW (8.45)

(Original dated 1999)

8.46

- 1 **Topography.** The dominant feature of the port is the high ground of Hinchinbrook Island (18°20'S 146°15'E) (8.33). Lucinda Point, with the town and port complex of Lucinda standing on it, is low. The coast S of Lucinda Point and the shores of Hinchinbrook Channel extending NW from it, are low and fringed with mangroves. George Point (18°29'S 146°20'E), at the SE extremity of Hinchinbrook Island, is low, sandy and wooded until rising abruptly to Mount Straloch (8.37).

On the W side of Hinchinbrook Channel, the low coastal belt is backed by the high ground of Mount Leach and Cardwell Ranges.

8.47

- 1 **Port limits.** Limits of the Lucinda Pilotage Area are shown on the charts.

8.48

- 1 **Approach and entry.** The offshore berth is approached from the Inner Route, passing N of Palm Isles. Waters in the approach from S inshore of Palm Isles, have not been adequately surveyed.

- 2 Inner parts of the port may be approached through the N entrance to Hinchinbrook Channel which is fronted by a bar lying between Gould Island (18°10'S 146°10'E) and the mainland W. Before closure of the inshore berth at Lucinda Point this channel was in regular use by vessels up to a reported maximum size of 6770 tonnes and 7.3 m draught. The S entrance to Hinchinbrook Channel is obstructed by an extensive shallow bar, across which there are two possible channels.

- 3 **Cautions.** Buoys and beacons in Hinchinbrook Channel are liable to be out of position or missing after bad weather or freshets from the rivers and creeks flowing into the channel.

The S entrance to Hinchinbrook Channel should not be attempted unless the leads can be properly identified whilst still to seaward of the bar; nor should it be attempted after bad weather and freshets. In either case it is wiser to use the N entrance to the channel from Rockingham Bay.

- 4 **Pearl farms,** consisting of floating or fixed structures marked by buoys and beacons, which may be lit, exist in Hinchinbrook Channel. The farms and their associated moorings should be avoided.

8.49

- 1 **Traffic.** In 2004 the offshore berth handled 21 vessels totalling 779 814 dwt.

8.50

- 1 **Port authority.** Ports Corporation of Queensland, PO Box 409, Brisbane, Queensland 4001.
Website: www.pcq.com.au
Email: portbris@portbris.com.au

Limiting conditions**8.51**

- 1 **Controlling depths:**

Sea to offshore berth 13.6 m.

Hinchinbrook Channel 4 m.

Depths are liable to change: information is promulgated from time to time in *Australian Temporary Notices to Mariners*.

The bottom in Hinchinbrook Channel is mud and sand.

- 2 **Tidal levels.** See information in *Admiralty Tide Tables*. Mean spring range about 2.2 m; mean neap range about 0.6 m.

Maximum size of vessel handled. The largest vessel handled has been of 31 661 grt and 215 m LOA. The offshore berth is designed to accommodate vessels up to 40 000 dwt, 225 m LOA and 12.3 m draught.

- 3 **Local weather and sea state.** During SE winds the offshore berth and the S entrance to Hinchinbrook Channel are sheltered from the swell by Palm Isles. Fresh NE winds however cause a heavy surf to break over the bar fronting the S entrance.

The N entrance to Hinchinbrook Channel is sheltered from all except N winds; even these seldom blow hard and raise but little sea.

Arrival information**8.52**

- 1 **Outer anchorages.** There is good holding ground everywhere, and no known dangers, between the offshore berth (18°31'S 146°23'E) and Palm Isles 6 miles ESE. The chart should however be consulted for an indication of the reliability of the surveys in the waters S of Lucinda. Anchorage is recommended in the pilot boarding ground 1½ miles NNE of the offshore berth, on the line of the Lucinda Point Leading lights (8.56).

- 2 **Prohibited anchorage** exists within 2 cables of the offshore berth and the conveyor jetty leading to it.

Pilotage is compulsory for the offshore berth and is arranged through Cairns (9.58). The boarding ground is 1½ miles NNE of the head of the berth as indicated on the charts.

Pilots for Hinchinbrook Channel may be embarked as above or in the N entrance 7½ cables W of Hecate Point (18°15'S 146°04'E). See *Admiralty List of Radio Signals Volume 6(4)*

- 3 **Tugs** are required for all movements at the offshore berth; they are provided from neighbouring ports.

Local knowledge is required for Hinchinbrook Channel whether entered from S or N.

Quarantine. Lucinda is a first port of entry: see 1.64 for extracts from the Quarantine Act.

Vessels proceeding to the offshore berth may be granted pratique alongside. The quarantine anchorage for Hinchinbrook Channel lies within its N entrance between lines drawn 270° from Hecate Point (18°15'S 146°04'E) and from Scraggy Point, 3 miles SE.

Harbour

8.53

- 1 **General layout.** The bulk sugar terminal consists of a large storage area on Lucinda Point (18°32'S 146°20'E) with a covered trestle conveyor jetty extending 3 miles E to a single offshore loading berth.

The inshore berth at Lucinda Point itself, formerly the molasses terminal, was closed to commercial operations in 1989.



Lucinda Bulk Sugar Terminal berth (8.53)

(Original dated 1999)

- 2 **Tidal streams** in the vicinity of the offshore berth can be expected to conform to those described at 8.32.

On the rising tide an in-going stream sets through both S and N entrances to Hinchinbrook Channel at a rate between 1 and 3 kn; the two streams meet between Haycock Island (18°28'4S 146°13'0E) and Leafe Peak, 2 miles NNW.

- 3 **Landmarks:**

Bulk storage sheds (18°31'6S 146°19'8E) standing 3 cables W of Lucinda Point; adjacent tanks and a tower are also conspicuous.

Directions

8.54

- 1 **Offshore berth.** From a position a convenient distance not less than 5 miles ENE of Lucinda Point (18°32'S 146°20'E), the track leads WSW in open water direct to the pilot boarding ground, 4 miles ENE of the point and

1½ miles NNE of the berth. Course may then be directed as required for berthing. A light is displayed from the N end of the berth.

Caution. An obstruction, with a depth of 12 m over it, lies ¾ cable NNE of the N end of the berth.

- 2 **Clearing marks.** Cape Sandwich (18°14'S 146°18'E) (8.37) bearing NNW and kept open E of Hillock Point (8.37) (11 miles SSE of the cape), clears ENE of the bar fronting the S entrance to Hinchinbrook Channel.

Useful marks:

Mount Cordelia (18°37'S 146°14'E), an isolated hill appearing from the offing as an island.

- 3 The Thumb (18°22'S 146°17'E), a pointed rock prominent from SSE, standing alone on the E side of Mount Bowen (8.37).

8.55

- 1 **Hinchinbrook Channel south entrance:** see cautions at 8.48 and clearing marks above. There are two possible tracks across the bar.

8.56

- 1 **Lucinda Point Leading lights:**

Front light (white triangular topmark, point up) (18°31'5S 146°20'5E), situated on the N side of the conveyor jetty, 6 cables from its inner end.

Rear light (tower, 21 m in height; white triangular topmark, point down) (775 m WSW of front light), standing on Lucinda Point.

- 2 From the vicinity of the pilot boarding ground (3½ miles ENE of the front light), the alignment (247½°) of the above lights (also displayed by day), leads WSW across the S part of the bar in a least charted depth of 0.6 m, passing (positions from the front leading light):

NNW of No 19 Light-buoy (safe water) (2½ miles ENE), marking the outer end of the fairway, thence:

- 3 NNW of the head of the offshore berth (2½ miles E).

Leading mark. When the front leading light is distant 2½ cables, the track leads W with the head of the inshore berth (6 cables W) bearing 270°; a light is displayed from each end of the berth. The track leads direct to the berth.

Caution. The shoal, with a small drying patch, lying ½ cable N of Lucinda inshore berth, has extended S over a long period into the channel.

8.57

- 1 From a position between NNE and NE distant about 4 miles from Lucinda Point (18°32'S 146°20'E) a second track leads generally SW across the bar, passing (positions from Lucinda Point):

Clear of a bank, with depths less than 2 m over it, (3 miles NNE), forming the outer danger E of George Point (2½ miles N) (8.46) as shown on the chart; thence:

- 2 SE of a drying sandbank extending SE from George Point, in depths of more than 5 m.

Course should then be directed S or as otherwise dictated by local knowledge, towards the deeper water E of Lucinda inshore berth.

8.58

- 1 **Approaches to Hinchinbrook Channel north entrance.**

Approaching from S having passed at least 5 cables E of Eva Island (18°14'S 146°20'E) the track then leads NW into Rockingham Bay, passing (positions from Cape Richards (18°12'S 146°14'E)):

NE of Eva Island (6 miles ESE) (8.37), Channel Rock (2 m in height) and Cape Sandwich; tidal streams set strongly between the rock and the cape; thence:

- 2 SW of Brook Islands (4½ miles NE) (8.37), and:

Clear of Brook Shoal (3 miles NE) as prudence dictates, and:

NE of Cape Richards, a promontory at the N extremity of Hinchinbrook Island connected by a low, sandy neck of land to Kirkville Hills, 165 m in height, 1 mile S. Thence:

- 3 NE of Goold Island (2½ miles NW), steep and rocky on its NE and NW sides and standing at the outer end of a bank, with depths of less than 5 m over it, extending from the N side of Hinchinbrook Island. Passage S of Goold Island is restricted to small craft.

The track then leads W, passing N of Goold Island.

- 4 **Clearing marks.** South Island (5 miles ENE) (8.37) bearing E and astern, kept open N of Goold Island, passes clear of the N edge of the bank on which Goold Island stands.

When Hecate Point (9½ miles WSW), a long low mangrove-covered point with high ground rising abruptly 1 mile E of it, bears 187°, the track leads SSW on 197°.

- 5 **Leading marks:**

Front mark, the W slope of Thorpe Island (13½ miles NNW).

Rear mark, the summit of Dunk Island (243 m in height) (3 miles NNE of the front mark).

The front mark bearing 017° astern, just open E of the rear mark, leads SSW in a least charted depth over the bar of 5.5 m (1990), passing:

- 6 WNW of Garden Island (4½ miles W), sparsely wooded and fringed with drying and below-water rocks; Sail Rock, close S of the island, is white and prominent.

When the S extremity of Garden Island opens N of Cape Richards, the track leads S on 188°.

- 7 **Leading mark.** A tower (elevation 225 m) (12 miles SW), prominent and standing on an E slope of Cardwell Range, bearing 188°, leads S to the N entrance to Hinchinbrook Channel and the pilot boarding ground, passing W of No 2 Light-buoy (port hand) and about 6 cables W of Hecate Point. A stranded wreck 3 cables S of Hecate Point is marked by a light-beacon (special). **8.59**

- 1 **Channel south of Goold Island.** The bank S of Goold Island (18°10'S 146°10'E) has a least charted depth of 1.9 m (1990) in the fairway and may be crossed by small craft.

Keeping clear of Brook Shoal (18°09'6S 146°15'7E) and from a position 5 cables N of Cape Richards (18°12'S 146°14'E), the track leads W, passing (positions from Cape Richards):

- 2 S of Sail Rock (4½ miles W) (8.58) distant 3 cables. The alignment, (072°) astern, of the S extremity of Goold Island with the S extremity of North Island, 6½ miles farther ENE (8.37), then leads WSW until Hecate Point (9 miles WSW) bears 180°.

Course may then be directed as required for Hinchinbrook Channel or for Cardwell.

8.60

- 1 **Approaching from N,** from a position on the Inner Route E of Hudson Island (18°03'S 146°12'E), the track leads SW as required into Rockingham Bay to join the tracks described above, passing between Hudson Island (8.37) and Brook Islands (8.37) 6½ miles SE.

8.61

- 1 **Hinchinbrook Channel.** From a position 7 cables WSW of Hecate Point (18°15'S 146°04'E) (8.58) the recommended track shown on the chart leads SE on 144°,

passing (positions from Mangrove Island (18°19'S 146°08'E)):

NE of the town of Cardwell (7 miles WNW); Mount Elphinstone, about 183 m in height and standing 1½ miles W of Cardwell jetty, is the highest summit of a small range of hills backing the town. Thence:

- 2 NE of No 1 Light-buoy (starboard hand) (5¼ miles NW), which is moored at the head of a channel marked by light-beacons (lateral), leading NW to Port Hinchinbrook Marina, thence:

NE of a light-buoy (special) (3½ miles WNW), marking an obstruction; thence:

SW of Scraggy Point (2¾ miles NW).

The track then continues SE, passing:

SW of No 6 Light-buoy (port hand) (3 cables WSW), marking the edge of the bank on which Mangrove Island stands, thence:

- 3 SW of No 8 Light-buoy (port hand) (1 mile SSE), thence:

NE of No 3 Light-buoy (starboard hand) (2¼ miles SE).

Mendel Directional Light. The line of bearing (135°) of Mendel Directional Light (5¼ miles SE) then leads SE, passing:

NE of Anchorage Point (3¼ miles SE), the NE extremity of an extensive area of mangrove islands on the W and S sides of the channel; thence:

- 4 NE of a bank, with a least charted depth of 0.3 m over it, (4½ miles SE); the chart shows deeper water close NE of the bank; thence:

NE and round E of No 5 Light-buoy (starboard hand) (5¼ miles SE).

Useful mark:

Round Hill (18°22'S 146°07'E).

8.62

- 1 **Deluge Leading Lights.** The alignment (184°) of a pair of lights (18°25'3S 146°11'7E) leads S for 1¼ miles, passing (positions from Haycock Island (18°28'4S 146°13'0E)):

W of No 10 Light-buoy (port hand) (4¼ miles NNW), marking shoal depths on the E side of the channel.

The track then leads SSE.

- 2 **Leading mark.** The summit of Leaf Peak (2 miles NNW) bearing SSE and open slightly W of No 12 Light-beacon, (port hand) (3 miles NNW), standing at the foot of Wilkin Hill, leads in mid-channel.

When No 12 Light-beacon is distant 4 cables the track leads S in mid-channel, passing E of No 7 light-buoy (starboard hand) and rounding the point abreast Leaf Peak at a distance of 1 cable.

- 3 The track then leads generally SSE in mid-channel adjusting as required to keep in the deeper water and passing:

WSW of Haycock Island distant ½ cable. The island lies in mid-channel and is marked by No 14 Light-beacon (port hand). Thence:

WSW of No 16 light-buoy (port hand) (7 cables SSE), moored off Reis Point.

- 4 The track then leads ESE, passing:

NNE of No 9 Light-buoy (starboard hand) (1½ miles SE), marking the outer limit of shoal depths in the entrance to the Seymour River.

Seymour Leading Lights. A pair of lights (1¼ miles S), standing on the W side of the entrance to the Seymour River.

- 5 **Bluff Leading marks.** Front mark a light (special) (4½ miles ESE); rear mark a beacon close E of the light. The alignments (269¾°), astern, of Seymour Leading Lights and (089¾°) of Bluff Leading marks, both lead E from the vicinity of No 9 Light-buoy, passing:
S of The Bluff (4 miles ESE), cliff-faced; and:
N of No 11 Light-buoy (starboard hand) (4¼ miles ESE) marking a 1.8 m patch.

8.63

- 1 The track then leads ESE, passing (positions from Lucinda Point (18°32'S 146°20'E)):
SSW of Bluff Leading marks (¾ miles NW) above, at a distance of 1 cable offshore, thence:
NNE of No 13 Light-buoy (starboard hand) (¾ miles NW), thence:
Between No 15 and 18 Light-buoys (lateral) (2 miles NW), marking the fairway across an inner bar where the controlling depth (8.51) for Hinchinbrook Channel is found.
- 2 **Leading Light-beacons:**
Front light (white triangular topmark, point up; black stripe) (5 cables WNW).
Rear light (similar but point down) (77 m SE of front light).
The alignment (143½°) of the above lights leads SE towards Lucinda, passing:
NE of Dungeness Bank (1 mile WNW), and:
SW of No 20 Light-buoy (port hand) (8 cables NW).
- 3 The track then leads ESE, passing:
SSW of No 22 Light-buoy (port hand) (5½ cables NW), marking the S edge of shoal depths: see caution at 8.56. Thence, with the above beacon (8½ cables WNW) bearing 281° astern:
Close NNE of the head of the inshore berth (4 cables NW), or as otherwise required.

Berths

8.64

- 1 **Offshore berth (Bulk Sugar Terminal)** (3 miles E of Lucinda Point (18°32'S 146°20'E)). The wharf face is 213 m in length, providing a berthing length of 341 m between outer mooring dolphins; depth alongside is given at 8.51.
Inshore berth (4 cables NW of Lucinda Point). An L-shaped concrete wharf with a berthing face 133 m in length and a depth alongside of 9.0 m. Disused and reported in disrepair since 1989.

Port services

8.65

- 1 **Repairs.** No facilities.
Other facilities. Doctor and dentist available at Lucinda; hospital at Ingham (18°39'S 146°10'E) (chart Aus 372), distant 29 km by road. No facilities for the disposal of oily waste.
Supplies. Provisions may be obtained in small quantities. Fuel and fresh water not available at the offshore berth.
Communications. Nearest airport Ingham 29 km.

Rivers

8.66

- 1 **Herbert River** enters the S end of Hinchinbrook Channel 6 cables NNW of Dungeness village (18°31'4S 146°19'2E) through its E entrance, known as Enterprise Channel. From abreast Dungeness a branch flows NW

passing S of Tide Gauge Islet thence E of Oyster Rock to enter Hinchinbrook Channel 1¼ miles NW of Dungeness. The river is navigable on a rising tide by small craft with draught not exceeding 1.8 m for about 6 miles to a road bridge which crosses at the town of Halifax (18°35'S 146°17'E). Seaforth Channel (18°31'S 146°16'E) is not apparently navigable.

- 2 **Local knowledge** is essential.

Tidal streams can set strongly across the channels and it is advisable to enter the river only as the stream slackens towards HW.

Facilities on the E bank of the river abreast Dungeness consist of a concrete jetty with landing steps and a least depth of 1.8 m alongside, and a concrete boat ramp.

8.67

- 1 **Seymour River** enters Hinchinbrook Channel about 1 mile SSE of Reis Point (18°29'S 146°13'E) and is navigable for a distance of 7 miles at HW springs by small craft with draught not exceeding 1.8 m. There is a depth of 0.3 m over a bar at the entrance and the channel dries in places farther upstream.

Local knowledge is essential.

Anchorage and harbours

Chart 827

Cape Bowling Green

8.68

- 1 Anchorage may be obtained in the sheltered but shallow E part of Bowling Green Bay. Vessels of appropriate draught may find shelter from SE winds in depths of 4 m, WNW of Cape Bowling Green Light (19°20'S 147°26'E) (7.36) and under the lee of the cape.
Larger vessels may obtain shelter to leeward of a sandspit, the outer part of which dries 0.7 m, extending 3½ miles WSW from the same light.
Local knowledge is required. Care is necessary in the approaches and at the anchorages; see Caution at 7.3.

Chart Aus 256

Cape Ferguson

8.69

- 1 A small breakwater and a jetty for the use of research vessels are situated on the S side of Cape Ferguson (19°16'6S 147°03'7E) at the N entrance point to Chunda Bay, which is filled by a drying sandbank and fringed with mangroves. A light (white rectangular daymark, 4 m in height) stands at the head of the breakwater. Red obstruction lights are displayed from a radio mast (chart Aus 827), with an elevation of 157 m, standing 3 miles SSW of Cape Ferguson.
- 2 Bare Islet, 1¼ miles NNE of Cape Ferguson, and Bray Islet 7 cables farther NW, lie in the approaches from N; both are steep-to. Bald Islet, 1 cable NE of the N side of the cape, is the E-most known danger close in.

Townsville anchorages

8.70

- 1 See 8.95 for details of outer anchorages within the port limits of Townsville.

Charts Aus 256, Aus 827

Rattlesnake Island

8.71

- 1 **General information.** Rattlesnake Island (19°02'S 146°37'E) rises to a rounded grassy summit near its centre. The E extremity of the island is relatively steep-to but elsewhere foul ground extends up to 4 cables offshore. Herald Island (8.39) lies 4½ cables E and Bramble Rock,

itself rock-fringed, lies 5 cables NE of the island; Lorne Reef, 7 cables W, consists of one below-water and one drying rock.

- 2 Phillips Reef, 3 miles N of Rattlesnake Island, over which there is a depth of 1.1 m, is the nearest charted danger N of the anchorage.

The island and anchorage lie within an exercise area (8.30).

Anchorage in depths of 7 to 9 m may be obtained in SE winds $7\frac{1}{2}$ cables NW of the summit of Rattlesnake Island.

Charts Aus 827, Aus 828

Challenger Bay

8.72

- 1 **General information.** Challenger (Gowyarowa) Bay ($18^{\circ}44'S$ $146^{\circ}34'E$) lies on the W side of Great Palm Island (8.36) which is fringed with drying reefs and foul ground.

Anchorage may be obtained $2\frac{1}{4}$ miles NNW of Miranda Point ($18^{\circ}46'S$ $146^{\circ}35'E$), off a small jetty in depths of 7 to 9 m as indicated on the chart.

Caution. A stranded wreck lies off the small jetty.

Juno Bay

8.73

- 1 **General information.** Juno Bay lies on the W side of Fantome Island ($18^{\circ}42'S$ $146^{\circ}31'E$) (8.40) and is fronted by drying reefs and below-water rocks extending up to 5 cables offshore. The N summit of the island (217 m in height) slopes NW to a low sandy plain on which there is a hillock which appears from a distance as an islet. A leprosy hospital stands on the hillock.
- 2 The NW extremity of Fantome Island is separated from Orpheus Island, 2 cables NW, by a narrow channel with a depth of 2.7 m between drying reefs fringing the shore on each side. Tidal streams through this channel are likely to be strong as indicated on the chart.
- 3 **Anchorage** may be obtained in depths of 11 to 15 m, mud, $1\frac{1}{4}$ miles SSW of the NW extremity of Fantome Island.

Pearl farms, consisting of floating or fixed structures marked by buoys and beacons, which may be lit, exist in Juno Bay. The farms and their associated moorings should be avoided.

Orpheus Island

8.74

- 1 **General information.** Hazard Bay ($18^{\circ}38'S$ $146^{\circ}29'E$) and Pioneer Bay, 2 miles farther N, lie on the W side of Orpheus Island (8.40). Drying reefs, with foul ground outside, extend up to 5 cables to seaward from the head of each bay. A jetty, 15 m in length and approached through a channel marked by a light-beacon (port hand) and small buoys, is situated in the N part of Hazard Bay, $2\frac{1}{4}$ miles N of Harrier Point.

Good **anchorage** may be obtained off both bays, $7\frac{1}{2}$ cables offshore, in depths of 13 m, coral.

Chart Aus 259

Cardwell

8.75

- 1 **Anchorage** may be obtained by small craft off Cardwell ($18^{\circ}16'S$ $146^{\circ}01'E$) (8.61). A concrete jetty which extends 200 m from shore has a light at its head, where there is a depth of 0.9 m alongside.

Chart Aus 828

Goold Island

8.76

- 1 **General information.** Goold Island ($18^{\circ}10'S$ $146^{\circ}10'E$) (8.58) lies in the S part of Rockingham Bay and in the approach to the N entrance to Hinchinbrook Channel. The SW coast of the island terminates in a low, narrow point where convenient landing may be made over a sandy beach.

A rock (1 m in height), close E of Garden Island, 6 cables farther SW, is conspicuous.

- 2 **Anchorage** in a depth of 6 m may be obtained by vessels of suitable draught $7\frac{1}{2}$ cables WSW of Hayman Point, the NW extremity of Goold Island. Directions given at 8.58 lead to the vicinity of the anchorage.

Richards Island

8.77

- 1 A small jetty and a few buildings stand at the W extremity of Richards Island ($18^{\circ}00'S$ $146^{\circ}09'E$) (8.37). There are depths of less than 2 m in the approach within $3\frac{1}{2}$ cables of the jetty.

Local knowledge is required.

Chart Aus 829 (see 1.15)

Dunk Island

8.78

- 1 **General information.** Dunk Island ($17^{\circ}57'S$ $146^{\circ}09'E$) (8.37) provides anchorage off its NW side.

A wooden jetty, with a depth of 1.8 m alongside, is situated on the S side of Brammo Bay on the NW side of the island; a rock which dries lies close NE of the jetty.

Local knowledge is required for any approach from S on account of depths and the reliability of survey.

- 2 **Submarine power cable** is laid from the W extremity of the island to South Mission Beach on the mainland $2\frac{1}{4}$ miles W.

Tidal streams through the anchorage set S on the rising and N on the falling tide. In 1937 observations from HMAS *Australia* (9870 tonnes) gave rates of $\frac{3}{4}$ kn in each direction; a N-going Trade Wind Current of $\frac{3}{4}$ kn was experienced at the same time.

8.79

- 1 **Directions.** From a position as convenient about 3 miles N of Toogan-Toogan Point ($17^{\circ}56'S$ $146^{\circ}09'E$) (8.37), the track leads SSW direct to the anchorage, passing (positions from Toogan-Toogan Point):

ESE of Clump Point ($4\frac{1}{2}$ miles NNW) (8.139) and its off-lying dangers, thence:

WNW of Mound (Purtaboi) Island (5 cables WNW), the outermost danger NW of Dunk Island.

- 2 **Useful mark:**

Tam O'Shanter Point ($17^{\circ}58'S$ $146^{\circ}06'E$), a promontory connected to the mainland by a low neck of land; the middle of three hills on the point is the highest.

Anchorage sheltered from SE winds may be obtained in depths of 9 to 15 m, good holding ground, 1 mile W or NW of Mound Island. Small craft may anchor SW of the island, clear of the submarine power cable, and obstruction, which lies 4 cables SSW.

Other rivers and creeks

Charts Aus 371, Aus 827

Barratta Creek

8.80

- 1 Barratta Creek ($19^{\circ}26'S$ $147^{\circ}15'E$) enters the sea on the S side of Bowling Green Bay where a spit, with a least

depth of 1.4 m over it, extends 6 miles to seaward. A mudbank which dries 1.6 m, obstructs the entrance to the creek.

The creek is unmarked. Obstruction lights are displayed from a radio mast (elevation 49 m (162 ft)) 7½ miles SE of the entrance.

Local knowledge is required.

Haughton River

8.81

- 1 Haughton River (19°24'S 147°08'E) enters the sea through drying sand flats in the SW corner of Bowling Green Bay. The village of Cunggulla stands at the W entrance point to the river. The river is obstructed by sandbanks at Connors Island, 2 miles above the entrance, but is navigable by small craft for 5 miles farther upstream.

Alligators are numerous in the river.

Local knowledge is required.

Eleanor Creek

8.82

- 1 Eleanor Creek (18°52'S 146°16'E) joins the S side of Cattle Creek 5 cables within the common entrance to the two creeks: the former is navigable by boats for a distance of 6 miles.

Local knowledge is required.

Chart Aus 828

Victoria Creek

8.83

- 1 Victoria Creek (18°37'S 146°20'E) is navigable by small craft and entered through a channel marked by light-buoys and a light-beacon, leading between drying sandbanks. The village of Cassady stands on the N bank, close within the entrance.

Local knowledge is required.

Charts Aus 828, Aus 829

Murray River

8.84

- 1 Murray River (18°05'S 146°02'E) has a bar of coarse shifting sand, with a depth of 0.3 m over it, lying 5 cables to seaward of the entrance. The river is navigable by vessels not exceeding 2.4 m draught for a distance of 8 miles to The Bluff, and by boats for 9 miles farther upstream.

Local knowledge is required.

Anchorage, with restricted swinging room and a depth of about 1.8 m, may be obtained close S of a sandspit at the N entrance point to the river.

Tully River

8.85

- 1 Tully River enters the sea on the S side of Tully Heads (18°02'S 146°03'E). There is a bar to seaward similar to that off Murray River above. The river is navigable for a distance of 3½ miles above the entrance by small craft not exceeding 1.8 m draught.

Local knowledge is required.

Charts Aus 828, Aus 829 (see 1.15)

Hull River

8.86

- 1 Hull River is entered between Hull Heads (18°00'S 146°04'E) and a grassy bluff 115 m in height on the N side; a light-beacon (white square topmark) stands at the N entrance point. The entrance is fronted by a mudbank which dries 0.4 m, but which is constantly changing. The

village of Googarra stands on Hull Heads; there is a jetty on the S bank, 5 cables farther WNW, and a boat ramp.

Local knowledge is required.

PORT OF TOWNSVILLE

General information

Charts Aus 257, Aus 256, Aus 827

Position and function

8.87

- 1 Townsville harbour (19°15'S 146°50'E) is situated on the SW side of Cleveland Bay and serves a large area of northern Queensland, for which it is the principal port. The town, which is large, is situated on both sides of Ross Creek, and extends from the slopes of Castle Hill (19°16'S 146°48'E) to the foothills of Mount Stuart, 5 miles SSW. In 2004, the population of Townsville was 140 100.

A fishing fleet operates from the port.

Topography

8.88

- 1 The head of Cleveland Bay, which is low-lying and fronted by mangroves, is surrounded by more dominant features of higher ground. Mount Cleveland rises on the E side of the bay; Mount Matthew (19°21'S 146°54'E) and Mount Stuart, 7 miles farther W, on the S side; Castle Hill rises close to the town, and Many Peaks Range terminates at Cape Pallarenda 4½ miles NNW. The off-lying Magnetic Island (19°08'S 146°50'E) is also high, being studded with thickly wooded peaks and covered with immense granite boulders; Mount Cook rises in the middle of the island.

Pilotage area limits

8.89

- 1 The limits of the Townsville pilotage area, shown on the chart, lie between a point on the coast 1½ miles WNW of Cape Pallarenda (19°11'4S 146°46'5E) and Cape Cleveland (19°10'9S 147°00'9E); they enclose Magnetic Island and the whole of Cleveland Bay.

Approach and entry

8.90

- 1 Cleveland Bay is approached from between ESE and NNW from the Inner Route. The preferred route shown on chart Aus 827 for the approach from ESE leads in a least charted depth of 13.1 m but greater depths may be obtained a little farther to seaward if required.

Townsville harbour is entered through dredged channels leading SSW for 7 miles from the E side of Magnetic Island. The channels are marked by leading lights and light-beacons. Coasters may approach the harbour through West Channel on the SW side of Magnetic Island.

Traffic

8.91

- 1 In 2004 the port handled 521 vessels totalling 13 394 035 dwt.

Port authority

8.92

- 1 Townsville Port Authority, PO Box 1031, Townsville, Queensland 4810.

Website: www.townsville-port.com.au

Email: info@townsville-port.com.au

Limiting conditions

8.93

- 1 **Controlling depths** throughout the port are subject to frequent change and are maintained where required by



Port of Townsville from N (8.87)

(Original dated prior to 2005)

(Photograph – Townsville Port Authority)

dredging. Available depths are promulgated regularly by *Australian Temporary Notices to Mariners*; the latest information may be obtained from the Harbour Master.

Available depths: (As charted)

Sea to Inner Harbour 11.7 m.

Outer Harbour arrival channel 8.5 m.

Outer Harbour departure channel 11.7 m.

Ross Creek 2.2 m.

Ross River Channel 2.5 m.

- 2 **Under-keel clearances.** An allowance of 0.9 m is required for all movements. A minimum clearance of 0.6 m is required at all berths.

Vertical clearance. Denham Street Bridge, with a vertical clearance of 2.2 m, spans Ross Creek 3 cables W of Platypus Channel Rear Leading Light (19°15'6S 146°49'4E); there are other bridges farther upstream. A road and rail bridge spans Ross River about 2 miles above its entrance.

Deepest and longest berths: No 2 and 3 Berths. See 8.124.

- 3 **Tidal levels.** See information in *Admiralty Tide Tables*. Mean spring range about 2.4 m; mean neap range about 0.6 m.

Density of water is reported to be 1.025 gm/cm³ with little variation.

Maximum size of vessel handled. The largest vessel to have entered the port has been of 85 180 grt, the longest 262 m LOA and the deepest 13.0 m draught. Vessels over 238 m LOA and 34 m beam may require special arrangements.

Arrival information

Notice of ETA

8.94

- 1 ETA and draught for vessels requiring a pilot should be sent at least 24 hours in advance.

Outer anchorages

8.95

- 1 **Cape Cleveland.** Anchorage for vessels of suitable draught may be obtained in SE winds off the W side of Cape Cleveland (19°10'9S 147°00'9E) (8.109), although at some distance offshore. Small craft may obtain good shelter closer to the cape in depths of 4 m.

In strong SE winds a heavy swell sets in round the cape which, combined with the out-going tidal stream, can cause heavy rolling.

8.96

- 1 **Cleveland Bay.** Holding ground is reported to be good throughout Cleveland Bay SW of a line from Cape Cleveland to Orchard Rocks, 8¼ miles WNW. Vessels awaiting a pilot have been recommended to anchor as convenient according to draught adjacent to the fairway light-beacons.

8.97

- 1 **Horseshoe Bay** lies on the N side of Magnetic Island between The Point (19°06'S 146°52'E) and White Rock, 1¾ miles W, which is easily identified. The head of the bay is fronted by a sandy beach behind which lies the village of Horseshoe Bay. There is a boat ramp in the SE corner of the bay.

Good anchorage for vessels of suitable draught, sheltered from all except N weather, may be obtained in a depth of 5 m in the E part of the bay, noting Sunken Rock 5 cables ESE of White Rock.

8.98

- 1 **Bremner Point.** Anchorage in a depth of 9 m with good holding ground may be obtained 6 cables SSW of Bremner Point (19°09'3S 146°52'3E). Explosives may be discharged to lighters at this anchorage.

Attention is drawn to the charted submarine power cables farther SW.

8.99

- 1 **Cape Pallarenda.** Coasters using West Channel may obtain good anchorage in a depth of 5 m, sheltered from NE winds, 1½ miles NNE of Cape Pallarenda (19°11'4S 146°46'5E).

Prohibited anchorage

8.100

- 1 Anchoring is prohibited in the approaches to the dredged channels, as shown on the chart.

Submarine pipeline and cables

8.101

- 1 Submarine pipelines cross West Channel (8.120), one laid from a position on shore, 7½ cables W of Kissing Point (19°14'S 146°48'E), to land at Magnetic Island 2 cables WNW of Nobby Head (8.131), and the other laid from 3½ cables S of Cape Pallarenda (8.121) NE to Magnetic Island.

Submarine power cables are laid between Kissing Point and the marina at the root of the Western Breakwater to land at Magnetic Island in Picnic Bay (8.131), Rocky Bay (19°10'S 146°51'E) and Nelly Bay (8.130) as shown on the chart.

Pilotage and tugs

8.102

- 1 **Pilotage** is compulsory except for exempted vessels. The outer boarding ground 'A', which is generally for vessels with draughts in excess of 8 m, is situated 3 miles NE of Bremner Point (19°09'3S 146°52'3E) as shown on the chart; the inner boarding ground 'B', also shown, is situated 3 miles E of the same point. Vessels will be advised which boarding ground is to be used. See *Admiralty List of Radio Signals Volume 6(4)*

Tugs are available and are allocated as may be deemed necessary by the Harbour Master.

Quarantine

8.103

- 1 Townsville is a first port of entry; see 1.64 for extracts from the Quarantine Act.

Harbour

General layout

8.104

- 1 The Inner Harbour is centred around the swinging basin (19°15'S 146°50'E), contained within breakwaters and lying at the entrance to Ross Creek; the Outer Harbour, consisting of a dredged area leading to an ore berth, lies 2½ cables NE of the Eastern Breakwater. Ross River enters the sea through a dredged channel 7½ cables SE of the swinging basin. Ross River and Creek are both used by vessels of appropriate size and draught.
- 2 A marina (19°15'2S 146°49'4E) situated at the root of Western Breakwater is approached by a channel, which has a depth of 3.0 m (2003), and marked by leading lights and a pair of light-beacons (lateral) at each end.

Visual signals

8.105

- 1 **Port closed signal.** A red occulting light, displayed by day or night from the Port Control Tower (19°15'S 146°50'E) (8.107), indicates that the port is closed either due to an emergency or to facilitate the movement of a

Castle Hill



Townsville Harbour (8.104)

(Original dated prior to 2005)

(Photograph – Townsville Port Authority)

large vessel. Further information may be obtained on VHF radio.

Berthing marks. A green flag by day and a green quick flashing light by day or night is used at the berths to indicate where a vessel's bridge should be positioned.

Natural conditions

8.106

- 1 **Tidal streams.** In October 1985 HMAS *Supply* (11 200 grt) experienced an in-going stream of 2 kn aligned with the channel when entering harbour 45 minutes before HW, midway between neaps and springs. On departure 3 hours after HW, 4 days before springs, an initial W-going set of 1 to 1½ kn was experienced across Platypus Channel, becoming WNW-going farther to seaward, then NW-going in Sea Channel.

Climatic table, see 1.192 and 1.202.

Principal marks

8.107

- 1 **Landmarks:**

Two bulk sugar storage sheds (19°15'S 146°50'E) and the Port Control Tower standing close NE.

Sheraton Hotel-Casino (19°15'1S 146°49'6E).

Major light:

Cape Cleveland Light (white round metal tower, red cupola; 11 m in height) (19°11'S 147°01'E).

Other aid to navigation

8.108

- 1 **Racon:**

Cape Bowling Green Light (19°20'S 147°26'E) (7.36).

For details see the relevant *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 7.177)

Approach from south-east

8.109

- 1 From a position 5½ miles ENE of Cape Bowling Green (19°18'S 147°24'E) (7.36) the preferred route shown on the chart leads WNW, passing (positions from Cape Cleveland (19°10'9S 147°00'9E)):

NNE of charted depths of 11 m (9½ miles E), thence: NNE of a charted depth of 12.8 m (5½ miles E), thence:

- 2 NNE of Salamander Reef (2¾ miles E), two steep-to drying rocks over which the sea nearly always breaks. A safe passage for small vessels rounding the cape closer inshore exists between Four Foot Rock which is steep-to, 1 mile WSW of the reef, and Twenty Foot Rock lying 8 cables farther WSW. Salamander Reef and Four Foot Rock are both covered by the red sector (259°-286°) of Cape Cleveland Light. Thence:

- 3 NNE of Cape Cleveland distant 3 miles. The cape is a narrow hilly point at the N extremity of a promontory extending from Mount Cleveland, 4½ miles S; Cape Cleveland Light (8.107) stands on the cape.

The track then leads either 8 miles WNW to the outer pilot boarding ground (8.102), passing N of a light-beacon

(N cardinal) (19°08'S 146°54'E) indicating the deeper water in the approach to Sea Channel; or 6¾ miles WSW to the inner pilot boarding ground (8.102).

8.110

- 1 **Useful marks:**

Cape Bowling Green Light (19°20'S 147°26'E) (7.36).

Mount Cook (19°08'4S 146°49'7E), the central and highest peak of Magnetic Island; an obstruction light is displayed from the summit.

Hawkings Point (19°11'S 146°51'E), the SE extremity of Magnetic Island.

Mount Marlow (19°12'S 146°44'E), the W summit of Many Peaks Range.

Castle Hill (19°16'S 146°48'E) (8.116).

Approach from north

8.111

- 1 From a position a convenient distance N of Magnetic Island (19°08'S 146°50'E) (8.88), the track leads between SSE and S as required, in open water to the vicinity of the required pilot boarding ground (see 8.102). The track passes:

- 2 E of the NE point of Magnetic Island. Orchard Rocks, which are plainly visible, and some below-water rocks, all within 2 cables of the point, are the outermost dangers. The E side of Magnetic Island, between there and Bremner Point 2½ miles farther SSW, is indented and otherwise generally rocky and steep-to.

8.112

- 1 **Useful marks:**

Cape Cleveland Light (19°11'0S 147°00'9E) (8.107).

Mount Cook (19°08'4S 146°49'7E) (8.110); when viewed from N a narrow valley may be seen separating the mountain from the range of hills on the E side of Magnetic Island.

Sea Channel and Platypus Channel

8.113

- 1 **Sea Channel Leading Lights:**

Front light, P4 Light-beacon (port hand) and direction light (19°11'8S 146°51'9E); a dredging side-mark, see below, stands adjacent on each side.

Rear light (isolated danger mark) and direction light (5 cables SSW of the front light; a dredging side-mark stands each side.

- 2 The alignment (201½°) of the above direction lights, (which may also be displayed by day), leads SSW from the vicinity of the outer pilot boarding ground through Sea Channel; the controlling depth for the passage into harbour is given at 8.93.

- 3 **Sea Channel dredging side-marks.** A light-beacon (pile; white rectangular daymark) stands each side of each of the above Sea Channel Leading Lights. The side light-beacons in line (201½°) mark the edges of the dredged channel, which is 92 m in width. The S-numbered light-beacons (lateral) marking the channel stand outside these limits.

- 4 The track passes (positions from Sea Channel Rear Leading Light):

WNW of the outermost light-beacon (5¼ miles NNE) (8.109), thence:

WNW of S2 Light-beacon (port hand) (4¼ miles NNE), marking the outer end of Sea Channel, thence:

WNW of S4 Light-beacon (port hand) ($3\frac{3}{4}$ miles NNE), thence:

- 5 Between S5 and S6 Light-beacons (lateral) (3 miles NNE), standing about 230 m apart, thence:

Between pairs of numbered light-beacons (lateral) to a position between P1 and P2 Light-beacons (8 cables NNE), marking the junction with Platypus Channel. Lighter-draught vessels may join the channel in this vicinity from the inner pilot boarding ground.

8.114

- 1 **Platypus Channel Leading Lights:**

Front light (white structure, red stripe) ($19^{\circ}14'9S$ $146^{\circ}49'8E$), standing in the entrance to Ross Creek.

Rear light ($7\frac{1}{2}$ cables SSW of the front light).

The alignment ($211\frac{1}{2}^{\circ}$) of the above lights (also displayed by day) leads SSW through Platypus Channel: the controlling depth for the passage into harbour is given at 8.93.

- 2 **Platypus Channel dredging side-marks** (positions from the above front leading light):

Front beacon ($2\frac{1}{2}$ cables NNE), standing close to the outer end of Western Breakwater.

Centre light-beacon (starboard hand) ($1\frac{1}{4}$ cables SW). Rear beacon ($5\frac{1}{4}$ cables SW).

- 3 The channel is 80 m wide. The above beacons in line bearing $211\frac{1}{2}^{\circ}$ indicate the W limits of the dredged width for the inner part of the channel. The pairs of P-numbered light-beacons (lateral) marking the channel stand outside these limits.

The track passes (positions from Platypus Channel front Leading Light):

- 4 Between pairs of numbered light-beacons (lateral) to a position between P11 and P12 Light-beacons ($1\frac{1}{2}$ miles NNE), marking the junction with West Channel; thence:

Between P13 and P14 light-beacons (lateral) (1 mile NNE).

Course may then be directed for the berth allocated or as otherwise required; see 8.115 for the approach to No 11 Berth.

- 5 **Lights in line** (positions from Platypus Channel front Leading Light):

Lights ($2\frac{3}{4}$ cables S), standing 20 m apart at the NE end of the bulk sugar sheds, in line bearing 199° indicate the centreline of the basin between No 9 and 10 Berths.

Lights ($1\frac{3}{4}$ cables SSE), standing 145 m apart near the head of Pier No 2, in line bearing 199° indicate the approximate centreline of the swinging basin parallel to the line of Berth Nos 2, 3 and 4.

8.115

- 1 **Outer Harbour Leading Lights:**

Front light ($19^{\circ}14'8S$ $146^{\circ}50'3E$).

Rear light (35 m S of front light).

The alignment ($184\frac{1}{4}^{\circ}$) of the above lights leads from a position in Platypus Channel between P13 and P14 Light-beacons (8.114) through the dredged approach to No 11 Berth.

8.116

- 1 **Useful mark:**

Castle Hill ($19^{\circ}15'5S$ $146^{\circ}48'1E$). An obstruction light is displayed from the summit. Seacom Tower, one of a group of radio towers, 5 cables NNW on the N slope of the hill, is also marked by an obstruction light.

Outer Harbour Departure Leading Lights

8.117

- 1 **Inner Departure Leading Light-beacons:**

Front: P13 Light-beacon (starboard hand) ($19^{\circ}14'0S$ $146^{\circ}50'3E$).

Rear: ($\frac{1}{2}$ cable N of front light).

The alignment ($004\frac{1}{4}^{\circ}$) of the above light-beacons (which may also be displayed by day) leads from No 11 Berth through the Outer Harbour departure channel.

- 2 **Outer Departure Leading Light-beacons:**

Front light ($19^{\circ}13'8S$ $146^{\circ}50'5E$).

Rear light ($\frac{1}{2}$ cable NNE of front light).

The alignment ($020\frac{1}{4}^{\circ}$) of the above light-beacons (which may also be displayed by day) leads from the inner departure leading line (above) into Platypus Channel.

Ross Creek

8.118

- 1 From a position in the swinging basin at the inshore end of Platypus Channel, the track continues leading SSW into Ross Creek.

Local knowledge is essential and must be recent, as depths are liable to change after freshets.

A rocky bar lies across the entrance to the creek in the vicinity of Platypus Channel Front Leading Light-beacon ($19^{\circ}14'9S$ $146^{\circ}49'8E$). The controlling depth for the creek is given at 8.93.

Ross River

8.119

- 1 **Leading light-beacons:**

Front light-beacon (white triangular topmark) ($19^{\circ}16'7S$ $146^{\circ}49'7E$), standing on the W shore of Ross River.

Rear light-beacon (similar topmark) (735 m SW of the front beacon).

- 2 From a position a convenient distance to seaward in Cleveland Bay, the alignment ($219\frac{1}{4}^{\circ}$) of the above lights (also displayed by day) leads SW, passing (positions from No 2 Light-beacon ($19^{\circ}15'2S$ $146^{\circ}51'0E$)):

Close NW of No 2 Light-beacon (port hand), marking the seaward end of Ross River Channel, dredged over a width of 30 m. The controlling depth is given at 8.93. Thence:

- 3 SE of an area which has been reclaimed ($2\frac{1}{2}$ cables SW); the area is enclosed by a rock retaining wall and marked on its SE side by two light-beacons (special); thence:

NW of No 4, 6 and 8 Light-beacons (port hand) (4, 8 and 12 cables SW), standing about 15 m outside the channel.

- 4 The track then follows the fairway within the river which continues generally SW and is marked initially by a light-buoy (port hand).

West Channel

8.120

- 1 From the vicinity of Bay Rock ($19^{\circ}07'0S$ $146^{\circ}45'2E$), West Channel leads SSE between Magnetic Island and the mainland SW to join Platypus Channel about 1 mile NNE of the harbour entrance. The channel has a least depth of 3.4 m passing SW of Middle Reef and may be used by coasters using the inshore route from N across Halifax Bay.

8.121

- 1 **Leading marks:**

Front mark: Bay Rock ($19^{\circ}07'0S$ $146^{\circ}45'2E$), from where a light is displayed; a rock shelf, with a

depth of 3.1 m over it, extends 2 cables SW from the rock.

Rear mark: Cordelia Rocks (19°00'S 146°41'E) (8.39) (chart Aus 827).

- 2 From a position to seaward of Bay Rock the line of bearing 331°, astern, of Cordelia Rocks passes 2½ cables E of Bay Rock from whence, keeping the rear mark open just E of the front mark, it leads SSE, passing (positions from Cape Pallarenda (19°11'4S 146°46'5E)):

WSW of West Point (3½ miles N), the W extremity of Magnetic Island; thence:

- 3 ENE of the E edge of a bank, with depths of less than 2 m over it with much of it drying, extending 2¼ miles NNW from the cape; thence:

WSW of the outer edge of a drying reef (1¾ miles NE), extending up to 9 cables from mangroves fronting the SW side of Magnetic Island; thence:

- 4 ENE of Cape Pallarenda, the E extremity of Many Peaks Range; conspicuous radar towers stand on high ground 5 and 8 cables W of the cape; the town of Pallarenda stands S of the cape; thence: WSW of a light-beacon (W cardinal) (1¾ miles E), distant 1 cable. The beacon marks the NW end of Middle Reef.

ENE of Virago Shoal (1½ miles SE), rock.

- 5 **Leading marks.** The line of bearing 122½° of P11 and P12 Light-beacons (19°13'6S 146°50'7E) (8.114), which are not quite in line on that bearing, then leads SE, passing:

SW of Middle Reef (2 miles E), marked at its SE end by a light-beacon (E cardinal), and:

NE of Kissing Point (3½ miles SSE) 33 m in height; a rock ledge extends 1 cable N.

The track then continues leading SE to the vicinity of P11 and P12 Light-beacons where course may be directed to join Platypus Channel or as otherwise required.

8.122

- 1 **Alternative track.** From a position abreast Cape Pallarenda on the track through West Channel described above, an alternative track leads between Middle Reef and Magnetic Island in a least charted depth of 3.3 m.

Leading marks. The line of bearing 117° of P7 and P8 Light-beacons (19°12'7S 146°51'3E), which are not quite in line on that bearing, leads ESE passing NNE of Middle Reef (2 miles E of Cape Pallarenda).

- 2 When the light-beacon (E cardinal) (2¾ miles ESE), marking the SE end of Middle Reef, bears SSW distant about 3 cables, the track leads SE on 144° to the vicinity of P11 and P12 Light-beacons.

Course may then be directed to join Platypus Channel or as otherwise required.

8.123

- 1 **Useful marks:**

Boulder (19°11'2S 146°44'9E), on the N fall of Many Peaks Range.

Stranded wreck (19°10'5S 146°49'5E).

Berths

Townsville harbour

8.124

- 1 There are nine berths in the Inner Harbour grouped around the swinging basin with a total length of about 1975 m. No 11 Berth lies in the Outer Harbour, 1¼ cables NE of Eastern Breakwater.

No 2 and 3 Berths together provide the longest continuous wharf, with a total length of 570 m and a depth of 12.2 m alongside.

No 1 Berth, on dolphins, is for tankers and bunkering; depth alongside 12.2 m.

- 2 No 10 Berth is the Ro-Ro terminal; decking 4.99 m above datum. A pad for angled Ro-Ro stern ramps is also available at No 4 Berth; decking 5.18 m above datum; depth alongside 9.7 m.

No 11 Berth (BHP), 240 m long with a depth alongside of 12.2 m, is used for loading ore.

The bottom throughout is silt and clay.

Depths declared in the berths are measured at 1 m off the wharf or fender face.

Ross Creek

8.125

- 1 The main wharves in the creek are situated on the N bank, opposite Platypus Channel Rear Leading Light (19°15'6S 146°49'4E). The berths are 213 m and about 110 m in length and are used principally by tourist launches. A boat harbour with pile moorings, a marina and boat ramps are also situated in the creek.

Ross River

8.126

- 1 Alongside berths may be found at Fishermans Wharf, a port authority wharf and some small private wharves. There is a marina and mooring areas for commercial vessels of appropriate size and draught.

Port services

8.127

- 1 **Repairs** can be effected. A slipway, with a modular cradle up to 64 m in length and adjacent ship repair workshop, is situated on the E side of Ross Creek, 4 cables SW of the Port Control Tower.

Additional repair facilities for vessels of suitable size and draught are available in Ross River.

Other facilities. Customs board at the pilot boarding grounds; hospital; deratting; garbage disposal. Disposal of oily waste can be arranged by road tanker.

- 2 **Supplies.** Fresh provisions; fresh water is supplied and shore power connections are provided to all main harbour berths.

Fuel oil can be supplied by pipeline to No 1, 7 and 9 berths, and distillate to No 1 berth; diesel is available. Supply can be made by road tanker to other berths.

Communications. Nearest airport 10 km.

Other rivers and harbours

Crocodile and Alligator Creeks

8.128

- 1 **Description.** Crocodile Creek (19°18'1S 146°57'5E) and Alligator Creek, 1 mile farther W, enter the sea through separate shallow channels between extensive drying sandbanks, backed by mangroves, at the head of Cleveland Bay. Depths increase within both entrances. Alligators are reported to be numerous.

Crocodile Creek has depths in the fairway of 1.8 m for a distance of 7 to 8 miles above the entrance. Land in the vicinity of the creek is mostly mangrove swamp and low grassland which covers at HW springs and during freshets.

- 2 **Alligator Creek** has depths of 2.4 to 3 m over the bar at HW springs, and is navigable for a distance of 5 miles by small craft with a draught of 1.8 m or less to the site of

a former meatworks. Land in the vicinity of the creek is grassland covered with gum trees.

Local knowledge is required.

Arcadia Boat Basin

8.129

- 1 **General information.** A boat basin, containing a vehicle ferry wharf and ramp, lies in Geoffrey Bay on the W side of Bremner Point (19°09'3S 146°52'3E). There is a separate jetty on the SW side of the same point. The boat basin is 46 m long and 55 m wide, with a depth of 1.8 m; piles mark the limits.

The approach to the basin is made on the alignment (326°) of Arcadia leading lights standing 3 cables WNW of Bremner Point: there is a width of 15 m in the entrance.

Magnetic Harbour

8.130

- 1 **General information.** A harbour, containing three jetties on its NE side, lies in Nelly Bay on the W side of Bright Point (19°09'6S 146°51'5E).

The approach and entry to the harbour is made through a channel with a depth of 3.4 m, marked by light-beacons (lateral), passing E of a light-beacon (E cardinal) (3½ cables SSW of Bright Point).

Anchoage is prohibited in the approach channel and within the harbour entrance, as shown on the plan.

Picnic Bay

8.131

- 1 **General information.** Picnic Bay lies between Hawkings Point (19°10'8S 146°50'9E) and Nobby Head, 5 cables W, and is surrounded by drying coral reef except in its entrance off Hawkings Point. A jetty on the W side of the bay has depths of 2 m alongside its head; there is a boat ramp and a village on shore.

Beacons at the root of the jetty, in line bearing 300° lead into the bay, passing between Hawkings Point and a light-beacon (port hand, pile) 2 cables SW.

DUNK ISLAND TO CAPE GRAFTON

General information

Charts Aus 829, Aus 830 (see 1.15)

Route

8.132

- 1 From the vicinity of Dunk Island (17°57'S 146°09'E) the route leads through relatively open water to a position off Cape Grafton, 65 miles NNW. The least navigable width occurs between Fitzroy Island (16°56'S 146°00'E) and Sudbury Reef, 8¼ miles ESE. The tracks shown on the reference charts are for a two-way route, the use of which is not mandatory; see notes on the charts.

Topography

8.133

- 1 From abreast Dunk Island to Cape Grafton, the mainland coast is generally wooded and alternates between low, flat and sometimes swampy land, and ranges of hills which rise abruptly from the coast. The low land is mostly fronted by sandy beaches and is sometimes interrupted by isolated hills, of which Bay Hill (17°46'S 146°05'E), Mount Brown 4½ miles N, and Double Point 5 miles farther NE, are examples.
- 2 Inland from the coastal belt there is a background of a continuous series of mountain ranges from the N side of Tully River (18°02'S 146°03'E). Mount Mackay (17°57'S

145°58'E) is a solitary peak; Mount Tyson, 4 miles WNW, is the S summit of Walter Hill Range, from where Francis and Bellenden Ker Ranges stretch N towards Cape Grafton.

- 3 Offshore are South and North Barnard Islands, Frankland Islands and Fitzroy Island which, in clear weather and together with the mainland features, provide a succession of good marks by day or night. Descriptions of these are given under Directions at 8.139.

Exercise area

8.134

- 1 A military exercise area exists SW of the W entrance to Noggin Passage (8.22); for further details see 1.9.

Historic wreck

8.135

- 1 An historic wreck (1.70), within a protected area, lies at the S edge of Scott Reef (17°05'S 146°11'E).

Tidal streams

8.136

- 1 The general pattern of tidal streams is described at 8.9. Streams in the vicinity of Frankland Islands (17°13'S 146°05'E) are probably not more than ¾ kn at springs and are influenced by the winds. Near Fitzroy Island (16°56'S 146°00'E) streams are similarly weak but the N-going stream setting towards Green Island, 10 miles N, must be guarded against.

Major light

8.137

- 1 Little Fitzroy Island Light (white GRP hut, 4 m in height) (16°55'S 146°00'E).

Other aid to navigation

8.138

- 1 **Racon:**
Stagg Patches (17°01'S 146°07'E) (8.140).
For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 8.37)

Dunk Island to Heath Point

8.139

- 1 From a position ENE of Dunk Island (17°57'S 146°09'E), the two-way route leads NNW, passing (positions from Kent Island (17°41'S 146°11'E):
ENE of Clump Point (11½ miles SSW), a low, narrow and rocky projection marking the N limit of foul ground which, from 2 miles SSW of the point, extends up to 6 cables offshore. The point may be identified by reference to Clump Mountain, 2 miles farther WNW. Thence:
2 WSW of Ellison Reef (11½ miles ESE) (8.21), the nearest part of the inner edge of Great Barrier Reef in this vicinity; and:
ENE of King Reefs (partly dries 2.4 m) (6 miles SSW), marking the SE extremity of a rocky flat which dries in places and extends up to 3½ miles to seaward of Murdering Point, low and covered by scrub. Care should be taken in this vicinity as a fresh SE wind, on a rising tide, produces a set inshore. Thence:
3 ENE of South Barnard Islands (4 miles SSW), lying on a drying reef and marking the NE edge of the rocky flat extending from Murdering Point. Sisters Island is in two parts, 29 and 4 m in height, connected at LW; Stephens Island, 4 cables farther N, is bold. Thence:

- 4 ENE of Kent Island, covered by scrub; Kent Island Light (white GRP tower on square concrete tower, 11 m in height) stands near the summit. A rock which dries, lying 3 cables ENE is the outermost danger E of the island and also of North Barnard Islands which extend 2 miles NW. Depths in the vicinity of these islands are irregular, and the channels between should not be used without local knowledge. Spiers Rock (below-water) lies midway between Bresnahan Island and Lindquist Island, which is in two parts. Thence:
- 5 ENE of Double Point (2¼ miles NW), 81 m in height, scrub-covered and rising in isolation from the surrounding low-lying land. Being the outermost point on this stretch of the mainland coast, it may be identified from about 25 miles N in clear weather. Foul ground extends SE from the point towards North Barnard Islands; an islet (25 m in height) lying close offshore 6 cables NW of the point is identifiable from the offing. Thence:
- 6 ENE of the entrance to Mourilyan Harbour (5¼ miles NNW), which is not easily identified except when the headlands are open of each other bearing between WNW and SW. Thence:
- ENE of Meaburn Rock (6½ miles N), steep-to except on its W side and marked by a light-buoy (S cardinal). Thence:
- 7 ENE of Heath Point (13 miles NNW) which rises steeply to Mount Maria, 293 m in height, the S summit of the thickly wooded Seymour Range. The point is identifiable from a distance N in clear weather. And:
- ENE of a bank (11 to 23 miles NNW), with depths of less than 5 m over it, which extends up to 2 miles offshore abreast Heath and Cooper Points. There are drying rocks in places on the bank; the outer edge is steep-to.

Heath Point to Cape Grafton

8.140

- 1 The two-way route continues NNW, passing (positions from Russell Island (17°14'S 146°06'E)):
- ENE of Cooper Point (10 miles S), rising to Mount Cooper, 294 m in height, 7 cables WNW and thence by a ridge to Mount Arthur, 3 miles WSW of the point. Mount Arthur is 498 m in height and the S summit of the densely wooded Graham Range. Thence:
- ENE of a wreck with a depth of 8.1 m over it (5½ miles S), thence:
- 2 ENE of Russell Island, the SE-most of Frankland Islands, steep and wooded at its S end and rock-fringed on all sides; Russell Island Light (white metal framework tower surmounted by white hut; 17 m in height) stands near the summit. A sandspit covered with casuarinas extends 2½ cables N from the island, with foul ground beyond; Outer Rock (2 m in height) close S and Round Island 6 cables NNW, are the immediate outer dangers respectively S and N of the island. Thence:
- 3 ENE of Normandy Island (1½ miles NW), a flat coral island with a rocky knoll, lying on a drying coral reef and connected at LW by a sandspit to Mabel Island, 2 cables S; both islands are covered with dense scrub. Normandy Island is the N-most

danger of the SE group of the Frankland Islands. Thence:

- 4 ENE of High Island (6 miles NW), the NW of Frankland Islands, wooded and rock-fringed except on its SE side; Tobias Spit (8.159) extends 1¼ miles N from the island. And:
- WSW of Scott Reef (9½ miles NNE) (8.25), the nearest part of the inner edge of Great Barrier Reef in this vicinity; thence:
- 5 WSW of Stag Patches (12½ miles N), which is marked by a light-beacon (GRP hut on white pile structure, 12 m in height) and which lies inshore of the edge of the barrier reefs.
- Clear of an obstruction and wreck with a depth of 21.9 m over it (16½ miles N), both lie in the two way route, thence:
- 6 ENE of Little Fitzroy Island (19 miles NNW), from where a light (8.137) is displayed, and which lies on a small spit of foul ground extending NE from the larger island. Fitzroy Island, close SW, is wooded nearly to its summit, steep-to and rocky; a disused lighthouse (white concrete tower 17 m in height) stands on high ground in the NE part of the island.

8.141

- 1 The two-way route then continues NW, to a position 3 miles NE of Cape Grafton (16°52'S 145°55'E). The cape is the N extremity of the outer ridge of a wooded promontory extending 5 miles NE from Murray Prior Range. The high ground of these features, and of Fitzroy Island (8.140), appears from a distance S or N in clear weather as a series of islands. The floors of the valleys on the promontory are low and not clearly visible beyond the range of the sea horizon.
- 2 Viewed from NE, Cape Grafton is distinguished by the two small peaks (358 and 376 m in height) near the W side of the outer ridge, and by a prominent brown scar on its NE side, 1¼ miles SE of the cape.

Useful marks

8.142

- 1 Bartle Frere South Peak (Mount Bartle Frere (chart Aus 372) (17°24'S 145°49'E), the S summit of Bellenden Ker Range.
- Bellenden Ker Centre Peak (17°16'S 145°51'E).
- Bell Peak North (17°05'S 145°53'E), part of the densely wooded Malbon Thompson Range rising steeply from the coast. Bell Peak South 1¼ miles SE, and Grey Peaks 2½ miles NNW, are also distinctive.
- 2 Mount Massie (Massey) (17°11'S 145°47'E).
- Walsh's Pyramid (17°08'S 145°48'E).
- Grant Hill (16°55'S 145°55'E), standing on the inner ridge of Cape Grafton promontory.
- Mount Gorton (16°57'S 145°52'E).
- May Peak (16°58'S 145°51'E), the highest summit of Murray Prior Range.

(Directions continue at 9.79)

Side Channel

Inshore route North Barnard Islands to Cape Grafton

8.143

- 1 From the Inner Route abreast Kent Island (17°41'S 146°11'E) an inshore track, which may be used in daylight and in good visibility, leads NNW to pass between Frankland Islands (17°13'S 146°05'E), thence inshore of

Fitzroy Island (16°56'S 146°00'E) to rejoin the Inner Route NE of Cape Grafton.

8.144

- 1 **Directions.** From the vicinity of a position 1¾ miles ENE of Kent Island (8.139) the Directions given in the same reference may be followed until passing Cooper Point 18 miles farther NNW.

Care should be taken to ensure that Meaburn Rock (6½ miles N of Kent Island) (8.139) and the bank off Heath and Cooper Points (8.139), are given a sufficiently wide berth.

- 2 After passing ENE of Cooper Point (17°24'S 146°04'E), the track continues generally NNW towards a position inshore of Fitzroy Island, but is adjusted as required to pass (positions from High Island (17°10'S 146°01'E)):

Clear of a wreck (10 miles SSE) (8.140), thence:

WSW of Russell Island (6 miles SE) (8.140), thence:

- 3 WSW of Jones Patch (5 miles SE), the S-most of the immediate dangers S of Normandy Island (8.140), 1 mile farther N. Grange Rock, 5 cables NNE of the patch, is the nearest mark to it. Thence:

Midway between Normandy Island (4½ miles SE) and High Island, thence:

ENE of High Island (8.140), thence.

Clear of a dangerous wreck (7½ miles N).

8.145

- 1 From a position as convenient SSW of Fitzroy Island (16°56'S 146°00'E) the track then leads generally N to rejoin the Inner Route in the vicinity of a position 3 miles NE of Cape Grafton (16°52'S 145°55'E) (8.141), passing (positions from Cape Grafton):

E of Deception Point (5 miles S), a steep, wooded point rising to Grant Hill 1¾ miles NW (8.142); the coast for about 3 miles SW of the point consists of Oombunghi Beach backed by wooded sand dunes 15 to 30 m in height. Thence:

- 2 W of Fitzroy Island (5¾ miles SE) (8.140). A light is displayed from the head of a jetty on the NW side



Fitzroy Island from NE (8.145)

(Original dated 1999)

of the island; a light-buoy (starboard hand) is moored 1 cable NW of the jetty. Thence:

E of Wide Bay (4 miles SSE), its head formed by King Beach, backed by the low wooded ground of the valley between the inner and outer ridges of Cape Grafton promontory; thence:

- 3 E of a headland (3¼ miles SE) at the E extremity of Cape Grafton promontory.

Course may then be directed NW as required to rejoin the Inner Route, passing NE of Cape Grafton (8.141).

(Directions continue at 9.79)

Mourilyan Harbour

Chart Aus 829 (see 1.15)

General information

8.146

- 1 **Position and function.** Mourilyan Harbour (17°36'S 146°08'E) occupies a landlocked site at the mouth of Moresby River. It is the deep water port for Innisfail (17°32'S 146°02'E) (8.162) and functions primarily as an export terminal for bulk sugar and molasses.

- 2 **Topography.** The coast on both sides of the entrance to Mourilyan Harbour is steep, wooded and rock-fringed.

Goodman Point



Sugar Terminal

Government Wharf

Camp Point

Mourilyan Harbour from WSW (8.146)

(Original dated 1999)

Georgie Hill rises on the S side of the entrance. Land on the N side of the entrance rises quickly to Hilda Hill at the S end of Moresby Range; Mount Leeper (Leiper), 2¼ miles NW of the entrance, also wooded, is identifiable as the highest summit of the range and also as the highest point on the coast between Double Point, 5 miles SSE of the mount, and Gladys Inlet 5 miles NNW.

- 3 **Port limits:** limit of Mourilyan Harbour pilotage area is shown on the chart.

Approach and entry. The port is approached direct from the Inner Route and entered through a narrow dredged channel to a swinging basin. Vessels are always turned to berth bows E at the sugar terminal berth, known as Government Wharf.

- 4 **Departure.** A separate departure channel for laden vessels leads NNE from Hall Point.

Traffic. In 2004 the port handled 25 vessels totalling 633 207 dwt.

Port authority: Ports Corporation of Queensland, PO Box 409, Brisbane, Queensland 4001. Local control is vested in the Harbour Master, Cairns (9.51).

Website: www.pcq.com.au

Email: info@pcq.com.au

Limiting conditions

8.147

- 1 **Controlling depths:**

Sea to Swing Basin for entry 6·7 m.

Berth to sea for departure: 9·6 m for vessels up to 28 m beam; 7·4 m for vessels of 28 to 32 m beam.

Available depths, which are subject to some change, are promulgated regularly in *Australian Temporary Notices to Mariners*.

Under-keel clearance. Minimum under-keel allowance on departure is 0·91 m, or 10% of draught for vessels over 10 m draught. Minimum under-keel allowance in the swinging basin is 0·6 m.

- 2 **Tidal levels:** see information in *Admiralty Tide Tables*. Mean spring range about 2·1 m; mean neap range about 0·2 m. There is a tide gauge and recorder on the sugar terminal wharf.

Density of water is usually between 1·024 and 1·027 g/cm³ irrespective of the tide but, after heavy rains and particularly between January and April, considerable freshening can occur to 1·008 g/cm³.

- 3 **Maximum size of vessel handled.** The largest vessel handled has been of 27 333 grt and 32 m beam; the longest 187 m LOA; and the deepest of 10·0 m draught.

The berth is designed to accommodate vessels up to 183 m LOA and 32·2 m beam.

Arrival information

8.148

- 1 **Port radio.** There is no port radio station. The Innisfail Volunteer Coast Guard, based at the sugar terminal berth, monitor VHF Channel 16 and will take messages but regular watch is not kept.

Notice of ETA. ETA and draught should be notified as early as possible and at least 24 hours in advance to the ship's agent at Cairns.

- 2 **Outer anchorage.** Anchorage for vessels awaiting a pilot may be obtained in the vicinity of the pilot boarding ground; holding ground is reported to be good.

Pilotage is compulsory except for exempted vessels and is available by prior arrangement. Vessels berth and depart at slack water, day or night, depending on draught. The boarding ground lies 2¼ miles E of the harbour entrance as shown on the chart. The pilot launch is about 11 m LOA

with white hull, orange superstructure and fitted with VHF radio; see *Admiralty List of Radio Signals Volume 6(4)* for details of frequencies.

- 3 **Tugs** are available. Tugs towing ropes are normally used.

Regulations concerning entry. Vessels of a size approaching the maximum for the port are restricted to a slack water entry in daylight.

Quarantine. Mourilyan is a first port of entry: see 1.64 for extracts from the Quarantine Act.

The quarantine limit is a line drawn across the harbour entrance from Hall Point (17°36'S 146°08'E) to a point on the coast 1 cable NNE of Goodman Point.

Harbour

8.149

- 1 **General layout.** The entrance channel leads direct from sea to a swinging basin abreast a single sugar terminal wharf on the N side of the harbour 4 cables within the entrance.

Tourist Wharf, 15 m in length and with a depth of 3·5 m alongside, is situated 60 m W of the sugar terminal wharf; Pilot Jetty extends 30 m SE, close E of Tourist Wharf. There is also a public boat ramp and a jetty on the W side of the harbour.

8.150

- 1 **Tidal streams** in the harbour entrance may attain a rate of 3 kn at springs as noted on the chart. The in-going stream, which is the stronger, sets towards the S shore between Hall and Camp Points; thence WNW across the harbour towards the berth, until the last of the stream when it sets S round Camp Point.

- 2 The out-going stream from Moresby River sets on to the berth, turning E through the entrance channel, thence N from abreast Hall Point. Freshets in the river can have a considerable effect on the timing of slack water in the entrance, which otherwise occurs within 1 hour of HW or LW. When entering against the out-going stream, it will be found that its strength in the entrance channel decreases suddenly on passing Camp Point; a timely reduction in speed may be required.

At springs a strong eddy sets off the E end of the berth at all states of the tide.

Directions for entry

8.151

- 1 From a position on the Inner Route, E of the entrance to Mourilyan Harbour (17°36'S 146°08'E) (8.139), the track leads W direct to the vicinity of the charted pilot boarding ground.

Leading lights:

Front light (red triangular daymark, point up; orange border; neon) (17°36'·1S 146°07'·2E), standing on reclaimed land W of the berth.

Rear light (similar mark, point down) (287 m W of front light).

- 2 The alignment (270°) of the above lights, (also displayed by day when vessels are entering or leaving) and which are visible only over a limited arc through the entrance, leads from the vicinity of the pilot boarding ground into harbour. The entrance channel is dredged over a least width of 91 m, rock bottom, between a steep-to headland on each side and requires care; see 8.150 for description of tidal streams. The track passes (positions from Hall Rock Light-beacon (17°36'S 146°08'E)):

- 3 Across the coastal shelf within the 10 m depth contour (extending to 1 mile E) in a least charted depth of 8·0 m on the leading line; and:

S of a light-beacon (special) ($7\frac{1}{4}$ cables NE) which is the outer mark for the departure channel; thence:
S of a light-beacon (starboard hand) ($1\frac{3}{4}$ cables NNE), and:

- 4 N of Hall Rock (which dries); a light-beacon (N cardinal) stands on the rock. Hall Point, $\frac{1}{2}$ cable SSW of the rock, is steep, wooded and rock-fringed, as is the S shore of the entrance channel from there to Camp Point, $3\frac{1}{2}$ cables W. Thence:

- 5 S of Goodman Point ($2\frac{1}{2}$ cables WNW), low and rocky, rising to wooded slopes close N; a light-beacon (starboard hand) stands on the point; and:

N of a light-beacon (port hand) ($2\frac{1}{4}$ cables W), marking the point at which the entrance channel widens WSW towards the swinging basin.

- 6 Course may then be directed as required for manoeuvring within the swinging basin, passing N of Camp Point ($3\frac{1}{2}$ cables W), marked by a light-beacon (white). The S side of the swinging basin is marked by three light-buoys (special). Depths in the basin vary between 23 m, found W of Camp Point, and the controlling depth (8.147) found near the limits of the basin.

7 **Useful marks:**

Bulk sugar loader ($17^{\circ}36'0S$ $146^{\circ}07'4E$), standing on Government Wharf.

Molasses tank ($17^{\circ}35'9S$ $146^{\circ}07'4E$). The N and highest of three tanks is conspicuous.

Directions for departure

8.152

- 1 From a position in the harbour entrance abreast Hall Rock ($17^{\circ}36'S$ $146^{\circ}08'E$) (8.151), the track for laden vessels on departure leads NNE in depths greater than 9 m, passing (positions from Hall Rock):

ESE of the light-beacon ($1\frac{1}{4}$ cables NNE) (8.151), thence:

WNW of the light-beacon ($7\frac{1}{4}$ cables NE) (8.151).

Course may then be directed as required to join the Inner Route, passing clear of Meaburn Rock ($2\frac{1}{2}$ miles NE) (8.139).

Berths

8.153

- 1 **Anchorage** within the harbour may be obtained by vessels of suitable size and draught in the swinging basin (8.151), S of the alignment of the entrance channel leading lights; bottom soft mud.

Small craft should not anchor in the swinging basin.

Government Wharf, at the bulk sugar terminal, is of concrete construction, 193 m in length and has a depth alongside of 10.4 m (2002), fine silt.

Port services

8.154

- 1 **Repairs** of a minor nature can be undertaken.

Other facilities. Doctor and hospital; disposal of oily waste by road tanker. Customs board between the pilot boarding ground and the harbour entrance.

Supplies. Provisions are available; fresh water is supplied to the berth. Bunkering facilities are limited and can only be supplied by road tanker.

Communications. Nearest airport Cairns 90 km.

Moresby River

8.155

- 1 **General information.** Moresby River upstream of the swinging basin is mainly filled with shallow and drying flats and bordered by thick belts of mangrove. The river channel is narrow and has a least depth of 2.4 m for a distance of 1 mile above Camp Point, and of 0.8 m for 10 miles farther. There are no reported obstructions for the first 4 miles, but snags exist from there on.

There are pile moorings in Moresby River channel S of the swinging basin.

Tidal streams in the river are slight.

Local knowledge is essential.

Anchorage

Chart Aus 829 (see 1.15)

South Barnard Islands

8.156

- 1 **Anchorage**, sheltered from SE winds, may be obtained by vessels of suitable draught about 4 cables N of Stephens Island ($17^{\circ}44'S$ $146^{\circ}10'E$) (8.139) as shown on the chart.

Liverpool Creek

8.157

- 1 **General information.** Liverpool Creek ($17^{\circ}43'S$ $146^{\circ}06'E$) enters the sea between low ground and sandy beaches stretching 4 miles S to Murdering Point and the same distance NNE to Double Point (8.139). The entrance is fronted by a drying bar, which is subject to change after bad weather or freshets but is always very narrow. Mount Brown, which is wooded and identifiable from seaward, stands $1\frac{1}{2}$ miles NW of the entrance and at the S end of a small range of hills rising from the surrounding low ground.

- 2 **Anchorage** may be obtained by vessels of suitable draught $7\frac{1}{2}$ cables to seaward of the bar in depths of 7 m. The anchorage is good and is well sheltered by King Reefs and by South and North Barnard Islands, all described at 8.139.

Small craft may anchor in a depth of 1.5 m inside the entrance under the S bank. Local knowledge is required.

North Barnard Islands

8.158

- 1 **Anchorage** may be obtained in a depth of 15 m NNW of Kent Island ($17^{\circ}41'S$ $146^{\circ}11'E$) (8.139), sheltered from SE winds. Jessie and Hutchison Islands, both scrub-covered, mark foul ground extending $7\frac{1}{2}$ cables W from Kent Island.

Local knowledge is required.

Chart Aus 830

Frankland Islands

8.159

- 1 **Russell Island.** Anchorage may be obtained during SE winds in a depth of 20 m, mud, 4 cables W of the sandspit extending from Russell Island ($17^{\circ}14'S$ $146^{\circ}06'E$) (8.140); a rough sea is experienced in the berth during strong S winds.

- 2 **High Island.** Anchorage on the N side of High Island ($17^{\circ}10'S$ $146^{\circ}01'E$) (8.140) may be obtained on Tobias Spit by vessels of suitable draught in depths of less than 10 m, sand and mud, but there will be a rough sea there in strong

winds. Anchorage may be made fairly close to the island for better shelter in S winds.

Good landing may be made on a sandy beach at the NW extremity of the island.

Fitzroy Island

8.160

- 1 **Anchorage** may be obtained between 2½ and 5 cables off the NW side of Fitzroy Island (16°56'S 146°00'E) (8.140) in depths of 15 to 20 m. Features on the NW side of the island and on the mainland 2½ miles W are described at 8.145.

Bay and inlets

Chart Aus 829 (see 1.15)

Bingil Bay

8.161

- 1 Bingil Bay lies immediately N of Clump Point (17°51'S 146°07'E) and is fronted in its S part by Narragon Beach. A concrete jetty extending from shore has a depth of 1.8 m at its head and is marked by a light. A ramp, marked by a light-beacon at its head lies 6 cables ESE of the jetty.

Gladys Inlet

8.162

- 1 **General information.** Gladys Inlet, entered between Flying Fish Point (17°30'S 146°05'E) and Thompson Point 1½ miles S forms the estuary of South and North Johnstone Rivers, which meet at the town of Innisfail 3 miles upstream. The waters of the port of Innisfail extend from the 5 m depth contour to seaward of the inlet, to the heads of navigation of the two rivers.
- 2 A bar across the entrance is normally awash at chart datum but is subject to frequent change, especially from January to March when bad weather and freshets prevail. There is deeper water inside the bar and the Johnstone rivers are navigable by small craft for a distance of 12 miles at HW.

Local knowledge is required.

Caution. In 2001 it was reported that no channel existed across the bar. The following details on Gladys Inlet are retained pending further information.

- 3 **Vertical clearance.** Jubilee Bridge, vertical clearance 5.8 m, spans South Johnstone River at Innisfail just S of the confluence of the two rivers. Geraldton Bridge, vertical clearance 5.9 m, spans North Johnstone River about 6 cables farther N; overhead power cables, vertical clearance 10.5 m, span the river on the N side of Geraldton Bridge. A road bridge across Ninds Creek, entered 1½ miles SW of Flying Fish Point, has zero vertical clearance at MHWS.

- 4 **Speed limit.** A limit of 4 kn is in force between the entrance to Ninds Creek and the town of Innisfail.

Tidal streams are irregular and much influenced by the wind; water level is raised by E and SE winds and lowered by those from W. River currents are generally sluggish except during freshets when water in the entrance can be fresh.

8.163

- 1 **Directions.** From S after passing ENE of Kent Island (17°41'S 146°11'E) (8.139) and North Barnard Islands, the track leads NNW with Kent Island bearing 160°, astern, to

a position about 1 mile E of Flying Fish Point (17°30'S 146°05'E) (8.164).

From N, the track leads SSE in depths greater than 10 m, passing (positions from Flying Fish Point):

- ENE of the bank off Cooper and Heath Points (extending to 11 miles N) (8.139), and:
- 2 ENE of Cooper Point (6½ miles N) (8.140), distant not less than 1½ miles; thence:
- ENE of Heath Point (1½ miles N) (8.139); a group of rocks (drying 1.2 m) lies 5 cables E of the point. A buoy (special) moored ¼ miles SE of the point marks the outer end of a seawater intake pipeline to shore.

When Flying Fish Point bears SW course may be directed SSW to the position about 1 mile E of Flying Fish Point.

- 3 **Useful marks:**

Thompson Point (17°32'S 146°05'E), identifiable by a prominent bare triangular patch.

Kent Island (17°41'S 146°11'E) (8.139). In good visibility the line of bearing of the island more than 164° passes ENE of the bank (8.139) off Cooper and Heath Points in depths of more than 10 m.

8.164

- 1 See Caution at 8.162. The channel up-river, which is narrow and shallow, is marked by light-beacons, buoys and light-buoys which are moved to meet the frequent changes. The channel passes (positions from Flying Fish Point):

N of Coquette Point (6 cables SW), thence:

N of Barney's Point (8 cables WSW), thence:

N of the entrance to Ninds Creek (1½ miles SW), thence:

S of Banana Island (2¼ miles SW).

8.165

- 1 **Anchorage** may be obtained in depths of 4 to 5 m off Coquette Point and also in Town Reach in a depth of 3 m between the Fish Board jetty and Geraldton Bridge; an unmarked rock, with a depth of 0.6 m over it, lies 20 m off the Fish Board jetty.

Berths at Innisfail consist of three wharves with a total length of 55 m and a least depth alongside of 2.0 m at 3 m off. There is a boat harbour and pile and swinging moorings.

8.166

- 1 **Repairs** can be carried out; workshop facilities available; slips available with a maximum capacity of 250 tonnes.

Other facilities. Hospital at Innisfail; there are several boat ramps.

Supplies. Provisions may be obtained at Innisfail; fresh water is supplied to the wharves; diesel fuel is available.

Communications. Airport at Mundoo, 3 km S of Innisfail.

Charts Aus 829, Aus 830

Mutcherio Inlet

8.167

- 1 **General information.** Mutcherio Inlet is entered between Constantine Point (17°14'S 145°58'E), the N extremity of a low, narrow and wooded promontory, and Russell Heads 2½ cables NW. The inlet forms the common estuary of Russell and Mulgrave Rivers, and is fronted by drying sandbanks and a bar subject to frequent change, particularly after strong winds. Depths of about 0.2 m can be expected

in the fairway over the bar which is marked by a light-beacon displayed from Russell Heads.

2 **Tidal streams** at the entrance to the inlet are much affected by winds.

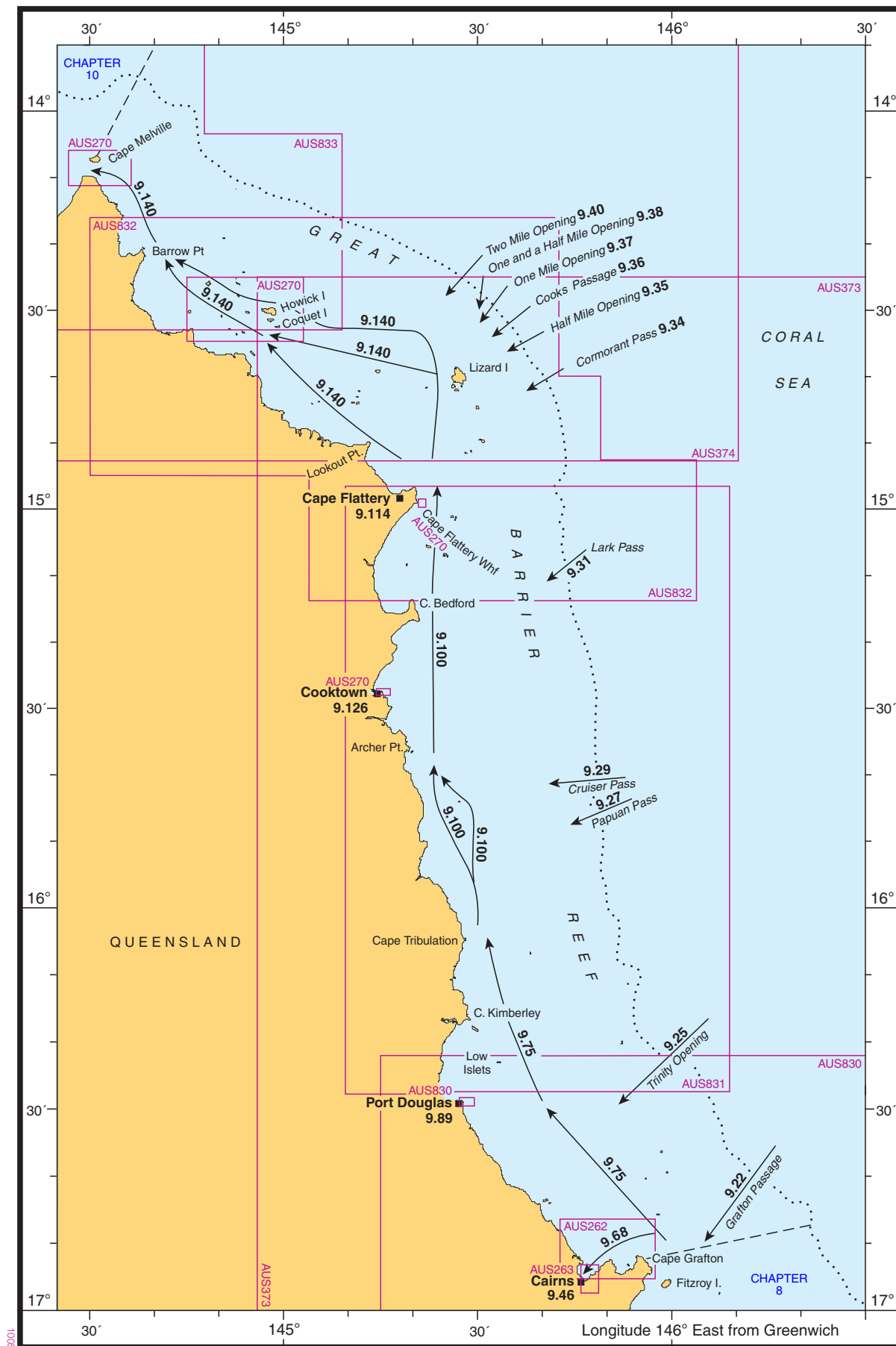
Local knowledge is essential as the inlet and rivers are rarely used other than by boats, and little is known of the channels.

Russell River, which enters the inlet from S is narrow and filled with numerous snags.

Mulgrave River, which enters the inlet from NW, has depths of 1·8 m at HW springs as far as Deeral Landing, 3 miles upstream from the junction, where it is spanned by a bridge.







CHAPTER 9

CAPE GRAFTON TO CAPE MELVILLE

GENERAL INFORMATION

Charts Aus 373, Aus 374

Scope of chapter**9.1**

- 1 This chapter covers that part of the Inner Route leading from Cape Grafton (16°52'S 145°55'E) to Cape Melville (14°10'S 144°31'E), 182 miles NNW. The area covered includes the off-lying Great Barrier Reef and the passages and openings between them from Grafton Passage to Waterwitch Passage. The ports of Cairns (9.46) and Cape Flattery (9.114), and the smaller ports of Port Douglas (9.89) and Cooktown (9.126), are also described.

Routes**9.2**

- 1 From abreast Cape Grafton the Inner Route leads NW for 36 miles to the vicinity of Low Islets (16°23'S 145°34'E).

Two-way route. The two-way route shown on the charts is not mandatory and is not a traffic separation route. *International Regulations for Preventing Collisions at Sea (1972)* apply equally to all vessels whether navigating inside or outside the two-way route.

- 2 The two-way route indicates the best route for vessels of moderate draught (9 m or less) having regard to the charted depth and dangers. Larger vessels constrained by draught may be encountered in the two-way route and its vicinity in certain areas.

Topography**9.3**

- 1 The general pattern of the coastal belt from Cape Grafton (16°52'S 145°55'E) to Forsberg Point (15°40'S 145°20'E), 79 miles NNW, is dominated by high ground which rises either steeply from the coast, or from not too far inland. The coast itself is generally formed of sandy beaches broken by rocky points but, where the land behind is low, it is often fringed with mangroves.

- 2 From the N side of Forsberg Point, the mountain ranges become more isolated, and the land more barren. The coast from there is generally low with long sandy beaches or stretches of sand and mud flats backed by mangroves. The general line of the coast is broken by Cape Bedford (15°14'S 145°21'E) and Cape Flattery, 15 miles N, and finally by Cape Melville (14°10'S 144°31'E). Altanmoui Range (14°32'S 144°37'E) and Melville Range, 13 miles NNW, are particularly prominent along this N part of the coast.

- 3 **Offshore islands** between Capes Grafton and Melville are not numerous and are described in the relevant parts of the text: the most significant is Lizard Island (14°40'S 145°28'E) (9.146).

Pilotage**9.4**

- 1 Pilotage is compulsory for most vessels transiting the waters of the Inner Route of Great Barrier Reef N of latitude 16°40'S. The area of compulsory pilotage includes all waters between the Australian mainland and the outer edge of Great Barrier Reef. The size and type of vessels affected are given at 1.26 and in notes on the charts.

Details of the pilot services are given in *Admiralty List of Radio Signals Volume 6(4)*.

Exercise area**9.5**

- 1 Military exercises may be carried out in an area NW of Lizard Island (14°40'S 145°28'E) and NE of Euston Reef (16°41'S 146°15'E).

Ship reporting system**9.6**

- 1 For details of Torres Strait and Great Barrier Reef ship reporting system, see 1.89 and *Admiralty List of Radio Signals Volume 6(4)*.

Marine protected area**9.7**

- 1 The whole area covered by this chapter is a part of Great Barrier Reef Marine Park, which itself is a Marine Protected Area. Some restrictions on access and use may apply; see 1.72 and 1.74.

Designated Shipping Area**9.8**

- 1 Within this chapter are Designated Shipping Areas, for further information see 1.74 and *Australian Seafarers Handbook*.

Particularly Sensitive Sea Area**9.9**

- 1 The whole area of this chapter is within Great Barrier Reef Marine Park which is an IMO approved Particularly Sensitive Sea Area (PSSA). The area is shown on the relevant charts. For further details see 1.71 and *Australian Seafarers Handbook*.

Submarine cable**9.10**

- 1 A submarine cable is laid from a position 2¼ miles NW of Barron River entrance (16°52'S 145°46'E), through Trinity Opening to Port Moresby (9°28'S 147°08'E).

A disused submarine cable lies close SE of the above cable until through Trinity Opening, from where it branches NE and E.

Rescue**9.11**

- 1 An Emergency Co-ordination Centre, manned by the Coast Guard, is sited at Cairns (16°55'S 145°47'E); see 1.87 for details of national rescue services.

Natural conditions**9.12**

- 1 **Tidal streams** on the Inner Route between Capes Grafton and Melville set N on the rising tide and S on the fall, and are generally weak with rates between ½ and ¾ kn. Local variations in strength and direction, where such information is available, are described in the appropriate parts of the text or are shown on the larger scale charts.

- 2 **Currents**, which are much influenced by the prevailing winds, are described in the detail given for the whole area covered by this volume at 1.144. Local currents on this stretch of coast are generally stronger than the tidal streams and are described in notes on the charts.

- 3 **Local weather.** The generally settled weather accompanying the South-east Trade Winds, which prevail between April and October, may include periods of dense haze in latitudes N of Cooktown (15°28'S 145°15'E). The NW monsoon, from December to April, is the hurricane season.

GREAT BARRIER REEF

GENERAL INFORMATION

Charts Aus 373, Aus 374

Scope of the section 9.14

- 1 There are a number of passages through the barrier within the coverage of this chapter. The most important of these, and the one in general use, is Grafton Passage which is entered from seaward in the vicinity of 16°39'S 146°15'E; this and the other passages and openings are described individually at 9.22 to 9.42.

Outer edge 9.15

- 1 For the first 35 miles NNW of the seaward entrance to Grafton Passage (16°39'S 146°15'E), the outer edge of the barrier reef is broken and ill-defined, with detached reefs and irregular depths being found to seaward of the visible reefs. Between Saint Crispin Reef (16°06'S 145°51'E) and the parallel of 14°57'S 69 miles farther N, the edge, which lies nearly parallel to the coast, is more uniform and well-defined and consists of a series of mostly narrow reefs, awash. From there Ribbon Reef No 10 stretches unbroken to Cormorant Passage, 17 miles N.
- 2 From Cormorant Passage (14°39'S 145°40'E) to Two Mile Opening 21 miles NW, the barrier reef is effectively formed only of a single line of oval or irregularly shaped drying reefs with minor navigable passages, described later, between them.
- 3 On the NW side of Two Mile Opening (14°24'S 145°25'E) the reef widens again to about 13 miles and the outer edge from there to Waterwitch Passage, 34 miles WNW, is formed of large drying reefs enclosing an area which is inadequately surveyed and should be avoided. From Waterwitch Passage a drying reef, apparently unbroken and steep-to on its seaward side, extends 23 miles NW to North Broken Pass (13°56'S 144°35'E) (10.23).
- 4 The extent to which the outer edge and off-lying waters are known can be judged from inspection of the charts. More information on surveys of the area may be obtained from reliability diagrams on the larger scale coastal charts quoted where required in the text. In general any approach from seaward to this section of Great Barrier Reef should be made with caution.

Charts Aus 373, Aus 831

9.16

- 1 **Anchorage** may be obtained on the W sides of Saint Crispin Reef (16°06'S 145°51'E) and Agincourt and Escape Reefs, 5 and 14 miles farther N as shown on the chart. Use of these anchorages is appropriate only to vessels specifically working within the reefs.

Local knowledge is essential.

Coast radio stations

9.13

- 1 Coast radio stations are sited near Cairns (16°55'S 145°47'E) and near Cooktown (15°28'S 145°15'E). Details are given in *Admiralty List of Radio Signals Volume 1(2)*.

Charts Aus 373, Aus 374

Inner edge

9.17

- 1 The line of the inner edge of the barrier, although generally more fragmented than that of the outer edge, can be seen from inspection of the charts. The edge has been surveyed throughout to the standards required for safe navigation of the Inner Route which passes inshore of it. Passage away from recognised channels should not be attempted without careful consideration of the factors involved.

9.18

- 1 **Pilotage** for all passages is governed by the rules referred to at 9.4. Pilots are available only for Grafton Passage.

9.19

- 1 **Reliability of surveys.** Reliability diagrams shown on the appropriate reference charts give an indication of the confidence that may be placed in the chart for each passage through the reefs.

9.20

- 1 **Former mined areas.** All recognised passages from seaward through the reefs are former mined areas. See 1.5 for general remarks and Appendix II for details of the areas involved.

9.21

- 1 **Currents.** A general description of currents in Coral Sea and off the E coast of the Australian continent is given at 1.144 and more local information is given in notes on the charts. Specific detail, where available, is given in the appropriate parts of the text.

PASSAGES THROUGH THE REEFS

Grafton Passage

Chart Aus 830

General information

9.22

- 1 **Pilotage** is not compulsory for Grafton Passage, but can be provided as required. The boarding place is situated 2 miles N of Euston Reef (16°41'S 146°15'E) as shown on the chart; boarding is normally by launch but a helicopter may be used. See *Admiralty List of Radio Signals Volume 6(4)* for details.

Exercise area: see 9.5.

- 2 **Tidal streams**, which are generally less than ½ kn, are shown on the chart.

A **current** setting SSE at a rate of 4½ kn was experienced off the seaward end of the passage by HMAS *Anzac* in 1963.

Other aid to navigation

Racon: Euston Reef Light (16°41'S 146°15'E).

For details see *Admiralty List of Radio Signals Volume 2*.

Directions**9.23****1 Leading marks:**

Front mark, Fitzroy Island S shoulder ($16^{\circ}56'S$ $146^{\circ}00'E$) (8.140).

Rear mark, Bell Peak North summit (11 miles SW of the front mark) (8.142).

- 2 From the vicinity of a position 5 miles N of Euston Reef ($16^{\circ}41'S$ $146^{\circ}15'E$) the alignment (217°) of the above marks leads SW through Grafton Passage almost in mid-channel. The marks are easily identified in clear weather, but occasionally only the summit of Fitzroy Island may be distinct. The track passes (positions from Arlington Reef Light ($16^{\circ}44'S$ $146^{\circ}07'E$)):

- 3 NW of Euston Reef (8 miles ENE); Euston Reef Light (white GRP hut on metal framework tower, 16 m in height) stands on the W side of the reef; and:

SE of Fin Reef ($7\frac{1}{2}$ miles NNE) which, with Euston Reef, marks the seaward end of the passage; thence:

- 4 SE of Arlington Reef, steep-to on its E and S sides; Arlington Reef Light (white GRP hut on concrete column, 7 m in height) stands near the SE edge of the reef.

Leading light. Little Fitzroy Island Light ($13\frac{1}{2}$ miles SSW) (8.137), bearing about 217° in a white sector (214° – 223°), leads SW in continuation of the same track. The SE part of Arlington Reef, and a patch ($5\frac{1}{4}$ miles SW) described below, are covered by the adjacent green sector (197° – 214°) of the same light. The track leads:

- 5 NW of Thetford Reef (5 miles SE). The N part of the reef is foul and, although occasionally marked by rollers, is not so easily seen as the S part, which dries. The reef lies on the SE side of the inner end of the passage and, together with the 19.8 m patch (6 miles SSE), is covered by the adjacent red sector (223° – 240°) of Little Fitzroy Island Light. Thence:

- 6 SE of an 18.3 m patch ($5\frac{1}{4}$ miles SW), the outermost shoal lying ESE of Green Island (8 miles WSW) (9.79). The island marks the NW side of the inner end of the passage.

Course may then be directed for the approach to Cairns (9.68) or as otherwise required.

9.24

- 1 **Clearing marks.** The alignment (215°) of the summit of Fitzroy Island with the summit of Bell Peak North passes clear SE of Arlington Reef and the shoals ESE of Green Island.

Useful marks are described at 8.142.

Trinity Opening

Charts Aus 830, Aus 831

General information**9.25**

- 1 Trinity Opening is entered from seaward between Spur Reef ($16^{\circ}24'S$ $146^{\circ}03'E$) and Linden Bank, 5 miles NNW. The channel is wide but has not been closely examined and uncharted dangers may exist. The inner end of the opening lies between Oyster Reef ($16^{\circ}38'S$ $145^{\circ}56'E$) and Batt Reef, 12 miles NNW.

Submarine cable, see 9.10.

Tidal streams, which are generally less than $\frac{1}{2}$ kn, are tabulated on the charts.

Directions**9.26**

- 1 **Approach.** Care should be taken to confirm the latitude when closing Trinity Opening from seaward. The 100 m depth contour in the entrance may then be approached on the parallel of $16^{\circ}20'S$.

Leading mark. From the vicinity of $16^{\circ}20'S$ $146^{\circ}02'E$ in the entrance, the N summit of Mount Formartine ($16^{\circ}43'S$ $145^{\circ}37'E$) (9.81) bearing 226° , if it can be identified, then leads SW through the opening, passing (positions from Norman Reef ($16^{\circ}26'S$ $146^{\circ}00'E$)):

- 2 Between Spur Reef ($2\frac{1}{2}$ miles ENE) and Linden Bank (6 miles N), thence:

NW of Norman Reef; a beacon, 3 m in height, stands on the N side of the reef; thence:

SE of Tongue Reef (6 miles NW), thence:

SE of Batt Reef (8 miles W) (9.79), thence:

NW of Jorgensen Patch with a depth of 0.1 m over it (7 miles SSW), the outermost danger from Hastings Reef, 2 miles farther ENE; thence:

- 3 NW of Pixie Reef (10 miles SW), thence:

SE of a 16.8 m patch ($11\frac{1}{2}$ miles WSW), as required by draught or prudence.

Course may then be directed for the Inner Route (9.79) or as otherwise required.

Useful mark:

Black Mountain ($16^{\circ}39'S$ $145^{\circ}29'E$) (9.81), may assist in identifying Mount Formartine.

Papuan Pass

Chart Aus 831

General information**9.27**

- 1 Papuan Pass is entered from seaward between Andersen Reef ($15^{\circ}47'S$ $145^{\circ}48'E$) and Ruby Reef, $\frac{1}{2}$ miles NW, from where it leads 16 miles WSW to join the Inner Route.

Tidal streams, which attain spring rates of about $1\frac{1}{4}$ kn in the seaward entrance, are tabulated on the chart.

Directions**9.28**

- 1 From a position in deep water a safe distance NE of Andersen Reef ($15^{\circ}47'S$ $145^{\circ}48'E$), the track leads generally WSW, passing in mid-channel (positions from Andersen Reef):

NNW of Andersen Reef; foul ground extends $7\frac{1}{2}$ cables N and W from the SW end of the reef; and:

- 2 SSE of Ruby Reef ($1\frac{1}{2}$ miles NW), steep-to on its E and SE sides.

The track then continues WSW, passing in mid-channel:

SSE of Endeavour Reef ($10\frac{1}{2}$ miles W), and:

NNW of Pickersgill Reef ($11\frac{1}{2}$ miles WSW) (9.104).

Course may then be directed as required.

Useful marks: see 9.30.

Cruiser Pass**General information****9.29**

- 1 Cruiser Pass is entered from seaward between Pearl Reef ($15^{\circ}43'S$ $145^{\circ}48'E$) and Lena Reef $2\frac{3}{4}$ miles N; Endeavour Reef lies at its inner end.

Directions**9.30**

- 1 From a position in deep water a safe distance NE of Pearl Reef ($15^{\circ}43'S$ $145^{\circ}48'E$) the track leads to a position

in the middle of the entrance. The track passes (positions from Pearl Reef):

S of Lena Reef (2¾ miles N), steep-to on its E side, and:

N of Pearl Reef, which is foul.

The track then leads WSW, passing:

NNW of Ruby Reef (close S) (9.28); thence:

SSE of Irene Reef (5½ miles NW); several boulders lie on the reef; thence:

- 2 Either side of Endeavour Reef (11¼ miles WSW). To the N of the reef the track passes SSE of Cairns Reef (13 miles W) (9.105); to the S of Endeavour Reef the track joins the W part of the track through Papuan Pass described at 9.28. Thence:

As required to join the Inner Route (9.104).

Useful marks:

Mount Pieter Botte (16°04'S 145°25'E) (9.78).

Mount Thomas (15°43'S 145°20'E) (9.109).

Mount Amos (15°42'S 145°18'E) (9.101).

Mount Cook (15°29'S 145°16'E) (9.111).

Pickersgill Reef Light (15°52'S 145°33'E) (9.104).

Lark Pass

General information

9.31

- 1 The seaward end of Lark Pass (15°08'S 145°43'E) is 1 miles in width and lies between Ribbon Reefs No 7 and No 8; the inner end lies between Startle Reefs (15°12'S 145°31'E) and Lark Reef, ¾ miles S.

Tidal streams at the inner end of the pass are shown on the chart.

Caution. The reefs bordering Lark Pass are very difficult to see at HW in calm conditions with a smooth sea. Particular care is required in the vicinity of Lark Reef (9.32).

Directions

9.32

- 1 From a position in open water to seaward of Lark Pass the track leads midway through the entrance (15°08'S 145°43'E) between the drying reefs on each side.

The track then leads SW, passing (positions from Marx Reef (15°12'S 145°37'E)):

Well clear SE of a detached reef (5½ miles NE), lying 5 cables SE of Harrier Reef; thence:

SE of Marx Reef, which is steep-to.

- 2 The track is then adjusted to lead generally WSW, passing:

Clear of a 5-7 m shoal (1 mile S), thence:

SSE of a drying reef (1¼ miles WSW), also steep-to; a 4-1 m patch lies between it and Marx Reef; thence:

NNW of Pullen Reefs (3 miles SSW), thence:

Well clear SSE of a 1-4 m patch (4 miles SW), the outermost charted danger 8 cables E of Swinger Reef.

- 3 **Leading marks:**

Front mark, South Cape Bedford (15°17'S 145°21'E) (9.110).

Rear mark, Rounded Hill (8 miles W of the front mark).

The alignment (264°) of the above marks then leads W, passing:

- 4 N of Lark Reef (5½ miles SW), which is dangerous, and clear of a 6-4 m patch 4 cables N, which is the N most danger at the W end of the reef. Several

vessels have grounded on the N edge, which is below-water and can only be seen in the finest weather and at LW when some of the S parts of the reef dry. A number of coral heads off the W edge are not visible until close to. And:

- 5 S of Swinger Reef (5 miles WSW), lying in the middle of the SW entrance to the pass and nearly always visible; a 4-5 m patch, 5 cables W, is the outer danger on that side of the reef. Startle Reefs, on the N side of the entrance and 1½ miles NNW from Swinger Reef, are at times very difficult to see.

Course may then be directed to join the Inner Route (9.110), or as otherwise required.

- 6 **Useful marks:**

Mount Cook (15°29'S 145°16'E) (9.111).

Grassy Hill (15°28'S 145°15'E) (9.111).

Mount Saunders (15°25'S 145°14'E) (9.110).

Mount Milman (15°24'S 145°15'E) (9.110).

Indian Head (15°23'S 145°17'E) (9.110).

Quoin Hill (15°18'S 145°15'E).

Cape Bedford (15°14'S 145°20'E) (9.110).

Channels between Ribbon No 10 and Jewell Reefs

Chart Aus 832

General information

9.33

- 1 Between the N end of Ribbon Reef No 10 (14°40'S 145°40'E) and Jewell Reef 22 miles NW, Great Barrier Reef is formed by a single line of reefs, through which there are a number of channels which are described individually. Where directions are given, courses from the inshore ends of the channels may in each case be directed as required and guided by the chart or by local knowledge.

- 2 One Mile Opening (9.37) and One and a Half Mile Opening (9.38) are both used in clear weather and favourable light by coasters trading to and from Papua.

Water conditions. Between Lizard Island (14°40'S 145°28'E) and the barrier between Ribbon No 10 and Jewell Reefs, the water has been observed to be clear with very irregular depths over a mainly coral bottom. The clarity of the water is in contrast to that described at 9.145, inshore of Lizard Island.

- 3 **Exercise area:** see 9.5.

Tidal streams for two of the channels and for positions to seaward of Cooks Passage are shown on the chart. The stream sets through Cormorant Passage at a considerable rate.

Currents close to seaward of the reefs set mainly NW at up to 1½ kn as described by a note on the chart. A general description of currents is given at 1.144.

Landmark:

Lizard Island (14°40'S 145°28'E) (9.146).

Cormorant Passage

9.34

- 1 The passage lies between the N end of Ribbon Reef No 10 (Ribbon Reef) (14°40'S 145°40'E), which dries and is not more than 5 cables in width, and another drying reef about 4 cables NW. The passage was used by HMS *Cormorant* in 1879 to enter from seaward; the reefs on each side show up well. A visitors mooring buoy lies on the N edge of Ribbon Reef No 10.

Local knowledge is required.

Tidal streams are described at 9.33.

Fishing in the pass, other than by trolling, is prohibited.

Half Mile Opening

9.35

- 1 The opening lies between the N end of Yonge Reef (14°35'S 145°37'E) and the SE end of Carter Reef, 3½ cables NW.

Directions. The summit of Lizard Island (14°40'S 145°28'E) (9.146) bearing 236° leads through the opening in a least depth of 13.9 m.

Cooks Passage

9.36

- 1 The passage lies between the NW end of Carter Reef (14°32'S 145°35'E) and the SE end of Day Reef 7½ cables NW, both well-defined by breakers. The passage was used by Captain Cook in HMS *Endeavour* outbound from the coast in 1770. There is a heavy swell with SE winds.

Tidal streams are shown on the chart.

- 2 **Directions.** The summit of Lizard Island (14°40'S 145°28'E) (9.146) bearing 215° leads through the passage in a least depth of 19.2 m. Depths decrease rapidly from more than 200 m as the passage is entered.

Useful mark:

Boulder (14°29'S 145°32'E), on Day Reef.

One Mile Opening

9.37

- 1 The opening lies between the NW end of Day Reef (14°28'S 145°32'E) and the SE end of Hicks Reef, 7 cables NW, which breaks heavily in SE winds. The seaward side is steep-to, though pinnacles up to 200 m off the outer edge rise to 13 m and lesser depths are likely. Both sides of the entrance are steep-to and there is a least depth of 24.4 m at the inner end of the opening.

- 2 **Directions.** From a position NNE of the opening, the summit of Lizard Island (14°40'S 145°28'E) (9.146) bearing 194½° leads to the entrance. The track then leads SW in mid-channel bearing 215° through the opening.

Useful mark: see 9.36.

One and a Half Mile Opening

9.38

- 1 The opening lies between the W end of Hicks Reef (14°26'S 145°27'E) and Hilder Reef, 1¼ miles W, which dries, is steep-to except on its W side, and is normally visible. A boulder stands on its E side.

Tidal stream predictions are tabulated on the chart but actual streams can become strong and irregular in strong SE winds, which also cause a heavy sea.

9.39

- 1 **Directions.** The opening may be approached and identified from N.

Leading marks. The summit of Lizard Island (14°40'S 145°28'E) (9.146) bearing 174° leads through the middle of the fairway in depths of more than 25 m.

At night Palfrey Island Light (14°42'S 145°27'E) (9.147), if raised in good visibility, bearing 179° leads through the fairway. The light is obscured bearing more than 190°.

- 2 **Useful marks:**

South Direction Island (14°50'S 145°32'E) (9.147) bearing 169° and open half its width W of North Direction Island, 5 miles N (9.147), may assist in indicating the opening from seaward.

Boulder (14°23'S 145°23'E) 1 m in height, on Jewell Reef (9.41).

Two Mile Opening

9.40

- 1 The opening lies between the NW edge of Hilder Reef (14°26'S 145°25'E) and the SE edge of Jewell Reef, 1¼ miles NW.

9.41

- 1 **Directions.** There are no leading marks. From a position NE of the seaward entrance, the track leads SW through the opening bearing 235° in a least depth of 29 m. Depths decrease rapidly from more than 200 m close outside the entrance. The track leads in mid-channel, passing (positions from Hilder Reef):

SE of Jewell Reef (1¼ miles NW), which dries, is steep-to on its SE edge and normally visible; thence:

- 2 NW of Hilder Reef (9.38); there is foul ground on its W side; thence:

SE of Parke Reef (3 miles W), steep-to on its SE side and normally visible. Waining Reef, 6 cables farther SW, dries; its long SSE edge is steep-to.

Useful marks: see 9.39.

Waterwitch Passage

Chart Aus 833

General information

9.42

- 1 Waterwitch Passage (14°10'S 144°53'E) is entered at its seaward end between two drying reefs 1¼ miles apart, but the fairway is restricted to 7½ cables in width by shoals on the NW side. The passage leads generally SSW, in a least charted depth of 11.7 m, to its inner end between Stapleton Island (14°19'S 144°51'E) and Switzer Reef 5 miles WSW, from where it gives access to the Inner Route.

Tidal streams in the seaward end of the passage are shown on the chart.

Directions

9.43

- 1 From seaward the approach track leads to a position in mid-channel, midway between the two entrance points.

Leading mark. Stapleton Island (14°19'S 144°51'E), a grassy sand cay lying on the W side of a drying reef, bearing 190° from midway between the entrance points, leads S through the entrance, passing (positions from Stapleton Island):

- 2 E of a shoal, with a depth of 5.9 m over its outer end (8 miles N), which extends 6 cables SSE from the SE extremity of an extensive drying reef forming the NW entrance point to the passage. Heavy tide-rips occur over this shoal. And:

W of a drying reef (7 miles NNE), forming the SE entrance point to the passage and marked on its W side by a sand cay (0.3 m in height); thence:

- 3 E of a shoal, with a depth of 7.8 m over its NE end, (6½ miles N), the outermost danger SSW from the NW entrance point.

When 4 miles N of Stapleton Island the track then leads SSW in mid-channel, passing:

ESE of a drying reef (2½ miles WNW), a small sand cay lies near the SW end of the reef; and:

- 4 WNW of Stapleton Island, thence:

WNW of an 8·4 m patch (4 miles SSW), thence:
ESE of Switzer Reef (5 miles WSW) (9.158). A
channel between Switzer Reef and Munro Reef,
5 cables N, is restricted by foul ground extending
up to 5 cables SW of the latter, and by Davy
Patches 7 cables farther SW (9.153).

Course may then be directed as required for the Inner
Route (9.152).

INNER ROUTE FROM CAPE GRAFTON TO CAPE MELVILLE

GENERAL INFORMATION

Charts Aus 373, Aus 374

Scope of the section

9.45

- 1 This section covers that part of the Inner Route leading from Cape Grafton (16°52'S 145°55'E) to Cape Melville (14°10'S 144°31'E), 182 miles NNW. The ports of Cairns (9.46) and Cape Flattery (9.114), and the smaller ports of Port Douglas (9.89) and Cooktown (9.126), are also described.

PORT OF CAIRNS

General information

Charts Aus 262, Aus 263, Aus 830

Position and function

9.46

- 1 The port of Cairns (16°55'S 145°47'E) occupies a sheltered position in the natural harbour of Trinity Inlet. In addition to handling the commodity trade for the surrounding area, the port accommodates a naval base, a cruise liner terminal and extensive facilities for tourist and pleasure craft. A large fishing fleet operates from the port.

Population. In 2004 the estimated residential population of the district of Cairns was 133 700.

Topography

9.47

- 1 Trinity Inlet (16°55'S 145°47'E), with the town of Cairns extending for about 2 miles on its W side, lies between the high ground of Murray Prior and Nisbet Ranges to E, and that of Whitfield Range to W. The E side of the harbour is low and formed by a thick belt of mangroves; Admiralty Island (16°58'S 145°47'E) and the upper reaches of Trinity Inlet and Smiths Creek are similar.

Port limits

9.48

- 1 The seaward limit of Cairns Pilotage Area lies between Taylor Point (16°47'S 145°42'E) and Cape Grafton, 14 miles ESE, as shown on the chart. The Port Authority's area of responsibility however, extends farther to seaward to include Green Island (16°46'S 145°58'E) and the area W of Fitzroy Island, 10 miles S.

Approach and entry

9.49

- 1 The port is approached from the Inner Route in the vicinity of Cape Grafton (16°52'S 145°55'E) and entered through a dredged channel, 6 miles in length, with a width of 90 m. There is direct access to the port from Coral Sea through Grafton Passage (9.22).

9.44

Useful marks:

- Noble Island (14°30'S 144°46'E) (9.152).
Bewick Island (14°26'S 144°49'E) (9.152).
Watson Island Light (14°28'S 144°54'E) (9.157).
South Barrow Island Light (14°21'S 144°39'E) (9.153).

Traffic

9.50

- 1 In 2004 the port handled 156 vessels totalling 1 826 699 dwt.

Port authority

9.51

- 1 Cairns Port Authority, PO Box 594, Cairns, Queensland 4870.

Website: www.cairnsport.com.au

Email: enquiries@cairnsport.com.au

Naval Waters under the jurisdiction of the Australian Defence Department are located in Trinity Inlet adjacent to HMAS *Cairns* (16°56'·2S 145°46'·6E). See regulations at Appendix I.

Limiting conditions

Controlling depth

9.52

- 1 Available depth in Entrance Channel is 8·3 m. The actual depth available is liable to change after bad weather.
Latest information on depths in the channel and berths is promulgated when required in *Australian Temporary Notices to Mariners* or may be obtained from the Port Authority.

Under-keel clearances

9.53

- 1 The following under-keel clearances are required when underway in the channel:
Vessels up to 20 000 grt: 0·6 m.
Vessels up to 30 000 grt: 0·9 m.
Vessels up to 40 000 grt: 1·5 m.
Vessels over 40 000 grt: 2·0 m.
A minimum clearance of 0·6 m is required in the swinging basins, and 0·3 m whilst berthed.

Deepest and longest berths

9.54

- 1 The deepest berth is No 12; the longest is on the main wharf of Trinity Inlet where adjacent berths from No 1 to No 6 can be combined as required. See 9.72.

Tidal levels

9.55

- 1 See information in *Admiralty Tide Tables*. Mean spring range about 2·1 m; mean neap range about 0·2 m.

Maximum size of vessel handled

9.56

- 1 The largest vessel to have entered the port has been of 55 451 grt and the longest has been of 267 m LOA; the deepest draught handled has been 10·1 m. Vessels up to 32 000 dwt and 8·5 m draught can be accepted as a matter of routine.

Local weather**9.57**

- 1 Cairns is an all-weather port except during the cyclone season, approximately from November to April, when some restrictions on movements may apply.

The Port Authority has a contingency plan detailing the actions to be taken if the area is threatened by destructive force winds.

Arrival information**Notice of ETA****9.58**

- 1 Vessels requiring a pilot should give notice of ETA 72, 48 and 24 hours in advance. For details see *Admiralty List of Radio Signals Volume 6(4)*.

Outer anchorage**9.59**

- 1 **Mission Bay** lies between Cape Grafton (16°52'S 145°55'E) (described with its adjacent features at 8.141) and False Cape, 3¾ miles W; the latter is rock-fringed, high and wooded, with ruins on its summit. The bay is shallow as shown on the chart, and fronted by mainly sandy beaches. At the W end of its S side, there is a small jetty and a settlement; two stranded wrecks lie between the settlement and Gribble Point (16°54'S 145°52'E). Rocky Island, standing near the middle of the bay, is 42 m in height and connected at LW to the mainland by a drying flat of mud and sand.

- 2 **Anchorage**, with shelter from SE winds, may be obtained by vessels of suitable size and draught 5½ cables N of Rocky Island in a charted depth of 3 m.

Local knowledge is required.

Pilotage**9.60**

- 1 Pilotage is compulsory for all foreign vessels 35 m LOA and over, and Australian vessels of 50 m LOA and over, except for vessels exempted, and is available 24 hours a day. The Cairns Port boarding place is situated 1¾ miles NE of C1 and C2 Light-beacons (16°50'S 145°50'E); for large deep-draught vessels the pilot may board at Cairns Fairway boarding place (2¾ miles farther NE). Both boarding places are shown on the chart. For details see *Admiralty List of Radio Signals Volume 6(4)*.

Tugs**9.61**

- 1 Tugs are available and compulsory for vessels over 100 m LOA. The number of tugs to be employed depends upon LOA, manoeuvrability and berth allocated, and may be varied at the pilot's discretion.

Traffic regulations**9.62**

- 1 Speed limits are 10 kn in the Entrance Channel, 8 kn in Trinity Inlet and 4 kn in Smiths Creek.

Quarantine**9.63**

- 1 Cairns is a first port of entry: see 1.64 for extracts from the *Quarantine Act*. Radio pratique may be granted.

Notice of medical requirements**9.64**

- 1 Notice of patients requiring medical attention must be given in advance of arrival.

Harbour**General layout****9.65**

- 1 The principal berths and a marina lie on the W side of the entrance to Trinity Inlet where two separate swinging basins facilitate manoeuvring; a further swinging basin lies at the junction of Smiths Creek and Trinity Inlet. On the E side of the inlet there are pile moorings for craft up to 18 m in length, opposite the main wharves. There are also areas designated for anchorage only, situated N and S of the piles, and E of Admiralty Island.

- 2 Smiths Creek, which enters the inlet close S of Senrab Point (16°56'·5S 145°46'·7E), contains two large commercial fishing bases and shipbuilding, berthing and repair facilities for small vessels. Beyond Senrab Point, Trinity Inlet extends S on the E side of Admiralty Island and is navigable by vessels of suitable draught to Swallows Landing (16°59'·5S 145°46'·2E), which is disused.

Natural conditions**9.66**

- 1 **Flow** in the outer approaches may be affected by flood water from Barron River (16°52'S 145°46'E) (9.74) which sets strongly NE after heavy rains.

Tidal streams are much influenced by the winds and can sometimes attain a rate of 2 kn at springs. Slack water occurs at the times of HW and LW. The stream generally sets fair with the channel but slight cross-sets may be expected. Care is needed when passing C20 Light-beacon (16°54'·7S 145°47'·2E) where a strong W-going set may be experienced.

Climatic table: see 1.192 and 1.203.

Landmarks**9.67**

- 1 Tower (16°52'·5S 145°45'·3E) at Cairns International Airport; an aero light displayed from the top of the structure is lost in shore lights when viewed from SE.

Buildings (conspicuous hotels and an apartment block), standing within 3½ cables between S and WNW of the Outer Cutting rear direction light (16°55'·2S 145°46'·8E).

Directions

(continued from 8.142)

Approach**9.68**

- 1 From a convenient position on the Inner Route in the vicinity of Cape Grafton (16°52'S 145°55'E), the approach leads direct to the pilot boarding places (9.60).

Entrance Channel**9.69**

- 1 **Caution.** It is not advisable to enter the channel if another vessel is already navigating therein.

Outer Cutting Leading Lights:

Front light, T1 Light-beacon (white rectangular daymark; a light may also be shown by day) (16°54'·7S 145°47'·1E).

Rear direction light (5 cables SSW of the front light), standing on shore.

- 2 The alignment (209¼°) of the above lights leads SSW through Entrance Channel, which is 90 m in width with depth as given at 9.52; the bottom is mud in the outer part, sand in the vicinity of C15 and C16 Light-beacons, thence clay, mud and sand to harbour. The track passes (positions from the rear direction light):

Between C1 Light-beacon (E cardinal) (6 miles NNE) and C2 Light-beacon (port hand) standing 1 cable ESE of C1. These light-beacons mark the seaward end of the Entrance Channel. Thence:

- 3 Between light-beacons numbered C4 to C18 (port hand) and C3 to C17 (starboard hand), standing in pairs 1 cable apart on each side of the dredged channel. All lights except C11 and C12 are synchronised with C2 Light-beacon. Thence:
ESE of Inner Cutting Leading Light-beacons (front beacon 1 miles NNE) (9.70); thence:
WNW of and round C20 Light-beacon (special) (6½ cables NE); see 9.66 for remarks on tidal streams in this vicinity.

9.70

1 Inner Cutting Leading Lights:

Front light-beacon (9¼ cables NNE).

Rear light-beacon (690 m NNE of front beacon).

From a position in the channel WNW of C20 Light-beacon, the alignment (013°), astern, leads SSW through the inner part of Entrance Channel to Trinity Inlet and the harbour.

- 2 Course may then be directed for manoeuvring in one of the swinging basins prior to berthing, or as otherwise required. It is recommended that vessels berthing in Trinity Inlet turn on entry to berth bows N. An anchor may be used to assist turning short round.

Smiths Creek

9.71

- 1 From a position on the alignment of the above Inner Cutting Leading Lights and abreast Berth No 8 (16°55'9S 145°46'8E), the track leads S in mid-channel through the S swinging basin, off Berth No 11, passing the numbered berths on the W side of the inlet, to the swinging basin off the entrance to Smiths Creek.
- 2 The track then leads W into Smiths Creek between Senrab Point (9.65), from where a light is displayed, and Admiralty Island (9.47), 1 cable S. The junction of the creek with Trinity Inlet is marked by a light-buoy (special); S2 light-beacon (port hand) stands on the N side of Admiralty Island. Course should be directed to keep in mid-channel until otherwise required for berthing.

Berths

Alongside berths

9.72

- 1 **Trinity Inlet.** The main wharf, of reinforced concrete construction, is 595 m in length with depths of 8.4 m alongside, providing berths for vessels in excess of 200 m LOA. The wharf is divided into Berths No 1 to 5, each with a nominal length of 91.5 m, and No 6, the container terminal, with a length of 138 m and an adjustable Ro-Ro link span at its S end. Berths No 7 and 8 have a combined length of about 250 m and alongside depths of 9.3 m and 10.0 m, respectively. Berth No 12, the deepest berth, is 183 m in length and has a depth of 10.5 m alongside.
- 2 Berth No 10, on dolphins 76 m apart, is a tanker berth for petroleum products. The berth has been used by a vessel of 202.7 m LOA.
Berth No 11, lying within an area of Naval Waters (9.51), is controlled by the Royal Australian Navy.
Smiths Creek provides two berths totalling 77.4 m in length. Smiths Creek No 1, charted as Mason's Wharf, which is the larger, has a depth alongside of 9.4 m.

Depths. See 9.52 regarding further information on depths at the berths. The bottom at all berths is clay.

Port services

9.73

- 1 **Repairs.** A dry dock in Smiths Creek has an extreme length of 60.5 m and breadth of 13.0 m. An extensive shipbuilding and refitting industry exists, with ship straddle lifts and a floating dock; the slipway with the largest lifting capacity has a length of 213 m.

Voyage repair facilities and commercial diving services are available to vessels alongside in Trinity Inlet.

- 2 **Other facilities.** Hospital; deratting and certificates issued; compass adjustment; facilities for disposal of oily waste, garbage and sewage; customs board off C1 Light-beacon; one tug equipped for fire-fighting.

Supplies. Provisions; fresh water at all wharves; marine fuels by pipeline at No 10 Berth and by barge or road tanker elsewhere; stores.

Communications. Cairns airport 8 km.

Barron River

Charts Aus 262, Aus 830

General information

9.74

- 1 Barron River enters the sea on the NW side of Casuarina Point (16°52'S 145°46'E) and is fronted by a bar lying between extensive drying sandbanks which are subject to change. The river is navigable by small craft for a distance of 4 or 5 miles but is spanned by a road bridge 3½ miles above the entrance. A strong river current may be expected at times (see 9.66 for effect offshore).

Local knowledge is essential. A pilot may be obtained from Cairns.

CAPE GRAFTON TO CAPE TRIBULATION

General information

Charts Aus 830, Aus 831

Route

9.75

- 1 From the vicinity of Cape Grafton (16°52'S 145°55'E) the route leads NW for 33 miles to Low Islets, thence 20 miles farther NNW to a position abreast Cape Tribulation (16°05'S 145°29'E). The tracks shown on the reference charts between Cape Grafton and Low Islets are for a two-way route the use of which is not mandatory; see note on the charts.

Topography

9.76

- 1 A description of the mainland E of Cairns, consisting of Cape Grafton (16°52'S 145°55'E) and the promontory on which it stands, is given at 8.141.

The low ground in the vicinity of Cairns and Trinity Inlet is bordered on its W side first by Whitfield Range then, 2 miles farther W, by the wooded Lambs Range which terminates at North Peak (16°54'S 145°40'E). Red Peak, 2½ miles farther N and standing on the N side of Barron River, is the S-most summit of Macalister Range which rises steeply from the coast between Buchan Point (16°44'S 145°40'E) and Yule Point, 13½ miles NW. The hills NW of Macalister Range, which are lower and recede inland, are backed by Heights of Victory, a bold range of mountains rising about 8 miles W from Island Point (16°29'S 145°28'E) and forming the background to Trinity Bay.

- 2 Between Cape Kimberley (16°17'S 145°29'E) and Cape Tribulation, 12 miles N, high ground again stands close to the coast; significant features are described in the appropriate parts of the text.

Natural conditions

9.77

- 1 **Flow.** Water movement in the area is described at 9.12 and in notes on the charts.

Caution should be exercised when passing Satellite Reef (16°26'S 145°41'E) during the NW monsoon, or rainy season, as there is frequently a set off the mainland towards Trinity Opening during the N-going tidal stream.

Climatic table. See 1.192 and 1.204.

Principal marks

9.78

- 1 **Landmarks:**

Marks in the approaches to Cairns: see 9.67.

White patch at Slip Cliff Point (16°39'S 145°34'E); White Cliff Point, wooded and cliff-faced, stands adjacent SE.

Water tower (16°25'S 145°24'E).

- 2 Mount Pieter Botte (16°04'S 145°25'E); a crag at the summit, overhanging to N, is conspicuous from the offing above the intervening coastal range.

Major light:

Low Islets Light (white round tower, 18 m in height; red cupola) (16°23'S 145°34'E).

Directions

(continued from 8.142 or 8.145)

Cape Grafton to Low Islets

9.79

- 1 **Caution.** When bound SE along the track described below in misty weather, which often occurs on this coast, care must be taken that False Cape (16°52'S 145°51'E) (9.59) is not mistaken for Cape Grafton.

From the position 3 miles NE of Cape Grafton (16°52'S 145°55'E) (8.141) the two-way route leads NW to a position 2 miles ENE of Low Islets (16°23'S 145°34'E), passing (positions from Pixie Reef (16°33'S 145°52'E)):

- 2 SW of Green Island (14 miles SSE), a tourist resort, tree-covered to a height of 24 m and lying on a drying coral reef which is steep-to only on its SW side; a boat channel (9.85) to the W end of the island is marked by light-beacons. A tidal stream described at 8.136 must be guarded against. Thence:
- 3 SW of Upolu Reef (8½ miles SSE); a cay near the NW end of the reef is covered with vegetation. Luger Passage, a buoyed channel lies between this reef and Arlington Reef 6 cables ESE; thence: NE of Double Island (14½ miles SW), rising to a hummock at each end, the W one being the higher. Haycock Island 5 cables farther SE, steep and conical, marks the E extremity of the drying reef on which both islands stand. Thence:
- 4 NE of a wreck with a depth of 11.3 m over it (12 miles SW), and:
SW of Pixie Reef (3½ miles WNW), thence:
SW of Batt Reef (5 miles NNW); many large boulders lie within its S edge. Thence:

- 5 Clear of the wreck of a fishing vessel (11½ miles WNW), as required by draught or prudence; and:
NE of the wreck of a fishing vessel (16¼ miles W), lying 2 miles ENE of Korea Reef. Korea and Yule Reefs extend ENE from Yule Point (20 miles W), which is wooded. All these dangers are covered by the red sector (285°–325°) of Island Point Light (9.90).

9.80

- 1 From a position 8¼ miles ENE of Yule Point (16°35'S 145°30'E) the two-way route then leads NNW, passing (positions from Low Islets Light (16°23'S 145°34'E)):

ENE of Egmont Reef (8¼ miles S), drying and steep-to; a beacon stands on the E edge. The reef is the outermost danger off the entrance to Mowbray River (9.88); Alexandra and Wentworth Reefs lie between. And:

- 2 WSW of Satellite Reef (7¼ miles ESE), lying inshore of the inner edge of barrier reefs; it is easily seen under favourable conditions but see Caution at 9.77 on tidal streams. Thence:

ENE of a dangerous wreck (5½ miles SSW), thence:

- 3 ENE of Low Islets, consisting of two islets lying on a drying reef which is fringed with below-water rocks and steep-to on all but its NW side. Low Islets Light (9.78) stands at the centre of the W islet, which is tree-covered to a height of 20 m; the E and larger islet is low and covered with mangroves.

9.81

- 1 **Useful marks:**

Little Fitzroy Island Light (16°55'S 146°00'E) (8.137).

Mount Formartine (16°43'S 145°37'E), wooded with N and S summits; part of Macalister Range rising steeply from the coast.

Black Mountain (Mount Harris) (16°39'S 145°29'E), wooded and with a rounded summit, the highest of Macalister Range.

Island Point Light (16°29'S 145°28'E) (9.90).

Low Islets to Cape Tribulation

9.82

- 1 From the position 2 miles ENE of Low Islets (16°23'S 145°34'E) the track continues NNW, within the charted two-way route (9.2), passing (positions from Cape Kimberley (16°17'S 145°29'E)):

WSW of a 7.2 m patch (10 miles ESE), thence:

ENE of Snapper Island (1 mile SSE); three abrupt grass-covered hills, the highest 102 m in height, form the E part of the island. A low neck of land separates this from the W and higher part which is thickly wooded. Thence:

- 2 ENE of Cape Kimberley, a bold and steep promontory; Mount Alexandra (2 miles NW) is densely wooded with a well-defined peak. A wooded ridge stretches WNW inland from the mount. Thence:

WSW of a patch of below-water rocks (10 miles NE), the outermost of dangers extending up to 2½ miles W from Rudder Reef; thence:

- 3 WSW of Pratt Rock (11 miles NE), thence:
WSW of Undine Reef (13 miles NE); a light-beacon (white square topmark) stands at the NW end; thence:

ENE of Cape Tribulation (12 miles N), a grassy hill, steep-to and jutting out from a bold headland; the cape is only prominent when seen from close inshore S or N of it.

Useful mark:

Thornton Peak (16°10'S 145°22'E), a remarkable sharp peak at the S end of the bold and lofty higher part of the Thornton Range.

(*Directions continue at 9.104*)

Side Channels

Inshore of Low Islets

9.83

- 1 Light-draught vessels may pass inshore of Low Islets (16°23'S 145°34'E).

Directions. The line of bearing (137°), astern, of the E extremity of Fitzroy Island (16°56'S 146°00'E) leads NW, passing NE of a dangerous wreck (9.80) to a position about 3 miles SW of Low Islets, where the route rounds to the N, passing E of Snapper Island to join the two-way route NE of Cape Kimberley.

Penguin Channel

9.84

- 1 **General information.** Penguin Channel leads NE between Snapper Island (16°18'S 145°30'E) (9.82) and Cape Kimberley 1 mile NNW (9.82). A depth of 9.1 m lies 1¼ miles NNE of Snapper Island and depths of less than 10 m extend S from Cape Kimberley to within 3 cables of the NW point of Snapper Island; depths in the fairway are otherwise greater than 10 m.

Tidal streams are slight and set fair with the channel.

Anchorage, harbours and rivers

Green Island

9.85

- 1 **Anchorage** may be obtained 1¾ miles NW of Green Island (16°46'S 145°58'E) (9.79) as shown on the chart in depths of 20 to 30 m.

Landing. A concrete pier on the W end of Green Island (16°46'S 145°58'E) (9.79) is approached by a boat channel leading ENE through the surrounding reef. The channel may be used by boats of suitable draught at all states of the tide.

- 2 The reef should be given a wide berth at LW and the channel approached from a position 1½ cables W of the outer light-beacon.

Another boat channel, marked by small floats, leads ESE through the reef.

Local knowledge is required.

Cook Bay

9.86

- 1 **Anchorage** for small craft, and shelter for boats, may be obtained in Cook Bay on the W side of Taylor Point (16°47'S 145°42'E).

Local knowledge is required.

Double Island

9.87

- 1 **Anchorage** for vessels of a suitable size and draught may be obtained 4 cables W of Double Island (16°44'S 145°41'E) (9.79) in a depth of 6 m. Buchan Point, 8 cables SW of the island, is about 20 m in height and rocky; 5 cables inland the ground rises steeply to Mount Buchan.

There are depths of less than 5 m in the passage between Buchan Point and the reef on which Double Island stands.

A jetty fronts the village of Palm Beach, close S of Buchan Point; a light is displayed from its head.

Mowbray River

9.88

- 1 Mowbray River (16°33'S 145°29'E), which is fringed with mangroves, is navigable by vessels not exceeding 1.5 m draught to the town of Hockley, 1½ miles above the entrance, and for about 5 cables farther upstream.

The approach is partially obstructed by Alexandra Reefs, 8 cables offshore (9.80). The entrance is over a bar which dries for about 2 hours at LW springs and forms part of the extensive drying coastal reef.

Local knowledge is required.

Charts Aus 270 plan of Port Douglas, Aus 830

Port Douglas

9.89

- 1 **General information.** Port Douglas (16°29'S 145°28'E) lies at the mouth of Dicksons Inlet and is entered through a dredged channel which was widened and deepened in 1985 but has since been subject to some shoaling.

Controlling Depth. Available depth in the entry channel 1.3 m. Up to date information on available depths and where the best water may be found should be obtained locally before entry.

- 2 **Pilotage** is compulsory for all foreign vessels over 35 m LOA and is arranged through Cairns; see *Admiralty List of Radio Signals Volume 6(4)* for details. Pilots board in position 16°28'3S 145°27'9E, 3 cables NE of the outer pair of entrance channel light-buoys.

Local knowledge is required.

9.90

- 1 **Landmarks:**

Island Point (16°28'7S 145°27'9E) rises from the low land in its vicinity to appear from seaward as an island. The point, which lies at the N end of a low, sandy and mangrove-covered promontory, is formed by a reddish-coloured ridge covered in large trees except on its W side. Island Point Light (metal framework tower, 40 m in height), stands on the point.

Water tower (16°25'S 145°24'E).

9.91

- 1 **Directions from south-east.**

Leading mark. Mount Beaufort (16°28'S 145°23'E), the termination of a range of hills extending NW from Macalister Range, bearing about 280° and open N of Island Point 4½ miles ESE (9.90), leads from seaward to the anchorage, passing clear S of a dangerous wreck (9.80).

- 2 **Clearing marks:**

Low Islets Light (16°23'S 145°34'E) (9.78) bearing less than 351° passes clear E of Korea and Egmont Reefs (9.80), 8 miles S of the light.

Island Point Light bearing 269°–285° in the white sector (162°–285°) passes clear S of a dangerous wreck (9.80), and clear N of Egmont and Wentworth Reefs (9.80) and of a 4.6 m patch lying 1 mile NW of the latter; the reefs and shoal patch are covered by the adjacent red sector (285°–325°) of the same light.

9.92

- 1 **Directions from north.** From a position 7½ cables ESE of Snapper Island (16°18'S 145°30'E) (9.82) the track leads SSW on 196° in open water towards Island Point, 11 miles SSW, and direct to the anchorage.

9.93

Directions for entry.

Caution. Due to substantial shoaling on the S side of the entrance channel, the light-buoys marking the channel have been relocated. As a result, the leading lights below will be open S when vessels transit the centre of the channel.

Magazine Island Leading Lights:

Front light (yellow triangular topmark, point up) (16°28'9S 145°27'5E), standing on the drying mud flat on the W side of Dicksons Inlet.

Rear light (white triangular topmark, point down; black stripe) (280 m SSW of the front light), standing on Magazine Island.

- 2 The alignment (212°) of the above lights leads from the roadstead N of Island Point into Dicksons Inlet passing between Island Point and Morey Reef, 2 cables NW. The channel is marked by two pairs of light-buoys (lateral) and leads to a position about 2 cables from the front mark, but see 9.89 for remarks on finding the best water. From there the fairway is marked by light-beacons.

9.94

- 1 **Anchorage**, with good holding, may be obtained in the open roadstead 6 cables NNE of Island Point Light in depths of 7 to 9 m. Some shelter is afforded by Wentworth and Alexandra Reefs 4 miles SE.

Prohibited anchorage exists in Dicksons Inlet in an area E of Magazine Island.

Berths are situated on the E side of the inlet as shown on the chart.

Repair and other facilities: none.

Supplies: provisions; water.

Mossman River

9.95

- 1 **Description.** Mossman River (16°26'S 145°24'E) enters the sea in the S part of Trinity Bay. The town of Mossman stands on the S bank of the river, 2 miles above the entrance.

The river is entered over a long, drying and shelving sand bar, which extends some distance from the river mouth and is subject to change with every tide. A drying reef extends 1 mile ESE from the entrance; a drying sandbank lies 2½ cables NE of the same point. A light is displayed from the entrance to the river

Local knowledge is required.

Chart Aus 831

Low Islets

9.96

- 1 **Anchorage**, with good holding, may be obtained NNW of the light on Low Islets (16°23'S 145°34'E) (9.80) as shown on the chart, in depths of 11 to 15 m, mud. There is shelter for boats and good landing on the E side of the W islet.

Snapper Island

9.97

- 1 **Anchorage** may be obtained in Penguin Channel (9.84) off the NW end of Snapper Island (16°18'S 145°30'E) (9.82) during SE winds, but the swell sets in round the island to make it an uncomfortable berth. With NE or SW winds good anchorage may be obtained in the lee of the island.

Daintree River

9.98

- 1 **Description.** Daintree River enters the sea through flat country covered with dense bush 2¼ miles WSW of Cape Kimberley (16°17'S 145°29'E). The town of Daintree (chart Aus 373) is situated 11 miles above the entrance.

A bar lies between drying sandbanks extending generally S from both entrance points. The bar is subject to frequent change, as is the river channel within. There are dangerous snags and drying heaps of ballast near the N bank at the first bend and much shoaling in the upper reaches.

- 2 **Local knowledge** and great care are required.

Tidal streams set across the drying sandbank on the E side of the entrance between the last quarter of the in-going stream and the first quarter of the out-going stream; care is required when crossing the bar. Seas which break right across the bar in conditions of strong SE winds and an out-going stream, are dangerous for boats.

- 3 **Approach and entry.** The entrance is marked by a light-buoy (safe water) and the channel within by light-beacons and a light-buoy from where the channel is marked by light-beacons.

The channel over the bar is generally visible from near the entrance in smooth water, but not during freshets and SE winds when the water is much discoloured.

Anchorage may be obtained for three or four small craft close off the N bank within the entrance.

Alexandra Bay

9.99

- 1 Bailay (Bailey) Point (16°13'S 145°28'E), which rises to Bailay Hill, with a double summit and thickly wooded, 5 cables WSW, forms the SE entrance point to Alexandra Bay. The bay is shallow and affords no sheltered anchorage; two rocks (both drying 2.7 m), lying close E of Struck Island (16°10'S 145°27'E), are the outer dangers off the NW entrance point.

- 2 Bailay Creek (16°12'S 145°27'E) enters the SW corner of Alexandra Bay and is navigable at HW for a distance of 5 cables by small craft with draught not exceeding 2.1 m. A bar, which dries, lies 1½ cables to seaward of the entrance; the channel within is very narrow and leads between a sandbank, 1.8 m in height, on the W side, and a rocky ledge, which dries, on the E side.

Local knowledge is required.

CAPE TRIBULATION TO CAPE FLATTERY**General information**

Chart Aus 831

Route

9.100

- 1 From Cape Tribulation (16°05'S 145°29'E) the charted two-way route leads generally N for 68 miles to Cape Flattery.

Between Cape Tribulation and Archer Point (15°36'S 145°20'E), the route divides to pass either outside or inshore of Hope Islands (15°44'S 145°27'E). The choice of track must depend on preference and the circumstances of each intended passage.

Topography

9.101

- 1 From Cape Tribulation to Cowie Point, 7 miles NNW, a range of mountains, which includes Mount Pieter Botte (16°04'S 145°25'E) (9.78), runs parallel to the coast and close inland. From there to Rattlesnake Point 8 miles

farther NNW, the mountains recede and the intervening land behind the shores of Weary Bay is formed by low, undulating and wooded hills, set against a higher and more distant background in which the highest peak is that of Mount Misery (15°53'S 145°14'E).

- 2 From Rattlesnake Point the coast is backed by a high ridge running from Mount Finlay, 2¼ miles WNW of the point, to Mount Amos which rises 2¾ miles SW of Forsberg Point (15°40'S 145°20'E). Mount Finnigan, rising 3¾ miles W of Mount Finlay, is well-defined but often obscured by cloud. This part of the coast is described in more detail under directions at 9.108.

- 3 From Forsberg Point to Cooktown Harbour 13½ miles NNW, the land is generally low and wooded with mountains about 12 miles inland. On the N side of Cooktown the coast is backed by a steep and wooded ridge of hills stretching from Mount Saunders (15°25'S 145°14'E) to Nob Point 6 miles NE (9.110).

- 4 From Nob Point the appearance of the land changes. The promontories of Cape Bedford (15°14'S 145°21'E) and Cape Flattery, 15 miles N, stand out well but the remainder of the coast is generally low and sandy, sparsely covered with trees or scrub, and intersected by many streams. On the N side of McIvor River (15°08'S 145°14'E) there are scrub-covered dunes of white and yellow sand and numerous small lagoons of brackish water.

Principal marks

9.102

- 1 **Landmark:**

Mount Pieter Botte (16°04'S 145°25'E) (9.78).

Major lights:

Archer Point Light (white lantern on grey square concrete tower; 6 m in height) (15°36'S 145°20'E).

Three Isles Light (white GRP hut on red metal framework tower, 26 m in height) (15°07'S 145°25'E).

Other aid to navigation

9.103

- 1 **Racon:**

Gubbins Reef Light (15°43'S 145°24'E) (9.108).

For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 9.82)

Cape Tribulation to Archer Point via outer two-way route

9.104

- 1 From the position in the two-way route ENE of Cape Tribulation (16°05'S 145°29'E) (9.82) the outer track leads N as shown on the chart, passing (positions from Rattlesnake Point (15°50'S 145°23'E)):

E of Cowie Point (8 miles SSE), bold and cliffy and rising to Mount Cowie, wooded, 5 cables WNW. The coast for 2½ miles NW from the point is bold and, in places, precipitous. Thence:

E of a dangerous wreck (7 miles SSE), thence:

- 2 E of Lake Reef (4¼ miles SSE), which dries and is the outermost danger in the S part of Weary Bay. Collins Hill, 2 miles farther WSW, is prominent. Thence:

W of Pickersgill Reef (10 miles E); Pickersgill Reef Light (white GRP hut on white concrete tower, 7 m in height) stands on the NW part of the reef. Thence:

E of Rattlesnake Point, steep and bold with its upper part thickly wooded; thence:

W of Endeavour Reef (10¼ miles ENE), thence:

- 3 E of Hope Islands (6½ miles NE), consisting of two sand cays lying on separate drying reefs which are always visible; the passage between the two reefs is not recommended as below-water patches near the N end are difficult to see except in favourable light. The SW cay, at the S end of the SW reef, is covered with bushes to a height of 9 m and has mangroves extending 5 cables NNW from it; a small sand cay (drying 1.5 m) lies at the N end of the same reef. The NE cay, on the NE reef, is covered with thick tropical vegetation to a height of 21 m.

9.105

- 1 **Leading mark.** Archer Point Light (15°36'S 145°20'E) (9.102) bearing 309° in a white sector (305°–313°) then leads NW, passing:

SW of Cairns Reef (11 miles NE), covered by the adjacent green sector (276°–305°) of Archer Point Light, and:

NE of Hope Islands (6½ miles NE) (9.104); the NE reef is mostly covered by the adjacent red sector (313°–320°) of Archer Point Light, thence:

- 2 NE of Stonor Patch (8½ miles NNE) and of Ottaway Patch, coral, 6 cables farther W. These are the outer dangers NNW of Hope Islands and are covered by the same red sector of Archer Point Light; thence:

SW of Bee Reef (11¾ miles NNE), marked on its W side by a beacon. The reef lies 1 mile W of the NW end of Cairns Reef and is covered by the same green sector of Archer Point Light.

- 3 The track then leads N within the two-way route, passing:

E of Archer Point (14½ miles N), distant about 2¾ miles. The point is 61 m in height, prominent, rocky and surmounted by Archer Point Light (9.102); Archer Hill, grass-covered, rises 7 cables W of the point.

9.106

- 1 **Useful marks:**

Mount Thomas (15°43'S 145°20'E) (9.109).

Gubbins Reef Light (15°43'S 145°24'E) (9.108).

Egret Reef Light (15°29'S 145°24'E) (9.110).

Cape Tribulation to Archer Point via inshore two-way route

9.107

- 1 From the position in the two-way route ENE of Cape Tribulation (16°05'S 145°29'E) (9.82), the inshore track leads NNW as shown on the chart, passing (positions from Rattlesnake Point (15°50'S 145°23'E)):

ENE of Cowie Point (8 miles SSE) (9.104), thence:

ENE of a dangerous wreck (7 miles SSE), thence:

ENE of Lake Reef (4¼ miles SSE) (9.104).

9.108

- 1 **Leading marks:**

Front mark, a disused lighthouse (white square masonry daymark 2 m in height; red cupola) (15°36'S 145°20'E), standing on the W slope of Rocky Island, 50 m in height and steep-to on its E side.

Rear mark, Archer Point Light (1 mile NNW of the front mark) (9.102).

- 2 The alignment (336°) of the above marks, in a white sector (334°–338°) of Archer Point Light, continues the lead NNW between the mainland and offlying reefs, passing:

ENE of Rattlesnake Point (9.104), thence:

WSW of Hope Islands (6½ miles NE) (9.104); the SW reef of which, together with Gubbins Reef below, is covered by the adjacent green sector (320°–334°) of Archer Point Light, and:

- 3 ENE of Obree Point (4 miles N) and of the mainland coast stretching 6½ miles farther NNW. The land behind this part of the coast rises to the wooded summits of Mounts Hartley, Thomas (9.109) and Amos. Reefs of drying coral and other dangers fringing the coast lie inshore of the 10 m depth contour, as shown on the chart, and are covered by the adjacent red sector (338°–358°) of Archer Point Light. And:

- 4 WSW of Gubbins Reef (7 miles N), coral; foul ground extends from the S extremity of the reef which can be difficult to see. Delius Patch lies 5 cables E. Gubbins Reef Light (white GRP hut on white concrete column, 7 m in height) stands near the N end of the reef. The wreck of a fishing vessel stranded in 1995 lies on the S end of the reef.

- 5 The track then leads N within the two-way route, passing:

E of Forsberg Point (10½ miles NNW), a small rocky point surmounted by a prominent knob and rising to Bald Hill 5 cables W; thence:

E of Archer Point (14½ miles N) (9.105).

9.109

- 1 **Useful marks:**

Pickersgill Reef Light (15°52'S 145°33'E) (9.104). Mount Thomas (15°43'S 145°20'E) has a prominent saddle between it and a similarly wooded summit 695 m in height, 1 mile SSE. The saddle is easily identifiable on a dark night when few other marks are visible.

Archer Point to Cape Flattery

9.110

- 1 From a position within the two-way route E of Archer Point (15°36'S 145°20'E) (9.105) the track leads N as shown on the chart, passing (positions from Indian Head (15°23'S 145°17'E)):

E of Walker Point (11¼ miles S), rocky and moderately steep-to but low and flat; Walker Hill, 7 cables farther WNW, grassy and rising abruptly from the low wooded land behind this part of the coast, is readily identifiable. Grave Point, 9 cables farther NNW, is again low, but sandy. Thence:

- 2 E of Cowlshaw Reef (9½ miles SSE), steep-to on all sides; the E side is marked by a beacon (E cardinal) and the NW end by a sand cay (drying 2.4 m). Dawson Reef, 2 miles farther NW, has a sand cay drying 1.5 m at its NW end and is marked by a light-beacon (W cardinal). Thence:

- 3 W of Egret Reef (9 miles SE), visible at all times due to ripples and to discolouration of the water; Egret Reef Light (white GRP hut on white concrete column, 7 m in height) marks the W side of the reef; thence:

W of Boulder Reef (7¾ miles ESE), steep-to and always visible; a number of large black boulders mark its E and SE sides; thence:

- 4 E of Indian Head, rising to Rocky Mountain 7½ cables WNW; thence:

E of Nob Point (2 miles NNE), 60 m in height and almost steep-to. The point is the NE extremity of a range of coastal hills extending from Mount Saunders 6 miles SW, which is bare. Some of the summits of this range appear from seaward as sharp peaks, of which Mount Milman (5 miles SW) is the highest; the slopes of the hills show alternate streaks of grass and scrub. Thence:

- 5 E of Cape Bedford (9½ miles NNE), formed by a range of hills extending 3 miles NNW from South Cape Bedford and connected to the mainland by a low, sandy isthmus. From E the cape appears as three separate hills. South Cape Bedford is conical and scrub-covered; Mound Stone is almost flat-topped but has a mound with a boulder on it near its centre; the N hill (247 m in height) is formed of cliffs rising from tree-covered lower slopes to a flat top. Petty Patch, with a depth of 5.5 m over it, 6 cables ENE of the N extremity of the cape, is the N-most of the dangers E of the cape, lying up to 1 mile offshore and close within the 10 m depth contour.

9.111

- 1 **Useful marks:**

Mount Cook (15°29'S 145°16'E), densely wooded and conical. The mountain is fronted 1¼ miles ESE by Monkhouse Point, a rounded and reddish-coloured grassy hill, 136 m in height, and to N by a spur which terminates in Grassy Hill.

Grassy Hill Light (white round tower, red cupola, 6 m in height) (15°28'S 145°15'E), standing near the summit of Grassy Hill and marking the entrance to Cooktown.

Quoin Hill (15°18'S 145°15'E).

Charts Aus 831, Aus 832

9.112

- 1 The track then continues N to a position within the two-way route ENE of Cape Flattery (14°57'S 145°21'E), passing (positions from Cape Flattery):

W of Forrester Reef (14½ miles SE), steep-to on all sides except its N, and always visible; thence:

E of Conical Rock (11½ miles S), black in colour and standing at the E end of a steep-to drying reef; thence:

- 2 W of Three Isles (10½ miles SSE), lying on a steep-to drying reef. The islets are all low and covered with trees, grass and mangroves; the SW and smallest islet (10 m in height to the tops of the trees) is the highest. Three Isles Light (9.102) stands at the NW point of the N islet. Tidal streams in this vicinity are unlikely to exceed ½ kn, as shown on the chart. Thence:

- 3 E of Low Wooded Isle (9 miles S), fringed by a steep-to drying reef and tree-covered except at its NW end; a clump of casuarinas rising to a height of 17 m are prominent; thence:

W of Two Isles (7 miles SE), lying on a steep-to drying reef. Both islets are wooded; the highest tree (17 m in height) stands on the W islet. Thence:

- 4 E of Cape Flattery, a bold, well-defined headland, formed by an isolated range of hills standing out from the adjacent low land and appearing from a distance as an island; the E face is cliffy, with

several gullies and sandy beaches. The summit is grass-covered and surmounted by a stone cairn. Cape Flattery Offshore Wharf (9.114) is situated at the SE extremity. The E side of the cape may be passed at a distance of 6 cables in depths of more than 20 m. A spit with depths of less than 5 m over it, extending 2 miles NNW from the cape (chart Aus 832), may be seen by the lighter colour of the water.

9.113

Useful marks:

- 1 Finger (15°06'S 145°14'E), a prominent white sand patch so-named from its shape.
 - Red Hill (15°05'S 145°15'E), with a red sand streak on its NE side.
 - Casuarina Hill (15°01'S 145°17'E), well-defined by the dark colour of the casuarinas which cover it.
 - White Sand Hills (72 m in height and conspicuous) (14°59'S 145°16'E).
 - Lizard Island (14°40'S 145°28'E) (9.146).
- (Directions continue at 9.147)

Port of Cape Flattery

Charts Aus 832, Aus 270 plan of Cape Flattery Wharf

General information

9.114

- 1 **Position and function.** The port, at Cape Flattery (14°57'S 145°21'E), operates solely for the export of silica sand from the Cape Flattery mines.



Offshore Wharf

Cape Flattery from S (9.112)

(Original dated 1999)

Topography. Cape Flattery (9.112) and Lookout Point 9½ miles NW (9.148) are described in the course of directions given for the charted two-way route in the vicinity. The shore of the bay between these points is formed by a sandy beach, broken in places by mangroves and, in the S part, by sand cliffs about 6 m in height. Behind the coast low, wooded sandhills rise from a plain which is otherwise studded with numerous brackish lagoons and streams.

- 2 On the SE side of the bay a remarkable conical peak (213 m in height) rises 2 miles W of Cape Flattery and 3 cables ESE of the jetty forming the inner harbour.

Port limits. Limits of Cape Flattery Pilotage Area are shown on the chart.

Approach and entry. The port lies immediately W of the charted two-way route in its vicinity, from which it may be entered direct. Anchorages for vessels waiting to berth are listed at 9.116.

- 3 **Traffic.** In 2004 the offshore wharf handled 20 vessels totalling 942 837 dwt.

Port authority. Ports Corporation of Queensland, PO Box 409, Brisbane, Queensland 4001.

Website: www.pcq.com.au

Email: info@pcq.com.au

The port is operated by Cape Flattery Silica Mines Pty Ltd.

Limiting conditions

9.115

- 1 **Limiting draught** is about 14.5 m.
- Tidal levels:** see information in *Admiralty Tide Tables*. Mean spring range about 1.7 m; mean neap range about 0.4 m.
- Maximum size of vessel handled.** The offshore wharf has been designed to accommodate vessels of Panamax size up to about 70 000 dwt and 250 m LOA. The largest vessel handled has been of 69 911 dwt, 225 m LOA and 13.35 m draught; the greatest beam has been 32 m.
- 2 **Current** normally sets NE under the wharf at rates up to 1 kn but may be stronger during the wet season (December to March). After N winds the set is occasionally S or SW.

Arrival information

9.116

- 1 **Port operations.** At the offshore wharf, berthing is carried out in daylight only and may be suspended in winds exceeding 20 kn; loading is usually stopped in winds above 40 kn.
- Main engines are required to remain ready for sea whilst alongside.
- Port radio.** There is a port radio station but watch is kept only if arranged in advance through the shipping agent and otherwise prior to pilot boarding. Details are given in *Admiralty List of Radio Signals Volume 6(4)*.
- 2 **Notice of ETA:** 48 hours notice is required, with confirmation 24 hours before arrival.
- Anchorage** may be obtained by vessels of suitable draught about 1½ miles N of the inner harbour jetty (9.117) in depths as shown on the chart. The approach passes E of a dangerous wreck lying 2¾ miles NNW of the jetty. This anchorage, known locally as No 1, has been used since vessels were formerly loaded there by lighter.
- 3 An alternative berth, known locally as No 2 anchorage and which may be used in good weather, is available in a depth of 27 m in position 14°56'8S 145°22'0E, on the W side of the charted two-way route and 2½ miles NNE of the offshore wharf.
- Anchorage in a least depth of 8 m may also be obtained about 5 miles NW of Cape Flattery in an area bounded by the following coordinates:
 - 14°52'8S 145°15'7E.
 - 14°53'0S 145°16'7E.
 - 14°54'5S 145°18'9E.
 - 14°54'0S 145°16'7E.
- 4 **Pilotage** is compulsory. Pilots are not stationed at Cape Flattery but are provided from Cairns and available for movements by day only; details of communications are given in *Admiralty List of Radio Signals Volume 6(4)*. The

boarding place is in position 14°56'·8S 145°23'·0E, about 2 miles E of Cape Flattery.

Tugs are not available. Two work-boats run mooring lines to the berth.

Quarantine. No local facilities. Arrangements for health clearance must be made through the shipping agent at Cairns.

Harbour

9.117

- 1 **General layout.** The export terminal consists of a single offshore berth on a jetty extending 2½ cables from the S extremity of Cape Flattery. A small jetty situated 2¼ miles WSW of the cape was formerly used to load sand by lighter.

Landmark:

Cape Flattery (14°57'S 145°21'E) (9.112).

Directions for the offshore wharf

9.118

- 1 **Leading beacons:**

Front (red light-beacon) (14°59'·0S 145°21'·3E), standing ½ cable off the SE extremity of the cape.

Rear (black and white beacon) (180 m SW of the front), standing on the knuckle at the inshore end of the wharf.

- 2 From a position about 1½ miles E of Cape Flattery (14°57'S 145°21'E) (9.112) in the charted two-way route, the alignment (215°) of the above beacons leads SW towards the inshore end of the berth.

Vessels normally berth with bows SSE using the port anchor to assist; the bottom in the vicinity of the wharf is rocky slate.

Useful marks: see marks described at 9.113.

Berth

9.119

- 1 **Offshore wharf:** trestle construction; wharf 210 m in length, with berthing on dolphins No 2 to 6 on NE side only; a light is displayed from a mooring dolphin about 65 m off each end of the wharf; total berth length 230 m; depth alongside 13·7 m.

Cautions. A 12 m patch is reported to lie inshore of berthing dolphin No 6.

An overhead wire with vertical clearance 3 m is permanently rigged from No 1 outer mooring dolphin to No 2 berthing dolphin at the outer end of the wharf.

Port services

9.120

- 1 No supplies or other facilities; waste and garbage must be retained onboard; no road or rail communication with the port from inland; no shore access for crew members; emergency medical cases may be flown to Cairns by light aircraft.

Anchorage, harbours, landings and rivers

Chart Aus 831

Cowie Point

9.121

- 1 Small craft can shelter during SE winds under the lee of a fringing coastal reef of drying coral, 7½ cables SSE of Cowie Point (15°58'S 145°26'E) (9.104).

Weary Bay

9.122

- 1 **Description.** Weary Bay, entered between Rattlesnake Point (15°50'S 145°23'E) and a point on the coast 6 miles SSE, does not recede enough to afford any protection from SE winds.

- 2 At the head of the bay lies Bloomfield River (15°55'S 145°22'E), the entrance of which can be identified by Collins Hill 5 cables S of it (9.104), and lies between South Head, a wooded knoll 46 m in height, and North Head 1½ cables N, formed by a sandbank backed by scrub and mangroves. Drying banks of sand and shingle extend 5 cables to seaward from both heads to a bar which is awash.

- 3 The entrance is marked by a light-beacon (white). The channel up-river is then marked by beacons.

Within the bar there are depths of 1·8 to 2·7 m for about 5 cables along the SE bank. A wharf, with a depth of 1·8 m alongside, is situated near a sawmill on the NW bank, 1 mile above the entrance. The village of Bloomfield stands on the N bank 2¼ miles farther upstream.

- 4 The river is navigable by boats as far as rapids which occur at a distance of 6 to 7 miles from the entrance; above these the river is made impassable by a waterfall 30 m in height.

Anchorage with some shelter for a vessel of suitable size and draught may be found in a lee provided by Lake Reef (15°55'S 145°24'E) (9.104) and the drying reef and foul ground extending from shore 1 mile SSW.

Local knowledge is required.

Hope Islands

9.123

- 1 Hope Islands (15°44'S 145°27'E) (9.104) provide shelter from SE winds under the lee of the NE reef but tidal streams setting through the passage between the two reefs may cause a short and confused sea.

Anchorage in a depth of 16 m may be obtained 1 mile NW of the NE cay, taking care to anchor out of the tidal stream and to avoid the below-water patches off the NW side of the reef.

- 2 **Anchorage** for vessels up to 400 tonnes may be obtained closer in, with the W point of the NE cay bearing 161° distant 4½ cables.

Trawlers frequently anchor in the lagoon close W of the same cay.

Local knowledge is required for both inner anchorages, which should only be approached in good light, as numerous coral outcrops exist.

Forsberg Point

9.124

- 1 **Landing.** Good landing may be made at LW on the reef on the S side of Forsberg Point (15°40'S 145°20'E) (9.108). Landing in Walsh Bay or the next bay between the point

and Archer Point, 4¼ miles farther N, is not possible during SE winds.

Archer Point

9.125

- 1 **Anchorage** for small craft drawing not more than 1.8 m may be obtained in the lee NW of Archer Point (15°36'S 145°20'E) (9.105), taking care to avoid a below-water rock 2 cables W of the point.

Local knowledge is required.

Charts Aus 270 plan of Cooktown, Aus 831

Port of Cooktown

9.126

- 1 **General information.** The port lies at the entrance to Endeavour River where the N and W slopes of Grassy Hill (15°28'S 145°15'E) (9.111), at its E entrance point, are fronted by the town of Cooktown. The port is much used by small craft, fishing vessels operating both locally and off Cape York 325 miles NNW, and by tourist craft operating from Cairns.
- 2 The entrance to Endeavour River is obstructed by a bar. The W entrance point is Point Saunders, which lies 5 cables W of Grassy Hill and is the S extremity of a sandy ridge extending 2 miles N. Upstream of this point the river is shallow, tortuous and obstructed by drying banks of sand and mud, but is navigable by boats for a distance of 15 miles.
- 3 **Pilotage area limits**, shown on chart Aus 831, extend about 1½ miles E of Grassy Hill Light.

Controlling depth. The maintained depth in the entrance channel is 3.1 m, and within the swing basin it is 2.5 m, as shown on the chart; but depths are liable to change due to freshets.

- 4 **Pilotage** is compulsory for all foreign vessels over 35 m LOA, and is arranged through Cairns; see *Admiralty List of Radio Signals Volume 6(4)* for details. Pilots board in position 15°26'9S 145°15'7E, 5½ cables NE of the outer end of the entrance channel.

Local knowledge is required.

- 5 **Tidal streams** attain rates of 2 to 3 kn at springs, with the last half of the in-going stream setting W and diagonally across the entrance. The range of tide is much influenced by wind.

Climatic table: see 1.192 and 1.205.

Landmark:

Mount Cook (15°29'S 145°16'E) (9.111).

9.127

- 1 **Directions from south.** From a position in the charted two-way route bearing 090° distant about 7 miles from Grassy Hill Light (15°28'S 145°15'E) (9.111), the track leads WNW on 286° to a position NE of the same light and on the line of the entrance leading lights. The track passes (positions from Grassy Hill Light):
- 2 NNE of Dawson Reef (4½ miles ESE) (9.110), thence:
NNE of Blackbird Patches (2¼ miles ESE), two sandy patches lying on the E edge of a flat, with depths of less than 5 m over it, extending 1½ miles NNE from Monkhouse Point (9.111).

9.128

- 1 **Directions from north.** From a position in the charted two-way route E of South Cape Bedford (15°17'S 145°21'E) (9.110), the track leads between SSW and SW to

a position about 1 mile NE of Grassy Hill Light (15°28'S 145°15'E) (9.111).

Useful marks:

Mount Saunders (15°25'S 145°14'E) and the hills of the coastal range extending 6 miles NE to Nob Point (9.110).

9.129

- 1 **Directions for entry.** From a position about 1 mile NE of Grassy Hill Light, the track leads SW through the entrance channel, passing between three pairs of light-beacons and light-buoys (lateral). Care must be taken to reduce speed in good time when approaching the swinging basin on the in-going tidal stream.

Course may then be directed as required for berthing, passing SE of a light-buoy (special) (3½ cables WNW of Grassy Hill Light), marking the NW edge of the swinging basin and shoal depths extending from Sachs Spit (a drying sandspit), 1 cable farther NW.

9.130

- 1 **Berths.** Information on charted wharves and actual depths available throughout should be obtained locally.

Berthing should not be attempted at night unless special arrangements have been made.

There is not sufficient room to anchor in the swinging basin.

- 2 **Anchorage** for small craft may be obtained in Endeavour River; cyclone anchorages are available in the mangroves upstream of Point Saunders.

Repairs: light engineering facilities only.

Other facilities: hospital; boat ramp.

Supplies: fresh provisions; fresh water and marine diesel.

Chart Aus 831

Boulder Reef

9.131

- 1 **Anchorage** may be obtained 5 cables NW of Boulder Reef (15°25'S 145°26'E) (9.110) in a depth of 22 m, mud, sand and shells.

Swinger Reef

9.132

- 1 **Anchorage** may be obtained NW of Swinger Reef (15°15'S 145°32'E) (9.32), taking care to avoid the danger on the W side of the reef.

Local knowledge is required.

Cape Bedford

9.133

- 1 **Description.** The wide bay between Cape Bedford (15°14'S 145°21'E) (9.110) and Cape Flattery, 16 miles N, is too exposed to E and SE winds to offer safe anchorage except where indicated in this and following paragraphs.

On the S side of the bay, Green Hill (15°17'S 145°18'E), grass-covered, and Red Hill 7 cables SE, bare and peaked, may be identified rising from the low and sparsely covered land of Cape Bedford isthmus; Knob Hill, 3 miles WNW, and Mission Hill (not charted) (5 miles WNW), are both tree-covered.

- 2 **Anchorage** for vessels of suitable draught may be obtained 2 to 3 miles W of Cape Bedford in a depth of 5 m, mud and sand with good holding. When the Trade Winds are blowing strongly a swell sets in at this anchorage and powerful gusts come off the land.

Forrester Reef**9.134**

- 1 **Anchorage** may be obtained under the lee of Forrester Reef (15°10'S 145°30'E) (9.112) at a distance of 5 cables off in depths of 27 m, mud and sand. Mackay Reefs, 2½ miles NE, formed of a group of coral heads, some of which dry, do not show up well.

Conical Rock**9.135**

- 1 **Anchorage** may be obtained during SE winds on the N side of the reef on which Conical Rock (15°08'S 145°20'E) (9.112) stands.

McIvor River**9.136**

- 1 **Description.** The entrance to McIvor River (15°08'S 145°14'E) is easily identified by the opening in the mangroves 5 miles W of Conical Rock (9.112). A sandy bar, which dries for a distance of 7½ cables offshore, is dangerous for small craft to cross, even at HW, when the Trade Wind is strong. Beor Reef, 2 miles SE, and Murray Reefs 3 miles farther N, both of drying coral, lie in the approaches between Conical Rock and shore.

Three Isles**9.137**

- 1 **Anchorage** may be obtained 5 cables W of Three Isles (15°07'S 145°25'E) (9.112) in depths of 20 to 22 m. The proximity of traffic passing in the two-way route may need to be considered.

Low Wooded Isle**9.138**

- 1 **Anchorage** may be obtained under the lee of Low Wooded Isle (15°06'S 145°23'E) (9.112), 3 cables off its W end in a depth of 15 m, but a considerable swell sets in during strong SE winds.

Two Isles**9.139**

- 1 **Anchorage** under the lee of Two Isles (15°01'S 145°27'E) (9.112) is not good but can be used with safety, provided that the reef is not approached within 4 cables. Ada Bank, 1½ miles farther NE, is of coral.

CAPE FLATTERY TO CAPE MELVILLE**General information**

Charts Aus 832, Aus 833, Aus 270 plan of Cape Melville and Pipon Islets and plan of Howick Group

Routes**9.140**

- 1 From Cape Flattery (14°57'S 145°21'E) the charted two-way route leads 67 miles NW to Cape Melville. In the first part of the passage, between Cape Flattery and Coquet Island (14°33'S 145°00'E), the route divides as shown on the chart. The outer route has the greater depths and gives access to a Deep-water Route. The inshore route has the advantage of greater ease of navigation and is recommended for use by all vessels of suitable draught.
- 2 The Deep-water Route, which has a least navigable width of 5½ cables at its controlling depth, leads separately from the vicinity of Lizard Island (14°40'S 145°28'E) to rejoin the charted two-way route off Barrow Point 50 miles WNW.

Depths in the above routes are given at 9.143.

Topography**9.141**

- 1 **The mainland.** The coast between Cape Flattery and Lookout Point, 9½ miles NW, is described at 9.114. Thence to Red Point, 31 miles farther NW, the coastal plain which varies in width between 3 and 6 miles is covered with trees and bushes and intersected by numerous creeks. The coast itself is generally low, being formed either of sandy beaches or of mangroves, and is fronted by drying flats from which depths of less than 5 m extend up to 4 miles farther offshore. The range of mountains which rises inland and roughly parallel with the coast, appears from a distance as one continuous, flat-topped ridge and is well-defined by precipitous cliffs at its SE and NW extremities: it is however often obscured by cloud or haze.

- 2 Between Red Point (14°33'S 144°46'E) and Barrow Point, 13 miles NNW, the coast is again formed generally of sandy beaches or mangroves backed by low, tree-covered land except in the vicinity of Cape Bowen (14°31'S 144°40'E) where Altanmoui Range rises close inland. The mountains of this bare and isolated range are remarkable for the basaltic columns on them. Cape Bowen itself is low, cliffy and ill-defined.

- 3 From Barrow Point (14°22'S 144°39'E) to Cape Melville, 13 miles NNW, the land changes from low and wooded in the S part, to mountainous in the N, where Melville Range is the dominant feature. The range is remarkable for the heaps of immense blocks of granite found all over it. The coast is formed of sandy beaches separated by rocky points and, NW from North Bay Point (14°16'S 144°36'E), is fronted by rocks and islets a short distance offshore. From Rocky Point Islet to Cape Melville, 5 miles NW, the coast is bordered with immense blocks of granite, some above water, similar to those on the mountains close inland.

9.142

- 1 **Offshore islands.** The most significant of these is Lizard Island (14°40'S 145°28'E), described at 9.146.

Howick Group, farther WNW, is a group of ten islands extending from Coquet Island (14°33'S 144°59'E) to Bewick Island 12 miles WNW. With the exception of Howick Island, the largest and highest, all are low and tree-covered to heights of 7 to 16 m.

- 2 **Caution.** A sharp lookout should be maintained when passing through Howick Group, as the islands are difficult to see on a dark night and the tracks within the two-way route pass mostly close-to.

Depths**9.143**

- 1 On the two-way route from Cape Flattery to Cape Melville, using the outer route between Cape Flattery and Coquet Island 32 miles NW, there is a least charted depth of 12.5 m, 2½ miles SE of Coquet Island (14°33'S 145°00'E). When using the middle route (9.150), from Cape Flattery to the junction of the outer and inner routes, the least charted depth is 12.1 m, in position 6¾ miles W of Nymph Island (14°39'S 145°15'E), and when using the inshore route between Cape Flattery and Coquet Island there are least charted depths of 9.7 m, lying from 4 miles NNW to 3¼ miles ESE of Pethebridge Islets (14°44'S 145°06'E).

- 2 From Coquet Islands to Cape Melville using the two-way route, the least charted depth is 10.7 m, in position 1½ miles W of Newton Island (14°30'S 144°55'E).

From Cape Flattery to Cape Melville using the outer two-way route to Lizard Island 17 miles NNE, thence the

deep-water route to Barrow Point 50 miles WNW, thence the two-way route to Cape Melville 14 miles NNW, the least charted depth is 14.4 m, in position 1½ miles E of Bewick Island (9.152).

Exercise area

9.144

- 1 See 9.5.

Natural conditions

9.145

- 1 **Water conditions.** Between Lizard Island (14°40'S 145°28'E) and the mainland the water is discoloured; the bottom being generally even and muddy.

Flow. General information on water movement is given at 9.12 and in notes on the charts.

- 2 In the vicinity of Channel Rocks, 1½ miles NNW of Cape Melville (14°10'S 144°31'E), the tidal stream sets between W and NW on the rising tide at a spring rate of only about ¼ kn; the effect of the South-east Trade Winds is to produce a constant NW flow there with a maximum rate of 1¼ kn. During the NW monsoon, when calms and light winds are frequent, the flow is uncertain but most likely to be with the wind. Care must be taken in this vicinity as the possibility of a strong and unexpected set across track cannot be discounted.

Landmark

9.146

- 1 Lizard Island (14°40'S 145°28'E) of granite formation, with a distinctive mountain ridge on its E side, rising to a bare, dome-shaped summit. The island is mostly covered by grass, but with trees and bushes in the ravines and over a large part of the S end of the island. The SE extremity is formed by a narrow ridge 32 m in height extending from the mountainous interior.

Directions

(continued from 9.113)

Cape Flattery to Coquet Island via outer two-way route

9.147

- 1 From a position within the two-way route about 3 miles ENE of Cape Flattery (14°57'S 145°21'E) (9.112) the outer track leads N as shown on the chart, passing (positions from Eagle Island (14°42'S 145°23'E)):

W of an 8.7 m patch (12 miles SSE), the outer danger NW of Heldson Reef 4½ miles farther SE. Heldson Reef is well-defined and steep-to except on its N side, but the shoals and below-water rocks extending NW do not show up well from aloft and the area should be avoided, especially in thick weather. Thence:

- 2 W of Rocky Islets (11 miles SSE), three in number lying on a crescent-shaped drying reef of coral. The largest islet is wooded; the others are rocks, both lying on the S edge of the reef and steep-to on that side. The N side of the reef is foul to a distance of 1 mile. Thence:

- 3 W of South Direction Island (11¼ miles SE), steep and rocky, it rises abruptly to the summit near its E end to give a quoin-shaped appearance from S or N. The island is steep-to on all except its N side from which reefs and foul ground extend 1¼ miles. Some trees stand near the W end of the island. Thence:

E of Linnet Reef (5 miles SSW), which dries in patches; thence:

- 4 E of Martin Reef (3½ miles SSW), marked near the S end of its SE side by drying boulders; thence:
W of North Direction Island (8 miles ESE), a steep, bare and dome-shaped island rising abruptly from the sea and fringed by a drying reef; landing may be made at a sandy point on the NW side. Thence:
E of Eyrie Reef, of drying coral, well-defined and steep-to on its E and S sides; the SE edge is marked by drying boulders; Eagle Island, low and bush-covered, marks the NW end. Thence:

- 5 W of Palfrey Island (3½ miles E) which, together with South Island 4 cables farther SE, marks the drying reefs extending SW from Lizard Island. Palfrey and South Islands are both rocky and covered with coarse grass, with a few bushes and trees in the sheltered parts; a light (white square concrete tower, 5 m in height) stands on the W slope of Palfrey Island. Thence:

- 6 W of Lizard Island (4 miles ENE) (9.146); a row of casuarina trees marks South Bay Point, the W extremity of the island.

The track then leads WNW within the charted two-way route, passing:

NNE of a rock (drying 0.2 m) (6 cables N), lying on foul ground extending 6 cables N from Eyrie Reef; thence:

- 7 NNE of Nymph Island (7¼ miles WNW), reef-fringed and wooded, with some prominent casuarina trees near the N side; and:

SSW of an 8.6 m patch (9 miles NW), the least depth on a bank, with depths of less than 15 m over it, lying on the N side of the two-way route.

The track then continues WNW within the charted two-way route to a position about 1¾ miles WSW of Coquet Island (14°33'S 145°00'E), passing:

- 8 SSW of Coquet Island, the SE-most danger of the Howick Group (9.142) and lying in two parts on a drying reef; a clump of trees on the S side of the W part rises to a height of 16 m. Coquet Island Light (white hut on red metal framework tower, 22 m in height) stands near the W end of the island.

Useful marks:

Decapolis Reef Light (14°51'S 145°16'E) (9.148).
Pethebridge Islets Light (14°44'S 145°06'E) (9.149).
Miles Reef Light (14°32'S 144°55'E) (9.152).

Cape Flattery to Coquet Island via inshore two-way route

9.148

- 1 From a position within the two-way route about 3 miles ENE of Cape Flattery (14°57'S 145°21'E) (9.112), the inshore track leads NW as shown on the chart, passing (positions from Lookout Point (14°50'S 145°14'E)):

NE of the spit (7½ miles SE) (9.112), thence:

NE of Decapolis Reef (2¾ miles ESE); a light (white hut on concrete column, 5 m in height) stands near the middle of the reef; thence:

- 2 SW of Sim Reef, with a depth of 1 m over it, (3 miles ENE), coral; detached 2.3 m and 3 m coral heads lie, respectively, 5 cables NW and 7½ cables SE of the reef. All are difficult to see unless the current is strong enough to cause tide-rips; the water is often dark green in colour and the bottom cannot be seen even when passing

over the coral head. A light (pile structure with white GRP cabinet on stainless steel platform, with helideck and walkway, 8 m in height) is displayed from Maxwell Reef, 2½ miles farther NE. Thence:

- 3 NE of Lookout Point, a reddish-coloured hill appearing as an island when seen from a distance SE or NW. The land behind the point is low and formed of bare sandhills. Landing is almost impossible between 2 and 5¼ miles W from the point due to a thick coastal belt of mangroves and swamp. Thence:

NE of a reef with a depth of 1.1 m over it (2¼ miles NW), the outermost of the dangers within the coastal 5 m depth contour extending generally WNW from Lookout Point. Thence:

- 4 SW of a below-water reef (5½ miles NNW), not easily distinguished. The reef is the S-most danger of Turtle Group, consisting of six islets and a number of shoals extending up to 4½ miles NNW and 3¼ miles WNW from the reef. The islets are all fringed with reefs, low and tree-covered; many of the shoals are steep-to and difficult to distinguish, even when close to, as the water is generally much discoloured. There is no good anchorage off the group and channels through it should not be attempted.

9.149

- 1 The track then continues NW within the charted two-way route, passing (positions from Coquet Island (14°33'S 144°59'E)):

NE of Pethebridge Islets (13 miles SSE), two wooded islets, 4 m in height and good marks, each lying on a drying reef; Pethebridge Islets Light (white GRP hut, 3 m in height) stands at the NE end of the outer islet. Thence:

- 2 NE of a narrow shoal with a least charted depth of 3.6 m over it (4 miles SW). The shoal is the outer danger off Murdoch Island, 6 cables farther SW, which is low and stands on a detached drying reef. Murdoch Point (6¼ miles SW) on the mainland coast, is low, rounded, sandy and ill-defined. Thence:

- 3 NE of Beatrice Reef (4 miles WSW), difficult to distinguish when covered; it is the SE-most danger of Cole Islands. And:

To a position WSW of Coquet Island (9.147) where the outer and inshore two-way routes rejoin.

9.150

- 1 From the position about 3 miles ENE of Cape Flattery, an alternative route leads NNW as shown on the chart, between the outer route and the inshore route, passing (positions from Eagle Island (14°42'S 145°23'E)):

ENE of Decapolis Reef (11 miles SW) (9.148), thence:

ENE of Sim Reef (8¾ miles SW) (9.148), thence:
WSW of Maxwell Reef (6½ miles SW) (9.148), thence:

WSW of Crompton Shoals (6½ miles WSW) with a depth of 7.2 m over it, thence:

- 2 ENE of Gunga Shoals (10.5 miles W) with a depth of 6.9 m over it. A dangerous underwater rock lies at the SE end of the shoal, a detached shoal patch with a depth of 2.6 m over it lies 1 mile WNW, thence:

WSW of Nymph Island (7¾ miles WNW) (9.147).

The track rejoins the outer route and continues WNW within the charted two-way route to a position about

1¾ miles WSW of Coquet Island (14°33'S 145°00'E) (9.147).

9.151

- 1 **Useful marks:**

White Sand Hills (14°59'S 145°16'E) (9.113).

Mount Stuckey (Numbargulme) (14°57'S 145°06'E), flat-topped.

Sand Hill (42 m in height) (14°51'S 145°09'E).

- 2 Round Hill (14°48'S 145°00'E), a distinctive dome-shaped hill prominent against its background.

Hummocks (14°46'S 144°57'E), two isolated conical hills, good landmarks seldom obscured by cloud or haze.

Miles Reef Light (14°32'S 144°55'E) (9.152).

Coquet Island to Barrow Point

9.152

- 1 **Caution.** See 9.142 for caution on passage through Howick Group.

From a position WSW of Coquet Island (14°33'S 144°59'E) (9.147) the two-way route leads generally NW as shown on the chart to a position E of Barrow Point (14°22'S 144°39'E). The track follows within the two-way route, passing (positions from Bewick Island (14°26'S 144°49'E)):

SW of Wilson Rock (9½ miles SE), a pinnacle; thence:

- 2 NE of Miles Reef (8½ miles SE), two steep-to and partly drying reefs lying parallel with one another and forming the NE-most dangers of the Cole Islands. Miles Reef Light (white hut on round concrete column with platform, 10 m in height) stands at the NW end of the outer reef. Cole Islands consist of four low and wooded islands lying between 1 and 3 miles WSW of Miles Reef, together with a number of reefs and shoals as shown on the chart. Thence:

- 3 SW of Newton Island (7 miles SE), fringed with a drying reef and tree covered to a height of 7 m; thence:

SW of Watson Island (4½ miles ESE) (9.157), and:

NE of Sand Island (5 miles SSE), reef-fringed, bare; thence:

NE of Red Point (6¾ miles SSW), cliffy and remarkable for its red colour; densely wooded land rises from the point to a range of hills (145 m in height) 1½ miles SW; thence:

- 4 NE of Noble Island (4½ miles SSW), barren, rocky and distinctive from every direction. The summit (123 m in height) rises near the NE extremity; two rocky mounds mark the S part of the island. The W extremity is formed by a low wooded point with a sandy beach fringed by a drying reef. The island affords no sheltered anchorage. Thence:

SW of Bewick Island, reef-fringed, the NW-most danger of Howick Group (9.142); thence:

- 5 NE of Wooden Patch (3 miles SW), sand and mud; thence:

SW of Switzer Reef (3¾ miles NW) (9.158); and:
NE of a 7.2 m patch (5 miles WNW) and clear of a wreck with a depth of 17.7 m over it (4¾ miles WNW). The patch is covered by the red sector (305°–315°) of South Barrow Island Light (9.153), 5½ miles farther NW; thence:

- 6 E of Barrow Point (10 miles WNW), barren, the E extremity of a narrow peninsula which extends

from the coastal plain stretching up to 9 miles SSW.

Useful mark:

Cone Peak (14°32'S 144°39'E), prominent from E and N and the E-most peak of Altanmoui Range (9.141).

Barrow Point to Cape Melville

9.153

- 1 From a position E of Barrow Point (14°22'S 144°39'E) (9.152) the track follows within the charted two-way route and leads initially NNW, passing (positions from North Bay Point (14°16'S 144°36'E)):

WSW of Davy Patches (8 miles ESE), consisting of two separate groups, the W one being rock. They are the W-most dangers between Switzer and Munro Reefs; thence:

- 2 ENE of Barrow Islands (6 miles SSE), two islands standing on a drying reef with foul ground between the reef and Barrow Point 5 cables SW. South Barrow Island Light (white square concrete tower, 3 m in height) stands on the S and lower island, which is steep-to on its E side. Thence:

- 3 WSW of Unison Reef (5½ miles ESE), marked near its NW end by a drying boulder; foul ground extends 4 cables SE from the reef; thence:

WSW of South Warden Reef (4½ miles E), and: ENE of North Bay Point, fairly high and sloping steeply from Nares Hill, 6 cables W, and Temple Hill, 1¼ miles farther W, both of which are prominent; thence:

- 4 ENE of a spit with depths less than 2 m over it (extending 3½ miles NNW), steep-to on its seaward side; Rocky Point Island (2 miles NNW) lies inshore of the spit; and:

WSW of Broomfield Rock (4½ miles NE), awash, the outer danger on the edge of reefs and foul ground extending N from the NW side of South Warden Reef. The rocks in this area do not dry but are nearly always visible.

- 5 The two-way route then leads WNW as shown on the chart. See 9.145 for details of a possible set across track. The track passes:

SSW of Singleton Patch (6 miles N), steep-to and covered by a red sector (287°–301°) of Pipon Islets Light, 5 miles WNW (below); thence:

- 6 NNE of Hales Island (6 miles NW), with above-water rocks close E and SE, a rocky point on the mainland (61 m in height), lies 3 cables S. Thence: NNE of Cape Melville (7 miles NW), rising to over 200 m a short distance inland; Wedge Rocks, close off the cape, lie within the coastal 5 m depth contour; thence:

- 7 SSW of Pipon Islets (9 miles NNW) consisting of a number of islets lying near the edges of a drying reef, steep-to on its E and S sides. The largest islet, on the NE side of the reef, is covered with mangroves; Pipon Islets Light (white GRP hut on stainless steel framework tower, 25 m in height) stands on the SW islet, which is 12 m in height and tree-covered. Thence:

- 8 NNE of Channel Rocks (9¾ miles NW); the immediate outer danger on the N side of Cape Melville and covered by a red sector (059°–082°) of Pipon Islets Light. Boulder Rock and Cape

Rock, which resemble each other, lie 6 cables and 1½ miles S of Channel Rocks. Foul ground which extends 2½ cables NE from Boulder Rock is marked at its outer end by a rock, 2 m in height, and by a detached rock which dries 1.2 m and nearly always breaks. Details of the flow to be expected in the vicinity of Channel Rocks are given at 9.145. And:

- 9 SSW of Oswald Shoal (11 miles NNW), difficult to see, even from aloft; thence:

SSW of Aylen Patch (12 miles NW), the outer danger immediately WNW of Pipon Islets.

9.154

Useful marks:

- 1 Beabey Hill (14°19'S 144°35'E); its E side forms a cliff 140 m in height on the W shore of Ninian Bay. From its summit the hill slopes SSW for 1¾ miles where it terminates in two conspicuous sandhills, 65 m in height.

- 2 Abbey Peak (14°19'S 144°29'E), at the S end of Melville Range and easily identified; the highest summit of the range, 612 m in height, stands 2 miles farther NE.

Twin Peaks (14°13'S 144°32'E).

Saint Paul's Hill (14°13'S 144°30'E), prominent.

(Directions continue at 10.69)

Deep-water route

Charts Aus 832, Aus 833

Route

9.155

- 1 From a position in the outer two-way route, 2 miles W of Lizard Island (14°40'S 145°28'E) (9.146), the deep-water route leads generally WNW along the recommended tracks shown on the charts to rejoin the charted two-way route E of Barrow Point (14°22'S 144°39'E). See 9.142 for caution on passage through Howick Group, and 9.143 for controlling depth.

Directions

9.156

- 1 From the position W of Lizard Island the recommended track leads NW with Palfrey Island (14°42'S 145°27'E) (9.147) astern, passing (positions from Palfrey Island Light):

NE of a 14.9 m patch (8 miles WNW), thence:

SW of a 14.9 m patch (9½ miles NW), thence:

NE of the patch (12 miles WNW) (9.147).

9.157

- 1 The recommended track then leads W towards Coquet Island (14°33'S 144°59'E) (9.147), passing (positions from Coquet Island Light):

N of a 12.2 m patch (15 miles E), the outer danger 4½ miles N of Nymph Island (9.147); thence:

- 2 S of Fly Reef (9¾ miles ENE), steep-to and marked by drying boulders and a sand cay. The reef is the S-most of the inner edge of the barrier reef in this vicinity, with foul ground and drying reefs to N of it. Thence:

S of a 14.1 m patch (7 miles E), the S-most of shoal patches lying between Fly Reef and Howick Group.

Charts Aus 832, Aus 270 plan of Howick Group

- 3 The recommended track then leads NW, passing:
NE of Coquet Island, thence:
SW of Snake Reef (3¾ miles NNE), steep-to and marked by a conspicuous boulder on its E edge and by a sand cay at its NW end. Passage between the reef and Mid Reef, 1 mile farther W, is not recommended. And:
- 4 NE of Howick Island (1¾ miles NNW), fringed by a drying reef and marked at its SE end by three rounded hillocks. The remainder of the island is formed by a mangrove swamp except for the W end which is sand and coral, covered by low scrub. Howick Island Light (white GRP hut on concrete column, 6 m in height) marks the edge of the reef off the N extremity of the island.
- 5 The recommended track then leads W through North Channel, passing:
Close S of the green sector (270°–280°) of Megaera Reef Light (4¼ miles NNW), see below, indicating overshoot N of the turning point; and:
N of Howick Island, and:
- 6 S of Megaera Reef (4 miles NNW), marked at its W point by a light (single piled structure with white GRP cabinet on piled stainless steel platform, with helideck and walkway; 8 m in height); a beacon (white) stands 1 cable ESE of the light. Thence:
N of a bank, with depths less than 15 m over it, extending 1¼ miles NW from the W end of Howick Island. The charted 15 m depth contour marking the N edge of the bank is mainly covered by the green sector (090°–100°) of Howick island Light (3 miles NNW).
- 7 **Leading light.** Coquet Island Light bearing 138°, astern, then leads NW, passing:
SW of Mid Reef (4½ miles NNW), with foul ground extending up to 6 cables from its W side; an isolated 9.2 m patch (7 miles NW) is the outer danger W of the reef. And:
NE of Watson Island (7 miles NW), lying near the S end of a drying reef; Watson Island Light (white hut on concrete column, with platform, 10 m in height) stands at the N end of the reef.

9.158

- 1 The recommended track then leads WNW, passing (positions from Bewick Island (14°26'S 144°49'E)):
Close SSW of the red sector (121°–131°) of Megaera Reef Light (8½ miles ESE) (9.157), indicating overshoot NNE of the turning point; thence:
- 2 SSW of Beanley Islands (3¾ miles E), lying along the SW side of a drying reef and covered by the same red sector of Megaera Reef Light. The NW side of the reef is fronted by foul ground and marked by Ingram Island (4 miles ENE), a wooded sand cay. Thence:
NNE of Bewick Island (9.152).

Charts Aus 832, Aus 833

- 3 The recommended track then continues WNW within a white sector (290°–305°) of South Barrow Island Light (10¼ miles WNW) (9.153), passing:
SSW of Switzer Reef (3¾ miles NW), steep-to; the S part of the reef and a detached 10.7 m patch (5½ miles NW), being the outer danger on the SW side, are covered by the adjacent green sector (275°–290°) of South Barrow Island Light. And:
- 4 NNE of the patch (5 miles WNW) (9.152), thence:

SSW of Davy Patches (7¼ miles NW); the patches and onward directions for the two-way route are described at 9.153.

Anchorage and landings*Chart Aus 832***Cape Flattery****9.159**

- 1 See 9.116.

Starcke River**9.160**

- 1 **Description.** The entrance to Starcke River (14°47'S 145°01'E) is obstructed by a bar. In 1957 a vessel of draught not exceeding 2 m could enter at HW and reach a landing ramp for cattle on the E bank, 5 cables within.
Local knowledge is essential.

Lizard Island**9.161**

- 1 **Description.** The NW side of Lizard Island (14°40'S 145°28'E) (9.146) is formed by an open bay entered between the NW extremity of the island and South Bay Point, 1½ miles SSW (9.147). The bay is fringed with drying reefs extending up to 4 cables offshore and has a sandy beach at its head.
Between the SE extremity of Lizard Island (14°40'S 145°28'E) (9.146) and Seabird Islet, 4 cables SW, a narrow entrance leads WNW between fringing, drying reefs to a lagoon where small craft may find shelter. Local knowledge is required.
- 2 **Leading marks.** The alignment (057°) of the leading beacons (14°39'3S 145°27'0E) situated near the NW extremity of Lizard Island leads into the bay.
Anchorage may be obtained 7½ cables N of South Bay Point in a depth of 12 m.

*Charts Aus 270 plan of Howick Group, Aus 833***Howick Group****9.162**

- 1 **Coquet Island** (14°33'S 144°59'E) (9.147). Anchorage in a depth of 13 m may be obtained 3½ cables N of Coquet Island Light and W of the charted spit, with depths less than 10 m over it, extending 4 cables N from the island.
Houghton Island (14°32'S 144°58'E). Anchorage in depths of 16 to 18 m may be obtained 3 cables NNE of the W end of the island, taking care to avoid the spit, with depths less than 10 m over it, extending 3 cables NW from the same point.
- 2 **Howick Island** (14°30'S 144°58'E) (9.157). Anchorage in a depth of 12 m, mud, may be obtained 3½ cables N of the W end of the island.
Bewick Island (14°26'S 144°49'E) (9.152). Anchorage in depths of 13 to 15 m, mud, may be obtained close off the NW side of the island.
Ingram Island (14°25'S 144°53'E). Anchorage in depths of about 21 m may be obtained 5 cables NW of the island, as shown on the chart.

Ninian Bay**9.163**

- 1 **Description.** The shore of Ninian Bay, entered between Barrow Islands (14°21'S 144°39'E) (9.153) and North Bay Point (9.153) 6 miles NNW, is formed by sandy beaches separated by rocky points and backed by low wooded ground. The bay is shallow, reef-fringed at its head, and affords no shelter other than for small craft.
Local knowledge is required.

Charts Aus 270 plan of Pipon Islets, Aus 833

Pipon Islets

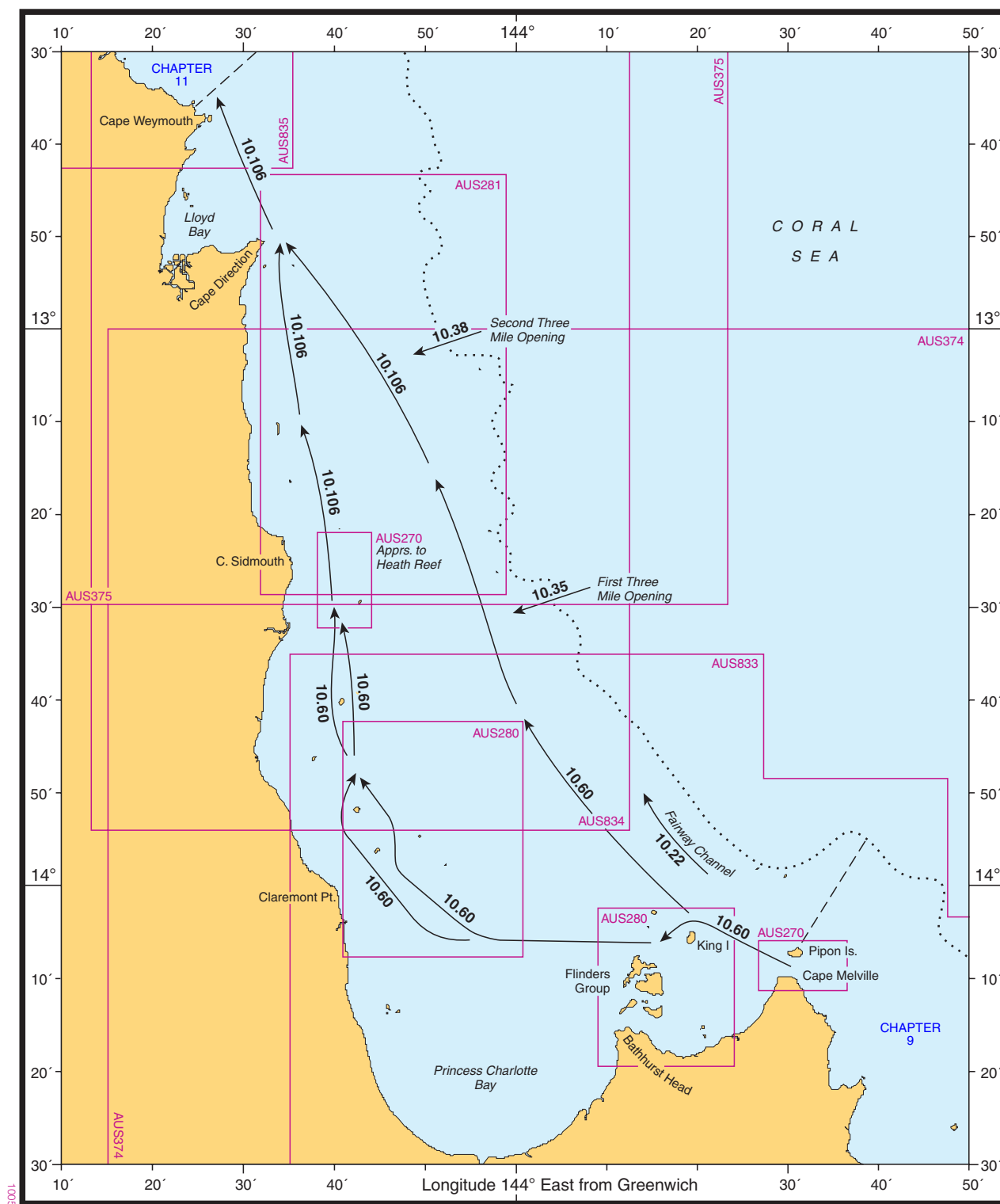
9.164

- 1 **Anchorage.** Shelter from SE winds may be found on the NW side of Pipon Islets (14°07'S 144°31'E) (9.153) where anchorage in a depth of about 15 m, mud, may be obtained 4 cables off the edge of the reef as shown on the chart, and clear of charted dangers. In 1993 HMAS *Paluma* (400 tonnes) approached with Pipon Islets Light bearing 163° and anchored with the light distant 1 mile; the holding ground was reported to be good in 20 kn winds, with sea and swell from SE.





Chapter 10 - Cape Melville to Cape Weymouth



CHAPTER 10

CAPE MELVILLE TO CAPE WEYMOUTH

GENERAL INFORMATION

Charts Aus 374, Aus 375

Scope of chapter**10.1**

- 1 This chapter covers that part of the Inner Route leading from Cape Melville (14°10'S 144°31'E) to Cape Weymouth (12°37'S 143°26'E). The area covered includes the off-lying Great Barrier Reef and passages through them from North Broken Passage to Quoin Island Entrance. There are no ports within the coverage of this chapter.

Topography**10.2**

- 1 The S part of the area consists of a large bight which extends 46 miles W from Cape Melville (14°10'S 144°31'E) and is formed by Bathurst and Princess Charlotte Bays. These bays are separated by the high ground of Bathurst Range on the mainland and by Flinders Group of islands extending N from the range. From Bathurst Head (14°15'S 144°13'E) to abreast Roberts Point, 43 miles WNW, high ground recedes well inland leaving a wide and low coastal belt which is often swampy. From inland of Roberts Point, which is otherwise of little navigational significance, broken ranges of hills are again found close to the coast, reaching N to Cape Direction (12°51'S 143°33'E). Between there and Cape Weymouth, 15 miles NNW, the land is low and generally flat again at the head of Lloyd Bay, with high ground receding inland to the middle distance.

Pilotage**10.3**

- 1 Pilotage is compulsory for most vessels transiting the waters of the Inner Route of Great Barrier Reef between latitude 16°40'S and Cape York (10°41'S 142°32'E). The area of compulsory pilotage includes all waters between the Australian mainland and the outer edge of Great Barrier Reef. The size and type of vessels affected are given at 1.26 and in notes on the charts. Details of the pilot services are given in *Admiralty List of Radio Signals Volume 6(4)*.

Ship reporting system**10.4**

- 1 For details of Torres Strait and Great Barrier Reef ship reporting system, see 1.89 and *Admiralty List of Radio Signals Volume 6(4)*.

Marine protected area**10.5**

- 1 The whole area covered by this chapter is a part of Great Barrier Reef Marine Park, which is itself a Marine Protected Area. Some restrictions on access and use may apply: see 1.72 and 1.74.

Designated Shipping Area**10.6**

- 1 Within this chapter are Designated Shipping Areas, for further information see 1.74 and *Australian Seafarers Handbook*.

Particularly Sensitive Sea Area**10.7**

- 1 The whole area of this chapter is within Great Barrier Reef Marine Park which is an IMO approved Particularly Sensitive Sea Area (PSSA). The area is shown on the relevant charts. For further details see 1.71 and *Australian Seafarers Handbook*.

Flow**10.8**

- 1 **Tidal streams** through the area follow the general pattern described at 1.153, setting N on the rising tide and S on the falling tide. Local variations caused by land or shoals, and the effects of flow in and out of Princess Charlotte Bay in the S part of the area, are described in the relevant parts of the text.

Currents: see 1.144 for a general description of currents in the area.

Coast radio station**10.9**

- 1 There is a radio station (12°47'S 143°21'E) in the vicinity of Lockhart River. Details are given in *Admiralty List of Radio Signals Volume 1(2)*.

GREAT BARRIER REEF

GENERAL INFORMATION

Charts Aus 374, Aus 375

10.10

- 1 From the NW end (13°55'S 144°36'E) of the unbroken reef extending 23 miles NW from the entrance to Waterwitch Passage, Great Barrier Reef consists of a single line of detached reefs forming a bight which extends to Rodda Reef, 14 miles farther W. Between these reefs there are a number of short passages, described later, with navigable widths varying between 5 cables and 1¾ miles.
- 2 At Rodda Reef (13°55'S 144°21'E) the width of the barrier is greatly increased and continues so, with widths

between 14 and 27 miles, for 100 miles NNW to Quoin Island Entrance (12°24'S 143°45'E). Between the inner and outer edges of this part of the barrier there are areas which are unsurveyed or have been only incompletely so; there is however sufficient knowledge available to permit passage by vessels of suitable size and draught through the length of Fairway Channel (10.22). There are numerous minor or small openings through the outer edge from seaward, but only Second Three Mile Opening (13°03'S 143°54'E) and Quoin Island Entrance, 39 miles farther N, give direct and recognised access to the Inner Route across the width of this part of the barrier.

Outer edge

General information

10.11

- 1 Rodda Reef (13°55'S 144°21'E) marks the W end of the bight in which the barrier is formed of a single line of reefs. From there, where the barrier widens considerably, the outer edge stretches 100 miles NNW to Quoin Island Entrance (12°24'S 143°45'E) and is formed throughout by a chain of detached reefs.

Caution. The limits of these outer reefs have not necessarily been determined with accuracy, and information on depth contours to seaward is sparse. The outer edge should only be approached with caution.

Off-lying reefs

10.12

- 1 Southern Small Detached Reef (12°35'S 143°52'E) and Northern Small Detached Reef, 10 miles farther N (10.49), are isolated, drying reefs lying to seaward of the outer edge of the barrier; both are marked by breakers.

Chart Aus 834

Anchorages

10.13

- 1 **Creech Reef.** Anchorage may be obtained in a position 7 cables W of Creech Reef (13°38'S 144°06'E) (10.34), as shown on the chart.

Horseshoe Reef. Anchorage in position 13°19'·1S 143°57'·1E, 1 mile W of the reef known locally as Horseshoe Reef and 5 cables SSE of a 2·0 m patch, was obtained by HMAS *Paluma* (400 tonnes) (1993). The anchorage, in a depth of 29 m, bottom mainly coral, provided good protection from sea and swell from SE and was found to be fairly secure. The berth was approached from Fairway Channel (10.22) on a bearing of 100° in generally regular depths of 30 m.

- 2 **Tijou Reef.** Anchorage in position 13°13'·7S 143°56'·6E, in the SW bight of Tijou Reef (10.39), was obtained in 1993 by HMAS *Paluma*, see above. The anchorage, in a reported depth of 31 m, coarse white sand, was found to be quiet and was approached from W from Fairway Channel (10.22) over an uneven bottom with depths just prior to anchoring of 22 to 31 m.

In 1996 HMAS *Shepparton* (400 tonnes) anchored on the W side of Tijou Reef in position 13°08'·5S 143°55'·0E. The anchorage, in a depth of about 20 m, mud and sand, provided good holding and protection from weather from SE.

Inner edge

Charts Aus 374, Aus 375

10.14

- 1 From Rodda Reef (13°55'S 144°21'E), the inner edge of the barrier is marked first by Corbett Reef, 6 miles W, from where it stretches NW then N as shown on the charts. The extent of surveys of the inner edge is shown in the reliability diagrams on the larger scale charts Aus 833 and Aus 834.

Anchorages

10.15

- 1 Anchorages off the reefs of the inner edge, with ready access from the Inner Route, are described at 10.89.

Passages through the reefs

Charts Aus 833, Aus 834

10.16

- 1 Numerous passages exist through the reefs but none is of particular relevance to passage of the Inner Route by through traffic; most require careful consideration before being attempted.

Openings in the outer edge of the barrier N of 13°55'S lead directly into Lads Passage, which provides an alternative route through the barrier reefs between Capes Melville and Weymouth.

All known passages within the reefs are described in the paragraphs following.

Pilotage

10.17

- 1 Pilotage is not available for any passages through the reefs covered by this chapter.

Reliability of surveys

10.18

- 1 Zone of Confidence diagrams shown on the appropriate reference charts give an indication of the confidence that may be placed in the chart for each passage through the reefs.

Former mined areas

10.19

- 1 All recognised passages from seaward through the reefs are former mined areas: see 1.5 for general remarks and Appendix II for details of the areas involved.

Landmark

10.20

- 1 Round Mountain (13°34'S 143°31'E) (10.67), distinctly visible in clear weather from the outer edge of the barrier.

Other aids to navigation

10.21

Racons:

Corbett Reef Light-beacon (13°54'S 144°17'E).

Diamond Reign Reef Light-beacon (13°12'S 143°48'E).

For details see *Admiralty List of Radio Signals Volume 2*.

PASSAGES THROUGH THE REEFS

Fairway Channel

Charts Aus 833, Aus 834

General information

10.22

- 1 Fairway Channel is entered from SSE in the vicinity of 13°55'S 144°16'E between Rodda Reef and Corbett Reef, 6 miles W. The channel leads into Lads Passage which itself leads generally NNW for about 80 miles (see 10.77), passing at a distance of 1 to 4 miles inside the outer edge of the barrier, to the vicinity of 12°26'S 143°41'E where it joins the tracks leading from Quoin Island Entrance (10.48) to the Inner Route off Cape Weymouth.

- 2 **Caution.** Lads Passage is generally deep but although features hazardous to surface navigation are not expected, they may exist (see Zone of Confidence diagram on chart Aus 834).

Anchorages which may be reached from the channel are described at 10.13.

North Broken Passage

Chart Aus 833

General information 10.23

- 1 North Broken Passage is entered between Eves Reef (13°58'S 144°34'E) and the NW end of the unbroken reef which extends 23 miles SE to Waterwitch Passage (9.42). The channel is 1¼ miles in width and has a least depth of 12 m near the middle of the entrance.

South Broken Passage

General information 10.24

- 1 South Broken Passage lies between Eves Reef (13°58'S 144°34'E) and Tydeman Reef 2 miles WSW, but the navigable width of the passage is reduced by a shoal, with a depth of 4.1 m over it, 6 cables E of Tydeman Reef. There is a least depth of 13.7 m in the fairway.

Melville Pass

General information 10.25

- 1 Melville Pass lies between Davie Reef (13°59'S 144°27'E) and Tydeman Reef, 1½ miles E. There are depths of 23 to 30 m in the fairway, which has a navigable width of 7½ cables between detached shoal patches on each side.

Tidal streams are tabulated on the chart. Eddies and discolouration of the water occur at springs.

Directions 10.26

- 1 The line of bearing 167½° of Pipon Islets Light (14°08'S 144°31'E) (9.153), when raised in suitable visibility, leads through the pass from NNW. The light is partly obscured in the sector (166°–167°). The track passes WSW of a 5.6 m patch, 7 cables WNW of Tydeman Reef, and ENE of a 10.2 m patch 5 cables SSE of Davie Reef.

West Melville Pass

General information 10.27

- 1 West Melville Pass, which leads in depths of 20 to 35 m directly from seaward to the Inner Route, lies between Davie Reef (13°59'S 144°27'E) and Wilson Reef, 1½ miles NW, and is reported to be a safe channel. Shoal patches on the NW side of the fairway reduce its navigable width to 4 cables.

Tidal streams are tabulated on the chart. Eddies and discolouration of the water occur at springs.

Directions 10.28

- 1 The lines of bearing 217½° of Flinders Peak (14°11'S 144°16'E) (10.71) by day, or 221° of King Island Light (14°05'S 144°20'E) (10.69) when raised in suitable visibility by night, lead separately through the pass from NE. The tracks pass NW of Davie Reef and SE of an 8.9 m patch, 6 cables farther NW; thence SE of two 10.2 m patches, 1 mile WNW and 1½ miles W of Davie Reef.

Lowry Passage

General information 10.29

- 1 Lowry Passage, which leads in a least charted depth of 25.5 m directly from seaward to the Inner Route, is entered between Wilson Reef (13°57'S 144°24'E) and Rodda Reef, 1¼ miles NW. The fairway is deep and clear of danger.

Tidal streams run strongly through the passage causing eddies and discoloured water, both being particularly marked at springs.

Directions 10.30

- 1 The lines of bearing 203° of Flinders Peak (14°11'S 144°16'E) (10.71) by day, or 195½° of King Island Light (14°05'S 144°20'E) (10.69) when raised in suitable visibility by night, lead separately through the passage from NNE, passing (positions from Wilson Reef):

WNW of Wilson Reef; a beacon, and numerous boulders which show up distinctly, lie on the SW end of the reef; and:

ESE of Rodda Reef (1¼ miles NW), thence:

ESE of Joan Reef (1½ miles W); depths of less than 10 m extend 2 cables ENE from the reef.

Openings between Lowry Passage and First Three Mile Opening

General information 10.31

- 1 From Lowry Passage (13°56'S 144°22'E) to First Three Mile Opening (13°28'S 144°01'E), 35 miles NW (chart Aus 834), there are a number of small openings on which information is limited.

Local knowledge is essential.

The Gut 10.32

- 1 This passage lies between Rodda Reef (13°55'S 144°21'E) and the large unnamed drying reef 2 cables NNW. No information is available beyond that shown on chart Aus 833.

Opening (13°43'S 144°12'E) 10.33

- 1 This opening, which has been only incompletely surveyed, lies between two unnamed drying reefs and is 7½ cables wide and apparently deep. Flinders Peak (14°11'S 144°16'E) (10.71) bearing 172°, distant 29 miles, can be easily identified from the entrance in clear weather.

Opening (13°39'S 144°08'E) 10.34

- 1 An opening, which has been only incompletely surveyed, lies between Creech Reef (13°38'S 144°06'E) and an unnamed drying reef 2¼ miles SE. The opening was formerly reported to have appeared from the masthead to be clear of danger but a shoal with a least known depth of 3.7 m over it, marked by South Creech Light-beacon (white hut on white pile), has since been found 1¼ miles S of Creech Reef.

First Three Mile Opening

Chart Aus 834

General information 10.35

- 1 First Three Mile Opening lies between an unnamed drying reef (13°29'S 144°03'E), marked at its W end by a

sand cay, and a smaller unnamed drying reef 3½ miles WNW, marked at its NW end by another sand cay on the W end of which stands a light-beacon (white GRP hut on white pile, 13 m in height). The opening leads from seaward to join Lads Passage (10.22) inside the outer edge of the barrier.

Openings between First and Second Three Mile Openings

General information

10.36

- 1 There are several openings between First Three Mile Opening (13°28'S 144°01'E) and Second Three Mile Opening 25 miles NNW, but all, with the one exception below, are considered too narrow to pass through with safety.

Opening south of Tijou Reef

10.37

- 1 An opening (13°16'S 143°57'E) with general depths of over 30 m on the S side of Tijou Reef was used by HMAS *Paluma* (400 tonnes) entering from seaward in 1993.

Caution. Entry should not be attempted unless the edges of the reefs can be clearly seen.

Directions. The line of bearing 293¾° of High Peak (13°03'S 143°27'E) (10.110), distant about 33 miles, leads WNW through the opening, passing:

- 2 SSW of the S edge of Tijou Reef (13°15'S 143°58'E) (10.39), thence:
NNE of a drying reef known locally as Kidney Reef (13°16'S 143°57'E).

When the W edge of Kidney Reef bears SSW, the track leads W on 270° to pass S of the SW extremity of Tijou Reef to join Lads Passage (10.22).

Second Three Mile Opening

General information

10.38

- 1 Second Three Mile Opening is entered at its NE end between the N extremity of Tijou Reef (13°03'S 143°58'E) and Ham Reef, 4½ miles W. There is a least charted depth of 9.6 m in the fairway. From the opening a channel leads between SW and WSW to join the alternative route (10.77) through Lads Passage, or continuing on to join the Inner Route about 3 miles SSE of Waterwitch Reef (13°09'S 143°37'E).

Directions

10.39

- 1 The seaward entrance to the opening is easily made out; see useful marks listed at 10.40.

The line of bearing 237° of Hangklip Peak (13°18'S 143°29'E) (10.114), readily identifiable from a distance of 5 miles to seaward of Great Barrier Reef, leads WSW through the fairway of Second Three Mile Opening, passing (positions from Ham Reef (13°02'S 143°52'E)):

- 2 NNW of the N extremity of Tijou Reef (4½ miles E), a long drying reef extending 12 miles farther S; the outer edge is dangerous to approach as the swell generally rolls in and breaks heavily. Thence:
NNW of Franklin Reef (1¼ miles SE), lying in the middle of the opening; the water between the reef and the NW extremity of Tijou Reef, 2¼ miles E, is partially obstructed by below-water rocks and a small drying reef; thence:

- 3 SSE of Ham Reef; Derry Reef lies 5 cables NW. A sand cay at the W extremity of Ham Reef can easily be seen at all states of the tide. Thence:
SSE of Wilsen Shoal (6 cables SW).

The track continues W for 5½ miles to join the alternative route through Lads Passage (10.77), or the track continues WSW through the channel to the Inner Route (10.112), passing;

- 4 SSE of Colclough Reef (7½ miles WSW), lying on the E limit of an incompletely surveyed area which extends 7 miles farther W; a light-beacon (white hut on white pile, 11 m in height) marks the E edge of the reef, thence:
NNW of Jubilee Reef (9¼ miles SW), lying at the NE extremity of Diamond Reign Reefs; thence:
Clear of Dart Shoal (9¼ miles SW), lying in mid-channel; and:
- 5 NNW of Diamond Reign Reefs (10 miles SW), a largely unsurveyed area lying between Jubilee Reef and Throne Shoals; thence:
NNW of Throne Shoals (14 miles SW) (10.112), and:
SSE of Gertrude Reef (14 miles WSW); foul ground extends to 4 cables on the N side of the reef.

10.40

- 1 **Useful marks** readily identifiable from a distance of 5 miles to seaward of Great Barrier Reef:

Cone Peak (13°24'S 143°30'E) (10.67).
Chester Peak (13°08'S 143°29'E) (10.114).
High Peak (13°03'S 143°27'E) (10.110).
Cape Direction (12°51'S 143°33'E) (10.113).

Useful marks for the inner part of the channel:

Bow Reef Light (13°18'S 143°40'E) (10.112).
Waterwitch Reef Light (13°09'S 143°37'E) (10.113).

Openings between Second Three Mile Opening and Quoin Island Entrance

General information

10.41

- 1 Between Second Three Mile Opening (13°03'S 143°54'E) and Quoin Island Entrance, 39 miles N, there are many small openings, the best of which is considered to be Hibernia Entrance (12°44'S 143°49'E) (10.45).

Opening between Ham and Derry Reefs

10.42

- 1 A channel between Ham Reef (13°02'S 143°52'E) (10.39) and Derry Reef, 5 cables NW, with general depths of 30 m and a navigable width of about 2 cables. There is always a heavy tide-rip between these reefs.

Bligh Boat Entrance

10.43

- 1 This entrance lies on the S side of Bligh Reef (12°50'S 143°51'E). It is 1½ cables in width and was used by Captain Bligh in 1789.

Entrance north of Bligh Reef

10.44

- 1 A small entrance exists on the N side of Bligh Reef (12°50'S 143°51'E); no details are available.

Hibernia Entrance

10.45

- 1 Hibernia Entrance (12°44'S 143°49'E) is narrow and was used by a vessel of that name in 1810. A 5.2 m patch lies 1 mile WSW of the entrance and a detached reef lies ½ mile farther SSW.

Unsurveyed opening (12°39'S 143°51'E)**10.46**

- 1 A channel lies between the N side of Log Reef (12°41'S 143°51'E) and an unnamed drying reef 2 cables N. Although narrow, with an uncharted below-water rock lying nearly in mid-channel, the passage is so short that the transition from heavy ocean seas to smooth water is almost instantaneous. A 7.7 m shoal lies ¾ mile WNW of the entrance.

Providential Channel**10.47**

- 1 Providential Channel (12°37'S 143°50'E) lies between two drying reefs and 2½ miles SW of Southern Small Detached Reef (10.12). A 1.2 m patch lies 1 mile within the entrance.

The channel was named by Lieutenant James Cook, HMS *Endeavour*, who passed through it from E to W in 1770 when in danger of being swept on to Great Barrier Reef during a calm. He described the passage as being 'not more than ¼ mile wide with depths from 7 to 30 fathoms in which the flood tide was rapid like a millrace'.

Quoin Island Entrance**General information****10.48**

- 1 Quoin Island Entrance (12°24'S 143°45'E), lying between drying reefs on both sides, is a good, deep passage with a least width of 4 cables and depths of 50 to 56 m in the fairway. After passing through the entrance there is a choice of three routes leading 20 miles SSW and SW to join the Inner Route off Cape Weymouth.

Tidal streams in positions 4 miles WNW and 9½ miles SW of the entrance are relatively weak, as tabulated on the chart.

Directions**10.49**

- 1 **Approach and entry.** Approaching the entrance from seaward, Northern Small Detached Reef (12°25'S 143°51'E), which dries in patches and is always marked by breakers, should first be identified. On passing close N of this reef, Quoin Island Entrance will bear 277°, distant 4 miles.

The line of bearing 270° of Quoin Island (12°24'S 143°29'E) (11.93) then leads W through the entrance. The island is visible from aloft at more than 16 miles in clear weather, but care is required as it subtends little more than 1° over the width of the fairway. The track passes (positions from Northern Small Detached Reef):

- 2 S of a below-water reef (¾ miles WNW), extending 4 cables from the SE extremity of Lagoon Reef. Extra care must be exercised when approaching this reef. Thence:
S of Lagoon Reef (¾ miles WNW), and;
N of an unnamed drying reef (4½ miles W); a small drying reef marks the outer end of dangerous ground extending 3 cables farther NW; and;
N of a larger unnamed drying reef (5 miles W).

On clearing W of the entrance, course may be directed SW to join the Inner Route by the routes described below.

10.50

- 1 **Kupuntutu Passage.** From the W end of Quoin Island Entrance the track leads SSW, passing (positions from Restoration Rock (12°37'S 143°28'E)):

ESE of Bunker Reef (12 miles NE) which dries; an isolated patch lies 1 mile SW, with a depth of 2.6 m. A detached shoal with a depth of 0.3 m lies 2 miles farther SSW. Thence:

ESE of the E end of Burke Reef (4¼ miles E), a crescent-shaped series of drying reefs with many large drying boulders; the bight formed by the reef contains numerous isolated coral heads.

- 2 The track then continues SW, passing:

NW of Ape Reef (9 miles SE), (10.115), thence:

SE of Tannadice Shoal (5 miles ESE) (10.115).

Course may then be directed as required to join the Inner Route (10.115).

Caution. Although the passage is over 2 miles wide with a least charted depth of 16.6 m in the fairway, some depths anomalies may be expected, for details see the chart.

10.51

- 1 **Route between Burke and Curd Reefs.** From the W end of Quoin Island Entrance the track leads SW, passing (positions from Restoration Rock (12°37'S 143°28'E)):

SE of Bunker Reef (12 miles NE), (10.50) distant 1 mile. Thence:

SE of foul ground extending 4¾ miles ENE from the NW extremity of Curd Reef (3½ miles NE).

- 2 The track then leads WSW through a clear and deep passage about 1¼ miles wide, passing:

SSE of Curd Reef (3½ miles NE) (10.115), and:

NNW of Burke Reef (4¼ miles E), (10.50); foul ground extends nearly 5 cables N of a line joining the outer ends of the reef. Caroline Rock is the outer danger on the W side of the reef.

Course may then be directed as required to join the Inner Route (10.115).

10.52

- 1 **Route between Dolphin and Eel Reefs.** From the W end of Quoin Island Entrance the track leads SW, passing (positions from Restoration Rock (12°37'S 143°28'E)):

NW of Bunker Reef (12 miles NE) (10.50), distant about 1 mile; thence:

SE of Eel Reef (6 miles NNE); the E part of the reef consists of a series of drying reefs with shallow channels between. Foul ground extends at least 3 miles farther NE. The S side of the reef is steep-to. And:

- 2 NW of Dolphin Reef (4¾ miles NE), a group of coral heads with a least depth of 0.5 m over them. There is a clear and deep passage 1½ miles in width between these dangers and Eel Reef. A passage between Dolphin Reef and Curd Reef 1¼ miles S is 6 cables in width with depths of 25 to 35 m.

Course may then be directed as required to join the Inner Route (10.115, or 11.92 for N-bound traffic).

Useful marks:

Restoration Island (12°37'S 143°27'E) (10.115).

Restoration Rock Light (12°37'S 143°28'E) (10.115).

INNER ROUTE FROM CAPE MELVILLE TO CAPE WEYMOUTH, INCLUDING ALTERNATIVE ROUTE THROUGH LADS PASSAGE

GENERAL INFORMATION

Charts Aus 833, Aus 834

Scope of section

10.53

- 1 This section describes the routes from Cape Melville (14°10'S 144°31'E) to Cape Weymouth (12°37'S 143°26'E).

Route

10.54

- 1 From Cape Melville (14°10'S 144°31'E) a two-way route leads generally NW, as shown on the charts, for 133 miles to the vicinity of Cape Weymouth (12°37'S 143°26'E). The purpose and use of the two-way route is described at 9.2 and in notes on the charts.

From the vicinity of King Island (14°06'S 144°20'E) an alternative two-way route leads generally NW then NNW, through Lads Passage to the vicinity of Cape Direction (12°51'S 143°32'E). Directions are given at 10.77 and 10.117.

Caution

10.55

- 1 The two way routes lie close to many shoals, islands and islets which require a sharp lookout if they are to be passed in safety. The safest course of action if marks cannot be easily identified may be to anchor. General considerations for passage of the Inner Route are given at 1.3.

Depths

10.56

- 1 The least charted depth within the two-way route between Capes Melville and Weymouth is 10.7 m, as shown on the chart, in position 1¼ miles WNW of Burkitt Island (13°56'S 143°45'E). Deeper water is found in those sections of the two-way route which pass E of Burkitt Island and E of Hay Island (13°40'S 143°41'E).

Pilotage

10.57

- 1 See 10.3.

Sea state

10.58

- 1 The barrier reefs, when uncovered, have a marked effect upon sea state. Better progress in low-powered vessels may often be made over LW periods.

History

10.59

- 1 A monument, commemorating 300 to 400 lives lost in 1899 when a cyclone destroyed a number of small vessels sheltering near Cape Melville, stands 1¼ miles S of the W extremity of the cape. The monument also serves as a lasting reminder of potential dangers in this area.

CAPE MELVILLE TO HEATH REEF

General information

Charts Aus 833, Aus 834, Aus 280 plans of Magpie Reef to Eden Reef and Flinders Group, Aus 270 plans of Cape Melville and Pipon Islets, Approaches to Heath Reef

Routes

10.60

- 1 From the vicinity of Cape Melville (14°10'S 144°31'E) the charted inner two-way route leads generally W for 35 miles to Eden Reef; thence generally NNW to Heath Reef (13°29'S 143°41'E). At Eden Reef the route divides to pass either E or W of Burkitt Island (13°56'S 143°45'E). The route W of the island leads through more open water; that passing E of the island is the deeper. After passing Magpie Reef Light (13°49'S 143°45'E), the two-way route again divides to pass either E or W of Hay Island, 9 miles farther NNW; the route E of the island is the deeper.

- 2 From the vicinity of King Island (14°06'S 144°20'E), a two-way route leads NW from the Inner Route for 30 miles, thence generally NNW for 44 miles through Fairway Channel and Lads Passage to the vicinity of First Three Mile Opening (13°28'S 144°01'E).

Topography

10.61

- 1 The shore of Bathurst Bay, lying between Cape Melville (14°10'S 144°31'E) and Bathurst Head 15½ miles WSW, is formed of sandy beaches fronting land which is generally low and sparsely wooded, the E side being backed by the Melville Range (9.141). Bay Hill (14°18'S 144°24'E), which stands prominently at the head of the bay, is the N extremity of a ridge extending inland. The W side of the bay is backed by Bathurst Range extending 16 miles S from Bathurst Head (14°15'S 144°13'E). Flinders Group of islands, extending N from Bathurst Head, also separates Bathurst Bay from Princess Charlotte Bay on the W and is described at 10.78.

- 2 Princess Charlotte Bay is an extensive bay in the low, flat country between Bathurst Head and Claremont Point, 34 miles NW. Hills of Bathurst Range back the coast on the E side of the bay but, except for a conspicuous peak (14°24'S 144°15'E) (10.71), these are featureless and generally lower than those on the E side of the range. Jane Table Hill (14°30'S 144°08'E), easily identified, and Jeannette Hill, 1 mile SE, both appear higher than their charted heights due to their isolation in otherwise low ground. From the steep and wooded W side of Bathurst Head, the SE shore of the bay is formed by a broad belt of mangroves which extend to about 3 miles W of the entrance to North Kennedy River (14°29'S 143°57'E); thence to Gorge Creek, 15½ miles farther NW, the SW shore is formed solely of swampy ground. The land backing the whole of this shore between Bathurst Head and Gorge Creek is flat and, in places, tidal for some distance inland; in the rainy season it is probably all swamp.

- 3 From Gorge Creek (14°17'S 143°44'E) to Claremont Point, 17 miles N, the W shore of Princess Charlotte Bay is formed of stretches of reef alternating with stretches of sandbank, both drying and extending up to 1 mile offshore. The land behind is devoid of any remarkable features, being flat, covered with scrub and sparsely wooded on the coast, with low, wooded, undulating country farther inland.

Claremont Isles, consisting of Burkitt, Hannah and Wilkie Islands lying between 6 miles NE and 14 miles N of

Claremont Point (14°01'S 143°41'E), are described in the course of directions for the Inner Route.

- 4 Between Claremont Point and Colmer Point (13°47'S 143°32'E) at the entrance to Rocky River, the coast is broken by entrances to creeks fringed with mangroves, backed by low land, covered with scrub and trees, which extends inland to the foothills of McIlwraith Range. Thence to Campbell Point (13°32'S 143°35'E) the coast is low and backed by salt flats, behind which the land becomes undulating and densely wooded. Emberly Range, which rises 5 miles WSW of Campbell Point, marks the S end of a long line of broken ranges of hills standing adjacent to the coast. Collins Hill (13°34'S 143°33'E) and two lower hills NNW of it are all wooded but, although standing within 1½ miles of the coast, do not show up well from seaward because of the more prominent Emberly Range in the immediate background.
- 5 From Campbell Point to Cape Sidmouth, 6 miles farther N, the coast is formed by a sandy beach which is broken only by red cliffs (10.76) 1¼ miles NNW of the point. Behind the coast, poor sparsely wooded land reaches inland to the wooded slopes of Macrossan Range. Whale Hill (13°29'S 143°32'E), at the SE end of this range, is table-topped.

Local knowledge

10.62

- 1 Local knowledge is required for the section of the two-way route (10.73) passing E of Burkitt Island (13°56'S 143°45'E).

Natural conditions

10.63

- 1 **General information on flow.** Princess Charlotte Bay, in the S part of the area, disturbs the general pattern of water movement in a number ways. The effects are described below.

Between Cape Melville and Heath Reef (13°29'S 143°41'E) the set resulting from the many variables is best described as irregular and can sometimes be directly across the recommended track.

10.64

- 1 **Tidal streams.** The general pattern of the stream on the rising tide is to set W or SW through the openings in Great Barrier Reef before branching SSW or S into Princess Charlotte Bay and NW or N along the Inner Route. On the falling tide the stream sets S along the Inner Route and N or NW out of Princess Charlotte Bay; then generally NE through the barrier. Streams near the inner edge of the barrier are noticeably stronger than elsewhere and their directions are such that the set is either towards or away from the nearest large opening. One example of this occurs in the vicinity of Wharton Reef (14°08'S 144°00'E); another occurs in the vicinity of Fahey Reef, 9 miles farther WNW, where a strong E set has been reported on the falling tide at springs.
- 2 Off the W end of Clack Reef (14°04'S 144°14'E) the stream appears to turn regularly 15 minutes after the times of HW and LW at Townsville. When unaffected by currents, the stream in Princess Charlotte Bay turns at about the same times.
- 3 Tidal streams setting through Melville and West Melville Passes, either side of Davie Reef (13°59'S 144°27'E) (10.25), are tabulated on the chart. Between there and the vicinity of Wharton Reef, 27 miles WSW, and in Princess

Charlotte Bay, the direction and rate of the stream is indicated in a number of positions on the chart; greater rates than these can be expected closer to reefs.

- 4 Between Wharton Reef and Claremont Point the stream sets S into Princess Charlotte Bay on the rising tide and N on the falling tide at rates of about ¾ kn.

In the area W of Morris Island (13°30'S 143°43'E) the stream sets generally SW on the rising tide, attaining a maximum spring rate of 1¼ kn usually between 3½ and 1½ hours before the time of HW at Townsville. On the falling tide the stream sets N, with a similar maximum rate occurring between 3½ and 5½ hours after HW at Townsville.

10.65

- 1 **Current and flow during the south-east Trade Winds.**

During these winds, a current of ½ to 1¼ kn setting N or NW is generated in the approaches to Princess Charlotte Bay between Wharton Reef and Claremont Point which, combined with the tidal stream, produces a resulting flow which is almost always N at a rate of 1¼ kn on the falling tide and up to ¼ kn on the rising tide.

- 2 At neaps, in the area W of Morris Island when the trade wind is strong, the current is strong enough to overcome the weak SW-going tidal stream. The resulting flow is then N at a diminished rate before HW, and at an increased rate after HW.

10.66

- 1 **Current and flow during the north-west monsoon.**

In the approaches to Princess Charlotte Bay between Wharton Reef and Claremont Point, the combination of wind current and tidal stream produces a resultant flow which is more frequently S than otherwise. The flow is however further compounded, during this season, by the outflow of fresh water from the rivers in the bay, which sometimes overcomes the in-going tidal stream. An outflow from the bay of as much as 2 kn has been reported after heavy rains. The effect can be particularly marked across the entrance to the bay but is less so in the vicinity of Clack Reef (14°04'S 144°14'E).

- 2 In the area W of Morris Island the wind current generated by the NW monsoon is weaker than the tidal stream but causes some modification to the rate and direction of flow.

Caution is necessary during the NW monsoon, especially after heavy rains, when surface water in Princess Charlotte Bay and its approaches is much discoloured by mud washed down from the rivers.

Landmarks

10.67

- 1 Hobbs Hill (13°35'S 143°31'E), rising to a sharp sugarloaf top.
Round Mountain (13°34'S 143°31'E), rounded and the highest summit of the sparsely wooded Emberly Range; a sharp peak rises 2½ cables N of the mountain.
Cone Peak (13°23'S 143°30'E), a sharp peak, the most N peak of the densely wooded Macrossan Range.

Other aids to navigation

10.68

- 1 **Racons:**
Eden Reef Light (14°05'S 143°55'E) (10.70).
Corbett Reef Light-beacon (13°54'S 144°14'E).
For details see *Admiralty List of Radio Signals Volume 2*.

Directions for the Inner Route

(continued from 9.154)

Cape Melville to Eden Reef

10.69

- 1 From a position within the two-way route about 3 miles NW of Cape Melville ($14^{\circ}10'S$ $144^{\circ}31'E$) (9.153) and clear of the off-lying dangers described at the same reference, the track leads initially WNW, passing (positions from Cape Flinders ($14^{\circ}08'S$ $144^{\circ}14'E$)):
 - 2 NNE of King Island ($5\frac{1}{4}$ miles ENE), low, wooded and reef-fringed; King Island Light (white GRP hut on red metal framework tower, 17 m in height) stands at the N end of the island.
The track then leads WSW, passing:
 - NNW of Atkinson Reef (3 miles ENE), a small and dangerous below-water coral reef, lying at the outer end of a spit which extends 3 miles WSW from King Island. The reef is not marked by any tide-rips. And:
 - 3 SSE of Clack Island ($3\frac{1}{2}$ miles NNE), its E end cliffy and bare, the W end covered with bushes and mangroves; a similar but lower islet lies close N. Clack Island marks the SE extremity of Clack Reef, which is steep-to; the NE end of the reef is marked by a mangrove island with some trees to a height of 15 m on it. Between Clack Island and the mangrove island a conspicuous tree stands above some rocks and bushes on the reef; the wreck of a fishing vessel, stranded in 1993, lies nearby.

10.70

- 1 The track then leads W, passing (positions from Wharton Reef Light ($14^{\circ}08'S$ $144^{\circ}01'E$)):
 - N of Flinders Rock ($13\frac{1}{4}$ miles E), a coral pinnacle lying 5 cables N of Cape Flinders, which is not itself prominent; the rock is marked by tide-rips on the falling tide. And:
 - S of a 9.9 m patch ($13\frac{1}{2}$ miles E), the outermost danger S of Clack Reef; low bushes mark the S side of the reef. Thence:
 - 2 S of the S extremity of Corbett Reef (3 miles NNE); the SW edge of the reef is steep-to and marked in places by drying rocks; and:
 - N of Wharton Reef, its NE end marked by an islet of dead coral and some bushes, 2.2 m in height. Wharton Reef Light (white GRP tower on concrete

pyles, 12 m in height) stands on the islet. The W end of the reef is marked by a sand cay and drying rocks. Thence:

- 3 N of Clark Shoal (4 miles W), coral; the shoal is covered by the green sector (084° – 097°) of Wharton Reef Light; thence:
 - S of Eden Reef (6 miles WNW), steep-to on all sides; drying rocks lie on the S end. Eden Reef Light (white GRP hut on white concrete column, 6 m in height) stands on the E side of the reef.

10.71

Useful marks:

- 1 Flinders Peak ($14^{\circ}11'S$ $144^{\circ}16'E$), a remarkable mountain, the slopes of which are in places formed into rocky terraces resembling ramparts; two table-topped hills (275 and 249 m in height) stand on a ridge extending $1\frac{1}{2}$ miles WNW from the peak. A spur extending $1\frac{1}{4}$ miles N from the peak terminates in a summit (240 m in height).
- 2 Castle Peaks ($14^{\circ}09'S$ $144^{\circ}16'E$), two rugged castellated summits of a remarkable headland which rises from a low, narrow isthmus forming the E end of Stanley Island; a knob on the W slope of the peaks is prominent from NE and SW. Peak (268 m in height) ($14^{\circ}24'S$ $144^{\circ}15'E$) (chart Aus 374), densely wooded and rising on the W side of Bathurst Range; it stands out as a sharp cone when seen from anywhere W of it, and is only shut in as Flinders Group is approached.

Eden Reef to Magpie Reef

10.72

- 1 **West of Burkitt Island.** From the position S of Eden Reef ($14^{\circ}05'S$ $143^{\circ}55'E$) the charted two-way route leads generally NW to a position about $2\frac{3}{4}$ miles W of Magpie Reef Light ($13^{\circ}49'S$ $143^{\circ}45'E$). The track leads initially WNW, passing (positions from Burkitt Island ($13^{\circ}56'S$ $143^{\circ}45'E$)):
 - SSW of Fahey Reef ($9\frac{1}{2}$ miles SE), drying and steep-to; Fahey Reef Light (red GRP hut, white concrete column, 7 m in height) stands on the W side of the reef.
 - 2 The track then leads NW. Hannah Island Light ($13^{\circ}52'S$ $143^{\circ}43'E$), described below, is obscured over part of this leg in the sector (328° – 332°) by trees on Burkitt Island. The track passes:



Light

Wharton Reef from NNW (10.70)

(Original dated 1999)

SW of Beabey Patches (6 miles SE), a group of coral heads; depths less than 15 m extend up to 1 mile E, and an 11 m patch lies 1½ miles WNW of the patches. These dangers are covered by the red sector (121°–133°) of Eden Reef Light. Thence:

- 3 NE of Claremont Point (5¾ miles SW), low and covered with scrub and small trees. From the vicinity of the point to Cape Sidmouth, 37 miles farther N, numerous dangers lie up to 3½ miles offshore and closely within the charted 5 m depth contour. Thence:

SW of Burkitt Island, the SE-most of Claremont Isles. The island lies on the N part of a steep-to drying reef and is covered by trees (to a height of 17 m) and by mangroves.

- 4 The track then leads firstly NNW then N, passing: WSW of a wreck with a depth of 9.7 m over it (1¼ miles NW), thence:

ENE of an isolated rock (awash) (4½ miles WNW); Rattlesnake Reefs lie between 1¼ and 3½ miles farther NW; thence:

- 5 W of Hannah Island (4½ miles NNW), low, fringed with mangroves and tree-covered to a height of 20 m. Hannah Island Light (white GRP hut on red metal framework tower, 21 m in height) stands on the NW side of the island. Thence:

E of Sullivan Shoal (6½ miles NNW), a group of coral heads; thence:

- 6 W of Magpie Reef (6½ miles N), an extensive drying reef with a sand cay, which dries 3 m, near the W end. Magpie Reef Light (white GRP hut on concrete column, 7 m in height), marks the W end of the reef; a steep-to sand spit, with depths less than 10 m over it, extends 9 cables NW from the light and a detached 8.5 m shoal lies a farther 2 cables NW. And:



Magpie Reef Light (10.72)

(Original dated 1999)

E of Helby Rock (9 miles NNW), a steep-to coral head.

10.73

- 1 **East of Burkitt Island.** From a position about 2½ miles NW of Wharton Reef (14°08'S 144°01'E), the track leads generally NW within the charted two-way route. There is a least depth of about 15 m along the tracks described.

The line of bearing about 123° within a white sector (097°–126°) of Wharton Reef Light (10.70) astern, leads WNW passing (positions from Burkitt Island (13°56'S 143°45'E)):

- 2 NNE of Eden Reef Light (12 miles SE) (10.70) distant 4 cables, and:

SSW of a charted depth of 11.1 m (12½ miles SE) lying close S of Taiwan Shoal. Grub Reef, 1½ miles farther NNE, is marked by some drying rocks on its SW edge and by a drying sand cay at its W end. Taiwan Shoal and Grub Reef, with Cameron and Keast Shoals lying between, are covered by the adjacent red sector (126°–229°) of Wharton Reef Light.

- 3 The line of bearing about 137° in the white sector (133°–121°) of Eden Reef Light (12 miles SE), astern, and the line of bearing about 317° of Hannah Island Light (4½ miles NNW) (10.72) ahead then lead NW, passing: NE of Fahey Reef (9½ miles SE) (10.72), and clear of a wreck with a depth of 17.2 m over it, thence: NE of depths less than 15 m extending up to 1 mile E from Beabey Patches (6 miles SE) (10.72), thence: SW of a 14.3 m patch (6 miles ESE).

- 4 An alternative two-way route leads NNW from a position WSW of Eden Reef Light, passing: ENE of Fahey Reef (9½ miles SE) (10.72), the track then continues as described below.

The line of bearing 163° of Fahey Reef Light (9½ miles SE) astern, then leads NNW passing:

- ENE of a bank with a least depth of 12.9 m over it (4¼ miles SE), thence:
- 5 WSW of Iris Reef (4¾ miles ESE), drying and steep-to except at the NW end from where a sandspit, with depths less than 5 m over it, extends 3 cables WNW. Stainer Island Light (three-piled structure with red GRP tower on stainless steel platform; 11 m in height) stands at the SW end of the reef. Stainer Island, lying near the NW end of the reef, is marked by low bushes. And:
- 6 ENE of a shoal (with a depth of 11.3 m over it) (3½ miles ESE), thence: WSW of a steep-to drying reef (4¾ miles ENE) which lies outside the area preferred for navigation as shown in the reliability diagram on the chart; Pelican Island, wooded, lies on the NW edge of the reef.

- 7 The line of bearing 146° in a white sector (144°–148°) of Stainer Island Light, astern, then leads NW within the charted two-way route, passing:

NE of Burkitt Island (10.72), thence: NE of Simpson Rock (2 miles NNE), steep-to, with a depth of 8.3 m over it; thence: NE of Yule Rock, (2½ miles N), which is steep-to and has a depth of 7.9 m over it; thence:

- 8 NE of Dayman Rock (4 miles N), which has a depth of 10.4 m over it, steep-to from surrounding depths of less than 15 m; Olver Rock (depth 7.6 m), also steep-to, lies 1 mile farther SW. And: SW of Ballerina Shoal (5 miles NNE), a coral pinnacle covered by the red sector (320°–337°) of Magpie Reef Light, 3 miles farther NNW (10.72); thence:

- 9 NE of Hannah Island (4½ miles NNW) (10.72), thence: NE of a dangerous wreck (5 miles NNW), position approximate; and: SW of Magpie Reef (6½ miles N) (10.72).

Magpie Reef to Heath Reef

10.74

- 1 **East of Hay Island.** From a position W of Magpie Reef Light (13°49'S 143°45'E) the track leads N within the

charted two-way route, passing (positions from Hay Island (13°40'S 143°41'E)):

E of Wilkie Island (6¼ miles SSW) (10.75), thence:
W of a small detached drying reef (5 miles SE), the outer danger off the SW end of Noddy Reef; a drying sandbank lies about 2 cables E of the detached reef. Thence:

- 2 E of Hay Island, lying on a drying reef. Although low, the island is covered with trees and mangroves to a height of 15 m, and is conspicuous.

Caution. A tide-rip sometimes extends across the track from Hay Island to Fife Island (1½ miles NE).

The track then continues leading generally N, adjusted as required to follow within the charted two-way route, passing:

- 3 W of Fife Island (1½ miles NE), covered with bushes and a few small trees to a height of 6 m and lying at the W end of a steep-to drying reef; a drying sandspit extends ENE from the island. Fife Island Light (white GRP hut, 2 m in height) stands at the W extremity. Thence:
W of a 7.7 m shoal (4¼ miles NNE), the outermost danger on a spit extending WSW from a large unnamed part of the barrier reefs; thence:
- 4 W of Ogilvie Reef (7 miles NNE), which dries; a drying sand cay lies on the W end of the reef; thence:
E of Macdonald Reef (7½ miles NNW), steep-to; thence:
E of a below-water coral reef (depth 8.6 m) (8¼ miles NNW), detached but lying 8 cables NNE of Macdonald Reef; thence:
- 5 W of Claremont Rock (10 miles N), the outer danger W of Morris Island. The island, which lies near the middle of the W side of a drying reef, is 4 m in height and covered with bushes and grass; a conspicuous single palm tree at the SW end of the island is 18 m in height. Thence:
- 6 W of Heath Reef (11½ miles N); a coral cay, awash at HW, lies near its centre. Heath Reef Light (white GRP hut on framework tower on piles; 11 m in height) stands on the reef.



Heath Reef Light (10.74)

(Original dated 1999)

10.75

- 1 **West of Hay Island.** From a position W of Magpie Reef Light (13°49'S 143°45'E) the track leads NNW within the charted two-way route, passing (positions from Hay Island (13°40'S 143°41'E)):

- 2 ENE of Wilkie Island (6¼ miles SSW); although low, the island is tree-covered to a height of 14 m, fringed with mangroves and surrounded by a drying reef which extends up to 2 cables from the island. There is a sandy beach on the W side. Holdsworth Rock, 1¾ miles farther WNW, is steep-to. Thence:

- 3 ENE of Poulsen Rock (5¼ miles SW), a pinnacle with a depth of 7.5 m over it.

The track then leads N in a least charted depth of 12.3 m, adjusted as necessary to pass:

W of Hay Island (10.74), thence:

W of Fife Island (1½ miles NE) (10.74), thence:

- 4 E of separate shoal patches (depth 9.6 m) (4 miles NW), (depth 7.7 m) 1 mile farther N, and (depth 7.1 m) 1¾ miles farther N again; thence:

E of Macdonald Reef (7½ miles NNW) (10.74).

Directions given at 10.74 for the track continuing N to Heath Reef (13°29'S 143°41'E) may then be followed.

10.76

- 1 **Useful marks:**

Red cliffs (13°31'S 143°35'E), well-defined, 18 m in height and of red sandstone; the land rises to an isolated hill (51 m in height) 1 mile SW.

Turret Hill (13°31'S 143°30'E), the S-most summit of Macrossan Range; the summit is not remarkable but usually shows up well on account of its isolation.

- 2 Plant Peak (13°25'S 143°30'E), a rounded summit, conspicuous only because of its height.

Hillocks on Cape Sidmouth (13°25'S 143°36'E) (10.112).

(Directions continue at 10.112)

Directions through Fairway Channel and south part of Lads Passage

(continued from 9.154)

King Island to First Three Mile Opening

10.77

- 1 From the position within the two-way route about 3 miles NW of Cape Melville (14°10'S 144°31'E) (9.209), the track leads WNW to a position 4¼ miles E of King Island Light (14°05'S 144°20'E) (10.70). The track then leads NW and follows the alternative two-way route shown on the chart, passing (positions from the W point of Joan Reef (13°57'S 144°20'E)):

NE of King Island (8¼ miles S) (10.70), thence:

- 2 SW of Wilson, Joan and Rodda Reefs (2¼ miles SSE) (10.30), thence:

NE of the N tip of Corbett Reef (7¾ miles WNW); a light-beacon lies 1¼ miles SE from the N tip of the reef and marks the W side of Fairway Channel (10.22), thence:

SW of an isolated shoal patch, (15 miles NW), marked by a light-buoy (isolated danger), thence:

- 3 To a position S of Creech Reef (23 miles NW) (10.34) whence the track continues NNW, passing (positions from South Creech light-beacon (13°40'S 144°06'E)):

WSW of First Three Mile Opening (10.35), thence:

ENE of the NE tip of Ogilvie Reef (18¾ miles NW) (10.75).

- 4 **Useful marks:**

South Creech light-beacon (13°40'S 144°06'E) (10.34).

Light-beacon (13°26'S 143°58'E) (10.35), marking the NW side of First Three Mile Opening (10.35). (*Directions continue at 10.117*)

Flinders Group

Charts Aus 833, Aus 280

General information

10.78

- 1 Flinders Group, of five islands, stands between Bathurst and Princess Charlotte Bays and extends from 1½ to 7½ miles N of Bathurst Head (14°15'S 144°13'E).

Topography

10.79

- 1 The islands are generally high and rugged, and partially covered with stunted trees and scrub.

Stanley Island, the N-most of the group, rises to Castle Peaks (14°09'S 144°16'E) (10.71) at its E end; the larger W part of the island is of a different character, with a table-topped summit (123 m in height), 1½ miles W of Castle Peaks, the only prominent feature.

- 2 Flinders Island, the central and largest of the group, is dominated by Flinders Peak (14°11'S 144°16'E) (10.71). The valleys of the island are wooded; the largest, on the NW side fronting Owen Channel, being a swamp during the rainy season. The W extremity of the island is formed by a scrub-covered sandy plateau.

The remaining islands, which are less significant to navigation of the Inner Route, are described in the course of directions for channels through the group.

Owen Channel

10.80

- 1 **General information.** Owen Channel (14°10'S 144°14'E), between Stanley and Flinders Islands, should only be used by small vessels. The SW entrance which leads direct to the anchorage (10.93), is clear of known dangers other than the bank, with depths less than 10 m over it, extending 1 mile W from the W extremity of Flinders Island. The directions given below have been up-dated from a report on a passage of the channel made by HMAS *Paluma* (400 tonnes) in 1993.

10.81

- 1 **Directions.** From a position SW of the entrance to Owen Channel the track leads NE.

Leading marks:

Front mark, Alderley Point (14°10'S 144°14'E), 76 m in height.

Rear mark, the knob on the W slope of Castle Peaks (1¼ miles NE) (10.71).

- 2 The alignment (042°) of the above marks leads into the channel in a least charted depth of 6.2 m and direct to the charted anchorage. The track passes (positions from Alderley Point):

SE of Heming Point (2 miles SW), the S extremity of Stanley Island and fringed by a drying reef; depths less than 2 m extend 2 cables SSW from the point.

10.82

- 1 If proceeding through the channel beyond the anchorage the track continues NE, adjusted as described below.

From the vicinity of the anchorage, the line of bearing 047° of the W summit (205 m in height) of Castle Peaks (1½ miles NE) (10.71) leads NE, passing (positions from Alderley Point):

NW of drying reefs (8 cables SSW), fringing the W side of Flinders Island, and:

- 2 SE of a narrow shoal, with depths of 4.0 m over it (extending 7 cables SW); thence:
SE of Alderley Point, distant ¾ cable, and:
NW of a drying sand bar (2½ cables SE), the outermost of drying flats in the bight immediately SW of Frederick Point; floating beacons of an oyster farm in the bight help to mark the outer edge of these flats. Thence:
- 3 NW of the charted 5 m depth contour extending 1 cable NNW from Frederick Point (5½ cables E).
When N of Frederick Point, the track leads E in mid-channel on 080°, passing:
S of rocks (6 m in height) (1 mile NE), lying near the edge of the drying reef fringing that part of Stanley Island; and:
- 4 N of a bank, with a depth of 5.8 m over it (9 cables ENE); there are several heads at about that depth on the bank; thence:
S of a point (1.1 miles NE), distant 1½ cables. From the point the land rises to the W summit of Castle Peaks, 3 cables farther NNE. Thence:
- 5 S of Nares Point (1¼ miles ENE), the E extremity of Stanley Island; and:
N of Richards Point (2 miles E), the NE extremity of Flinders Island, which, with Nares Point, marks the NE entrance to Owen Channel.
Course may then be directed as required and guided by the chart.

Fly Channel

10.83

- 1 **General information.** Fly Channel (14°12'S 144°15'E), which lies between Flinders Island on the N side, and Denham, Maclear and Blackwood Islands on the S, is not recommended on account of Sentry and Stainer Rocks lying in the fairway. Great caution must be exercised if circumstances require the use of this channel.

10.84

- 1 **Directions.** From a position in Bathurst Bay, E of the entrance to Fly Channel, the track leads W.

Leading marks:

Front mark, Maclear Island (14°13'S 144°15'E), fringed by a drying coral reef.

Rear mark, Blackwood Island summit (178 m in height) (1½ miles W); the summit is rounded with rocky terraces, similar to those on Flinders Peak (10.71), about halfway up its N, E and SW slopes.

- 2 The above summit bearing 272°, seen over the S edge of Maclear Island, leads through the E entrance to Fly Channel, passing (positions from Maclear Island):

S of Pirie Head (2 miles ENE), a precipitous headland conspicuous from between N and NE; a rock (drying 2.7 m) lies on a small detached reef 7 cables WSW of the head; and:

Close N of Howard Bluff (1½ miles ESE), a conspicuous steep-to cliff with an overhanging top; thence:

- 3 S of Sentry Rock (1 mile E), lying in the middle of the fairway.

The track then leads WNW with Howard Bluff astern and open S of Abbey Peak (14½ miles ESE) (9.154). The track passes:

NNE of Stainer Rock (depth 5.8 m); (2 cables NE), thence:

- 4 NNE of a rocky islet (6 m in height) (3 cables WNW), fringed by a drying coral reef; a boat

channel, $\frac{3}{4}$ cable in width, lies between it and Maclear Island.

Course may then be directed as required and guided by the chart.

Clearing marks:

Howard Bluff bearing 118° and open S of Abbey Peak, as above, passes close NNE of Stainer Rock.

Rattlesnake Channel

10.85

- 1 **General information.** Rattlesnake Channel, which lies between Bathurst Head (14°15'S 144°13'E) and Flinders Group, 1½ miles N, is clear of known dangers.

10.86

- 1 **Directions.** From a position in Bathurst Bay, ENE of Denham Island (14°14'S 144°16'E), the approach to the E entrance to Rattlesnake Channel leads WSW, passing (positions from the S extremity of Denham Island):

NNW of Rocky Islets (5 miles ESE), both with a few bushes on them; the outer islet lies about 3 cables within the coastal 5 m depth contour, which it helps to mark. Thence:

- 2 SSE of the S extremity of Denham Island, rising to its summit 3½ cables N. A prominent peak stands 6 cables WNW of the summit; lower peaks extend NW to the W extremity of the island. The SE coast of the island is bold, precipitous, 107 m in height and steep-to.

The track then leads W as guided by the chart; the greatest depths being found in mid-channel. The track passes:

- 3 N of Bathurst Head (2 miles SW), a rugged projection which terminates in three points, the middle and N—most of which being Combe Point, with a small bay on each side, both nearly filled with drying flats. Within the three points, the land rises abruptly from near the coast to tree-covered tableland. Thence:
- 4 S of Pullen Point (4 miles W), the outer of two rocky mounds, both 6 m in height, at the SW extremity of Blackwood Island. These and a similarly shaped but larger third mound (44 m in height), 6 cables NE of the point, form the narrow SW part of the island. A rock (drying 1.2 m) close W of the point is the outer danger.

Course may then be directed as required.

10.87

- 1 A passage from Fly Channel to Rattlesnake Channel, leading SW between Denham Island (14°14'S 144°16'E) and Blackwood Island 1 mile WNW, is not recommended other than for small craft, owing to the spits on both sides, with depths less than 5 m over them, which restrict the width of the navigable channel to 1½ cables.

Anchorage

10.88

- 1 Anchorages in Flinders Group, which are also readily accessible from the Inner Route, are described at 10.92.

Anchorage

General information

10.89

- 1 Numerous otherwise unlisted anchorages, affording shelter for vessels of suitable size and draught, may be found on the NW sides of most reefs along the Inner Route

between Cape Melville and Cape Weymouth. Anchorage should not be taken up too close to the reefs, as tidal streams near their edges are generally stronger than those about 5 cables off.

Bathurst Bay

10.90

- 1 Anchorage may be obtained in the NE part of Bathurst Bay (10.61), in depths of about 7 m, in a position $\frac{3}{4}$ miles WSW of Cape Rock (14°10'S 144°29'E) as shown on the chart.

King Island

10.91

- 1 Anchorage in SE winds may be obtained $7\frac{1}{2}$ cables W of King Island (14°06'S 144°20'E) (10.69) in depths of 15 to 18 m.

Flinders Group

10.92

- 1 **Stanley Island.** Anchorage offering good protection in rough weather from SE may be obtained 5 cables offshore in Stokes Bay, on the W side of Stanley Island (14°09'S 144°14'E) (10.79), in depths of 11 to 16 m, thick grey mud.

- 2 The berth was used by HMAS *Paluma* (400 tonnes) in 1993, approaching with Flinders Peak (14°11'S 144°16'E) (10.71) bearing 130°. Depths on the approach shoaled gently to the anchorage.

Anchorage may also be obtained 4 cables off the NE side of Stanley Island in the bay SE of Cape Flinders (10.70) in depths of 11 to 13 m.

Both anchorages are shown on the chart.

10.93

- 1 **Owen Channel.** The best and most protected anchorage in Flinders Group for vessels of suitable size and draught, sheltered from all except SW winds, is found in Owen Channel. The anchorage is 1 mile ENE of Heming Point (14°11'S 144°13'E) in a depth of 11 m, mud.

Directions. See 10.81.

10.94

- 1 **Blackwood Island.** Anchorage during SE winds may be obtained about 5 cables W of Blackwood Island (14°13'S 144°13'E) (10.84) in a depth of 11 m, mud. A dangerous wreck lies close inshore W of the summit of the island.

The anchorage is not recommended when the wind is N of E, as it sweeps with violence round Flinders Island.

Princess Charlotte Bay

10.95

- 1 Anchorage may be obtained anywhere in Princess Charlotte Bay (14°15'S 144°00'E) to seaward of the charted 5 m depth contour, according to draught.

The bay is particularly well sheltered from SE. A vessel at anchor in the middle of the bay will ride comfortably, in only a light to moderate breeze, when the wind off Cape Flinders and Cape Melville is blowing strongly from SE.

Good shelter from E winds may be obtained SW of Bathurst Head (14°15'S 144°13'E) (10.86) in depths of 9 m.

Iris Reef

10.96

- 1 Anchorage may be obtained under the lee of Iris Reef (13°58'S 143°50'E) (10.73) in depths of 16 to 18 m, mud. Attention is drawn to the two-way route (10.73) passing the W side of the reef.

Hannah Island**10.97**

- 1 Anchorage may be obtained under the lee of Hannah Island (13°52'S 143°43'E) (10.72) in a depth of 15 m, 5 cables off the reef.

Fife Island**10.98**

- 1 Anchorage may be obtained off the N side of Fife Island (13°39'S 143°43'E) (10.74), 5 cables from the reef in a depth of 27 m. The island must not be approached too closely.

Fife Island Light is partially obscured by trees in the sectors 208°–266° and 313°–320°.

Charts Aus 270, Aus 834

Morris Island**10.99**

- 1 Anchorage may be obtained 4 cables NW of Morris Island (13°30'S 143°43'E) (10.74), as shown on the chart, in a depth of 18 m, mud and sand, taking care to avoid Claremont Rock.

In 1993 HMAS *Paluma* (400 tonnes) approached with the NE edge of the island bearing 097° and anchored in the same depth of 18 m but closer in, with the island distant 2 cables. The berth provided good protection from SE and good holding in sticky grey mud.

Rivers

Chart Aus 833

Normanby River**10.100**

- 1 Normanby River (14°24'S 144°09'E), which enters Princess Charlotte Bay across drying mud flats, is navigable for some distance by small craft entering at HW. The river has been examined for a distance of 7 miles to abreast Jane Table Hill (10.61), beyond which it is still tidal. Marrett River, entered 1¾ miles NE of the entrance to Normanby River, is not navigable.

Local knowledge is required.

Bizant River**10.101**

- 1 Bizant River (14°29'S 144°02'E) (chart Aus 374) enters Princess Charlotte Bay across drying mud flats and is navigable for some distance by small craft entering at HW.

Local knowledge is required.

North Kennedy and Annie Rivers**10.102**

- 1 North Kennedy River (14°29'S 143°57'E) enters Princess Charlotte Bay across extensive drying mud flats and leads to a junction with the Annie River about 2 miles within its entrance. The rivers are navigable by small craft of shallow draught to Marina Plains (14°31'S 143°53'E), where there is a wharf on the S bank of the river; another small jetty at the junction of the two rivers has a depth of 1.8 m alongside.

Local knowledge is required.

Stewart River**10.103**

- 1 Port Stewart is situated 5 cables within the entrance to Stewart River (14°04'S 143°42'E), which is fronted by a drying sand flat extending 5 cables offshore. The entrance may be recognised by a break in the mangroves and also by an isolated clump of trees, standing 1½ miles farther S.

Within the bar, which is subject to change, the river is shallow but may be used for a short distance by small craft of suitable draught.

- 2 **Local knowledge** is essential.

Flow. The out-going flow through the entrance on the falling tide runs at a considerable rate once the sandbanks dry.

Caution. No approach to Port Stewart should be made in heavy weather from E or SE, as this part of the coast is then a dangerous lee shore.

Chart Aus 834

Chester River**10.104**

- 1 Chester River (13°42'S 143°33'E) has been described as the most important river on this stretch of coast. Small craft with a draught of 1.5 m can enter the river at HW. A ledge of coral rock, which dries, lies on the outer edge of the drying coastal sandbank extending 4 cables to seaward of the entrance. Frenchman Reef, sand and coral, 1½ miles SE of the entrance, marks the outer edge of the coastal bank, with depths of less than 2 m over it, which extends 1½ miles offshore in this vicinity. Passage inshore of the reef is not recommended.

Local knowledge is required.

Nesbit River**10.105**

- 1 Nesbit River (13°32'S 143°35'E) is of no importance as the approach is obstructed by much foul ground, and the entrance by a drying sandbank.

HEATH REEF TO CAPE WEYMOUTH**General information**

Charts Aus 834, Aus 281, Aus 270 plan of Approaches to Heath Reef

Route**10.106**

- 1 From Heath Reef (13°29'S 143°41'E) the track leads through the charted inner two-way route to Cape Weymouth, 53 miles NNW.

The alternative two-way route leads generally NNW for 43 miles through Lads Passage, from First Three Mile Opening (13°28'S 144°01'E) to the vicinity of Cape Direction (12°51'S 143°32'E) where the track rejoins the inner route.

Topography**10.107**

- 1 From abreast Heath Reef the line of coastal ranges, marked at the S end by Emberly Range (13°35'S 143°31'E), lies between 2 and 4 miles inland from the coast and extends 38 miles N to terminate in Heming Range, of which Mount Heming is the highest summit. The ranges, which are separated by deep and well-wooded valleys, are, with the exception of Meston Range and the SE slope of Howard Range, all densely wooded. This line of high ground provides a number of significant summits and intersecting valleys.

- 2 With the exception of Cape Sidmouth (13°25'S 143°36'E), the coast fronting these ranges as far as First Red Rocky Point, 22 miles farther NNW, is low and formed of a sandy beach behind which scrub and small trees extend inland to the foothills. The entrances to streams, of which there are several, are generally fringed with mangroves.

- 3 The sandy beach continues between First Red Rocky Point (13°04'S 143°31'E) and Second Red Rocky Point 6 miles N, but the coast is higher.

Thence to Cape Direction the coast is again low, as is the land behind. Clump, a solitary hill, rises midway between Heming Range and the cape. A sandy beach continues NNE to Villis Point (12°52'S 143°32'E) from where the land rises to the higher and more prominent ground of Cape Direction (10.113).

10.108

- 1 From Cape Direction to Cape Griffith 12½ miles NW, thence to Cape Weymouth 3½ miles farther NNE, the coast, except for those three capes, is generally flat and featureless and is formed by the deep indentation of Lloyd Bay. The two main entrances to Lockhart River, which flows into the head of the bay through a delta of low islands densely covered with mangroves, are obstructed by bars within which the river has not been examined. Lloyd Bay is relatively shallow and partly obstructed by an extensive drying sandspit and a number of reefs and islands as shown on the chart. A small harbour at Quintell Beach (12°48'S 143°22'E) is described at 10.121. Except for Orchid Hill (12°51'S 143°27'E) (10.122), the S and SW shores of Lloyd Bay between Cape Direction and Claudie River, 11 miles W, are backed by low, flat land, sparsely covered with scrub, and swampy in places.
- 2 From Claudie River (12°50'S 143°22'E) to Cape Griffith, 10 miles NNE, the land backing the coast is appreciably higher and rises to a ridge of sandhills which stretch from Line Hill to the cape 5½ miles farther NNE. Farther inland the land rises to Tozer and Janet Ranges (chart Aus 375), both thickly wooded. Mount Dobson (12°40'S 143°13'E), 5 miles N of Mount Tozer (10.116), is the highest summit of Janet Range; Mount Nelson, rises 2 miles farther N.
- 3 From Cape Griffith to Cape Weymouth, 3½ miles NNE (10.115), the coast is formed mainly by a drying sandy beach fringed with coral and backed by low ground covered by bush.

Flow

10.109

- 1 **Tidal streams** between Cape Sidmouth (13°25'S 143°36'E) and Cape Weymouth are not subject to the disturbing effects of Princess Charlotte Bay described at 10.64, but follow the general pattern for the area, setting N on the rise and S on the fall of the tide.
- 2 **Currents.** During SE gales a current is found to set N along the E side of Lansdown Reef (12°49'S 143°33'E), at a maximum rate of 2 to 3 kn, before branching W round the N extremity of the coastal bank causing the charted tide-rips, which occur in strong winds. This current is increased during the rise and decreased during the fall of the tide by approximately ½ kn.
- 3 The normal rate of the wind current in the same vicinity during the South-east Trade Winds is from ½ to 1¼ kn. During the NW monsoon the current is very variable but most frequently S at a rate which rarely exceeds ¾ kn.

Landmarks

10.110

- 1 Cone Peak (13°23'S 143°30'E) (10.67).
High Peak (13°03'S 143°27'E), conical, easily identified and the highest summit of High Range; it is the best landmark on this part of the coast.

Other aid to navigation

10.111

1 Racon:

Diamond Reign Reef Light-beacon (13°12'S 143°48'E).

For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 10.76)

Heath Reef to Cape Direction

10.112

- 1 From the position W of Heath Reef (13°29'S 143°41'E), the track leads initially N within the charted two-way route, passing (positions from Bow Reef (13°18'S 143°40'E)):
- E of Quake Reef (8¾ miles S); Bell Bank, its outer edge coral and otherwise hard sand, lies between the reef and the coast ¾ miles farther W. Thence:
- 2 W of South and North Khandalla Shoals (7½ miles S), each consisting of a coral ridge. Drake Shoals, 8 cables farther E, consist of a number of coral heads. Khandalla and Drake Shoals are the outer dangers W of Blanchard Reef, 1 mile farther E and, with Ellis Reef described below, are covered by the red sector (182°–217°) of Heath Reef Light (13°29'S 143°41'E) (10.74). Thence:
- 3 E of Roskrige Reef (6¾ miles SSW), which dries. Cape Sidmouth, 2 miles farther W, is a bare, rocky cape with stunted trees on the sandy beach at its foot; the cape is backed by a grassy slope rising to the E of two hillocks, the W one being 62 m in height. A low ridge connects the hillocks to Macrossan Range inland and the cape, when seen from a distance S or N, appears as an island. Thence:
- 4 W of Ellis Reef (3½ miles SSE); a group of drying boulders marks the N edge of the reef. Two sand cays lie at the NE and NW points of the reef; an area of foul ground, with depths of 5.4 and 5.6 m over it, lies 1 mile farther N.
- The track then leads NNW, passing:
- 5 WSW of Bow Reef; a light (white GRP hut on white concrete column; 8 m in height) stands near the N end of the reef where there is also a drying sand cay. Thence:
- WSW of Celebration Reef (1½ miles NNE); a coral patch, with several heads and a least charted depth 1.7 m over it, lies 4 cables off the middle of the N side. And:
- 6 ENE of Howard Rock (2¾ miles WNW), steep-to. Lowrie Island, reef-fringed and covered with trees to a height of 9 m, lies 2 miles farther WNW, with Chilcott Rock between. Norman Rock, steep-to and lying 5 cables W of Lowrie Island, is dangerous as it lies in a position where anchorage might be sought in E winds. Thence:
- 7 ENE of Parry Rock (¾ miles NW), and:
WSW of Throne Shoals (¾ miles N), a mass of detached reefs; thence:
ENE of Binstead Islet (8 miles NW), partly covered with stunted trees to a height of 6 m and lying near the NE edge of a drying reef; thence:
- 8 ENE of Night Island (9 miles NW), low and formed mostly of mangrove swamp but with a small patch of dry ground on the NW side. The island is very difficult to identify from any distance at night. A drying coral reef which fringes the island is

steep—to on its E and W sides, but foul ground extends 3 cables from the S extremity. A tide-rip occurs over a part of the coastal bank, with depths less than 10 m over it, which extends 6 cables N from the island.

10.113

- 1 The track then leads N, passing (positions from Sherrard Island (12°59'S 143°37'E)):

Either side of Waterwitch Reef (10 miles S), coral; Waterwitch Reef Light (white lantern on stainless steel framework tower on concrete piles, 19 m in height) stands on the NE side of the reef. And: W of Glennie Reef (10 miles S); depths less than 10 m extend up to 6 cables from the W side of the reef; thence:

- 2 W of New Reef (6½ miles SSE), a large area of foul ground which has not been completely surveyed; a drying reef marks the SW extremity of the reef. The W edge, extending 2¼ miles farther N, consists of several small reefs which may dry. And:

E of Sykes Reef (8¼ miles SSW), thence:

W of Morris Rock (6 miles S), small in extent but steep—to; thence:

- 3 E of Stork Reef (5½ miles SW); which dries 2 m. A drying coral head lies 2½ cables S of the reef. A smaller detached drying reef lies close off the NE side of the reef and foul ground extends 4 cables farther N. First Red Rocky Point, 2¼ miles W of Stork Reef, is formed of red cliffs; the lower part of the point is bare. Thence:

- 4 W of Osborne Reef (3 miles S); the SW end of the reef is marked by a beacon (W cardinal, white concrete column; 9 m in height) and by a large drying boulder. Large drying boulders also mark the NE end of the reef. A 10.5 m patch, 1 mile NNW of the beacon, is the outermost charted danger off the NW side of the reef. Thence:

E of Dugdale Rock (3¼ miles SW), coral; thence:

- 5 W of Sherrard Island, a small and low islet lying on the N edge of Sherrard Reef which dries and is bush-covered to a height of 2 m; another small islet, bush-covered to a height of 4 m, lies 4 cables WNW. Thence:

E of Ashton Rock (6 miles NNW), steep—to and the outermost of the many coastal dangers which otherwise all lie within the 15 m depth contour as shown on the chart; thence:

- 6 W of Chapman Reef (6 miles N), marked at its NW extremity by Chapman Reef Light (white lantern on stainless steel framework tower on concrete piles; 14 m in height). Chapman Island, 4 cables ESE of the light, is sandy and covered with bushes and trees to a height of 6 m. A 4.4 m patch, 3 cables S of the reef, is the outermost of a number of shoal patches on the S side. A detached drying reef extends 4 cables from the N end of Chapman Reef; the tide-rip charted close N of this reef occurs in strong winds. Thence:

- 7 E of Cape Direction (9½ miles NNW), a remarkable headland terminating in a rocky point with May Rock, bare and white, close NE. From the point the cape is formed by several well-defined round hills, covered with boulders but otherwise bare, rising to Direction Hill, 1½ miles SW, which appears as a sharp peak when seen from S or N. Chisholm Point, at the N extremity of the cape, is

bold and rocky. The outer edge of the coastal bank, which extends 1½ miles E and 3 miles N from the cape, is steep—to from depths of 15 m or more but is clearly defined by the change in colour of the water, and is covered by the red sector (134°–157°) of Chapman Reef Light. The wreck of a fishing vessel lies in the middle of the fairway 2½ miles ESE of the cape.

10.114

Useful marks:

- 1 Hangklip Peak (13°18'S 143°29'E), the N-most summit of Howard Range. The N side of the mountain falls very steeply to the valley below, which is the most remarkable of those between the mountain ranges on this stretch of coast.
- 2 Eve Peak (13°14'S 143°28'E), round-topped and the N-most summit of Adam Range with a steep fall to the valley on its N side. The NE face of the peak is of reddish sand and bare.
Chester Peak (13°08'S 143°29'E), the highest summit of Chester Range. The peak, with a bare patch near its foot, appears from seaward to be conical, with a gradual slope to First Red Rocky Point 4½ miles NNE (10.113).
- 3 Round Point (13°01'S 143°31'E), rounded and rocky; the unnamed point, 1 mile farther N, is bold.
Second Red Rocky Point (12°58'S 143°31'E), formed of red cliffs, the lower part bare. The point is similar in appearance to First Red Rocky Point, 6 miles S (10.113), but rises to Mission Hill 2½ cables inland; a number of abandoned houses stand at the foot of the N slope of the hill.

Cape Direction to Cape Weymouth

10.115

- 1 From the position E of Cape Direction (12°51'S 143°32'E), the track leads NNW within the charted two-way route, passing (positions from Cape Direction):
ENE of the outer edge of the coastal bank (1½ miles E) extending from the cape (10.113); the current that may be experienced in this vicinity is described at 10.109, and:
- 2 WSW of Wye Reef (4¼ miles ENE), marked at its NW end by Wye Reef Light (white GRP hut on concrete column; 6 m in height); depths less than 10 m extend 8 cables E from the reef. Thence:
WSW of Halloran Rock (4½ miles NE), a coral pinnacle; and:
ENE of Lansdown Reef (2 miles NNE), lying close to the edge of the coastal bank: thence:
- 3 WSW of Zenith Reef (5½ miles NE), with a drying sand cay at the N end; a number of detached drying reefs extend 1 mile E from the reef. A steep—to patch, with a depth of 11 m over it, lies midway between Zenith Reef and Ape Reef 3½ miles NNW. And:
- 4 ENE of a patch, with a depth of 3.2 m over it, (3 miles N), at the N extremity of the coastal bank extending from Cape Direction (10.113); tide-rips may occur off the end of the bank (see 10.109); thence:
ENE of Exit Reef (5 miles NW); Jackson Rock lies 1 mile farther SSW. These dangers obstruct the S side of the outer part of Lloyd Bay. Thence:
- 5 ENE of Hazelgrove Reefs (6¼ miles NNW), three detached drying reefs which form the outermost dangers in the mouth of Lloyd Bay; and:

WSW of Ape Reef (8½ miles NNE), with a drying sand cay at its NW end and an 11.1 m patch 7½ cables farther NNW. Thence:

WSW of Tannadice Shoal (10½ miles N), steep-to and with several heads; Tannadice Rock lies on the NW side of the shoal; thence:

- 6 ENE of Edwards Shoals (12 miles NNW), consisting of two close but separate shoals. Cape Griffith, 2 miles SW, is bold and rocky, rising to Red Hill, 4 cables farther SW, which is the NE and highest feature on a ridge of sandhills stretching 5½ miles SSW behind the coast; Evans Rock (2 m in height) lies 2 cables SE of Cape Griffith. Thence:

WSW of Sandy Islet (15½ miles N). Curd Reef, a series of drying reefs, extends generally E for 3¼ miles from the islet; and:

- 7 ENE of Restoration Rock (14 miles NNW), steep-to except on its N and NE sides where foul ground extends a short distance offshore; a 7.1 m patch, 2 cables ENE of the rock and on the SW edge of the charted two-way route, is the outer danger E of Cape Weymouth. Tide-rips occur between 2 and 5 cables N of the rock. Restoration Rock Light (white GRP hut, 4 m in height) stands on the summit. Thence:

- 8 ENE of Restoration Island (14½ miles NNW), rocky and partially covered with scrub. Depths less than 5.0 m extend 4 cables S to Old Man Rock, from which foul ground reaches a short distance farther S; depths less than 5.0 m also extend 4 cables N from the island. A stranded wreck lies off the N point. The channel between the island and Cape Weymouth, 3 cables W, is obstructed by rocks and only navigable by boats. Tide-rips may occur from about 5 cables NE to 8 cables N of the island as indicated on the chart. And:

- 9 ENE of Cape Weymouth (14½ miles NNW), a square-shaped promontory with a double summit wooded at the N end. The land W of the cape is low and bush-covered. Double Rock (2 m in height), 2 cables NW of the N extremity, marks coastal dangers on the N side of the cape.

10.116

1 Useful marks:

Radio tower (12°47'S 143°21'E) standing NW of Derry Hill near Quintell Beach; lights are displayed from the tower.

Mount Tozer (12°45'S 143°13'E) (chart Aus 375), rounded and prominent; the highest summit of the thickly wooded Tozer Range.

(Directions continue at 11.92)

Directions for the alternative route through Lads Passage

(continued from 10.77)

First Three Mile Opening to Cape Direction

10.117

- 1 From the position ENE of the NE tip of Ogilvie Reef (13°31'S 143°49'E), the track continues NNW, passing (positions from Diamond Reign Light-beacon (13°11.6'S 143°47.6'E)):

- 2 WSW of the S tip of Tijou Reef (9½ miles ESE) (10.39) and WSW of a light-buoy (W cardinal) marking a shoal known locally as Wideawake Shoals, with a least depth of 9.6 m. The white sector (329°–331½°) of Diamond Reign

Light-beacon leads between a pair of light-buoys (lateral) moored 5¼ miles SW and 6 miles WSW respectively of the SW tip of the reef. Shoals abreast of the W cardinal light-buoy are covered by the adjacent red (331½°–350°) and green (309°–328') sectors of Diamond Reign Light-beacon. Thence:

- 3 To a position ENE of Diamond Reign Reefs (10.39), marked on their E side by Diamond Reign Light-beacon (white GRP tower on white piles, 20 m in height). Diamond Reign East Light-buoy (W cardinal) marking a shoal, known locally as Fourteen-Five Shoal, is moored 1½ miles E of the light-beacon. A patch with a depth of 1.9 m lies 2¾ miles ENE from the beacon. Thence:

ENE of Jubilee Reef (1¾ miles NW) (10.39), thence: ENE of Colclough Reef (6½ miles NNW) (10.39), thence:

- 4 WSW of West Derry Shoal (9¾ miles N), which is marked by a light-buoy (port hand) at its W side. thence:

ENE of Hudson Light-beacon (white hut on white pile, 11 m in height) (12½ miles NNW), which marks the E edge of shoal bank with a least depth of 4 m over it. A dangerous underwater rock lies 3¼ cables SW of the beacon, thence:

ENE of a drying reef (15½ miles NNW), which lies at the N end of a shoal bank with a depth of 1.4 m over it.

- 5 From the position ENE of the drying reef, the track leads NW, then WNW, passing (positions from Chapman Island (12°53'S 143°36'E)):

SW of Robin Reef Light-beacon (white GRP tower on white piles, 20 m in height), (5½ miles E), which marks the SW end of Robin Reef, which dries, lying on a shallow bank, thence:

NE of Frederick Patches (1½ miles ENE), a shoal bank lying NE–SW, with a depth of less than 2 m over its SW end. A light-beacon (white hut on white pile) marks the NE end.

- 6 The track then continues WNW, passing:

SSW of Sunk Reef (3 miles NE), with a least depth of 0.3 m over it and marked on its S side by a light-beacon (white hut on white pile), thence:

NNE of Chapman Island (10.114), thence:

To a position 3 miles E of Cape Direction (12°51'S 143°32'E) (10.114) where the track rejoins the Inner Route.

- 7 **Useful marks:**

Light-beacon (13°26'S 143°58'E) (10.35), marking the NW side of First Three Mile Opening (10.35). Wye Reef Light (12°48'S 143°36'E) (10.115).

(Directions continue at 10.115)

Anchorage and harbour

General information

10.118

- 1 See 10.89 for information on unlisted anchorages.

Night Island

10.119

- 1 A clear passage exists between Night Island (13°11'S 143°35'E) (10.112) and the outer reefs off Bobardt Point, 3 miles farther W. The point is low and sandy with flat, scrub-covered land behind. A small underwater coral reef, dangerous to navigation, lies 3 cables NW of the N point of Night Island.

There are no good leading marks for the passage.

- 2 **Local knowledge** is required except at LW, when the edges on both sides of the channel can be plainly seen.

Tidal streams in the channel are not strong.

Anchorage may be obtained by vessels of suitable size and draught in the N entrance to the channel, as shown on the chart, in a depth of about 7 m, clay. Landing may be made 3 cables SSW of the N point of Night Island where there is a sandy beach on the NW side of the dry ground.

Sherrard Island

10.120

- 1 **Anchorage**, with fair shelter, may be obtained about 6 cables W of Sherrard Island (12°59'S 143°37'E) (10.113) as shown on the chart, in depths of about 21 m, mud. Landing may be made through a gap in the reef NW of the islet lying on the NW edge of Sherrard Reef (10.113).

Quintell Beach

10.121

- 1 **General information.** A landing at Quintell Beach (12°48'S 143°22'E) serves the Lockhart River Community, situated about 1 mile inland, and may be used by shallow-draught landing craft at suitable states of the tide.

Harbour limits, which extend to about 1¼ miles offshore, are shown on the chart.

10.122

- 1 **Directions.** From a position in open water about 5 miles NE of Sunter Island (12°47'S 143°25'E), the track leads SW through Lloyd Bay over a gently shelving bottom to the landing at Quintell Beach, passing (positions from Sunter Island):

NW of Hazelgrove Reefs (4 miles ENE) (10.115) distant 1 mile; thence:

- 2 NW of May Reef (3 miles E), thence:
SE of Sunter Island, distant 1 mile; depths less than 2 m extend up to 2½ cables around the island, which has bushes on it to a height of 6 m. And:

NW of Waight Bank (2½ miles SE), a coral flat.

The track then leads generally W or WSW as required passing S of Sunter Island, either to a selected anchorage or to the approach to the landing.

- 3 **Leading light-beacons:**

Front beacon (white triangle point up) (3 miles WSW).

Rear beacon (white triangle point down) (63 m NW of front beacon).

The alignment (305°) of the above light-beacons leads towards the N side of the landing, passing:

- 4 Close NE of a group of rocks (the highest 3 m in height) (3 miles WSW), of white granite and extending 2½ cables offshore.

When close in to the beach a sharp turn to port is required to align with the landing ramp.

Caution. The landing is exposed to winds between N and SE and the resulting short sea may make manoeuvring difficult. Extreme care is required to avoid the rocks close S.

- 5 **Useful marks:**

Orchid Point (12°51'S 143°27'E), bold, with a coconut plantation SE of it. The point is the only readily identifiable landmark in its vicinity and is the N termination of Orchid Hill, rising 5 cables farther S from low, flat ground on both sides. The coasts for 4 miles E of the point and that extending 3 miles WSW to Almond Point are fringed with mangroves.

- 6 Claudie River (12°50'S 143°22'E) (10.108), the mouth of which can be identified in good visibility.

Radio tower (12°47'S 143°21'E) (10.116).

Lloyd Islands (12°46'S 143°24'E). The largest of the four islands has two summits, the higher (71 m in height) rising on the NE side and the other, 60 m in height, rising over the S extremity of the island; both summits are round, bare and red in appearance. The E side of the island is bold; its coast is fringed with boulders.

10.123

- 1 **Anchorage** may be obtained as required within Lloyd Bay according to draught. In 1980 MV *Cape Don* (2106 grt and 4.3 m draught) anchored with the rocks close S of Quintell Beach bearing 270° distant 1.8 miles, in a depth of 7 m, mud, good holding ground.

Berth: a concrete landing ramp.

Facilities: small hospital; flying doctor when required.

Communications: air service link with Cairns.

Cape Weymouth

10.124

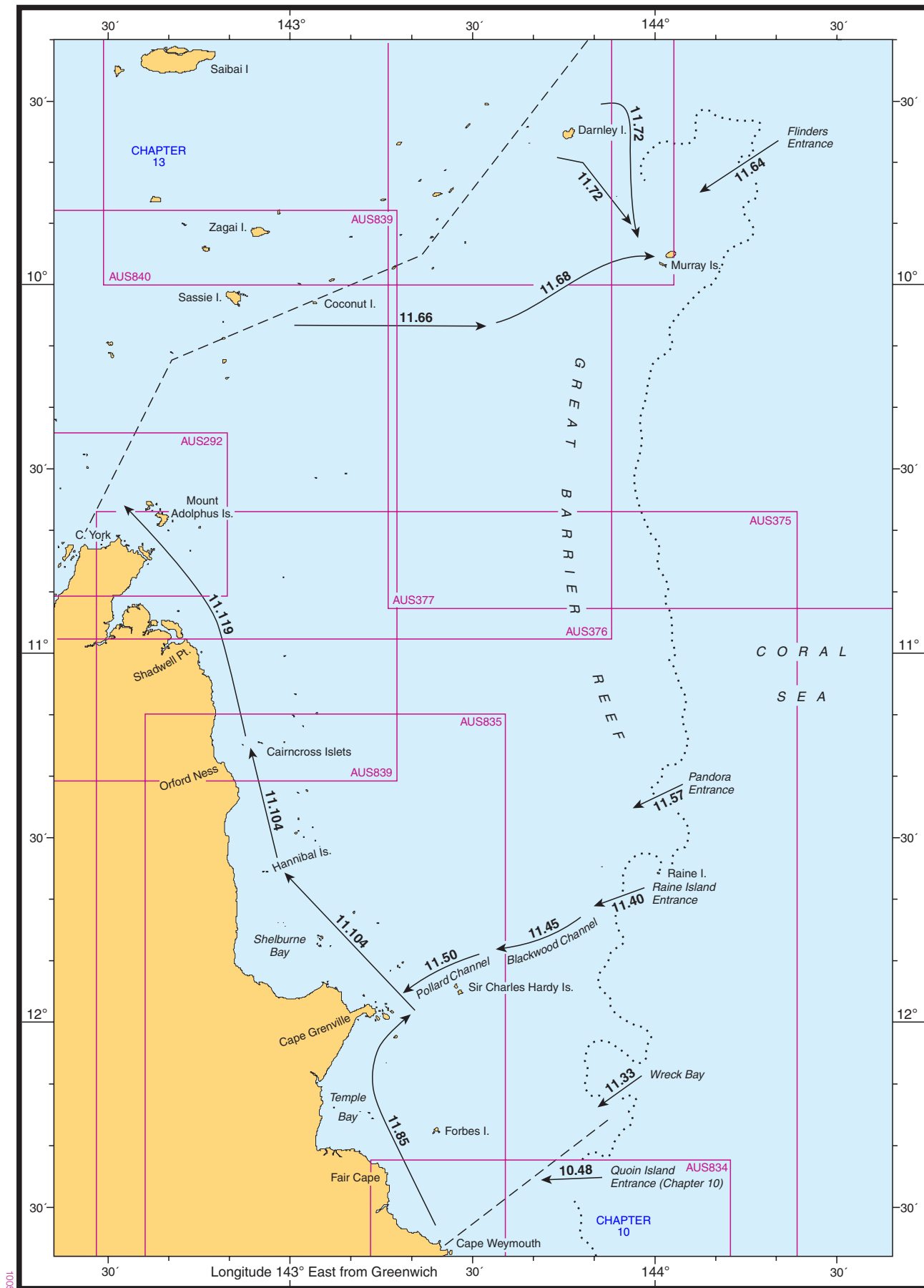
- 1 **Anchorage** in SE winds may be obtained by small vessels of suitable size and draught in depths of 6 to 7 m, good holding, 2½ cables WNW of the N extremity of Restoration Island (12°37'S 143°27'E) (10.115). The tide-rips off the N end of the island may be avoided by anchoring as close in as is prudent.

There is often a slight swell at the anchorage.

- 2 **Directions.** From a position in the two-way route NNE of Restoration Island the track leads SSW.

The line of bearing 201° of the summit of Red Hill (12°41'S 143°25'E) (10.115), seen midway between Cape Weymouth and Restoration Island, leads directly to the anchorage.

Chapter 11 - Cape Weymouth to Cape York



CHAPTER 11

CAPE WEYMOUTH TO CAPE YORK

GENERAL INFORMATION

*Chart Aus 375***Scope of chapter****11.1**

- 1 From Cape Weymouth (12°37'S 143°26'E) this chapter covers the Inner Route to its N end where it passes Cape York (10°41'S 142°32'E) and leads through Adolphus Channel. Routes leading from there onwards through Torres Strait are described at Chapter 13. This chapter also covers Great Barrier Reef from latitude 12°23'S to its N extremity at Anchor Cay (9°22'S 144°07'E) and describes the known openings and passages through the reefs. There are no ports within the coverage of this chapter and no passages through the reefs of significance to ocean-going vessels using the Inner Route.

Topography**11.2**

- 1 The mainland of this N extremity of Queensland and of the Australian continent is generally lower than is the case farther S; there are no features more than 200 m in height N of latitude 12°15'S. The background to the coast is provided in some areas by the N-most hills of Great Dividing Range, but elsewhere these recede too far inland to be identifiable from seaward.

Descriptions of the coast and off-lying islands, including those adjacent to the outer parts of the barrier reef, are given in the relevant parts of the text.

Pilotage**11.3**

- 1 Pilotage is compulsory for most vessels transiting the waters of the Inner Route of Great Barrier Reef between latitude 16°40'S and Cape York (10°41'S 142°32'E). The area of compulsory pilotage includes all waters between the Australian mainland and the outer edge of Great Barrier Reef. The size and type of vessels affected are given at 1.26 and in notes on the larger scale charts. Details of the pilot services are given in *Admiralty List of Radio Signals Volume 6(4)*.

Ship reporting system**11.4**

- 1 For details of Torres Strait and Great Barrier Reef ship reporting system, see 1.89 and *Admiralty List of Radio Signals Volume 6(4)*.

Marine protected area**11.5**

- 1 The N limit of Great Barrier Reef Marine Park extends E from Cape York (10°41'S 142°32'E) to beyond the E edge of Great Barrier Reef. The entire Marine Park is considered a Marine Protected Area and restrictions on access and use may apply: see 1.72 and 1.74.

Designated Shipping Area**11.6**

- 1 Within this chapter are Designated Shipping Areas, for further information see 1.74 and *Australian Seafarers Handbook*.

Particularly Sensitive Sea Area**11.7**

- 1 The whole area of this chapter is within Great Barrier Reef Marine Park which is an IMO approved Particularly Sensitive Sea Area (PSSA). The area is shown on the relevant charts. For further details see 1.71 and *Australian Seafarers Handbook*.

Flow**11.8**

- 1 **Currents:** see 1.144 for a general description of currents in the area.

Tidal streams throughout the area covered by this chapter follow the general pattern setting N on the rising tide and S on the falling tide. Variations caused locally by land or shoals, or by the proximity of Torres Strait to the N part of the area, are described in the relevant parts of the text.

GREAT BARRIER REEF

GENERAL INFORMATION

*Charts Aus 375, Aus 376, Aus 377, (see 1.15)***Scope of the section****11.9**

- 1 Several passages and channels through the barrier exist within the coverage of this section; they are described individually in succeeding paragraphs. Also described are several anchorages off the reefs and entrances.

Caution**11.10**

- 1 From abreast Cape Weymouth (12°37'S 143°26'E) the outer edge of Great Barrier Reef diverges from the mainland coast and reaches generally N to its extremity at Anchor Cay (9°22'S 144°07'E). The triangular area formed between the outer edge and the Inner Route following the

mainland coast to Cape York (10°41'S 142°32'E) contains large areas, shown on the charts, which are unsurveyed and considered dangerous for navigation.

Protected zone**11.11**

- 1 The area N of 10°28'S lies within a protected zone which is described at 13.9 and in notes on the appropriate charts.

Outer edge**General information****11.12**

- 1 From Quoin Island Entrance (12°24'S 143°45'E) (10.48) to Olinda Entrance, 74 miles NNE, the outer edge of the barrier differs from the more uniform formation that occurs farther S and is broken and irregular.

2 The form of the outer edge changes in the vicinity of Olinda Entrance from where, to Triangle Reef (10°45'S 144°00'E) and thence to Yule Entrance 22 miles farther N, the reefs appear from seaward as one unbroken line and may be regarded as an impenetrable barrier through which there are no openings, even for the smallest vessel. Although the area close W of the outer reefs appears deep, it is unsurveyed and considered dangerous.

3 From Yule Entrance to Flinders Entrance (9°41'S 144°15'E) the edge of the barrier consists of a great many small patches of reef on which the sea breaks heavily. There is deep water between some of the patches but, as they are so close together, the appearance of the reefs from seaward is again that of an impenetrable barrier.

From Flinders Entrance to Anchor Cay (9°22'S 144°07'E), at the N extremity of Great Barrier Reef, the edge of the barrier is considerably more open, as shown on the chart.

4 Except in Wreck Bay (12°08'S 143°53'E), Raine Island Entrance 32 miles farther N, and at the N end of the barrier, the 100 fm or 200 m depth contours off the outer edge have not been delineated. A passage from Raine Island Entrance to East Cay (9°24'S 144°13'E) made by HMAS *Flinders*, passing between 1 and 2 miles to seaward of the outer edge, revealed no uncharted off-lying dangers.

Natural conditions

11.13

1 **Current.** Off Great Detached Reef (11°45'S 144°01'E) and Raine Island Entrance on its N side, a current setting N along the face of the barrier at a rate of 1 kn can generally be expected during the South-east Trade Winds.

Overfalls. Gaps in the reefs are often marked by overfalls to seaward. These can be more severe N of Olinda Entrance (11°12'S 144°04'E).

Off-lying reefs and island

11.14

1 Off-lying reefs adjacent to the outer edge of this part of Great Barrier Reef occur only off the broken and irregular stretch between Quoin Island Entrance and Olinda Entrance and are described below. Other reefs farther offshore in Coral Sea are described where appropriate in Chapter 2.

11.15

1 **Yule Detached Reef** (11°57'S 143°59'E) dries and is steep-to. The reef may assist in identifying the approach to Single Rock Entrance or to Stead Passage from seaward.

11.16

1 **Great Detached Reef** (11°45'S 144°01'E) is formed of an almost continuous reef, drying on all but its W side and enclosing a large lagoon to which there are five entrances. The NW entrance is the widest and the only one to have been fully surveyed. Two narrow channels in the middle of the NE side are reported to be safe; two other openings, with a detached drying reef lying between them, on the SW side have not been examined. The E side of the lagoon is foul with numerous coral heads.

11.17

1 **Raine Island** (11°36'S 144°02'E) lies at the W end of a drying reef and is formed of coral sand and rock. The island was formerly used for the extraction of guano deposits but, together with the adjacent waters, is now included within Great Barrier Reef Marine Park (1.73) and is subject to restrictions on use and access. The island is marked by its tower (11.29). The best landing is on the NW side where the reef is narrow.

Anchorage

11.18

1 **Wishbone Reef** (12°04'S 143°58'E). Anchorage may be obtained in smooth water in the bight formed by the NW side of Wishbone Reef. The bight may be approached from Single Rock Entrance (11.36) and a berth selected in depths indicated on the chart, taking care to avoid the small reefs and a below-water rock 2 miles SSW of the entrance.

11.19

1 **Great Detached Reef** (11°45'S 144°01'E) (11.16). Sheltered anchorage may be obtained in the N part of the lagoon within the NW entrance as shown on the chart, in depths of 30 to 33 m. Anchorage may also be obtained in the E part in a depth of 15 m but great caution is necessary.

11.20

1 **Five Reefs to Small Opening.** There are below-water rocks near the W side of Five Reefs (11°52'S 143°50'E), but from there to Small Opening, 6 miles NNE, the inside edge of the barrier is comparatively clear of shoals. Several detached coral heads, which break, lie close W of Three Reefs on the N side of Small Opening.

Anchorage may be obtained in depths of 24 to 26 m at a distance of 3 miles W of these reefs, where it is not so deep and the bottom is less foul than is the case closer in.

11.21

1 **Pandora Entrance.** Well sheltered anchorage may be obtained inside the entrance (11.57) in depths of 20 to 22 m, coral and sand, 1 mile SW of Moulter Cay (11°24'S 144°01'E). Directions given for the entrance lead to the anchorage.

Prohibited anchorage. An historic wreck (1.70), HMS *Pandora*, lies on the NW side of Pandora Entrance, within a protected area 2½ miles WNW of Moulter Cay (11°24'S 144°01'E).

11.22

1 **Flinders Entrance.** Temporary anchorage may be obtained in Flinders Entrance (9°41'S 144°15'E) (11.64) when making Great Barrier Reef too late in the day to proceed farther before dark. From April to October the prevailing sea and swell from SE may render such an anchorage uncomfortable.

Inner edge

General information

11.23

1 From the vicinity of Cape Weymouth (12°37'S 143°26'E) the inner edge of the barrier is formed by a line of reefs stretching as far as Thrush Reef, 55 miles NNW. From there the reefs become more scattered and an inner edge to the barrier less well-defined.

Anchorage

11.24

1 See 11.98.

Passages through the reefs

General information

11.25

1 Numerous openings exist in the outer edge of the barrier but only the S side of Wreck Bay (12°08'S 143°53'E) and Raine Island Entrance, 32 miles farther N, provide ready access to recognised channels across the width of the barrier to the Inner Route. Although these channels to the Inner Route are navigable by small vessels, they are not normally used and cannot be considered to have been

proved safe through the passage of many keels over years of regular use.

- 2 The openings and passages through the reefs described from 11.31 onwards are generally only suitable for small vessels working specifically within the reefs.

Local knowledge is essential in all cases.

Pilotage

11.26

- 1 Pilotage is not available for any of the passages through the reefs within the limits of this chapter.

Reliability of surveys

11.27

- 1 Reliability diagrams shown on the appropriate reference charts give an indication of the confidence that may be placed in the chart for each passage through the reefs.

Former mined areas

11.28

- 1 All recognised passages from seaward through the reefs S of latitude 11°40'S are former mined areas. See 1.5 for general remarks and Appendix II for details of the areas involved.

Landmarks

11.29

- 1 Sir Charles Hardy Islands (11°55'S 143°28'E), two stony islands, covered with grass and stunted bushes, which have a reddish appearance from seaward and are distinctly visible from the outer edge of the barrier reefs. The N island has the sharper summit. A separate unnamed islet (19 m in height) stands on a drying reef 7½ cables SSE of the S island.
- 2 Tower (round stone, 21 m in height) (11°36'S 144°02'E), standing at the E end of Raine Island. Maer Island (9°55'S 144°03'E), the NE and largest of Murray Islands, with a mountainous terrain and areas of tropical rainforest. The SW extremity of the island rises abruptly to a conical hill (209 m in height), from which a ridge of lower and wooded hills, with areas of cultivation, extends NE. Darnley Island (9°35'S 143°46'E) (13.25).

Other aid to navigation

11.30

- 1 **Racon:**
East Cay Light (9°24'·1S 144°14'·2E) (11.78).
For details see *Admiralty List of Radio Signals Volume 2*.

PASSAGES THROUGH THE REEFS

Lagoon Reef to Wishbone Reef

Chart Aus 375 (see 1.15)

Opening north of Lagoon Reef (12°23'S 143°47'E)

11.31

- 1 A passage 3 cables in width, may be found in an opening between Lagoon Reef (10.49) and an unnamed

drying reef 3 cables NE. A dangerous rock lies 8 cables NW of the inner end of the passage.

Ferguson Reef openings

11.32

- 1 There are narrow openings, each 2 cables in width, SW and NE of Ferguson Reef (12°21'S 143°49'E); both have been surveyed.

Wreck Bay

11.33

- 1 **General information.** Wreck Bay is entered between Black Rocks (12°13'S 143°56'E) and the S extremity of Wishbone Reef 6½ miles N, and is formed on its N and W sides by a broken line of drying reefs with some passages between. The S side of the bay consists of isolated drying reefs and a number of below-water patches which extend in a shallow curve from a point on the reef edge, 2 miles SW of Black Rocks, to the S end of Martha Ridgway Reefs 8 miles farther WNW. The bay and the waters extending SW from it provide surveyed access to the Inner Route. General depths of 30 to 35 m can be found across the S part of the bay and off the reefs bordering its W and N sides.

- 2 **Landmark:**

Black Rocks (12°13'S 143°56'E), two rocks lying near the N extremity of Mantis Reef; the larger is 2.1 m in height and visible at horizon range in clear weather.

11.34

- 1 **Entrances on the south side.** Black Rock Entrance (12°14'S 143°52'E) is the middle of three clear passages on the S side of the bay. This and the one immediately W of it are each 1¼ miles in width and are the preferred entrances. From seaward the reefs forming the entrance points to Wreck Bay are readily visible with seas breaking on them except in the calmest weather; both entrance points are steep-to.

- 2 **Directions.** The line of bearing 248° of Henry Reef (12°13'S 143°49'E), which appear as the S-most of the reefs forming the W side of the bay and the most prominent of those on the S side, leads into the S part of Wreck Bay, passing NNW of Black Rocks (11.33) distant about 2 miles.

- 3 **Black Rock Entrance.** When Black Rocks bear 146° the track then leads SW on 224° through Black Rock Entrance, passing (positions from Henry Reef):

NW of Lloyds Reef (¾ miles ESE) and:

SE of William Reef (2 miles E), thence:

NW of a dangerous rock (8½ miles SSW), thence:

NW of Lagoon Reef (9½ miles SSW).

- 4 **Western entrance.** The approach track continues WSW with Henry Reef bearing as above, passing NNW of William Reef (2 miles E).

When Henry Reef is distant 1¼ miles the track then rounds William Reef to lead SSW on 213°, passing:

ESE of a dangerous rock (1 mile NE), thence:

ESE of Henry Reef, thence:

- 5 WNW of the dangerous rock (8½ miles SSW), distant about 9 cables, thence:

WNW of Lagoon Reef (9½ miles SSW), distant about 9 cables.

For either of the above entrances, directions given at 10.51 or 10.52 for the tracks from the W end of Quoin

Island Entrance to the Inner Route off Cape Weymouth may then be followed.

11.35

- 1 **Entrances on the west and north sides** of Wreck Bay are unsurveyed and lead into waters that are incompletely so. These entrances should only be used in clear visibility and with extreme caution.

Safe Entrance lies 8 miles WNW of Black Rocks and is about 6 cables in width.

Nimrod Passage is narrower and lies $4\frac{1}{2}$ miles farther N.

Other apparently deep but unsurveyed passages on these sides of the bay vary between 1 and 5 cables in width.

Wishbone Reef to Raine Island

Single Rock Entrance

11.36

- 1 Single Rock Entrance ($12^{\circ}01'S$ $143^{\circ}57'E$) is a safe opening, 6 cables in width, which may be identified by a black rock lying at the NW end of the drying reef which forms the SE side of the entrance.

Useful mark: Yule Detached Reef ($11^{\circ}57'S$ $143^{\circ}59'E$) (11.15).

Stead Passage

11.37

- 1 Stead Passage ($11^{\circ}54'S$ $143^{\circ}51'E$), which is 3 cables in width, is difficult to identify as it lies at the head of a bight in the barrier.

Useful mark: Yule Detached Reef ($11^{\circ}57'S$ $143^{\circ}59'E$) (11.15).

Openings between Five Reefs

11.38

- 1 Five Reefs, which lie within 3 miles N of Stead Passage ($11^{\circ}54'S$ $143^{\circ}51'E$) (11.37), are intersected by two or three narrow openings through which entrance might be made in case of necessity.

Small Opening

11.39

- 1 Small Opening ($11^{\circ}47'S$ $143^{\circ}52'E$), which has not been examined, is entered between the S side of Three Reefs and a smaller drying reef $2\frac{1}{2}$ cables farther S. The opening may be identified by some above-water boulders lying near the W end of Three Reefs.

Raine Island Entrance

General information

11.40

- 1 The outer part of Raine Island Entrance lies between Great Detached Reef ($11^{\circ}45'S$ $144^{\circ}01'E$) and the SE extremity of a large drying reef forming the edge of the barrier 9 miles NNE. There is a deep clear channel on each side of Raine Island (11.17), lying midway between these two points, but the channel S of the island is the wider and to be preferred. The inner part of the entrance crosses the submerged outer edge of the barrier 7 miles W of Raine Island in an area which has not been fully examined.

- 2 **Caution.** A crossing of this part of the submerged outer edge of the barrier requires extreme caution and should only be attempted in daylight unless local knowledge is available; the directions given should be used with caution. See 11.25 for remarks on use of the entrance.

Tidal levels: see information in *Admiralty Tide Tables*. Mean spring range at Raine Island about 1.8 m; neap tides are scarcely perceptible.

- 3 **Access to the Inner Route** may be obtained SW through Blackwood Channel, thence through either Pollard or North Channels. Access through surveyed water leading NW towards Cape York ($10^{\circ}41'S$ $142^{\circ}32'E$) may also be obtained directly from Raine Island Entrance.

Natural conditions

11.41

- 1 **Flow.** Tidal streams can be most irregular, with rates which sometimes exceed $1\frac{1}{2}$ kn. On average the W-going stream runs for 7 hours, ceasing approximately 1 to $1\frac{1}{2}$ hours after the time of HW; the E-going stream runs for 5 hours and is generally the weaker.

Current during the South-east Trade Winds sets generally N in the vicinity of the entrance as described at 11.13. The corresponding set through the entrance is NW at a rate of 1 kn.

- 2 The strength of the northerly components of tidal stream and current should not be underestimated.

Sea state. A turbulent cross sea occurs in the vicinity of the 200 m depth contour with strong E winds against an E-going tidal stream. These conditions are likely to be more significant in the channel N of Raine Island than elsewhere.

Directions

11.42

- 1 Knowledge of the vessels's latitude and identification of the tower (11.29) on Raine Island ($11^{\circ}36'S$ $144^{\circ}02'E$) are essential to a safe approach to the entrance; due allowance must be made throughout for the effects of flow.

11.43

- 1 **From east-south-east.** From a position ESE of Raine Island the track leads WNW through the S part of the entrance, passing (positions from Raine Island):

NNE of Great Detached Reef ($4\frac{1}{4}$ miles SSW) (11.16) and:

SSW of Raine Island (11.17); the tower kept distant more than $1\frac{1}{2}$ miles clears the reef extending SE from the island. Thence:

- 2 SSW of a patch, with a depth of 10.4 m over it ($5\frac{1}{2}$ miles W), lying at the WSW end of a line of below-water and drying reefs which extend to the N entrance point, 10 miles ENE; heavy breakers occur over this line of reefs.

Course must then be directed, as guided by local knowledge or the national large scale chart, across the submerged barrier (7 miles W), passing:

- 3 N of a 12 m patch ($7\frac{3}{4}$ miles WSW); a drying patch (charted as a rock awash) and a drying reef, on which there is a sand cay which dries, lie on a shoal bank, with depths less than 10 m over it, $1\frac{1}{4}$ miles farther SW. Thence:

- 4 Clear of two drying reefs ($7\frac{3}{4}$ miles W). Isolated 5 m and 6 m shoals lie, respectively, 8 cables NW and 5 cables SW of the W reef. Thence:

Clear of Jukes Reef (10 miles W); a cay (1.5 m in height) lies near its W end; a 5.9 m patch lies 8 cables S of the reef.

Course may then be directed SW or NW as required.

11.44

- 1 **From east-north-east.** If compelled to enter by the N entrance, the track leads WSW, passing (positions from Raine Island):

SSE of the N entrance point (5 miles NE) (11.40) and of the line of below-water and drying reefs extending 10 miles WSW from it. Sea conditions that may be experienced to seaward of these reefs are described at 11.41. And:

NNW of Raine Island (11.17), distant about 6 cables.

When clear of Raine Island, the directions given above for passage S of the island may be followed.

Channels from Raine Island Entrance to the Inner Route

Blackwood Channel

11.45

- 1 **General information.** Blackwood Channel is approached from seaward through Raine Island Entrance and is entered between shoals extending up to 2 miles NW of Three Reefs (11°46'S 143°54'E) and the shoal bank, 7 miles N of Three Reefs, which forms the S side of the inner part of Raine Island Entrance. From the 200 m depth contour to the inside of the barrier, the area N of Three Reefs features very irregular depths studded with below-water patches of coral and is marked by significant changes in the colour of the water and by tide-rips which, when seen together, give a clear indication of danger. Those patches with depths of less than 4 m over them are easily seen from aloft in good light conditions, and can be recognised by the pale green of the water over them, in contrast to the dark blue of deep water.

- 2 Three passages, situated 2, 4 and 6 miles N of Three Reefs, provide entry to Blackwood Channel through the waters described above. The middle one of these, which is 5 cables in width between shoal patches, is the one preferred.

11.46

- 1 **Cautions.** Remarks on the use of this and connecting channels are given at 11.25. Directions given should be used with caution.

That part of the channel between Middle Banks (11°46'S 143°39'E) and the E entrances to Pollard and North Channels, 10 miles WSW, is the most dangerous, particularly during the strength of the South-east Trade Winds when the waves, breaking ahead and away from the observer, render it very difficult to see discoloured water until close-to, even in favourable light. It is recommended that the precautions of safe speed and an anchor ready for letting go be taken from the time of first approach to the outer reefs.

- 2 If Raine Island Entrance has been entered late in the day, it is further recommended that a vessel should anchor in the vicinity of Middle Banks and proceed next morning when dangers in the channel W should be seen in more favourable light. Anchorage S of Middle Banks is likely to be the more suitable of the two listed at 11.49.

11.47

- 1 **Flow.** Tidal streams in Blackwood Channel are irregular but can be expected to set W or E at a rate of 1½ to 2 kn at springs. Irrespective of the tidal stream, an allowance for a N-going current of 1 kn may not be too much during the South-east Trade Winds.

11.48

- 1 **Directions.** From a position within Raine Island Entrance, SW of that island, the track leads WSW through the preferred middle entrance to Blackwood Channel.

The line of bearing (059°), astern, of the tower on Raine Island (11°36'S 144°02'E) (11.29) leads WSW, passing (positions from the N of Sir Charles Hardy Islands (11°54'S 143°28'E)):

- 2 NNW of Great Detached Reef (33½ miles ENE) (11.16), thence:

Between an 11.4 m patch and a 12.9 m patch (28¼ miles ENE); the fairway width of 5 cables occurs between these two patches.

Useful mark. The S of Sir Charles Hardy Islands (45 m (148 ft) in height) (7 cables SE) (11.29) bearing 239°, when raised, leads WSW on the same track.

- 3 When the above island is distant 17½ miles, the track is adjusted to lead more nearly WSW in mid-channel, passing:

SSE of Salamander Reef (14¾ miles ENE), distant 1 mile; thence:

SSE of a 3.3 m patch (13 miles ENE), the outer danger S of the main group of Middle Banks which consist of small, shifting sand cays on coral reefs. Passage N of Middle Banks is inadvisable. And:

- 4 NNW of a 10.7 m patch (12½ miles ENE), thence: SSE of a detached 4.9 m patch (11½ miles NE); a small but prominent cay ¼ miles farther NE is the W-most of the group forming Middle Banks. Thence:

- 5 SSE of a 7.2 m patch (7½ miles NE); a second patch, with a depth of 7.9 m over it, lies 8 cables WSW of the first; and:

NNW of a 7.1 m patch (6¼ miles ENE), the outer of a number of shoal patches extending SE; thence:

Charts Aus 835, Aus 375 (see 1.15)

- 6 SSE of a 3.3 m patch (5½ miles NE); tide-rips occur W of Inman Rock, 1½ miles WNW of the patch. And:

NNW of a 4.1 m patch (4¾ miles ENE).

With the NE edge of Cockburn Reef (5 miles NNE) then bearing 301°, the track leads W on 270° in mid-channel.

When the E edge of Sir Charles Hardy S Island (7 cables SE) bears 192°, the track leads WSW on 246° into Pollard Channel.

11.49

- 1 **Anchorage** may be obtained close W of the main group of Middle Banks (11°46'S 143°39'E) (11.48) as indicated on chart Aus 375 in depths of 13 to 18 m.

Anchorage may also be obtained in more open water S of the same banks in depths of 22 to 27 m. Ashmore Banks, consisting of a bare sand cay on a drying reef, 6½ miles S of Middle Banks, and a similar second cay and reef 2 miles farther W, are prominent within horizon range and may be useful marks for anchoring; a third sand cay lies on a drying reef 2½ miles farther SSE.

Chart Aus 835

Pollard Channel

11.50

- 1 **General information.** Pollard Channel is entered between the E extremity (11°50'S 143°30'E) of Cockburn Reef and the NE extremity, 2 miles SSW, of a ridge of foul ground which forms the NW edge of the bank on which Sir Charles Hardy Islands stand. The channel is the only recommended passage adjacent to these islands, and leads from Blackwood Channel to the charted two-way route off Cape Grenville (11°58'S 143°15'E).

- 2 **Caution.** Pollard Channel should only be navigated in favourable light conditions, when the shoals may be more easily seen. Remarks on the use of this and associated channels are given at 11.25.

11.51

- 1 **Directions.** From the W end of Blackwood Channel in the vicinity of a position 3½ miles NNE of the N of Sir Charles Hardy Islands (11°54'S 143°28'E), the SE edge of Cockburn Reef, which is steep-to outside the 5 m depth contour as shown on the chart, may be followed at a distance of 4 cables off until about 2 miles from the SW entrance to the channel. There are drying sand cays on this part of Cockburn Reef.

- 2 Alternatively, a track leads WSW on 246° in mid-channel between the SE edge of Cockburn Reef and the ridge of foul ground 1 mile SE.

The line of bearing 233° of Clerke Island (11°58'S 143°17'E) (11.94) then leads SW, passing (positions from Clerke Island):

NW of Queue Reef (5 miles ENE); lying at the SW entrance to the channel; a small drying sand cay lies at the W end of the reef, which is steep-to on that side; and:

- 3 SE of Erlangen Patch (4¾ miles NE), lying in mid-channel; Cockburn Patch lies 5 cables NW; thence:

SE of Paluma Patch (3 miles NNE) (11.109).

Course may then be directed as required to follow the two-way route SW-bound at 11.94, or NW-bound at 11.109.

11.52

- 1 **Anchorage.** Small vessels may obtain shelter from SE winds off a narrow neck of land on the NW side of the N of Sir Charles Hardy Islands. Both islands are fringed with reefs and anchorage off them is poor. The area between Sir Charles Hardy Islands, Wreck Reef 4 miles WSW, Queue Reef 2½ miles farther WNW, and Pollard Channel, should only be entered with extreme caution as these waters are generally shoal, murky and contain numerous coral heads. If anchorage is being sought in this general area, it is recommended that those listed at 11.98 or 11.113 be considered in preference to the one described here.

Charts Aus 835, Aus 375 (see 1.15)

North Channel

11.53

- 1 **General information.** North Channel is approached from E through Blackwood Channel and is entered S of Tynemouth Rock (11°47'S 143°32'E). From there the channel leads generally WNW towards the Inner Route through inadequately surveyed waters on the NE side of Cockburn Reef.

Caution. Remarks on the use of this and associated channels are given at 11.25.

11.54

- 1 **Directions.** From a position within Blackwood Channel, 7 miles E of Inman Rock (11°49'S 143°30'E), the track leads WNW on 284°, passing (positions from Inman Rock):

NNE of a rock (depth 2.3 m) (3¼ miles ENE) which, with Tynemouth Rock, forms the E entrance to the channel; thence:

The track then leads W, as guided by local knowledge and the chart, passing:

Clear of a shoal patch (depth unknown) (1¾ miles NNE), over which the water may be discoloured; a second similar shoal lies 8 cables farther S; thence:

- 2 N of Inman Rock (11.48), thence:

N of the NE point of Cockburn Reef (1 mile W); tide-rips also occur 1 mile N of this point; thence: S of a reef of below-water rocks (5½ miles WNW), the S-most of a chain of shoals and patches which form the NE side of the channel.

The track then leads generally WNW, as guided by local knowledge and the chart, passing:

- 3 SSW of a 2.3 m patch (12¼ miles WNW), lying in the fairway; thence:

NNE of the NW extremity (14 miles WNW) of Cockburn Reef; a 5.1 m patch, 3 cables N, and below-water rocks extending 6 cables NW are the outer dangers immediately off the end of the reef; thence:

- 4 SSW of a 1.4 m patch (14¾ miles WNW), sand and coral; thence:

SSW of a 2.3 m shoal (15½ miles WNW); Forward (Forwood) Reef which dries, 5 cables farther NNW, forms the NW entrance point to the channel; thence:

NNE of Fairway Reef (17 miles WNW), a wreck with a depth of 16.1 m over it, lies 4 cables ENE.

- 5 Course may then be directed to join the charted two-way route (11.109) or as otherwise required, passing S of Thrush Reef (11°43'S 143°12'E) (11.109).

An alternative track leaving North Channel passes NNE of Forward Reef, thence rounds NNE and N of Thrush Reef.

Charts Aus 835, Aus 839, Aus 375 (see 1.15)

Route north-west towards Cape York

11.55

- 1 **General information.** From Jukes Reef (11°36'S 143°51'E), W of Raine Island Entrance, a route leads 62 miles NW to the vicinity of Arnold Islets (11°00'S 142°59'E) from where the Inner Route may be joined. The route across the width of the barrier has been surveyed but is obstructed with numerous shoals and is unmarked. It should only be used by small vessels in clear visibility and as described at 11.25.

Denham Passage (11°20'S 143°19'E) lies separately in partially surveyed water SW of the route being described.

11.56

- 1 **Directions.** From the vicinity of Jukes Reef (11°36'S 143°51'E) (11.43) the track leads NW, as guided by local knowledge and the national large scale charts, initially to Turning Point Patches (11°21'S 143°28'E), thence to Arnold Islets (11°00'S 142°59'E) (11.137) from where course may be directed to join the charted two-way route (11.128) or as otherwise required. The track passes:

- 2 SW of Shadwell Reef (11°27'S 143°46'E), lying at the S end of a chain of drying reefs, with sand cays on them, extending 8½ miles farther NNE; thence:

Clear of numerous drying and below-water reefs as shown on the charts, and:

NE of Parsons Reef (11°12'S 143°12'E).

Raine Island to Yule Entrance

Chart Aus 375 (see 1.15)

Pandora Entrance

11.57

- 1 **General information.** Pandora Entrance, which is entered immediately NW of Moulter Cay (11°24'S 144°01'E) lying at the NW extremity of a long drying reef, has a width of 2¼ miles and a least charted depth of 20.1 m. The entrance provides limited access to the route

leading from Jukes Reef (11°36'S 143°51'E) NW towards Cape York, but the intervening area which extends at least 13 miles W and SW, although appearing to be moderately clear of reefs, has been only incompletely surveyed. The reefs which extend in a chain NNE from Shadwell Reef (11°27'S 143°46'E) lie near the E limit of surveyed waters. There are clear passages between these reefs.

- 2 The entrance and passage W from it should only be used as described at 11.25 and under favourable conditions: otherwise they should only be attempted by those unable to reach a more suitable channel.

11.58

- 1 **Directions.** When Moulter Cay (11°24'S 144°01'E), a sand cay with vegetation on it, has been identified, the track leads W and S rounding the cay at a distance of 5 cables. The line of bearing 050° of the same cay astern then leads SW for 2½ miles to a channel, 1¼ miles in width, through an inner line of drying reefs.

- 2 When clear of the inner reefs, and if proceeding to the Inner Route, course may then be directed NW with care towards the sand cay, sparsely covered with vegetation (8½ miles NNE of Shadwell Reef). The track then continues NW towards Mount Adolphus (10°38'S 142°39'E), as guided by local knowledge and the charts, leading through the general area of surveyed water described at 11.55.

Anchorage: see 11.21.

Olinda Entrance

11.59

- 1 **General information.** Olinda Entrance (11°12'S 144°04'E) is 3 cables in width and well-defined. From seaward it is the only opening in a long line of reefs which otherwise appears unbroken. The entrance, which has not been examined, is obstructed by a number of drying reefs close W and is not recommended.

Chart Aus 377 (see 1.15)

Yule Entrance

11.60

- 1 **General information.** The outer part of Yule Entrance (10°23'S 143°57'E) is approximately 1 mile in width, but it then narrows to 3 cables passing S of a small reef, on which the sea breaks, in mid-channel. The width of the passage increases W of the small reef, where there are depths of 9 to 30 m. The entrance is not recommended and should be avoided, except in a case of necessity.

Tidal streams. The W-going stream has been known to attain a rate of 5 kn through the entrance at springs.

Approaches to Murray Islands

General information

11.61

- 1 Murray Islands (9°56'S 144°02'E), a group of three islands of volcanic origin, lie about 5 miles within the outer edge of Great Barrier Reef and 32 miles from its N extremity. The population of 450 (2001) is subject to seasonal variation and is centred on a township situated on the NW side of Maer Island (9°55'S 144°03'E), where a mission and refuge station have for many years provided shelter and help to survivors from vessels wrecked in Coral Sea.

- 2 **Topography.** Maer Island (9°55'S 144°03'E), the largest of the group, is described at 11.29. Dowar and Waier (Wyer) Islets, both rocky, lie on a common reef 1 mile farther SSW. The former, which rises to a conical hill, is steep and cliff-faced on the NE side; the NW part is formed of a low and heavily wooded sand spit. Waier Islet is bare, with steep and rugged cliffs all round; a coral spit extends SE from it.

Tidal streams are indicated in places on the chart.

Fly Entrance

11.62

- 1 **General information.** Fly Entrance (10°01'S 144°06'E) is very narrow and appears worse from seaward than has been found to be the case on entering. Although it has been used, it is not recommended and should be avoided.

Cumberland Entrance

11.63

- 1 This entrance (unnamed on the chart) (09°53'S 144°11'E) is 5 cables in width but dangerous, and should not be attempted except in a case of necessity. There are drying sand cays on the reefs in the vicinity of the entrance, with dangerous underwater rocks in the fairway.

Flinders Entrance

11.64

- 1 **General information.** The NW entrance point to Flinders Entrance is Don Cay (9°36'S 144°14'E), which lies at the E extremity of a detached drying reef. The N extremity of a below-water reef, a submerged part of the outer edge of the barrier, 4¾ miles SSE of Don Cay forms the SE entrance point. The entrance, which is useable in most states of sea and swell, is the best approach to Murray Islands from seaward, and access to Torres Strait may be gained through Hibernia Passage, Cumberland Passage and Great North East Channel; see 11.66.

- 2 **Caution.** Notwithstanding the above, the area has been subject to only incomplete survey, as may be seen from the chart, and must be navigated with caution. Uncharted dangers may exist.

11.65

- 1 **Directions.** Care is required for entry, as the landmarks of Maer Island (9°55'S 144°03'E) (11.29) and Darnley Island (9°35'S 143°46'E) (13.25), are unlikely to be raised until after Don Cay is passed. Breakers will normally be visible, where indicated, over the weather sides of reefs when a SE swell is running, but not otherwise. The reefs themselves should be visible under favourable conditions of light and weather.

- 2 From seaward the track leads W into the entrance, passing (positions from Don Cay (9°36'S 144°14'E)):

S of a shoal with depths of 9-1 m over it (5½ miles NE), forming the outer end of a ridge of broken ground extending from Don Cay and marked by discoloured water; thence:

- 3 S of a reef (reported 1973) (2½ miles NE), marked by breakers, thence:

S of a dangerous rock (4 miles SSE) and:

N of the reef, with a dangerous rock at its N end, forming the SE entrance point (4¾ miles SSE).

The reef is marked by breakers and usually also by tide-rips; the stream sets E and W across it.

When clear to do so the track then leads S over an irregular bottom, passing:

- 4 SE of a drying reef (2 miles SSW), marked by breakers, thence:
W of the submerged reef extending 4½ miles S from the SE entrance point (4¼ miles SE), thence:
E of Shoal Patches (8½ miles SSW).

The line of bearing 223° of the summit of Maer Island (21 miles SSW) (11.29) then leads directly to the island passing SE of a dangerous rock (14½ miles SSW).

Useful mark:

Radio mast (9°35'S 144°12'E).

Charts Aus 839, Aus 377 (see 1.15)

Approach from west

11.66

- 1 **General information.** The approach to Murray Islands from W may be joined from Great North East Channel (13.19), and leads through Cumberland Passage and Hibernia Passage. The route lies within a narrow area which has been surveyed (1989–1996), but it is surrounded by unsurveyed waters and there are few landmarks, although drying cays of white sand on a number of reefs adjacent to the passages are clearly visible at LW from up to 5 miles in good weather; mariners should exercise due caution. See also 11.25 for general considerations.

11.67

- 1 **Directions.** From a position in Great North East Channel about 5 miles SW of Coconut Island water tower (10°03'S 143°04'E) (13.25), the track leads E, passing (positions from Coconut Island water tower):
N of Richardson Reef (4½ miles SSW), known locally as Gagainab; a cay 1.6 m in height lies on the NNW edge of the reef. Thence:
2 N of Caldbeck Reef (6½ miles SE), known locally as Beka; a light-beacon (rectangular topmark on white pile, 6 m in height) stands on the E edge of the reef, and a cay 0.8 m in height lies on the NW edge; and:
S of Newman Reef (6 miles E), known locally as Timan; a cay 0.9 m in height lies on its NW edge, marked by a beacon (W cardinal). Thence:
3 N of Woiz Reef (12 miles SE), on which lies a cay 1.6 m in height; thence:
N of Zuizin Island (15 miles ESE) (11.71), wooded and surrounded by a drying reef; Kodnasem Reef lies 2½ miles SSE of Zuizin Island. Thence:
S of Gurigur Reef (21 miles E) (11.70), at the entrance to Cumberland Passage.
4 If using the E two-way route (13.31) of Great North East Channel, about 4½ miles ESE of Coconut Island water tower, after rounding Newman Reef, the track leads E, and continues as the directions given above.

Chart Aus 376 (see 1.15)

11.68

- 1 **Cumberland Passage** is entered between Gurigur Reef and Derder Reef, 2¼ miles SE, and leads E for 16 miles to Hibernia Passage (11.69). From a position S of Gurigur Reef the track leads E, passing (positions from Gurigur Reef):
N of a 5 m patch (1½ miles SSE), thence:
Between two unnamed drying reefs (¾ mile E and 1¾ miles SE), thence:
2 S of Nepkem Reef (1¾ miles E), and:
N of an 11.5 m patch (3½ miles ESE); a below-water reef lies 1 mile SW of the patch. Thence:
N of a 6.6 m patch (6 miles ESE), thence:
Between the drying reefs to N and S of the passage to a position S of a dangerous rock (12 miles E),

with another dangerous rock 8 cables E of it. Thence:

S of an unnamed reef (10°00'S 143°41'E), where the track enters Hibernia Passage.

11.69

- 1 **Hibernia Passage.** From the junction with Cumberland Passage, Hibernia Passage leads generally NE for about 20 miles to a position about 6 miles NW of Maer Island, from where the approach described at 11.74 may be followed.

From a position S of the unnamed reef (10°00'S 143°41'E) the track leads NE, passing (positions from the summit of Maer Island (9°55'S 144°03'E) (11.29)):

- 2 NW of a 13.5 m shoal (13 miles WSW), thence:
NW of Gebar Reef (10 miles W); thence:
NW of a dangerous rock (6½ miles WNW); thence:
SW of a 10 m patch (6½ miles NW) and clear of the 10.7 m patch 6 cables S.

Directions given at 11.74 should then be followed.

Anchorage

11.70

- 1 **Gurigur Reef.** Anchorage has been obtained (1993) NW of Gurigur Reef (10°02'S 143°26'E), a steep-to coral reef, drying in parts, with a prominent sand cay drying 2.5 m near its NW extremity. The anchorage, in a depth of 40 m with good holding ground, sand, mud and clay, is sheltered from winds between E and SSE, but in heavy weather from SE is made uncomfortable by refracted swell.

11.71

- 1 **Zuizin Island** (10°06'S 143°19'E) is wooded except at its SW end where low scrub gives way to a long, drying sandspit which extends across the surrounding reef. The island is uninhabited (1993) but is occasionally visited by fishermen.

Anchorage, protected from winds between E and S has been obtained (1993) close N of the island in a depth of 30 m, with good holding ground in black mud. The anchorage is subject to refracted swell from both sides of the reef.

Chart Aus 840

Approaches from north-west

11.72

- 1 **General information.** The approach to Murray Islands from NW may be joined either from the vicinity of Underdown Islet (9°29'S 143°52'E) or from Darnley Island 7½ miles SW, and leads through waters that are either unsurveyed or inadequately so; see notes on the chart for the implications of this, and also for the special symbology used. The E limit of the route is formed by a doubtful and irregular chain of reefs extending from 5 to 23 miles N of Murray Islands. The tracks described below should be followed with great caution and only in clear weather, choosing if possible the time of LW or half tide for approaching Sarek Reefs (9°50'S 144°00'E). Of the two tracks described, that from Underdown Islet leads through more open water and was used in 1973 by MV *Cape Moreton* on passage from Darnley Island to Murray Islands.

11.73

- 1 **Directions from Underdown Islet.** Underdown Islet (9°29'S 143°52'E) is covered with sparse vegetation and lies on the W side of Merad Reef, which dries; waters in the vicinity of the reef, particularly those extending up to 2 miles SW, are foul and mostly unsurveyed. From a position in clear water N of Underdown Islet the track leads E then S passing (positions from the summit of Darnley Island (9°35'S 143°46'E)):

- 2 SW of a 5.7 m patch (13 miles NE), thence:
Clear of a rock patch (depth 5.5 m) (10½ miles NE);
another patch, with depths of 12.8 m (rock) over it,
lies 1½ miles farther ESE; thence:
E of Emar Reef (7½ miles ENE) at the E edge of an
area of possible shoaling extending 6 miles SSE
from Underdown Islet, and:
- 3 Clear of a 9.5 m patch (reported 1973) (10 miles
ENE), thence:
W of an area of possible shoaling (13 miles ESE),
thence:
E of Kibi Meri (Little Mary) Reef (12½ miles SE);
Big Mary Reef lies 1 mile NNW. The names of
these two reefs are transposed in local usage. And:
- 4 Clear of a 5.5 m patch (16 miles SE), thence:
Clear of a 14.5 m patch (reported 1998) (17½ miles
SE), and:
W of Sarek Reefs (18½ miles SE), consisting of a
curved drying reef enclosing an area of possible
shoaling.

11.74

- 1 The line of bearing 139° of the summit of Maer Island
(9°55'S 144°03'E) (11.29) then leads SE, passing (positions
from the summit of Maer Island):
SW of the edge of Sarek Reefs (6½ miles NNW),
distant about 5 cables; thence:
NE of a shoal with depths of less than 5 m over it
(5 miles NW).
- 2 **Leading marks:**
Front beacon (white triangle) (6 cables N), standing
on the NW foreshore of Maer Island.
Rear beacon (white triangle, point down), standing SE
of the front beacon and on the ridge extending NE
from the summit of the island.
- 3 Having passed Sarek Reefs, and with Maer Island distant
about 5½ miles, the track must then be adjusted to gain the
alignment (152°) of the above beacons whilst Maer Island
is still distant more than 1½ mile. The same alignment then
leads SE, passing:
NE of the extremity of Naire Reef (2½ miles NW),
thence:
- 4 NE of a large drying reef (1 mile NNW), lying at the
NE end of Mebgor Reef; thence:
SW of a dangerous rock (1¼ miles N).

Useful mark:

Church (about 1 mile NE), standing on the NW
foreshore of Maer Island; it is white painted and
the most prominent building on the island.

11.75

- 1 **Directions from Darnley Island.** From a position in
safe water about 1 mile SW of Darnley Island (9°35'S
143°46'E) (13.25) the track leads generally E, as guided by
local knowledge, through a narrow passage between
Darnley Island and Seo Reef, 1 mile S. The track passes
(positions from the summit of Darnley Island):
Clear of a dangerous rock (reported 1997) and a
beacon (white metal spar) which marks the N side
of a small drying reef (1½ miles SE), and:
 - 2 N of the NE end of Seo Reef (2 miles SE), marked
by a beacon (black and white metal spar).
- The track then leads generally SE between the
extremities of Gednor and Seo Reefs, and:
SW of a rock (awash) (2½ miles SE) which was
reported in 1998 to lie 3 cables W of the SW
extremity of an area of possible shoaling. A
channel leading NNE between this shoal area and

Gednor Reef is reported to exist, but should not be
attempted without the utmost caution. Thence:

- 3 NE of a 2.7 m patch (6½ miles SE), thence:
NE of Canoe Cay (8 miles SSE), thence:
NE of Kibi Meri Reef (12½ miles SE).

Directions given at 11.73 should then be followed.

Murray Island anchorages**11.76**

- 1 Anchorage may be obtained 1½ miles N of Maer Island,
as indicated on the chart, in a depth of 46 m, sand and
shell.
In 1987, HMAS *Gladstone* anchored in a depth of 38 m
with the church (11.74) on Maer Island bearing 144°
distant 4 cables. The anchorage was sheltered from winds
between E and S and the tidal stream did not exceed 2 kn.
- 2 In 1993 HMAS *Shepparton* anchored 1 mile offshore
with the same church bearing 159°. Tidal streams are
strong but the holding ground is good in black coral and
coarse sand. The anchor cable may foul on coral heads on
the bottom. Large eddies and confused seas, which may
occur at the turn of the tide, can make the berth
uncomfortable.

Murray Islands facilities**11.77**

- 1 **Landing ramp**, situated at the SW point of Maer Island,
is formed of metal track section laid over hard-packed sand
and is suitable for use by landing craft at all states of the
tide. The outer end of the metal section is above the level
of LW and may limit vehicle discharge at this state of tide.
Access is through a deep natural channel bounded on one
side by the reef which fringes most of the island.
Other facilities. Medical aid post; airstrip; public
telephones.
Supplies: fresh water, provisions, diesel and petrol; all
in limited quantities.

Passages each side of East Cay

Chart Aus 377

Between Don Cay and East Cay**11.78**

- 1 East Cay (9°24'S 144°13'E) is a low sand cay lying near
the NW end of a group of drying and below-water reefs as
shown on the chart. A light (red GRP tower, on metal
framework tower, on four-piled structure with helipad,
31 m in height) is displayed from the NE side of the cay.
A 7.0 m patch, 1½ miles E of the SE end of the group, and
an 8.3 m patch, 3½ miles farther N, are the outer known
dangers E of the group.
- 2 A passage, 6 miles in width, lies between East Cay and
its off-lying dangers on the N side, and Don Cay (11.64)
and other banks and dangers forming the N side of Flinders
Entrance on the S side. The passage is subject to the
general considerations described at 11.25. A 3.7 m shoal
(position approximate) lies in the fairway 5½ miles S of
East Cay, as shown on the chart.

Between East Cay and Anchor Cay**11.79**

- 1 Anchor Cay (9°22'S 144°07'E), a bare sand cay, lies at
the NW end of a drying reef which has not been closely
examined but appears to be steep-to on all sides. The reef
forms the N termination of Great Barrier Reef. A channel
3¼ miles wide, with a least charted depth of 8.7 m, lies
between the reef and foul ground lying W of East Cay.

INNER ROUTE FROM CAPE WEYMOUTH TO CAPE YORK

GENERAL INFORMATION

Chart Aus 375

Scope of the section

11.80

- 1 The Inner Route from Cape Weymouth to Cape York, together with a passage and several anchorages are described in this section.

Route

11.81

- 1 From Cape Weymouth (12°37'S 143°26'E) a two-way route leads generally NNW for 142 miles, as shown on the chart, to the NW end of Adolphus Channel, 4½ miles N of Cape York (10°41'S 142°32'E). The purpose and use of the two-way route is described at 9.2 and in a note on the chart.

Depths

11.82

- 1 The least charted depth within the two-way route between the two capes is 11.2 m as shown in position 10°45'S 142°41'E close to the NE side of the charted route; a depth of 13.6 m lies 5 cables SSW and is the S extremity of a bank which is subject to sandwaves. These depths can however be avoided, whilst remaining within the two-way route, to allow passage in charted depths of not less than 15 m throughout.

Pilotage

11.83

- 1 See 11.3.

Sea state

11.84

- 1 Low-powered vessels navigating the Inner Route may make better progress at the times of LW when the reefs are uncovered and the sea smoother.

CAPE WEYMOUTH TO CAPE GRENVILLE

General information

Chart Aus 835

Route

11.85

- 1 From Cape Weymouth (12°37'S 143°26'E) the charted two-way route leads generally NNW for 40 miles to Cape Grenville (11°58'S 143°15'E).

Topography

11.86

- 1 Between Cape Weymouth and Fair Cape, 15½ miles NW, the coast recedes gently to form Weymouth Bay. From Cape Weymouth to a point 2¼ miles SSE of the entrance to Pascoe River (12°30'S 143°16'E) the shore of Weymouth Bay is formed by a series of smaller, shallow bays fringed with drying reefs; the coast behind being generally low and backed by stony hills. From there N to Fair Cape, the coast is formed by rocky headlands and sandy beaches which rise abruptly to hills covered with stones and sparse vegetation.
- 2 Temple Bay lies between Fair Cape (12°24'S 143°16'E) and the entrance to Olive River, 18 miles NW. The high ground backing the SE part of the bay is completely divided by a valley, visible only from NE, which extends inland from First Stony Point (12°23'S 143°15'E) and rises

to hills more than 275 m in height on each side. From First Stony Point to Second Stony Point, 2 miles WNW, and thence to Mosquito Point, 2½ miles farther WNW, there are rocky points with mangroves between, and drying flats of coral and mud extending up to 5 cables offshore. Between Mosquito Point and the head of Temple Bay, 6 miles W, the coast is low, covered with mangroves extending 3½ miles inland and fronted with mud flats. Hunter Inlet, Kangaroo River, Glennie Inlet and some smaller creeks enter the sea on this stretch of the coast.

- 3 From the head of Temple Bay a sandy beach extends N to Bolt Head (12°15'S 143°06'E), an inconspicuous cliffy head 46 m in height. From there to Olive River, 5 miles farther N, the coast is formed by rocky points and sandy beaches. The entrance to the river is obstructed by a bar but there are depths of about 5 m within; the river has not been examined. Inland of the S part of Temple Bay, Great Dividing Range recedes inland and the land stretching N towards Cape Grenville is low; the S part being sparsely covered by scrub, and the N part by sand ridges and numerous small lagoons.

- 4 For a distance of 8 miles NNE from the entrance to Olive River the coast is formed by a sandy beach behind which the land consists of sand ridges, 35 to 78 m in height, with numerous small lagoons between. From the N end of this stretch of coast the sand ridges recede inland and a low sandy isthmus, sparsely covered with vegetation, backs the sandy shore to Cape Grenville (11°58'S 143°15'E). Indian Bay, which lies on the S side of this isthmus, is obstructed in its E part by Pickersgill Islet (11°59'S 143°13'E) and a number of small drying reefs lying within the 5 m depth contour.

- 5 Cape Grenville (11.94) and Home Islands (11.94), a group of seven islands lying within 2½ miles E of the cape, are described in the course of the relevant directions.

Local knowledge

11.87

- 1 Local knowledge is required for Paluma Passage (11°59'S 143°16'E) (11.96).

Flow

11.88

- 1 During the South-east Trade Winds the surface drift in the vicinity of Piper Islands (12°15'S 143°14'E) is always NW when the wind is strong; the rate generally increasing on the rise of the tide and decreasing on the fall. The greatest rates of flow, 1½ kn at springs and ¾ kn at neaps, occur near the time of HW; least rates occur near LW. When the wind is light, the NW flow may sometimes cease altogether on the falling tide, or the set may even be SW.
- 2 Similar conditions are experienced off Home Islands (11°59'S 143°16'E), where tidal streams set NW on the rising tide and SE on the falling tide at spring rates of about ½ kn. For vessels passing between Home Islands and Haggerstone Island, 3 miles SSE, these streams set across the recommended track. Strong SE winds create a NW-going current of ½ to 1¼ kn and a resulting flow which is always NW and stronger on the rising tide. When the wind is light the set may be SE; a rate of 1 kn has been reported.
- 3 **Caution.** When rounding Home Islands during strong SE winds, especially at night, proper allowance for the likely set NW across the recommended track must be made.

11.89

1 During the North-west monsoon the current in the vicinity of Piper Islands is mostly SE, or with the varying direction of the wind. At springs the stream on the rising tide usually overcomes the wind current, but at neaps the latter prevails to give a maximum SE flow of $\frac{1}{2}$ kn at about the time of LW and a minimum rate at about the time of HW.

2 During periods of light winds and calms some variation in the strength and direction of flow may occur at differing depths within the water column. The tidal stream, which predominates beneath the surface layer, sets NW for approximately 2 hours each side of the time of HW, and SE for approximately the same period each side of the time of LW. Within the surface layer the flow may be in opposition, or variable.

Landmarks**11.90**

1 Kennedy Hill ($12^{\circ}28'S$ $143^{\circ}15'E$), its two peaks prominent and distinctly visible at night.
Forbes Islands ($12^{\circ}17'S$ $143^{\circ}25'E$), three rocky islands partially covered with scrub, lying together on a drying reef. The islands are prominent from S appearing as a series of hummocks.

Other aid to navigation**11.91****Racon:**

Piper Reef Light ($12^{\circ}15'S$ $143^{\circ}15'E$) (11.92).

For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 10.116)

Cape Weymouth to Piper Reef**11.92**

1 From a position ENE of Cape Weymouth ($12^{\circ}37'S$ $143^{\circ}26'E$), the track leads NNW within the two-way route, passing (positions from Fair Cape ($12^{\circ}24'S$ $143^{\circ}16'E$)):

ENE of Rocky Islet (14 miles SE), lying at the outer end of foul ground extending 2 cables from the point N of Aylen Hills, $7\frac{1}{2}$ cables farther S. The hills appear as an island when seen from S or N. Thence:

2 WSW of Eel Reef ($5\frac{1}{2}$ miles E), which dries, extends $11\frac{1}{2}$ miles SE and is steep-to on its SW side; Eel Reef Light (red GRP hut on metal framework tower, 8 m in height) stands near the NW end of the reef. A stranded wreck lies close S of the light. The E and S sides of the reef are described at 10.52. And:

3 ENE of Middle Reef ($9\frac{1}{2}$ miles SE), a narrow, drying coral ridge, the N part of which is detached; Middle Reef Light (white GRP hut on white concrete column, 8 m in height) stands near the S end of the reef. Blue Bell Rocks, $1\frac{1}{4}$ miles W of the reef, consist of two pinnacles; the N rock dries, the S has a depth of 2.2 m over it. Pigeon Island, $4\frac{3}{4}$ miles farther W and lying 5 cables offshore, is difficult to identify owing to the high ground behind. Thence:

4 ENE of Kemp Rocks ($5\frac{1}{2}$ miles ESE), two pinnacles covered by the red sector (009° – 037°) of Eel Reef Light and the red sector (152° – 160°) of Middle Reef Light. Thence:

ENE of Kangaroo Shoals (1 mile E), extending to the outer edge of the steep-to coastal bank and

terminating in a spit 2 miles NNE of Fair Cape. The cape is a rocky point, rising abruptly to a height of 148 m thence to higher ground inland; a conspicuous patch of sand (1 mile NW) is visible from a distance of 6 to 8 miles. Thence:

5 WSW of South Pint Patch (6 miles NE) and of North Pint Patch, 1 mile farther NNW, the outer dangers off the SW edge of Gallon Reef, 1 mile farther NE. Rocks (1 m in height) lie on the edge of Gallon Reef, 7 cables NE of North Pint Patch. An apparently deep channel to Quoin Island ($12\frac{1}{2}$ miles E) (11.93), leading between Gallon Reef and Eel Reef $1\frac{3}{4}$ miles SW, has not been closely examined and should only be entered in case of necessity. A channel off the NE side of Gallon Reef, leading to Forbes Islands (10 miles NE) (11.90), requires similar care. Thence:

6 WSW of Hazel Reef (8 miles NNE), steep-to; a beacon (W cardinal, 7 m in height) stands on the W edge of the S end of the reef; a drying sand cay lies at the NW end and a drying rock lies on the N side of the reef. Thence:

WSW of Inset Reef (9 miles N), steep-to and marked on its W side by a light (white GRP hut on concrete column, 7 m in height); a group of drying rocks and a drying sand cay lie on the SW and NW ends, respectively, of the reef. And:

7 ENE of Piper Reef (9 miles NNW), marked on its E edge by a light (white lantern on stainless steel framework tower on concrete piles, 7 m in height). Fisher Island and Farmer Island, both of Piper Islands, lie on the SW side and W extremity, respectively, of the reef. Baird Island and Beesley Islet, also part of the same group, lie on the adjacent reef 6 cables farther W. The three islands are wooded; Beesley Islet is a sand cay covered with vegetation. There are above-water rocks on both reefs, and a second unnamed sand cay on the W reef.



Piper Reef Light (11.92)

(Original dated 1999)

11.93**Useful mark:**

Quoin Island ($12^{\circ}24'S$ $143^{\circ}29'E$).

Piper Reef to Cape Grenville**11.94**

1 The track then leads N within the two-way route, passing (positions from Young Reef ($12^{\circ}08'S$ $143^{\circ}13'E$)):

W of Kay Islet (6 miles SSE), a sand cay covered with vegetation lying at the NW end of Kay Reef, which is steep-to. Two small islets (0.3 m in height), each covered with vegetation, lie on the E edge of the reef. Thence:

Cape Grenville



Hicks I.

Clerke I.

Home Islands from E (11.94)

(Original dated 1999)

- 2 W of Laurel Reef (3 miles E), steep-to; there are drying rocks on the SW side and a drying sand cay at the NW end of the reef. Nomad Reef, 2 miles farther ENE, dries but has only been surveyed on its SW side, which is steep-to. Thence:

E of Young Reef, drying and steep-to; a beacon (E cardinal, 7 m in height) stands on a sand cay on the NW end of the reef. Thence:

- 3 W of Moody Reef (2½ miles ENE) which is steep-to; Moody Reef Light (white GRP hut on white concrete column, 7 m in height) stands on a drying sand cay at the NW end of the reef. Bannan Reef, 2¼ miles ENE of the light, is of drying coral.

The track then leads NNE to a position about 4 miles E of Cape Grenville, passing:

- 4 WNW of Haggerstone Island (7 miles NE). The island, which has its summit covered with scrub, is bare on its SE side, wooded on the NW, and stands at the S end of a drying reef. Two drying sand cays lie at the N end of the reef. The N arm of Mason Reef, 2 miles ESE of the island, dries. Numerous coral heads with a small drying patch lie close off the W edge of the N arm. Thence:

- 5 ESE of South Reef (7 miles N), the outer danger SW of Home Islands. Orton Island, 5 cables NE of the reef, is 44 m in height; Gore Island, 2½ cables farther NE, is formed by two summits, 43 and 44 m in height, separated by a low neck of land and fringed by a drying reef. These two islands, when first seen from N, appear as three hummocks. A rock close off the SE extremity of Gore Island is 4.6 m in height. These dangers, and Hicks Island (below), are covered by a green sector (034°–119°) of Clerke Island Light; see caution at 11.88 on allowance for a set across track. Thence:

- 6 SE of Hicks Island (8½ miles NNE), wooded near the middle of the W side. The NW part of the island is separated from the main part by a belt of low land fronted with mangroves. Cape Grenville, (8 miles N) and lying close W of Home Islands, is a peninsula connected to the mainland by a low

- 7 sandy isthmus; Highgate Hill, rising near the centre of the cape, is the highest part. Thence:

- SE of Clerke Island (10 miles NNE), wooded and the outer danger E of Cape Grenville; Clerke Island Light (white hut on red metal framework tower, 22 m in height) stands on rocks close SE of the island.

11.95

- 1 **Useful marks:**

Red Cliffs (12°13'S 143°05'E); a conspicuous clump of trees stands on a hill, 61 m in height, 1½ miles farther W.

Olive River entrance (12°10'S 143°06'E); the S entrance point is formed by a well-defined bluff, 51 m in height.

(Directions continue at 11.109)

Paluma Passage

General information

11.96

- 1 Paluma Passage is the principal one of several passages that may be found between Home Islands (11°59'S 143°16'E). The saving in distance over the two-way route passing outside Clerke Island is less than 3 miles and very strong tidal streams may be experienced. Dangers in the passage are largely unmarked but may generally be seen under good light conditions.

Local knowledge is required.

Directions

11.97

- 1 From a position in the two-way route about 3 miles SSW of Clerke Island Light (11°59'S 143°17'E) (11.94), the line of bearing 333° of the E extremity of Cape Grenville (11.94) leads NNW, passing (positions from Clerke Island Light):

WSW of the outer of Twin Reefs (2 miles SW), distant 2½ cables. The reefs, which both dry, lie 2 and 4 cables SW of Hicks Island (11.94); thence:

ENE of Gore Island (2½ miles WSW) (11.94); and:

- 2 WSW of Middle Reef (2¼ miles WSW), a small coral patch marked by a beacon at its NW end; thence:

Clear of a dangerous wreck (position approximate) (2½ miles W); thence:

WSW of Perry Island (2 miles W), 15 m in height and wooded; rocks 1-2 m in height lie on the end of the drying reef extending 4 cables SSE from the island. Hervey Island, 4½ cables farther E, is also wooded. Thence:

- 3 Close ENE of Cape Grenville (2¾ miles W) and: WSW of Passage Reef (2½ miles WNW). There is a least depth of 12.8 m in the fairway over a ridge between the reef and Cape Grenville.

The alignment (160°), astern, of the E extremity of Cape Grenville with the NE edge of Gore Island then leads NNW, passing:

WSW of Outer Reef (3 miles WNW), which dries in patches; thence:

- 4 ENE of Bremner Shoal (4 miles WNW), nearly awash in its central part. Passage inside the shoal should not be attempted except in small vessels and with local knowledge. Thence:

ENE of Sunday Island (5¼ miles WNW).

Course may then be directed as required to join the section of the two-way route described at 11.109.

Anchorages

General information

11.98

- 1 Anchorages between Cape Weymouth and Cape Grenville are numerous. The NW side of nearly every reef affords shelter but these unlisted anchorages should not be taken up too close, as the tidal stream sweeps round the edges of the reefs with greater strength than is the case at a distance of 5 cables off.

Portland Road

11.99

- 1 During the South-east Trade Winds anchorage for small vessels may be obtained in a depth of 8 m, mud, in Portland Road (12°35'S 143°24'E), 6 cables W of Rocky Islet (11.92), as shown on the chart. The dangerous wreck of a fishing vessel lies between the berth and the islet. Tide-rips occur N of Rocky Islet, as shown on the chart. Tidal streams in the vicinity of the berth are however less than 1 kn, setting SW on the rising tide and very weakly NE on the falling tide.

During the NW monsoon squalls raise a dangerous sea in the road with startling rapidity.

Kay Reef

11.100

- 1 Anchorage may be obtained on the N side of Kay Islet (12°13'S 143°16'E) (11.94) in depths of 20 to 26 m.

Piper Islands

11.101

- 1 Anchorage may be obtained between the two reefs of Piper Islands group (12°15'S 143°14'E) (11.92); the best anchorage during the South-east Trade Winds is 4 cables N of Farmer Island, in soft mud and dead coral. There is also an anchorage 4 cables WSW of Farmer Island. Both anchorages are shown on the chart.

Temple Bay

11.102

- 1 Sheltered anchorage may be obtained under the lee of Pickard Reef (12°14'S 143°08'E) lying off the W shore of Temple Bay (11.86). A sand cay (drying 3 m) lies on the

W side of the reef; a drying sand cay also lies on the outer of Tyrell (Tyrrel) Reefs, 2¼ miles NNW. Bolt Head (11.86) lies 2¼ miles WSW of Pickard Reef.

Attention is drawn to the state of the survey of the area, as indicated on the chart.

Home Islands

11.103

- 1 Anchorage may be obtained 2½ cables N of Perry Island (11°58'S 143°15'E) (11.97) and E of Passage Reef in a depth of 18 m. Small vessels may be anchored close off the reef on which the island stands.

CAPE GRENVILLE TO CAIRNCROSS ISLETS

General information

Chart Aus 835

Route

11.104

- 1 From Cape Grenville (11°58'S 143°15'E) the two-way route leads NW for 30 miles to Hannibal Islands (11°36'S 142°56'E). The route then splits to pass either side of Halfway Islet (11°23'S 142°58'E), and Cairncross Islets (11°15'S 142°55'E), with deeper water being found within the E route.

Topography

11.105

- 1 Margaret Bay (11.114) lies immediately WNW of Cape Grenville. The land behind the bay is low, sparsely covered with scrub and generally level, but with numerous sand hills. Similar land continues W to provide the background to Shelburne Bay, which lies between Round Point (11°54'S 143°06'E) and Red Cliffs, 15 miles WNW. The shore of Shelburne Bay consists mainly of mangroves, with sandy beaches between, and is generally low except at White Point (11°56'S 142°59'E) (11.107) and at Double Point, 6 miles NW, which is 72 m in height. The whole shoreline of Shelburne Bay is fronted by reefs and shoal water.
- 2 From Red Cliffs (11°49'S 142°51'E), which are 15 m in height and easily identified, to an unnamed cliffy point 14 miles N, the coast is formed by sandy beaches separated by rocky points and backed by undulating sand hills. These are generally low and covered with sparse scrub, but some are prominent. Messum Hill, 5½ miles N of Red Cliffs, is the only one of these features named. The land within the coast is barren, with numerous small lagoons in the S part.
- 3 Between the unnamed cliffy point (11°35'S 142°51'E) and the vicinity of Orford Ness, 17½ miles N, sand hills rise steeply from the coast to the higher and generally barren ground of part of Great Dividing Range which approaches this stretch of coast. The range recedes inland from Puddingpan Hill (11.112), 2¼ miles SSW of Orford Ness. The coast itself is mostly fringed by sandy beaches or drying reefs, as shown on the chart.

Flow

11.106

- 1 Flow off Home Islands, in the vicinity of Cape Grenville (11°58'S 143°15'E), is described at 11.88.

Tidal streams. In the vicinity of Hannibal Islands (11°36'S 142°56'E) the N-going tidal stream commences approximately 3 or 4 hours before the time of HW Townsville and the S-going stream commences approximately 3 hours after HW Townsville. During the strength of the South-east Trade Winds or of the NW

monsoon, the effect of the tidal stream is generally to increase or decrease the prevailing current.

- 2 Between Hannibal Islands and Cairncross Islets, 21 miles farther N, tidal streams generally set parallel with the coast, following the general pattern of N and S-going on the rise and fall of the tide, respectively.

Between Cairncross Islets and Bushy Islet, 2½ miles W, the rate of the stream is about 1½ kn, as shown on the chart.

Landmarks

11.107

- 1 White Point (11°56'S 142°59'E), covered by white sand and prominent; sand hills behind the point rise to a height of 107 m; a second remarkable patch of sand stands 5 miles ESE of the point.
Middle Peak (11°56'S 142°52'E), one of the most distinctive marks on the coast between Cape Grenville (11°58'S 143°15'E) and Hunter Point, 37 miles NW.

Directions

(continued from 11.95)

Cape Grenville to Hannibal Islands

11.108

- 1 **Caution.** Waters lying W of a line between Round Point (11°54'S 143°06'E) and Hannibal Islands, 20 miles NNW, are largely unsurveyed as shown on the chart, and should be avoided.

11.109

- 1 From a position about 4 miles E of Cape Grenville (11°58'S 143°15'E), the track leads NW within the two-way route, passing (positions from Bird Islets N reef (11°46'S 143°05'E)):
 - NE of Nob Island (14¾ miles SE), the N-most of Home Islands (11.94). It stands on the N end of a drying reef; two above-water rocks lie on the E edge of the same reef. And:
- 2 SW of Paluma Patch (Shoal) (15 miles SE), the outer danger off the SW entrance to Pollard Channel (11.50) and off the SW corner of Cockburn Reef; thence:
 - SW of Cockburn Reef (10 miles E) which dries in patches, the SW edge extending 8½ miles SSE. The three Cockburn Islands, consisting of Manley Islet, Bootie Islet and Pig Island, all wooded, with Buchan Rock to S of them, lie near the middle of the W part of the reef. Thence:
- 3 NE of Sunday Island (11½ miles SE), and:
 - SW of Magra Islet (12 miles ESE), a bush-covered sand cay lying at the NW end of the outer detached drying reef off the SW side of Cockburn Reef. The channel separating the two reefs is obstructed at each end by smaller drying reefs. Thence:
- 4 SW of Chimmo Shoal (9 miles ESE); Guthray Reef, lying 1 mile farther E with a deep channel between, has drying boulders on its N end. Thence:
 - NE of Rodney Island (7 miles S) which lies 7 cables ENE of Round Point and is the largest of three islets fronting the coast between there and Thorpe Point, 3 miles farther ESE. Conical Hill, rising 2 miles S of the island, is dark in colour and partially covered by trees. Thence:

5

SW of Fairway Reef (8 miles E) which dries, lying off the NW entrance to North Channel (11.53); thence:

SW of Thrush Reef (6¼ miles ENE); Saunders Islet, a bush-covered sand cay, lies on the NW end of the reef. And:

6

NE of Bird Islets, lying on two drying reefs which are always visible by day. Two wooded islets lie on the SE end of the S reef, which has a drying sand cay on its NW end; three more wooded islets lie on the N reef. Bird Islets may be seen from a distance of 3 to 4 miles on a dark night. Thence:

7

NE of Macarthur Islands (5½ miles WNW), consisting of six small bushy islands, connected by sand cays, lying on the E and N sides of a drying reef which is always visible by day but lies in unsurveyed waters; see Caution at 11.108. Numerous drying reefs, some of which have sand cays on them, lie farther SW. Thence:

SW of Viking Reef (10½ miles NNW), which dries and is always visible by day; drying sand cays lie on the S and NW ends of the reef. Thence:

8

NE of Hannibal Islands (13 miles NW), two low and wooded islands lying on the NE and NW ends of a drying reef, which is always visible by day; Hannibal Islands Light (white GRP hut on red metal framework tower, 22 m in height) stands on the E island. Pirie Islet, also wooded, lies on a drying reef 1¾ miles W of the islands.

The two-way route then splits to pass either side of Halway Islet (11°23'S 142°58'E) and Cairncross Islets (11°15'S 142°55'E).

Hannibal Islands to Cairncross Islets

11.110

- 1 **West of Halfway Islet.** The two-way route continues NNW, passing (positions from Halfway Islet (11°23'S 142°58'E)):
 - WSW of Wizard Reef (9 miles SSE), which dries and is always visible by day; thence:
- 2 WSW of Boydong Island (7 miles SSE), wooded and lying on the SW-most of Boydong Cays; Little Boydong Island, also wooded, lies 5 cables farther ENE. The cays consist of a group of drying reefs, all of which are steep-to and always visible by day; some have islands on them. Wallace Islet (5½ miles SE), with a few bushes on it, lies on the N-most of Boydong Cays. And:
- 3 ENE of Hunter Reefs (9½ miles SW), three detached drying reefs forming the outer dangers off Hunter Point, 2 miles WNW, behind which sand hills rise steeply to Hunter Hill, 6 cables farther W. Thence:
 - WSW of Pearn Rock (3¼ miles SW), a steep-to coral head.
- The route then leads N, passing:
 - W of Halfway Islet, bush-covered, with a clump of trees at its centre and lying at the N end of a drying reef which is always visible by day. Jardine Islet, a sandy islet, and Cholmondeley Islet, sandy and covered with stunted vegetation, lie on reefs 3½ and 5 miles farther E and are known collectively as East Islets. Both reefs appear to be steep-to but have been only partially examined. And:
- 5 E of False Orford Ness (5¾ miles W), thence:
 - E of Orford Ness (10 miles WNW), a sandy projection; see Caution at 11.120. Thence:

E of Bushy Islet (9½ miles NW), wooded and lying on the NE side of a drying reef which is always visible by day; mangroves extend 5 cables S from the islet. And:

- 6 W of Cairncross Islets (8½ miles NNW), two densely wooded islets lying on the N side of a drying reef which is always visible by day, and usually by night. Cairncross Islets Light (white GRP hut on red metal framework tower, 26 m in height) stands at the W end of the W islet. A prominent clump of trees stands at the centre of Douglas Islet, 4¼ miles E of the light.



Light

Cairncross Islets from WSW (11.110)

(Original dated 1999)

11.111

- 1 **East of Halway Islet.** The two-way route continues N, passing (positions from Halway Islet (11°23'S 142°58'E)):
 - W of Wizard Reef (9 miles SSE) (11.110), thence:
 - W of Boydong Island (7 miles SSE) (11.110), thence:
 - W of Wallace Islet (5½ miles SE) (11.110), thence:
 - E of Pearn Rock (3¼ miles SW) (11.110), thence:
 - E of Halfway Islet (11.110).
- 2 From a position 1¼ miles NE of Halfway Islet the two-way route continues NNW, passing:
 - ENE of Orford Ness (10 miles WNW) (11.110), thence:
 - WSW of Douglas Islet (8¾ miles N) (11.110), thence:
 - ENE of Cairncross Islets (8½ miles NNW) (11.110).

11.112

- 1 **Useful mark:**
 - Puddingpan Hill (11°20'S 142°48'E), prominent from S but not from E or N.

(Directions continue at 11.128)

Anchorage and landing

Sunday Island

11.113

- 1 A comfortable berth may be found 1 mile WNW of Sunday Island (11°56'S 143°13'E) in depths of 13 to 15 m. Anchorage closer in is not recommended, as the island is too small to afford shelter and tidal streams cause a confused sea in its lee. The island is fringed by a reef on all but the N side.

Margaret Bay

11.114

- 1 Margaret Bay is entered between the NW point of the Cape Grenville peninsula, lying 1½ miles S of Sunday Island (11°56'S 143°13'E), and Thorpe Point 4½ miles WNW. A sandy beach which stretches between the two entrance points is broken only by a section of drying reef

fronting a wooded bluff 3¼ miles WSW of Sunday Island. Depths of less than 5 m extend up to 2 miles from the head of the bay where the Macmillan River (11°59'S 143°10'E), which is fronted by a drying sand bar and by Ethel Islet, lying close NE of the entrance, enters the sea. The river is navigable for some distance by boats.

- 2 **Anchorage** for small vessels may be obtained 7½ cables WNW of the E entrance point to the bay in a depth of 5 m. Smaller vessels of suitable size and draught may anchor closer in where the tidal stream will be less.

Cockburn Islands

11.115

- 1 Cockburn Islands (11°51'S 143°19'E) (11.109) are difficult of access but may be reached by boats through numerous channels between the drying patches on Cockburn Reef. The easiest to reach is Pig Island, which may be approached from SSW, at half tide or more, on the alignment of Buchan Rock with Pig Island 1 mile farther NNE.

Bird Islets

11.116

- 1 Good anchorage may be obtained in the lee of Bird Islets (11°46'S 143°05'E) (11.109), 5 cables NW of the W-most islet on the N reef, in a depth of 16 m, mud.

Hannibal Islands

11.117

- 1 **Anchorage** may be obtained 5 cables NW of the W of the two Hannibal Islands (11°36'S 142°56'E) (11.109) in depths of 12 to 15 m.

Boydong Islands

11.118

- 1 **Anchorage** may be obtained in the lee of Boydong and Little Boydong Islands (11°29'S 143°01'E) (11.110), 5 cables NW of the reefs, in a depth of 22 m, as shown on the chart. A passage between the two islands and between their respective reefs has a least depth of 9.1 m in the fairway but leads, at its SE end, towards unsurveyed waters.

A drying sand cay lies at the NW end of the outer cay, 2 miles E of Little Boydong Island.

CAIRNCROSS ISLETS TO CAPE YORK

General information

Chart Aus 839

Route

11.119

- 1 The two-way route which passes either side of Cairncross Islets (11°15'S 142°55'E) leads generally NNW for 34½ miles to enter Adolphus Channel 3½ miles SE of Albany Rock (10°43'S 142°38'E). From there the route leads 13 miles farther NW through Adolphus Channel to its NW entrance abreast Alpha Rock, 4½ miles N of Cape York (10°41'S 142°32'E). Midway through Adolphus Channel the two-way route splits to allow passage either side of Mid Rock (10°41'S 142°36'E) and Alpha Rock,

6¼ miles NW. Adolphus Channel is the principal route for vessels bound for Torres Strait.

11.120

- 1 **Caution.** From Orford Ness (11°18'S 142°49'E) to Sharp Point, 21 miles NNW, the coast is fronted by a bank, with depths less than 10 m over it, which initially extends up to 5 miles offshore to encompass Bushy Islet (11°15'S 142°52'E), and up to 1¾ miles offshore farther N. Numerous detached shoal patches, as shown on the chart, are found throughout the length of this stretch of coastal bank, which should always be approached with caution.
- 2 The same stretch of coast; exposed as it is to the South-east Trade Winds, and subject to an onshore set (11.124); can become a dangerous lee shore. Frequent and regular fixing is recommended when passing this coast, especially at night.

Charts Aus 292, Aus 839

Topography

11.121

- 1 From Orford Ness (11°18'S 142°49'E) to Sharp Point, 21 miles NNW, the coast is formed of rocky points and bights and is backed by a range of mostly barren hills, amongst which are Left Hill (11°10'S 142°47'E) and Shadwell Peak (11.127), 11 miles NNW. Reddish-coloured, flat-topped cliffs extend along most of this stretch of coast as far as Tern Cliff (11°00'S 142°45'E).
- 2 Except for Turtle Head Island (11.134), the land stretching W and NW from Sharp Point (10°58'S 142°43'E) to Kennedy River is formed by low, mangrove-covered islands. From Cliffy Point (10°49'S 142°33'E), on the NW side of the river entrance, to Fly Point, 5¼ miles NE, the coast is formed by cliffy points with sandy beaches between them. Chandogoo Point, 2 miles NE of Cliffy Point, has a remarkable patch of sand N of it. Another remarkable patch of sand lies at the head of Freshwater Bay, entered between Vallack Point and Fly Point, 1 mile NE.
- 3 **Albany Island**, lying close off the mainland between Fly Point (10°45'S 142°37'E) and Osnaburg Point, 2 miles NW, is wooded in its N and highest part and in places on the W side, but is otherwise covered with grass. The central part of the island (67 m in height) is a rounded hill, bare except for a cemetery upon it. The NW side of this hill slopes to the lowest part of the island before rising again to its summit in the N. The island is uninhabited.

- 4 From Fly Point to Cape York, 6 miles NW, the coast is indented by a number of shallow bays, densely wooded and backed by ground rising first to Carnegie Range and then to Mount Bremer (10°42'S 142°32'E) (11.127). Inland the country is flat and there is usually a narrow belt of dense bush. Enormous pinnacle anthills of red clay and sand are a characteristic of the area.

11.122

- 1 **Mount Adolphus Islands** are a group of high and rugged islands, and a number of off-lying rocks, lying between Mount Adolphus Island (10°38'S 142°39'E) and Little Adolphus Island 1½ miles NW. The islands are mostly fringed by coral reefs and are partially covered with stunted trees and scrub. Mount Adolphus, the most prominent feature of the group, is described at 11.127.

Local knowledge

11.123

- 1 Local knowledge is required for passage of Albany Pass (10°44'S 142°36'E) (11.133) and its approaches, and for passage E of Kagar Reef (10°36'S 142°55'E) (11.136).

Natural conditions

11.124

- 1 **Tides.** Attention is drawn to the complex nature of the tides in Torres Strait (13.12) as this is approached.
Tidal streams in the two-way route. Between Cairncross Islets (11°15'S 142°55'E) and Sharp Point, 21 miles NW, the S-going tidal stream sets generally parallel to the coast, but there is an appreciable tendency for the N-going stream to set towards the land. The rate of the stream alone is ¾ to 1¼ kn, but the overall flow can be considerably greater; both rate and direction being much influenced by prevailing winds; see caution at 11.120.
- 2 From Sharp Point (10°58'S 142°43'E) to Wyborn Reef, 8 miles NNE, there is an increase in the rate of the stream to between 1½ and 2½ kn; a change in direction also occurs where the previously N-going stream sweeps more nearly NW into Newcastle Bay on the rising tide. On the falling tide the stream sets strongly out of the bay towards Shortland Reef (10°54'S 142°46'E). As before, the overall flow is influenced by prevailing winds.
- 3 **In Adolphus Channel** the tidal streams set NW and SE, attaining rates of 2 to 4 kn in both directions at springs. Strong SE winds increase the strength and duration of the



Mount Adolphus Island from N (11.122)

(Original dated 1999)

flow NW and correspondingly decrease that SE. Much information is given on chart Aus 292.

Tide-rips and eddies occur in many places, as shown on the chart, when the streams are running at strength, and give every appearance of foul ground. The charted two-way route is however free from known dangers.

- 4 There is a heavy and confused sea off Albany Rock when the streams are running strongly.

The W-going stream, setting past Mount Adolphus Islands from seaward, meeting the NW-going stream through Adolphus Channel, causes heavy overfalls at shoals and salient points. Streams attain a considerable rate between the islands of the group at springs.

11.125

- 1 **Tidal streams in Albany Pass** are strong, as indicated on the chart, and may attain rates of 5 kn at springs. A confused sea occurs under conditions of wind against tidal stream.

The stream runs NW until about 1 hour after the time of HW Twin Island, and SE until about 5½ hours before HW.

Strong SE winds increase the rate and duration of the NW-going stream and decrease those of the SE-going stream. At neaps this can result in a flow setting continuously NW.

- 2 **Caution.** Off Fly Point (10°45'S 142°37'E) a very heavy tide-rip always occurs on the NW-going stream at springs, which is dangerous for boats and requires careful attention to steering in all vessels. The conditions are caused by the outflow of tidal stream from Newcastle Bay meeting with the main run of the stream through Albany Pass.

11.126

- 1 **Sandwaves** which are known or considered to occur in a number of areas are mentioned in the relevant parts of the text; known occurrences are also shown on the charts. The effect of the waves may be to produce depths which differ from those charted. See *The Mariner's Handbook* for more detailed information.

Chart Aus 839

Landmarks

11.127

- 1 Shadwell Peak (69 m in height) (11°00'S 142°44'E), conical and the prominent feature in a range of mostly barren hills backing the coast.
Mount Adolphus (10°38'S 142°39'E), a wooded, flat-topped hill rising prominently from the N side of Mount Adolphus Island.
- 2 Cape York (10°41'S 142°32'E), the N extremity of the continent of Australia. The cape rises prominently from the land in its immediate vicinity which consists of low wooded hills with small valleys and plains. Mount Bremer, which rises 7 cables SSE, is a well-defined and wooded peak and the highest part of the cape.

Directions

(continued from 11.112)

Cairncross Islets to Wyborn Reef

11.128

- 1 **West of Cairncross Islets.** From the position W of Cairncross Islets (11°15'S 142°55'E) (11.110) the track leads NNW within the two-way route, passing (positions from Shadwell Point (11°00'S 142°45'E)):

ENE of Gilmore Bank (10½ miles SSE), a coral reef; drying patches in the centre part of the reef are not easily seen when covered. Ussher Point, 2 miles W of the bank, may be identified by well-defined red cliffs of moderate height standing 5 cables S of the point. Thence:

- 2 ENE of No 2 Point (7 miles SSE), which is cliff-faced; the red cliff, 5 cables S of the point, is remarkable, being 59 m in height with a distinctive white stripe.

East of Cairncross Islets. From the position ENE of Cairncross Islets (11°15'S 142°55'E) (11.111) the two-way route leads NNW, passing (positions from Shadwell Point (11°00'S 142°45'E)):

- 3 WSW of Millman Islet (18¾ miles SE), (11.137); thence:

WSW of Sinclair Islet (17¼ miles ESE), (11.137).

This route then rejoins the route at the position off Reid Point (11°05'S 142°47'E) which continues NNW,, passing:

ENE of Furze Point (4½ miles SSE); a drying sandbank fills the small bay between the point and Sadd Point, 8 cables NW. Thence:

- 4 ENE of Sadd Point (3½ miles SSE); Flat Hill, standing close W of the N end of the point, is 49 m in height. Thence:

ENE of Thompson Islet (15 m in height) (2 miles SSE), cliff-faced with a flat, grass-covered summit, but not easy to identify from seaward. Thence:

- 5 ENE of Tern Islet (8 cables ESE), rocky, wooded and lying 7 cables NE of Tern Cliff; a reef, which dries near its outer end, extends 7½ cables NE from the islet. Thence:

ENE of Shadwell Point, low but rising to Shadwell Peak 6 cables WSW (11.127); a ledge of drying rocks, which extends 2 cables N from the point, affords a lee under which a boat landing may be effected at half tide. Thence:

- 6 ENE of Sharp Point (2½ miles NW), which rises to a height of 38 m. The point is the S entrance point to Escape River. Thence:

ENE of Shortland Reef (5¼ miles NNE), always visible by day; the SW edge is marked by a beacon (W cardinal, 7 m in height). Thence:

ENE of Wyborn Reef (9¼ miles N), always visible; Wyborn Reef Light (white lantern on stainless steel framework tower on concrete piles, 21 m in height) stands on the NE side of the reef.

Chart Aus 292

Wyborn Reef to Adolphus Channel

11.129

- 1 From the position abreast Wyborn Reef the line of bearing 297°, within a white sector (292°–302½°), of Albany Rock Light (white lantern on white square concrete house, 6 m in height) (10°43'S 142°38'E) leads WNW within the two-way route. The light and a few stunted pandanus trees stand together on a remarkable peak, 25 m in height, forming the summit of Albany Rock, which is the outermost of three islets, connected by shallow below-water ridges, lying within 1 mile NE of Albany Island (11.121). Mai Islet, 2 cables WSW of the light, is rocky; Pitt Rock stands 1 cable farther SSW. Charlotte Point, 1½ cables SW of Pitt Rock, is cliff-faced, as is Alfred Point 6 cables farther NNW. The track passes (positions from Albany Rock Light):

- 2 NNE of Wyborn Reef (8 miles SE) which, together with shoal ground with depths less than 10 m over it extending $1\frac{1}{4}$ miles NW from the reef, is covered by the adjacent red sector ($302\frac{1}{2}^{\circ}$ – $312\frac{1}{2}^{\circ}$) of Albany Rock Light. Thence:
SSW of South Ledge (5 miles E), a drying reef; Tetley Islets lie near the middle of the S side of the ledge. Johnson Islet, $4\frac{1}{2}$ miles farther NNE, is low and wooded. Thence:
- 3 SSW of a shoal (depth 6.1 m) (4 miles ESE), the S end of a narrow spit, formed by sandwaves, extending $1\frac{1}{4}$ miles SSE from South Brother. The spit and The Brothers (described below) are covered by the adjacent green sector (210° – 292°) of Albany Rock Light and, additionally, by the red sector (133° – 143°) of Wyborn Reef Light. Overfalls occur E of the spit; sandwaves and tide-rips extend SSW from its S end across the two-way route, as shown on the chart.

Adolphus Channel

11.130

- 1 From the position about $1\frac{3}{4}$ miles S of South Brother ($10^{\circ}43'S$ $142^{\circ}41'E$), the track then leads NW within the two-way route through Adolphus Channel; see 11.124 for remarks on tidal streams and overfalls. The track passes (positions from Albany Rock Light):
SW of South Brother ($3\frac{1}{2}$ miles E); Middle Brother lies 6 cables NW. Both are above-water rocks lying near the ends of a drying reef which is always visible. Thence:
- 2 NE of a bank (depth 6.7 m) (1 mile SSE), thence:
SW of North Brother ($2\frac{1}{2}$ miles ENE), an isolated rock, its top covered with guano. The rock is visible from a distance of 6 to 8 miles, but is not always well-defined. Thence:
NE of Albany Rock (11.129); a small detached above-water rock stands close N of the rock; thence:
- 3 NE of a bank (depth 5.7 m) (8 cables NW), and:
SW of Akone Islet (4 miles NE); Morilug Islet, rocky and wooded, lies $1\frac{1}{2}$ miles farther NNE.
- The two-way route then splits to pass either NE or S of Mid Rock ($10^{\circ}41'S$ $142^{\circ}36'E$).

11.131

- 1 **North-east of Mid Rock.** The track continues NW within the charted two-way route, passing (positions from Eborac Island ($10^{\circ}41'S$ $142^{\circ}32'E$)):
SW of Quetta Rock ($5\frac{1}{2}$ miles E), a small and dangerous patch marked on the N side by overfalls; an historic wreck (1.70), *Quetta*, lies within a protected area 5 cables NW of the rock. A below-water rock (depth 6.9 m) lies 6 cables farther NW. These are the outer dangers SW of Mount Adolphus Island ($6\frac{1}{2}$ miles ENE) and are covered by a red sector (167° – 210°) of Albany Rock Light (11.129). And:
- 2 SW of the SW end of Mount Adolphus Island, formed of two virtual islets, each 50 m in height and connected to each other and to the main island only by mangroves. Dickey Point and Cambridge Point, 3 cables S are the NW and S points of the W-most islet; Pinnacle Peak, 5 cables farther ESE, is a rock standing close off the S extremity of the main island. The SE side of Mount Adolphus Island, between Pinnacle Peak and North East

Bluff 2 miles NE, is formed by small bays filled with drying reefs and separated by rocky points. Thence:

- 3 NE of Mid Rock ($3\frac{3}{4}$ miles E), a dangerous patch marked by overfalls and covered by a green sector (139° – $147\frac{1}{2}^{\circ}$) of Albany Rock Light. The edge of the red sector of Wyborn Reef Light ($10^{\circ}49'S$ $142^{\circ}47'E$) (11.128) should not be relied upon to pass clear between Mid and Quetta Rocks. Thence:
- 4 SW of Blackwood Bank (6 miles ENE), the outer danger off the W side of Mount Adolphus Island; Forbes Head, 5 cables farther ENE, is the W extremity of the island; Nigger Head, at the N extremity 7 cables farther NE, is cliff-faced. Thence:
- 5 SW of Lacey Island (6 miles NE), formed of three peaks, the SW-most and highest being connected to the NE part of the island by a drying sandy neck. The island is mostly covered with scrub and stunted trees and is fringed by a drying reef except at its SW end. Thence:
- 6 SW of a bank with depths less than 10 m over it ($5\frac{3}{4}$ miles NE), the outer danger W of Little Adolphus Island ($6\frac{3}{4}$ miles NE), which is covered with stunted trees and scrub.
- The track is then adjusted to lead between WNW and NW, as shown on the chart, passing:
- 7 NE of Alpha Rock ($4\frac{1}{4}$ miles NNW), which may be passed at a distance of 5 cables on either side and is a good mark from E or W. The rock is covered by a red sector ($131\frac{1}{2}^{\circ}$ – 139°) of Albany Rock Light near the outer limit of its range.

Useful mark:

Eborac Island ($10^{\circ}41'S$ $142^{\circ}32'E$) and adjacent features (11.132).

11.132

- 1 **South of Mid Rock.** From the position about $1\frac{1}{4}$ miles NNE of Albany Rock ($10^{\circ}43'S$ $142^{\circ}38'E$), the line of bearing 279° in a white sector ($267\frac{1}{2}^{\circ}$ – 281°) of Eborac Island Light ($10^{\circ}41'S$ $142^{\circ}32'E$) leads W within the two-way route. The light (white lantern on white square concrete house, 6 m in height) stands on the summit of Eborac Island, which is moderately steep-to on its N side. York Island, standing close W of the island, is rocky and similarly steep-to on its N side. Cape York (11.127) stands $2\frac{1}{2}$ cables S of Eborac Island. The track leads W within the two-way route, passing (positions from Eborac Island):
- 2 N of a 9.7 m patch (5 miles ESE), thence:
N of Sana Rock ($3\frac{3}{4}$ miles ESE), marked by overfalls off its N side and lying on the outer edge of the coastal bank, mostly steep-to, N of Albany Island; depths less than 10 m extend more than 1 mile ESE and $1\frac{1}{2}$ miles WNW from the rock. Tree Islet, $1\frac{1}{2}$ cables SW, and Brush Islet, 3 cables S of the rock, lie on the same bank and are cliffy and bare. Sana Rock and the patch (5 miles ESE) are covered by the adjacent red sector (281° – $288\frac{1}{2}^{\circ}$) of Eborac Island Light. And:
- 3 S of Mid Rock ($3\frac{3}{4}$ miles E) (11.131), covered additionally by the adjacent green sector ($252\frac{1}{2}^{\circ}$ – $267\frac{1}{2}^{\circ}$) of Eborac Island Light.
- The track then leads NW within a white sector (121° – $131\frac{1}{2}^{\circ}$) of Albany Rock Light (11.129), then additionally within a white sector (135° – $252\frac{1}{2}^{\circ}$) of Eborac Island Light. The NE edge of the two-way route is indicated by the adjacent red sector of Albany Rock Light

which covers Alpha Rock (11.131). Dangers SW of the two-way route are covered by the adjacent green sector (048°–121°) of Albany Rock Light, which also covers Sana Rock above. The track passes:

- 4 NE of a 7.6 m patch (1½ miles ESE), also covered by the red sector of Eborac Island Light covering Sana Rock. The patch is the outer danger off Evans Point, 1¼ miles WSW, a smooth double point rising to Mount Bremer (11.127) 3½ cables farther WSW; Sextant Rock, lying between the patch and Evans Point, is flat. Thence:
- 5 NE of Eborac Island; passage between Eborac and York Islands is obstructed by an above-water rock and by a bar with depths of less than 5 m over it. Heavy tide-rips occur N of the two islands as shown on the chart. There is foul ground between York Island and Cape York. Waters SW of the charted two-way route are then covered by the adjacent green sector (000°–135°) of Eborac Island Light. Thence:
- 6 NE of the dangerous wreck of a fishing vessel (2½ miles NW), thence:
SW of Alpha Rock (4¼ miles NNW) (11.131).
(*Directions continue at 13.79*)

Side channels

Charts Aus 839, Aus 292

Albany Pass

11.133

- 1 **General information.** Albany Pass lies between Albany Island (10°44'S 142°36'E) and the mainland, 3 cables SW, and provides an alternative to the two-way route through Adolphus Channel, but is not surveyed to the same standards. The pass is partially obstructed in its SE approaches by dangers lying between Albany Island and Wyborn Reef 7½ miles ESE, as shown on the chart. The NW entrance is obstructed by a bar, with depths less than 10 m over it, extending from the NW extremity of Albany Island to Eborac Island 3½ miles WNW.
- 2 Albany Pass and its SE approaches are suitable for coastal vessels drawing less than 5 m.

Tidal streams in the pass are described at 11.125.

11.134

- 1 **Directions for approach from SE.** From a convenient position within the section of the charted two-way route between Cairncross Islets (11°15'S 142°55'E) and Wyborn Reef (11.128), the approach to Albany Pass from SE passes WSW of Shortland Reef (10°54'S 142°46'E). Alternatively the passage between Shortland and Wyborn Reef 3 miles N may be used, as guided by the chart, to join the track described below. The track WSW of Shortland Reef leads NNW, mostly within a white sector (324°–337°) of Albany Rock Light (10°43'S 142°38'E) (11.129) when raised, passing (positions from Albany Rock Light):
- 2 ENE of Sharp Point (15½ miles SSE) (11.128), thence:
ENE of Turtle Head Island (12 miles SSE), conical near its centre and covered with trees, scrub and grass; and:
- 3 WSW of the beacon on Shortland Reef (13 miles SE) (11.128) distant 1¼ miles; an 11.8 m patch, 7½ cables WNW of the NW end of the reef, is always marked by tide-rips when the stream is running strongly. Thence:
ENE of Turtle Island (11 miles SSE), wooded and the outer danger on this part of the coastal bank;

overfalls occur off the NE side of the island. Thence:

- 4 WSW of a beacon (W cardinal) (8 miles SE) distant 5 cables. The beacon marks the SW side of Harrington Reef, which is always visible by day and, together with Harrington Shoal (below) and this part of the track, is covered by the adjacent green sector (312½°–324°) of Albany Rock Light. A passage between Harrington Reef and Wyborn Reef, 1 mile E, is clear but there are depths of less than 10 m at its NW end, as shown on the chart.
- 5 The track then leads NW through the clear and preferred passage between the dangers which partially obstruct the waters between Wyborn Reef and Albany Island. The track passes:
SW of Harrington Shoal (6½ miles SE), lying on a spit extending 1¼ miles NW from Harrington Reef; and:
- 6 NE of Four Fathom Patches (5 miles SSE), a number of shoal patches which lie within the same white sector of Albany Rock Light through which the track now passes; heavy tide-rips occur over the patches, which are considered to be formed by sandwaves. Passage SW of Four Fathom Patches is obstructed by shoal depths, beyond which only inadequate surveys have been conducted. The area is covered by the adjacent red sector (337°–048°) of Albany Rock Light.
- 7 Fly Point (2¼ miles SSW) bearing WNW then leads to the SE entrance to the pass. The point is black, rocky and 6 m in height; some large, red, pinnacled anthills stand on bare land within the point. The mainland coast from thence to Cape York, 6 miles NW, is densely wooded. The track passes:
- 8 NNE of a bank with depths less than 5 m over it (3½ miles S); a below-water reef lies on the NW side of the bank. Depths less than 10 m extend 2¾ miles farther SE towards Four Fathom Patches. Thence:
NNE of Ariel Bank (2¾ miles S); a sand cay lies on a drying reef in the middle of the bank.

11.135

Directions for Albany Pass. From a position off the SE entrance to the pass, the track leads NW in mid-channel and within a white sector (288½°–000°) of Eborac Island Light (10°41'S 142°32'E) (11.132); see caution on tidal streams at 11.125. The track passes (positions from Eborac Island):

- NE of Ulfa Rock (6½ miles SE), on which there are some trees; thence:
- 2 SW of a spit, with depths less than 10 m over it, extending up to 5 cables off Ulrica Point (6½ miles SE). The point is steep and rocky; a drying reef fringes the SW coast of Albany Island from there to Port Albany, 1¼ miles farther NW. Thence:
NE of Fly Point (6 miles SE) (11.134), thence:
- 3 SW of Kloster Point (5 miles SE), a wooded bluff; thence:
NE of Somerset Point (4¾ miles SE); Stover Bay, immediately WNW of the point, is filled by a mud flat and mangroves. Thence:
SW of a 9.8 m patch (4 miles SE), lying in mid-channel; and:
- 4 Close NE of Osnaburg Point (3¾ miles SE), a steep, wooded bluff of coarse sandstone, 87 m in height; thence:

SW of foul ground extending 2 cables SW from Frederick Point (3½ miles ESE), thence:

NE of Bishop Point (3 miles SE), keeping in depths of more than 10 m. The point is a bluff headland, with a grey patch on its N extremity.

- 5 The line of bearing 174°, astern, of the above patch on Bishop Point then leads N across the bar in a least charted depth of 7.3 m, passing:

E of Ida Island (2 miles SE), cliffy on its N and E sides; Ida Point, close W of the island, is low and rocky. Thence:

E of the patch (1½ miles ESE) (11.132), thence:

E of Eborac Island, from whence directions at 11.132 for the two-way route may be followed.

Chart Aus 839

Route east of Kagar Reef

11.136

- 1 **General information.** A route, for which several tracks exist, diverges N or NNE from the charted two-way route between Cairncross Islets (11°15'S 142°55'E) and Wyborn Reef, 25 miles NNW. The route passes E of Kagar Reef (10°36'S 142°55'E) thence N to connect with Great North East Channel 2 miles W or 6¼ miles SSW of Richardson Reef (10°08'S 143°03'E) (13.31). The route has been established as a result of investigative surveys carried out since 1979, but its use does not offer any commercial benefit (1993).

Caution. Dangers along the route are unmarked.

11.137

- 1 **Directions from Cairncross Islets.** From a position within the charted two-way route, 2 miles E of Cairncross Islets (11°15'S 142°55'E) (11.110) the track leads NNW for about 8 miles where it joins a track, surveyed by HMAS *Flinders* in 1979, which leads N on 006°, keeping clear of charted unsurveyed areas and passing (positions from Arnold Islets (11°00'S 142°59'E)):

- 2 ENE of Gilmore Bank (13 miles SW) (11.128), the outer danger off the coast described at the same reference; and:

WSW of Milman Islet (9½ miles S), densely wooded; Aplin Islet, also wooded, lies at the other end of the same reef 1¾ miles farther SE. Thence:

- 3 WSW of a small reef (drying 0.5 m) (7¼ miles S); Sinclair Islet, 1¾ miles farther NE, is covered with grass and a few bushes.

The track then continues N, passing:

W of Arnold Islets, two islets lying on a drying reef which is always visible; the SE islet is wooded, the NW one is a sand cay covered with grass and a few bushes. Thence:

- 4 E of an unnamed reef (12¼ miles NNW); a cay (drying 1.9 m) lies on the reef; thence:

W of Nomer Cay (3 m in height and unnamed on the chart) (12¾ miles N), distant 1.2 miles. The cay, sand and covered with vegetation, lies at the NW end of a drying reef.

11.138

- 1 The track, then adjusted to 003°, continues leading N, passing (positions from Dugong Island (10°31'S 143°06'E)):

E of Kai-Damun Reef (15½ miles WSW), thence:

W of a cay (2 m in height) (8½ miles SW), lying at the W end of a drying reef; and:

- 2 Midway between Kagar Reef (10½ miles WSW) and a shoal, with a least depth of 0.7 m over it, (8½ miles SW). Overfalls occur off the E and SE edges of Kagar Reef, as shown on the chart. Tidal streams can run strongly between Kagar and Kai-Damun Reefs.

- 3 The track, then adjusted to 010°, continues leading N, passing:

E of some drying rocks (11 miles WSW), distant 2 miles. The rocks lie near the NE edge of Kagar Reef. Thence:

- 4 Adjacent to an area of sandwaves (11.126), which extends up to 13 miles N from Kagar Reef as shown on the chart, the general trend of the ridges being N/S. Least depths over the ridges are between 9.4 and 14 m, but isolated shoaler patches exist in the area. And:

- 5 W of Dugong Island, known locally as Artub, heavily wooded and lying on an extensive drying reef; the island is fringed by a beach and has a long sand spit on the NW corner; the stranded wreck of a fishing vessel lies on the same reef. Thence:

E of a 6.1 m patch (11 miles WNW), the E-most of the isolated shoal patches in the area of sandwaves.

- 6 When Dugong Island bears 139°, distant 9.3 miles, the track leads N on the meridian of 143°00'E to join Great North East Channel (13.19).

11.139

- 1 **Directions from Shortland Reef.** From a position within the two-way route, with Shortland Reef (10°54'S 142°46'E) (11.128) bearing WNW distant 3 miles, a track leads NNE on 023°, passing (positions from Dugong Island (10°31'S 143°06'E)):

WNW of the unnamed reef (20 miles SSW) (11.137), distant 2.4 miles; thence:

ESE of Kagar Reef (10½ miles WSW) (11.138), distant 1.2 miles; thence:

- 2 WNW of the shoal (8½ miles SW) (11.138), distant 9 cables; and:

ESE of the drying rocks (11 miles WSW) on Kagar Reef, and:

ESE of the area of sandwaves (11.138).

When Dugong Island (11.138) bears 090°, the track leads N on the meridian of 143°00'E to join Great North East Channel (13.19).

11.140

- 1 **Other directions.** Apart from the two specific tracks described above, departure from the two-way route between Cairncross Islets (11°15'S 142°55'E) and Wyborn Reef (11.128), 25 miles NNW, may be taken as required to join a track leading NNE on 016°. The track passes (positions from Dugong Island (10°31'S 143°06'E)):

- 2 Between Kagar Reef (10½ miles WSW) (11.138) and the shoal (8½ miles SW), thence:

WNW of Dugong Island (11.138), distant 6.2 miles.

The track then leads N along the meridian of 143°00'E to join Great North East Channel (13.19).

Useful mark:

Wyborn Reef Light (10°49'S 142°47'E) (11.128).

11.141

- 1 **Anchorage.** Good anchorage for trawlers may be obtained NW of Dugong Island (10°31'S 143°06'E) (11.138). A number of isolated coral features and a small sand cay lie on the NW side of the reef; broken ground extends 1 mile W.

Local knowledge is required.

Anchorage

Douglas Islet to Arnold Islets

11.142

- 1 **General information.** Anchorage, during the South-east Trade Winds, may be obtained under the lee of each of the islets and reefs listed below. The holding ground is however poor, and the swell meeting in the lee of the islets may cause confused seas.

Caution. All the anchorages lie either within, or adjacent to, unsurveyed areas as shown on the chart. These areas should only be entered with extreme caution.

- 2 **Douglas Islet** (11°15'S 143°00'E) (11.110) lies at the NW end of a drying reef which is usually visible.

Milman Islet (11°10'S 143°01'E) (11.137) lies at the NW end of a drying reef which is always visible.

Sinclair Islet (11°07'S 143°01'E) (11.137) lies at the NW end of a drying reef which is always visible.

Arnold Islets (11°00'S 142°59'E) (11.137).

Chart Aus 292

Albany Pass

11.143

- 1 **General information.** Anchorage for vessels of suitable size and draught may be obtained in Albany Pass (10°44'S 142°36'E) (11.133) as indicated below. Use of Somerset Bay and Port Albany needs careful consideration of the tidal streams (11.125) which, together with the lack of swinging room, will require vessels to be moored in each case.

- 2 Somerset Bay and its vicinity are healthy except in the rainy season, when the climate is oppressive and mosquitoes are numerous. In this respect there are drying reefs in Somerset Bay and Port Albany, whereas the mainland bays NW of these are generally filled with drying mud flats and fringed with mangroves.

11.144

- 1 **Somerset Bay**, lying 3 cables SW of Kloster Point (10°44'S 142°36'E) (11.135), is the best anchorage in Albany Pass, with good holding ground, but is only suitable for small vessels and is exposed to SE winds. Tidal streams, with numerous eddies, are felt close up to the edge of the drying reef which fills the bay. Vessels should be moored with room to swing just clear of the reef.

11.145

- 1 **Port Albany**, lying between Kloster Point and Seymour Point 6 cables NW, is fringed with a steep-to reef. Vessels should be moored in the S part of the bay, where shelter from the predominant wind may be obtained.

11.146

- 1 **York Road** lies NW of Frederick Point (10°43'S 142°35'E) (11.135), at the NW end of Albany Island. The road is bounded on its NE side by the bank extending WNW from Sana Rock (11.132), 1 mile NE of the point, and on its SW side by the bar (11.133) between Albany and Eborac Islands. Anchorage, with shelter from SE winds and out of the strength of the tidal stream, may be obtained as convenient, according to draught.

11.147

- 1 **Evans Bay**, which lies between Ida Point (10°43'S 142°33'E) (11.135) and Evans Point (11.132), 1 mile NW, is shallow and fringed with drying sand and mud flats extending 3 cables offshore. There is seldom sufficient surf on the beach, even when blowing hard, to prevent boats from landing. Tidal streams to seaward of the 5 m depth

contour set NW and SE across the mouth of the bay at a maximum rate of about 2 kn, as indicated on the chart.

- 2 Depths in the approach to Evans Bay from NE are limited by the bar lying to seaward across the NW end of Albany Pass (11.133).

During SE winds the best anchorage for vessels of suitable size and draught is found 4 cables N of Ida Point in a depth of 11.3 m, sand and mud. During the NW monsoon there is better shelter a little farther WNW, 2½ cables from Sextant Rock (11.132).

Small craft can anchor closer within the bay as convenient for depth and shelter.

Mount Adolphus Islands

11.148

- 1 **Tidal streams**, which run strongly between these islands, are described at 11.124.

Caution. The waters of these islands are inadequately surveyed and should be entered with care.

11.149

- 1 **Blackwood Bay**, which lies on the W side of Mount Adolphus Island between Forbes Head (10°38'S 142°38'E) and Dickey Point (11.131), 1¼ miles SSE, may be entered at either end of the off-lying Blackwood Bank. Anchorage, with shelter from SE winds and out of the strength of the tidal stream, may be obtained within the bay in depths of 5 to 8 m, mud.

11.150

- 1 **Lacey Island** (10°37'S 142°37'E) (11.131) provides anchorage, in depths of 9 to 11 m and out of the strength of the tidal stream, 3 cables off the NW side of the sandy neck connecting the two parts of the island. Overfalls occur in the deep and narrow channel between the island and Little Adolphus Island (11.131) 2½ cables N. Salter Island, which may be seen 4 cables E of Little Adolphus Island, is flat-topped.

Escape River and Newcastle Bay

Charts Aus 839, Aus 292

General information

11.151

- 1 **Newcastle Bay** lies between the NW extremity of Turtle Head Island (10°56'S 142°41'E) (11.134) and Fly Point (11.134), 10 miles NNW. The bay is shallow, with depths less than 5 m extending almost to a line between the entrance points, and is partially obstructed by drying reefs and sandbanks, the latter being subject to frequent change. Kennedy River enters the sea at the head of the bay.

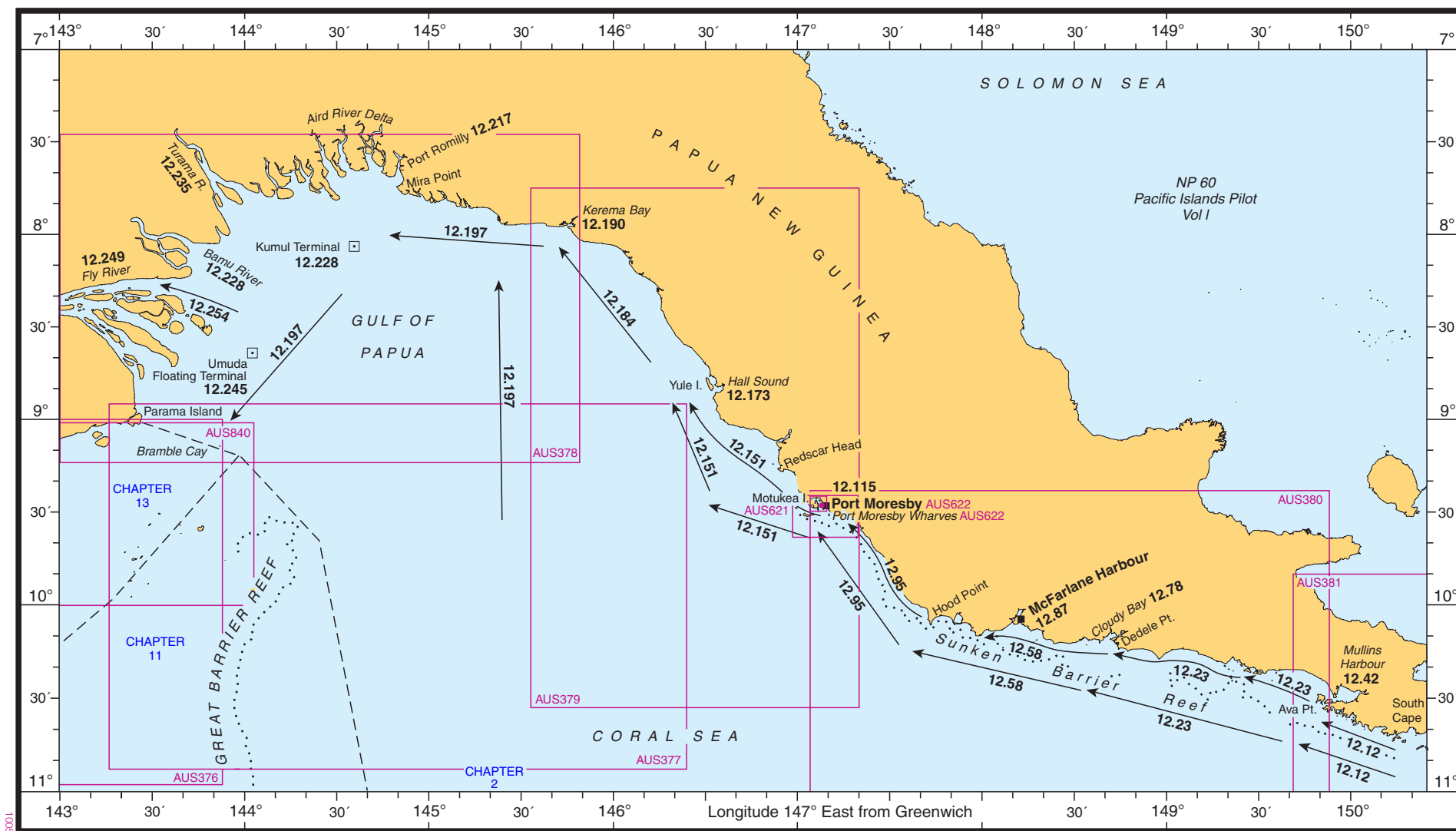
Tidal streams in the bay are described at 11.124.

- 2 **Escape River** enters the sea close SE of Newcastle Bay. The S entrance to the river lies between Sharp Point (10°58'S 142°43'E) (11.128) and the SE extremity of Turtle Head Island, 6 cables NW, and is fronted, 1 mile to seaward, by a bar. Within the bar there are depths greater than 5 m for a distance of about 3 miles; the water has been found to be fresh 7 miles up-river. The N entrance to the river, which dries, lies between Turtle Head Island and Trochus Island, a low, mangrove-covered island 7 cables W. There is a pearl farm close within the entrance, these farms which may be floating or fixed structures, and their associated moorings should be avoided. The farms are generally marked by buoys and beacons, which may be lit.

- 3 The rivers and Newcastle Bay lie within an area which has been only inadequately surveyed.

Local knowledge is required.

Chapter 12 - South coast of Papua New Guinea between South Cape and Parama Island, including Port Moresby



CHAPTER 12

SOUTH COAST OF PAPUA NEW GUINEA BETWEEN SOUTH CAPE
AND PARAMA ISLAND, INCLUDING PORT MORESBY

GENERAL INFORMATION

Charts 4621, Aus 4620

Scope of chapter**12.1**

- 1 This chapter covers the S coast of Papua New Guinea from South Cape (10°43'S 150°14'E) (chart Aus 381) to Parama Island (9°00'S 143°25'E) and includes Port Moresby (9°28'S 147°08'E) and Gulf of Papua.

Routes**12.2**

- 1 The route between the S entrances to Solomon Sea and Torres Strait leads offshore along the S coast of Papua New Guinea to the vicinity of Port Moresby and thence across Gulf of Papua to Bligh Entrance (9°14'S 144°00'E) and through Great North East Channel; see *Ocean Passages for the World*.
- 2 An alternative route from the E end of Papua New Guinea to Port Moresby leads inshore of Sunken Barrier Reef (12.4). This inshore passage, which is marked in places by well maintained beacons, is regularly used by small vessels to save time, and for comfort, during the South-east Trade Winds. The passage is reported to be fairly straightforward except in the vicinity of Round Point (9°52'S 147°31'E) (chart Aus 380) where it is shallow and tortuous. From Port Moresby the inshore passage continues to the NW termination of Sunken Barrier Reef in the vicinity of 8°58'S 146°28'E, but the first section, between Port Moresby and Liljeblad Passage 8 miles farther WNW (chart Aus 379), requires careful consideration of draught and conditions before being attempted.
- 3 The offshore and inshore passages E of the meridian of South Cape (150°14'E) are described in *Pacific Islands Pilot Volume I*.

Topography**12.3**

- 1 The S coast of Papua New Guinea from South Cape (10°43'S 150°14'E) to the entrances to Port Moresby is mostly fringed by Sunken Barrier Reef (12.4). Behind the coast the land rises to Owen Stanley Range which forms the backbone of the SE part of Papua New Guinea for about 300 miles WNW from its E extremity. Mount Victoria (8°54'S 147°31'E), the highest summit in the range, is remarkable for its square top and cannot be mistaken on account of its great height; a sharp ridge descends from its SW side towards the sea. Most of the summits in this range are visible in very clear weather at a distance of 90 miles, but within 20 or 30 miles of the coast they so alter their shape and appearance as not to be easily distinguished one from the other. The summits of the range are most easily seen during the NW monsoon, but are generally capped with clouds during the South-east Trade Winds.
- 2 From Port Moresby (9°28'S 147°08'E) the coast extends NW into Gulf of Papua, which lies between Cape Suckling (9°02'S 146°37'E) and the mouth of Fly River (190 miles W). The coast bordering the gulf is low and mainly

composed of mangrove swamps and numerous rivers forming an immense delta with many mouths.

- 3 Mount Yule (8°13'S 146°47'E) (12.186) (chart Aus 379) is the highest point of a detached part of Owen Stanley Range which stands about 25 miles inland and extends in a N/S direction between Cape Possession (8°35'S 146°23'E) and Freshwater Bay, 40 miles farther NW.

Charts Aus 381, Aus 380, Aus 379, Aus 378

Sunken Barrier Reef**12.4**

- 1 Sunken Barrier Reef is a remarkable barrier reef, about 450 miles in length and composed of growing coral, which extends from a position about 12 miles E of Tagula Island (11°30'S 153°30'E) (chart 4621), described in *Pacific Islands Pilot Volume I*, to a position about 50 miles NW of Port Moresby. The reef varies between 1 and 10 miles distant from the coast and, although it has many breaks and passages, may be considered as a single feature. It is remarkable that where the reef is submerged it is, so far as is known, not dangerous to vessels of moderate draught, depths over it being seldom less than 9 m (30 ft). The outer edge of the reef, in every place as yet examined, is steep-to.

Buoyage**12.5**

- 1 The general direction of buoyage on the S coast of Papua New Guinea is from E to W, with local variations when leading from seaward inshore. Care is required in the W approaches (12.63) to Dedele Point (10°14'S 148°44'E), and elsewhere where passages through the barrier reef join the inshore passage.

Hazards**12.6**

- 1 In Gulf of Papua, the coast is fronted by flats and shoals extending up to 30 miles offshore in some areas. During the height of the South-east Trade Winds this is a dangerous lee shore with a heavy surf breaking upon it; the sea breaks offshore in a depth of 7 m in places.
Large floating tree trunks and rafts of vegetation, washed down from the rivers of Gulf of Papua, are likely to be encountered within 100 miles of the coast and are hazardous to shipping; some of these may temporarily mark shoals on which they become stranded. Discoloured water may be found up to about 30 miles offshore in places.

Caution**12.7**

- 1 Extensive areas off the coast between South Cape and Port Moresby and in the vicinity of the barrier reef are unsurveyed, as indicated on the charts. Uncharted dangers may exist.

Local knowledge**12.8**

- 1 Local knowledge and large scale charts (see 1.15) are required in the vicinity of reef areas throughout the length of the passage inshore of the barrier reef and for all minor harbours and anchorages along the coast.

Currents

12.9

- 1 A general description of currents throughout the area covered by this book is given at 1.144. Currents off the S coast of Papua New Guinea are variable, as noted in a number of positions on the charts, and much influenced by the South-east Trade Winds, when rates up to about 1½ kn may be experienced.
- 2 During the South-east Trade Winds a S-going set between Ava Point (10°34'S 149°53'E) and Hood Point, 130 miles farther W, has been reported from vessels regularly navigating off this part of the coast. This set, at a rate of about ¾ kn, was experienced by HMAS *Paluma* in May 1961 after moderate SE winds for the preceding 4 days. A similar set was experienced in July of the same year. In August 1914, in the vicinity of Hood Point, a current was observed setting WSW at a rate of 20 miles a day.

- 3 During the NW Monsoon, SE-going sets with rates up to 2 kn may predominate. In April 1925 HMS *Bluebell*, on passage from Port Moresby to Samarai (10°37'S 150°40'E), experienced a current setting ESE at a rate of about 2 kn after the wind had been blowing strongly from NW for several days. In November 1886, during the monsoon, HMS *Diamond* was set 20 miles S in the one night between Keppel Point (10°10'S 147°58'E) and Port Moresby, 65 miles farther NW.
- 4 In the vicinity of Hood Point (see above), currents have also been noted setting SSE at a rate of 20 miles a day, but the season of observation is not recorded.

Coast radio station

12.10

- 1 There is a coast radio station at Port Moresby (9°28'S 147°08'E): see *Admiralty List of Radio Signals Volume 1(2)* for details.

SOUTH CAPE TO DEDELE POINT

GENERAL INFORMATION

Charts Aus 381, Aus 380

Scope of the section 12.11

- 1 In this section are described the inshore and offshore passages together with openings in Sunken Barrier Reef, from South Cape (10°43'S 150°14'E) to Dedele Point (10°14'S 148°45'E). Also described are the anchorages and harbours associated with this part of the coast.

SOUTH CAPE TO AVA POINT

General information

Chart Aus 381 (see 1.15)

Routes

12.12

- 1 From abreast South Cape (10°43'S 150°14'E) to Ava Point, 23 miles farther WNW, the offshore passage leads WNW through the area preferred for navigation to seaward of Sunken Barrier Reef.

The passage inshore of the barrier reef between South Cape and Ava Point is well charted, with general depths of 55 m (30 fm). South Cape and the navigable openings through the barrier reef in its vicinity, are described in *Pacific Islands Pilot Volume I*. The inshore passage gives access to a number of coastal anchorages (12.17).

Topography

12.13

- 1 Between South Cape (10°43'S 150°14'E) and Ava Point, the coast is indented with numerous bays. Mount Gugu Sari, formerly known as Cloudy Mountain, (9½ miles N of South Cape), stands at the E end of a steep, lofty coastal range and appears as a well-defined rounded peak from S but is not remarkable from any other direction. Between Fife Bay (10°36'S 150°01'E) and Ava Point, 9 miles farther W, there are wooded valleys and hills, most of which are cultivated.
- 2 Sunken Barrier Reef, over which the depths are very irregular and on which breakers have been reported in places, lies 6 miles offshore along this stretch of coast.

Landmark

12.14

- 1 Ava Point Lighthouse (white square concrete tower, 6 m in height) (10°34'S 149°53'E) standing on the summit of Ava Point.

Directions

(continued from Pacific Islands Pilot Volume I)

Offshore passage

12.15

- 1 From a position about 10 miles S of South Cape (10°43'S 150°14'E) the track leads WNW to seaward of the general line of Sunken Barrier Reef, passing (positions from Boutai Point (10°39'S 150°05'E)):
 - SSW of Guna Isu, formerly known as Rugged Head, (7¾ miles ESE). Guna Isu is the S-most point on the mainland of Papua New Guinea and rises to a height of 349 m 5 cables NE; Tauwalhia Bay lies immediately NW of the point. Thence:
- 2 SSW of a headland (5½ miles ESE), bold, prominent from W and rising abruptly to rugged hills of considerable height, covered with dense scrub and sharp protruding points of rock; Farm Peak (536 m (1758 ft) in height) is the highest point. The headland forms the W entrance point to Baxter Harbour. Thence:
- 3 SSW of Tree Point (2½ miles ESE), thence:
 - SSW of Boutai Point, 37 m in height; two islets, 36 and 32 m in height, lie close off the point; thence:
 - SSW of Cape Itihi (7 miles WNW), rising to a height of 191 m and forming the E entrance point to Gabugoghi Bay; thence:
- 4 SSW of Turea Island (9 miles WNW), 16 m in height; patches, with a least known depth of 3.6 m (12 ft) over them, lying up to 7½ cables SE and 4 cables S of the island, are the outermost dangers off the entrances to Sudaubo (Gabusanrea) and Gabusaiara Bays to be avoided when using the alternative inshore passage. Poupouri Island, 8 cables N of Turea Island, is 105 m in height and lies on a reef fringing the W entrance point to Gabusaiaru Bay. Thence:

Eagle Point



Light

Ava Point from SE (12.15)

(Original dated 1999)

- 5 SSW of Ava Point (13 miles WSW), rising to a height of 183 m and surmounted by Ava Point Light (12.14); an isolated 11 m (36 ft) patch, 1¼ miles SE, is the outer danger off the point. (Directions continue at 12.27)

Inshore passage

12.16

- 1 From a position about 1½ miles S of South Cape (10°43'S 150°14'E) (12.12) the track leads WNW for 23½ miles to a position about 2 miles SSW of Ava Point. The track passes clear NNE of Sunken Barrier Reef and closer SSW of the features described in directions for the offshore passage at 12.15 above. (Directions continue at 12.28)

Anchorage

Suau Island

12.17

- 1 **Anchorage** off the W side of Suau Island (10°42'S 150°15'E), of which South Cape is a part, is described in *Pacific Islands Pilot Volume I*.

Baxter Harbour

12.18

- 1 **General information.** Baxter Harbour (10°40'S 150°10'E) is entered between the headland rising to Farm Peak (12.15) and Tree Point, 3½ miles farther W. The N shore of the harbour, which is for the greater part low and wooded, is fringed by a reef extending as much as 6 cables offshore.

- 2 **Anchorage.** In 1849 during the South-east Trade Winds, HMS *Bramble* (161 tonnes, 22 m in length) anchored in a depth of 40 m (22 fm), mud, close inside the entrance and found smooth water.

Anchorage is also reported to be obtainable in a depth of about 11 m (36 ft) in the inner part of the harbour.

Fife Bay

12.19

- 1 **General information.** Fife Bay is entered between Leyama Point (10°38'S 150°01'E) and Danudanu Point, 1¼ miles farther NNW. The bay is not considered a well sheltered anchorage as there is always a swell and SW winds additionally raise a sea.

There are numerous villages on the shores of the bay and a college on the E side.

12.20

- 1 **Directions.** From a position within the inshore passage SW of Fife Bay the track leads ENE into the bay in depths that are greater than 18 m (60 ft) until close to the anchorage.

Leading marks:

- Front mark, mission station standing about 1 cable NE of Isuleilei Point (10°36'S 150°02'E) on a ridge rising inland.
- 2 Rear mark, a hill about 200 m in height, standing 7½ cables NE of Isuleilei Point.
- The alignment (057°) of the above marks leads ENE through the SE entrance to Fife Bay, passing (positions from Isuleilei Point):
- SSE of a bank, with a depth of 4.2 m (14 ft) over it, (2¼ miles WSW), thence:
- 3 NNW of Leyama Point (1¼ miles SW); a reef, which fringes the point at a distance of about 1 cable, then extends NE into the bay. Roux Islands,

consisting of five islands with coconut palms on them, lie on the same reef. Leyama Point and hills rising to a height of 79 m, 4 cables farther ESE, are almost separated from the mainland by a low isthmus. Thence:

NNW of a detached 5.5 m (18 ft) patch (1½ miles SW), thence:

- 4 SSE of Seu Seu (Seuseu) Islet (1¼ miles WSW) distant 1½ cables; depths less than 3.7 m (12 ft) extend up to ¾ cable ESE from the islet. Seu Seu Islet, 36 m in height, and Opea Islet, 44 m in height and 1½ cables farther NNW, lie together on a reef in the middle of the entrance. There is also a deep channel between this and the reefs fringing Danudanu Point, 5 cables farther WNW. Thence:
- 5 NNW of Momoni Islet (9 cables SW); depths less than 9 m (30 ft) extend up to ½ cable from the islet and from the fringing coastal reef.

The line of bearing 014° of the E edge of Geduna Islet (8 cables NW), lying on a reef at the head of the bay, then leads NNE, passing:

- 6 WNW of an isolated coral reef (6 cables WSW), with a least known depth of 4.1 m (13 ft) over it; Cardale Rock lies 3 cables farther ESE on the coastal reef; thence:
ESE of a 3.7 m (12 ft) patch (1.1 miles W).

The line of bearing 091° of the mission station then leads towards the anchorage.

- 7 **Anchorage** may be obtained in a depth of 16.5 m (54 ft), mud, SE of Geduna Islet, with the NE edge of the island bearing 336° distant about 5 cables.

Anchorage may also be obtained in the SE part of the bay, off Atana village (6½ cables S of Isuleilei Point) in depths of 13 to 15 m (43 to 49 ft), mud.

Facilities: hospital near Isuleilei Point; landing facilities in the same vicinity may be used by shallow-draught craft able to cross the coastal reef.

Gabugoghi Bay

12.21

- 1 **Anchorage**, sheltered from all winds, may be obtained in Gabugoghi Bay (10°36'S 149°58'E) which is entered between Cape Itihi (12.15) and Dagoabu Point (Cape Tawasuari), 1 mile farther W. Yamiga Islet, lying 5 cables SE of Cape Itihi and 2 cables offshore, is a remarkable rock and a good guide for identifying the entrance. A village stands on the E shore of the bay.

Kau Kau Bay

12.22

- 1 **General information.** Kau Kau Bay is entered between Ekutotoro Point (10°35'S 149°55'E) and Boruada Point 1¼ miles farther WNW. Ulawaboi Islets, 24 m in height and with some coconut palms on them, lie on a bank, with depths less than 5.5 m (18 ft) over it, which extends up to 1 mile W from Ekutotoro Point. An islet, lying 5 cables NNE of Boruada Point on a reef extending from shore, marks the entrance to the inner part of the bay which is almost landlocked.
- 2 Boruada Bay lies to seaward of Kau Kau Bay between Ekutotoro Point and Ava Point 2¾ miles farther W.
Anchorage may be obtained in a depth of 18 m (60 ft), mud, N of the islet marking the entrance to the inner part of the bay.

AVA POINT TO DEDELE POINT

General information

Charts Aus 381, Aus 380

Routes

12.23

- 1 From abreast Ava Point (10°34'S 149°53'E) the offshore passage leads WNW for 72 miles to a position to seaward of Rothery Passage and abreast Dedele Point (10°14'S 148°45'E). The route keeps well to seaward of the general line of the barrier reef and off-lying shoals, and leads through the areas preferred for navigation indicated on chart Aus 380.

The inshore passage between the same two points leads across the mouth of Orangerie Bay to Mailu Island (10°23'S 149°21'E), thence into Table Bay and close inshore off Batumata and Burumai Points.

Topography

12.24

- 1 From Mount Thompson (10°09'S 149°51'E), Owen Stanley Range extends WNW for 60 miles to Mount Suckling, which is flat-topped on its E side and the next highest summit to Mount Victoria (12.3). From Mount Suckling the range extends S to within 15 miles N of Dedele Point (10°14'S 148°44'E), its nearest approach to the coast, before turning NW towards Mount Victoria, distant 95 miles.
- 2 The coast between Ava Point (10°34'S 149°53'E) and Dedele Point (70 miles WNW) is mostly low, flat and wooded but in places hills covered with vegetation lie close to the coast; coconut plantations are visible on the sides of many of these hills. Dedele Point is low-lying and difficult to distinguish from outside the barrier reef but Table Top Hill which, although uncharted, stands about 10 mile ENE of the point, is aptly described by its name and can usually be identified when making a landfall.

Barrier reef

12.25

- 1 From the vicinity of Ava Point, the barrier reef, which here is submerged, extends WNW across the entrance to Orangerie Bay to the vicinity of Mogubu Point (35 miles WNW). The reef then extends W across the entrances to Table Bay and Baxter Bay; shoal patches both to seaward and inshore of the reef are shown on the chart.
Openings through the reef are described at 12.34.

Landmark

12.26

- 1 Ava Point Lighthouse (10°34'S 149°53'E) (12.14).

Directions for offshore passage

(continued from 12.15)

12.27

- 1 From a position SSW of Ava Point (10°34'S 149°53'E) (12.15) the track leads WNW to seaward of the barrier reef and off-lying shoals, passing:
SSW of Bona Bona Island (10°30'S 149°51'E), steep-sided, thickly wooded and separated from the high promontory of the mainland, 7 cables ESE, by San Roche Pass. Thence:
- 2 SSW of Mailu Island (10°23'S 149°21'E) (12.28), thence:
SSW of the entrance to Rothery Passage; a light (white framework tower, 22 m in height) (10°21'S 148°41'E), standing on the E end of West Reef, marks the entrance.
(Directions continue at 12.62)

Directions for inshore passage

(continued from 12.16)

Charts Aus 381, Aus 380 (see 1.15)

Ava Point to Mailu Island

12.28

- 1 **Direct route.** From a position about 2 miles SSW of Ava Point (10°34'S 149°53'E) (12.15) the track leads WNW across Orangerie Bay to a position about 1 mile NE of Mailu Island, 32 miles farther WNW, passing (positions from Juliade Island (10°25'S 149°35'E)):

SSW of Eagle Point (18½ miles ESE), which is easily identified; Eagle Rock, 4 cables W of the point, has the appearance from seaward of a vessel under sail. Thence:

- 2 SSW of Delami Island (15½ miles ESE), clifly and the outer danger SW of Bona Bona Island 5 cables farther NE (12.27), to which it is connected by a drying reef. Thence:

SSW of an 8.5 m (28 ft) patch (10½ miles SE), thence:

NNE of a 10 m (33 ft) shoal (9½ miles SE), and: SSW of a 9.5 m (31 ft) shoal (8 miles SE), thence: SSW of a 3 m (10 ft) patch (3 miles SSW), and:

- 3 SSW of Juliade Island, low and wooded, thence: Over a 10 m (33 ft) patch (4 miles SW), as draught permits, thence:

SSW of an 8.2 m (27 ft) patch (4½ miles WSW); several charted shoal patches lie between this and the coast, 3½ miles farther N; other shoals are believed to exist. Thence:

SSW of a drying reef (5½ miles W), which extends 7 cables E/W and usually breaks; thence:

- 4 SSW of Eunuoro Island (7 miles W), distant 1 mile. The island, which is rocky and covered with grass and a few trees, rises to high cliffs at its SE corner; a high rock stands close S of the island. Thence:

SSW of Ila-obu Rock (23 m (75 ft) in height) (8½ miles W); shoal depths extend 3 cables from the rock except on its S side. Thence:

- 5 NNE of a shoal (9½ miles W) with a least charted depth of 3.4 m (11 ft) over its SW end; thence: SSW of a 4.6 m (15 ft) patch (10 miles W), thence: NNE of a shoal (depth 6.1 m (20 ft)) (11½ miles W), thence:

NE of Mailu Island (13 miles W), reef-fringed and generally low but rising to its summit at the centre. The island is covered with grass and coconut trees; a village lies on the N side.

12.29

- 1 **Alternative route.** From a position close S of Ava Point (10°34'S 149°53'E) (12.15), an alternative track leads WNW on about 300° to the vicinity of the entrance to Geagea Doudou (24 miles WNW), passing (positions from Juliade Island (10°25'S 149°35'E)):

Close SSW of Eagle Point (18½ miles ESE) (12.28) and Eagle Rock, thence:

SSW of an 11 m (36 ft) patch (15 miles ESE) lying 7 cables SW of Delami Island (12.28), thence:

- 2 SSW of a 4.9 m (16 ft) patch (12 miles ESE), lying at the W end of foul ground which extends between 1 and 4 miles W from the NW extremity of Bona Bona Island and over which the sea breaks heavily; an isolated drying reef (reported 1972) lies 1 mile ESE of the patch. Tautauwata Islet, 3 miles E of the patch, which is 49 m in height and the

highest of several detached rocks lying off the NW point of Bona Bona Island, lies on the NE side of this foul ground. And:

- 3 Clear of an 8.5 m (28 ft) patch (10½ miles ESE), thence:

SSW of a 7.3 m (24 ft) patch (6 miles ESE), thence:

NNE of a 7.6 m (25 ft) patch (3 miles SE), thence:

Clear of a 4.9 m (16 ft) patch (1¼ miles ESE), thence:

NNE of Juliade Island (12.28) distant 2 cables. The island lies on the W end of a reef; shoal patches probably exist in this area. Thence:

- 4 NNE of a bank, with a least known depth of 4 m (13 ft) over it, (3 miles WNW), thence:

SSW of the entrance to Geagea Doudou (3¾ miles NW) (12.47); the harbour is surrounded by high land and the entrance is difficult to distinguish.

The track then leads W, keeping about 2 cables offshore and passing:

- 5 N of bank, with a least known depth of 6.1 m (20 ft) over it, (4½ miles WNW), thence:

S of a point (6½ miles WNW), the E entrance point to Sabiribo Doudou; two wooded islets and a rock lie off the point.

The track then continues leading W to join the direct route (12.28) about 1 mile NE of Mailu Island (13 miles W), passing:

- 6 S of a point (7½ miles WNW), the W entrance point to Sabiribo Doudou; an islet lies near the point. Thence:

N of Eunuoro Island (7 miles W) (12.28) and of Ila-obu Rock (12.28), 1 mile farther W, thence:

N of the 4.6 m (15 ft) patch (10 miles W) (12.28), thence:

NE of Mailu Island (12.28).

Chart Aus 380

Mailu Island to Batumata Point

12.30

- 1 From the position about 1 mile NE of Mailu Island, the track leads W on 270°, passing (positions from Onibu Point (10°16'S 149°11'E)):

S of Danawa Islet, also known as Double Rock, (12½ miles ESE), marking the SE extremity of reefs extending seaward from Mogubu Point, a prominent headland 3½ miles farther NW. Thence:

- 2 N of Mailu Island (12½ miles SE) (12.28), distant 5 cables; and:

S of a drying reef (12 miles SE); Laluoro Island, low and wooded, lies 1¼ miles N of the S edge of the reef. Thence:

Over an 8.8 m (29 ft) patch, as draught permits, (11 miles SE).

- 3 The line of bearing 120°, astern, of the summit of Mailu Island then leads WNW, crossing patches with depths of less than 9 m (30 ft) over them, into Table Bay, the shores of which are backed by Table Top and Inskip Ranges about 2 to 3 miles inland. The track leads to a position about 1½ miles S of Onibu Point, passing:

- 4 SSW of a drying reef (9 miles ESE), with a 4.9 m (16 ft) patch off its W end; Loupomu Island, low and wooded, lies 1¼ miles NNE of the reef. Thence:

NNE of a 4.3 m (14 ft) patch (8½ miles SE), thence:

Across a bank, with a least known depth of 6.4 m (21 ft) over it, (6½ miles SE), as draught permits, thence:

- 5 NNE of a 4-6 m (15 ft) patch (4½ miles SE), thence:
S of Onibu Point; a spit extends about 6½ cables SW
from the point.

The line of bearing 270° of Batumata (Table) Point
(12½ miles W), which is low but well-defined, then leads
W, passing:

- 6 N of two drying reefs (4 miles SW and 8½ miles
WSW), with breakers between them; thence:

N of Kidd Reef, which dries, (10½ miles WSW).

The track is then adjusted to pass S of Batumata Point,
distant 3 to 4 cables, passing:

N of a drying reef (12½ miles W).

12.31

- 1 **Caution.** The track across Table Bay described above is
frequently used by coastal vessels, but fixing is difficult as
the area has not been adequately surveyed. A vessel is best
kept on track by the use of bearings and distances of Mailu
Island and Batumata Point.

Chart Aus 380 (see 1.15)

Batumata Point to Burumai Point

12.32

- 1 From the position close S of Batumata Point (10°17'S
148°58'E) the track rounds the point to lead WNW on 295°
into Baxter Bay, which has a low and wooded coastline, to
a position about 2 or 3 cables off the village of Boru,
8 miles WNW of the point.

Local knowledge, or the charting authority's larger scale
chart, is essential for the passage from Boru village
(10°14'S 148°50'E) to Dedele Point, 6 miles farther W.

From Batumata Point the track passes (positions from
Batumata Point):

- 2 NNE of shoal depths (2 miles SW) extending NE
from Grange Reef, which dries; Grange Islet
(4½ miles WSW), low and wooded, lies on the
reef.

NNE of a below-water reef (5½ miles WNW).

The line of bearing 075°, astern, of Boru village then
leads WSW to Burumai Point (10 miles W), passing:

Across an area of reefs and below-water rocks
(8 miles W) lying in the W part of Baxter Bay,
thence:

- 3 SSE of Burumai Point, and:
NNW of a reef, lying 2 cables S of Burumai Point; a
beacon (port hand) marks the N edge of the reef.
The fairway is reported to be ¾ cable in width,
and deep.

Burumai Point to Dedele Point

12.33

- 1 From the position close SSE of Burumai Point (10°15'S
148°48'E) the track leads initially W across Henderson Bay,
passing (positions from Dedele Point (10°14'S 148°45'E)):

Close N of a below-water reef (2¼ miles ESE);
another reef lies about 4 cables farther N. Thence:

N of a dangerous rock (1¼ miles ESE), thence:

- 2 Close N of a beacon (port hand) (9 cables SSE)
marking Varoe Reef.

The track then leads WNW on 285°, passing:

SSW of Fan Reef (extending to about 6 cables SW
from the point); a beacon (starboard hand) marks
the SW edge of the reef. Dedele Point, behind the
reef, is a low, narrow and sandy point of land
fringed with coconut palms. And:

- 3 NNE of Cole Reefs (1¼ miles SW), which dry in
patches; a beacon (starboard hand) stands on the
W edge of the W-most of Cole Reefs. Thence:

Close N of Nell Rock Beacon (starboard hand)
(1¾ miles W).

(Directions continue at 12.63)

Openings in the barrier reef

Chart Aus 380

Passing Mailu Island

12.34

- 1 **General information.** A channel, 1 mile wide, which
passes about 2 miles E of Mailu Island (10°23'S 149°21'E),
leads from seaward of the barrier reef to give access to the
inshore route (12.28) and to a number of anchorages
between Geagea Doudou (10°22'S 149°32'E) (12.47) and
Mogubu Point (12.50), 12½ miles farther WNW.

12.35

- 1 **Directions.** From a position in open water SSE of Mailu
Island (12.28) the track leads N, passing (positions from
Mailu Island):

W of a 7-9 m (26 ft) patch (6½ miles SE), forming a
part of the barrier reef, and:

E of a 8-8 m (29 ft) patch (4½ miles S), thence:

E of Bonarua Island, also known as Turtleback
Island, (5 cables S), thence:

- 2 W of the shoal (3 miles ESE) (12.28), with the
shoalest part at the SW end; thence:

E of the shoal (1¼ miles ESE) (12.28).

Course may then be directed as required to join the
inshore passage (12.28). Otherwise the track continues N to
a position 1½ miles E of Danawa Islet (1¾ miles NNE)
(12.30), thence giving access to anchorages beyond.

Passing Grange Islet

12.36

- 1 A channel from seaward leading through a gap in the
barrier reefs 2½ miles ESE of Grange Islet (10°19'S
148°53'E) (12.32), is probably deep and may be the best
approach to Baxter Bay.

Chart Aus 380 (see 1.15)

Mindora Passage

12.37

- 1 Mindora Passage (10°21'S 148°47'E) lies between
Grange Reef and East Reef. The passage is marked by
heavy tide-rips, has not been examined and should be
avoided.

Rothery Passage

12.38

- 1 **General information.** Rothery Passage (10°22'S
148°41'E), which has a width of about 5 cables between
East and West Reefs and a deep fairway, is the principal
opening in this part of the barrier reef and may be
identified by the light (12.27) marking the entrance. The
passage leads to Dedele Point anchorages and to Cloudy
Bay. Use of the passage is not recommended at night.

12.39

- 1 **Directions.** From a position in open water SW of the
entrance, the track leads NE on 043° through the entrance
in mid-channel, passing (positions from Rothery Passage
Light (10°12'S 148°41'E)):

NW of below-water rocks (6 cables SE), extending W
and S from East Reef; and:

- 2 SE of the edge of West Reef, marked by Rothery
Passage Light (12.27); a beacon (port hand) stands
close NW of the light.

The track then leads N on 000°, passing:

E of Hodson Rock (3 miles N), distant 6 cables. The
rock is below-water and steep-to. Thence:

- W, distant 1½ cables, of the W extremity of Chapman Reefs (3½ miles N), marked by a beacon.
- 3 The track is then adjusted to 005°, passing:
E of Silvio Reefs (4 miles N) distant 3½ cables; thence:
W of a beacon (starboard hand) (5½ miles N), distant 5 cables. The beacon marks the W side of Rot Reef. An alternative deep channel between Rot Reef and Elevala Reefs, 6 cables farther E, may be used by coasters but requires local knowledge.
- 4 The track then leads NE on 035°, passing:
SE of a beacon (7 miles N), distant 8 cables. The beacon marks Neutral Reef. Thence:
NW of Nell Rock Beacon (7 miles NNE) (12.33), distant 1 cable.
- Course may then be directed to follow the inshore route (12.33), or to proceed to an anchorage (12.53) off Dedele Point (7¾ miles NNE).

Anchorage and harbours

Chart Aus 381 (see 1.15)

Argyle Bay

12.40

- 1 **General information.** Argyle Bay is entered between Eagle Point (10°33'S 149°51'E) (12.28) and a point 1½ miles NNE. The S shore of the bay extending ENE from Eagle Point is steep and hilly; the N shore is low and wooded.

Directions. From a convenient position W of Eagle Point the track into Argyle Bay leads ENE, passing (positions from Eagle Point):

- 2 NNW of Eagle Rock (4 cables W) (12.28), thence;
NNW of a dangerous rock (4 cables N), existence doubtful, thence:
SSE of Toua Islet (1¼ miles N); some low above-water rocks lie NE of the islet. Thence:
SSE of a drying rock (1½ miles NNE).

Anchorage, in mud and well sheltered from SE winds, may be obtained as required in the bay. In 1884, HMS *Espiegle* (1130 tonnes, 52 m in length) anchored in a depth of 13 m (42 ft) with Eagle Point bearing about 237° and the N entrance point bearing 303°.

Bona Bona Island

12.41

- 1 **General information.** Bona Bona Island (10°30'S 149°51'E) (12.27) stands in the SE part of Orangerie Bay and athwart the entrance to Mullins Harbour, 2½ miles farther E.

Anchorage in the vicinity of Bona Bona Island may be obtained:

- 2 In depths of 14 to 18 m (46 to 59 ft) in San Roche Pass (12.43); the anchorage is sheltered and may be approached from SW or round the N end of Bona Bona Island.
- In a depth of 22 m (12 fm), mud, W of the reef connecting Bona Bona and Delami Island (12.28) close SW. The anchorage is well sheltered during SE winds but swinging room is restricted by the partly encircling reef. The berth is always accessible but local knowledge is required.
- 3 NE of Tautauwata Islet (8 cables NW of Bona Bona) (12.29) distant 5 cables. The anchorage may be approached by passing close N of the islet but clear of the foul ground extending W from it.

Mullins Harbour

12.42

- 1 **General information.** Mullins Harbour, which is a large but generally shallow extension from the E end of Orangerie Bay, is entered through Maruta Passage between Debana Point (10°30'S 149°55'E) and Wabitu Point (1 mile SW). Charted depths of more than 11 m (36 ft) in the fairway through the entrance extend on the S side of the harbour to 3½ miles E of Wabitu Point. Farther in there are extensive mudbanks and the N side of the harbour is shoal. Approach to the harbour may be made from SW through San Roche Pass, with a least known depth of 8.2 m (27 ft) at its N end; or from NW, passing N of Bona Bona Island, in a least known depth of 3 m (10 ft).

12.43

- 1 **Directions for San Roche Pass.** From a position about 1½ miles W of Eagle Point (10°33'S 149°51'E) (12.28) the track leads NE through San Roche Pass, passing (positions from Eagle Point):

NW of Toua Islet (1¼ miles N) (12.40), thence:
SE of Bona Bona Island (1¼ miles N) (12.27), favouring the deeper water on the NW side of the pass.

- 2 The track then leads E towards Debana Point (5 miles NE), passing:

S of Hazard Rock (depth 1.5 m (5 ft)) (3¾ miles NNE), with clear water on all sides; thence:
N of Wabitu Point (4 miles NE).

12.44

- 1 **Directions from north-west.** From a position about 9 miles NW of Bona Bona Island a track, frequently used by small vessels of suitable size and draught, leads across the inner part of Orangerie Bay to Mullins Harbour.

Leading marks:

- Front mark, the NE extremity of Bona Bona Island (10°30'S 149°51'E) (12.27).
- 2 Rear mark, a hill (5 miles farther SE), 393 m (1288 ft) in height and standing on the mainland. The alignment (130°) of the above marks leads SE (see caution below), passing (positions from the front mark):
SW of an islet (8 miles NW), thence:
SW of a 3.7 m (12 ft) patch (7 miles NW), thence:
3 SW of a reef (least depth 1.0 m (3 ft)) (5½ miles NW), distant about 5 cables. The reef is extensive and usually breaks. Thence:
NE of Tautauwata Islet (2½ miles WNW) (12.29).
The track then leads ESE to join the track through San Roche Pass, passing:
- 4 Along the N coast of Bona Bona Island, thence:
NNE of Waliaba Islet (5 cables SE).
- Caution.** It is advisable to keep carefully to the alignment of the leading marks as other below-water reefs may exist on both sides of this track.

12.45

- 1 **Anchorage.** The usual anchorage is off the S side of the entrance, close SE of Wabitu Point in the bite between there and Isubada Point, 2 miles farther ESE.

Chart Aus 380

Orangerie Bay

12.46

- 1 **General information.** Orangerie Bay, which is entered between Eagle Point (10°33'S 149°51'E) and Island Bluff on the E side of the entrance to Geagea Doudou, 22 miles farther NW, is impeded by numerous reefs and shoal patches as shown on the chart. From Debana Point (10°30'S 149°55'E) (12.42) (chart Aus 381) to a position

about 6 miles E of Island Bluff the coast is flat, densely wooded and intersected by numerous creeks; a coastal range of hills then rises from the shore and continues W.

- 2 **Directions.** A track across the inner part of the bay is described at 12.44.

Anchorage may be obtained about 7½ cables SW of Gadaisu village (10°22'S 149°47'E). A beacon marks the outer end of a drying reef which extends about 5 cables offshore from the village.

- 3 **Side channel.** From the vicinity of 10°22'S 149°43'E a track which connects with that described at 12.44, leads W along the N shore of the bay to pass through a small craft channel N of Baibara Island (10°22'S 149°36'E). The channel lies between a beacon, marking a reef extending 1¾ cables from the NE extremity of the island, and the shore.

Geagea Doudou

12.47

- 1 **General information.** Geagea Doudou or Port Glasgow (10°22'S 149°32'E), which is landlocked and backed by high land, is the best small harbour on the coast. The shore of the harbour is fringed with a reef extending up to 1 cable offshore in places; the W end is shallow and impeded by reefs.

- 2 **Approach.** Geagea Doudou is best approached from seaward through the opening in the barrier reef E of Mailu Island; see 12.34 and 12.29 for details.

Anchorage may be obtained in depths of 7 to 11 m (23 to 36 ft), mud. Some ground swell enters the harbour at times.

Sabiribo Doudou

12.48

- 1 **General information.** Sabiribo Doudou or Millport Harbour (10°22'S 149°28'E) is entered about 3½ miles W of Geagea Doudou (12.47). The entrance (described at 12.29) is about 5 cables wide with depths of 18 m (60 ft) gradually shoaling to 7 m (23 ft), mud. Clumps of coconut palms, with white sandy beaches between, form the shores of the harbour which are fringed by a coral reef extending up to 1 cable offshore in places.

- 2 **Approach.** Sabiribo Doudou is best approached from seaward through the opening in the barrier reef E of Mailu Island; see 12.34 and 12.29 for details.

Anchorage may be obtained as convenient within the harbour, keeping clear of Dirivise Rock (depth 1.5 m (5 ft)), lying close off the N shore, and Ebeibi Reef 1 cable farther WNW, which dries. The harbour is subject to some swell.

Lannoka Doudou

12.49

- 1 **General information.** Lannoka Doudou or Mayri Bay (10°20'S 149°26'E) is about 1½ miles wide at its entrance; a spit extends nearly 5 cables W from the SE entrance point. The sandy shores of the bay are fringed with reefs extending over 5 cables offshore in places; the head of the bay is shoal.

Approach. Lannoka Doudou is best approached from seaward through the opening in the barrier reef E of Mailu Island; see 12.34 for details.

Anchorage, sheltered during SE winds, may be obtained in the bay in depths of 11 to 18 m (36 to 60 ft), mud.

Selae Doudou

12.50

- 1 **General information.** Selae Doudou, or Amazon Bay, is entered between Mogubu Point (10°19'S 149°20'E) (12.30) and a point ¾ miles E. The bay, which has numerous off-lying reefs and shoal patches, is generally shallow, with depths decreasing from 11 m (36 ft) between the entrance points to 3.7 m (12 ft) over mud, at its head. The shores are fringed with reef. There is a government station at Magarida, 1½ miles NE of Mogubu Point.

- 2 **Anchorage** may be obtained within the bay, but an outer anchorage in depths of about 13 m (42 ft), mud, NW of Laluoro Island (10°21'S 149°21'E) (12.30) is recommended. From a position close E of Danawa Islet (12.30) (1½ miles ESE of Laluoro Island), the line of bearing 308° of Mogubu Point leads to the anchorage, but great care is needed to avoid numerous shoals and reefs lying close to the track.

- 3 Anchorage may also be obtained off Magarida but the approach and anchorage are only suitable for small craft and vessels with draughts less than 2.5 m.

Facilities: small airstrip and small hospital with limited medical facilities at Magarida; small wharf at Mogubu Point.

Mailu Island

12.51

- 1 **Anchorage** may be obtained within a bight in the reef fringing the N side of Mailu Island (10°24'S 149°21'E) (12.28), but the berth is considered to be poor.

Baxter Bay

12.52

- 1 **Anchorage**, with good shelter during the South-east Trade Winds, may be obtained off the village of Magaubo (10°16'S 148°57'E) at the E end of Baxter Bay.

Chart Aus 380 (see 1.15)

Dedele Anchorage

12.53

- 1 **General information.** Dedele Anchorage (10°14'S 148°45'E) may be used by vessels up to about 120 m in length with a maximum draught of 6 m. Good shelter may be obtained in all weathers by selecting a berth either E or W of Dedele Point. The anchorage E of the point is recommended during the NW monsoon and will better accommodate larger vessels up to the size described above.

- 2 **Approaches** to the anchorage may be made from the inshore route (12.33), or from seaward through Rothery Passage (12.38), entered 8½ miles SSW of Dedele Point.

Local knowledge and a large scale chart are required.

12.54

- 1 **Directions for west anchorage** (positions from Dedele Point). From a position 1 cable NW of Nell Rock Beacon (1¾ miles W) (12.33) the track leads ENE on 078° to pass ¾ cable N of Clay Reef Beacon (starboard hand) (6 cables W).

The line of bearing 104° of Burumai Point (3 miles ESE) (12.32) then leads to the anchorage, passing:

S of Smith Rock (4¾ cables NW), marked by a beacon (port hand).

12.55

- 1 **Directions for east anchorage** (positions from Dedele Point). From a position close N of Nell Rock Beacon (1¾ miles WSW) (12.33), the track leads ESE following the inshore route (12.33), passing:

NNE of Cole Reefs (1½ miles SW), thence:

SSW of Fan Reef Beacon (6 cables SW) (12.33).

When Varoe Reef Beacon (9 cables SSE) is distant $2\frac{3}{4}$ cables ahead, the track leads NE, passing:

- 2 Midway between Varoe Reef and a shoal, with a depth of 2.4 m (8 ft) over it, ($2\frac{3}{4}$ cables NW of Varoe Reef Beacon); thence:

Not less than $2\frac{1}{4}$ cables SE of a beacon (starboard hand) marking the E end of Kerwin Reef (5 cables SE).

The track then leads N. The line of bearing 269° of Clay Reef Beacon (6 cables W) (12.54), seen over Dedele

Point, then leads to the anchorage.

12.56

- 1 **Anchorage** may be obtained (positions from Dedele Point):

W side: in a depth of about 11 m (36 ft) with Burumai Point (3 miles ESE) bearing 104° and Fan Reef Beacon (6 cables SW) bearing 208° .

E side: in a depth of about 9 m (30 ft) with Clay Reef Beacon (6 cables W) bearing 269° , distant about $8\frac{1}{2}$ cables.

DEDELE POINT TO YULE ISLAND

GENERAL INFORMATION

Charts Aus 379, Aus 380

Scope of the section

12.57

- 1 In this section are described the inshore and offshore passages together with openings in Sunken Barrier Reef, from Dedele Point ($10^\circ14'S$ $148^\circ45'E$) to Yule Island ($8^\circ49'S$ $146^\circ32'E$). Also described is the port of Port Moresby ($9^\circ28'S$ $147^\circ08'E$) (12.115), together with the anchorages and harbours associated with this part of the coast.

DEDELE POINT TO HOOD POINT

General information

Chart Aus 380 (see 1.15)

Routes

12.58

- 1 **Offshore passage.** From abreast Dedele Point ($10^\circ14'S$ $148^\circ45'E$) the offshore passage leads WNW for 61 miles to a position abreast Hood Point ($10^\circ06'S$ $147^\circ43'E$). The route keeps well to seaward of the general line of the barrier reef and off-lying shoals, and leads through the areas preferred for navigation indicated on the chart.
- 2 **Inshore passage.** The inshore passage between the same two points leads W to Cape Rodney ($14^\circ13'S$ $148^\circ24'E$), thence to Aroma Passage, $23\frac{1}{2}$ miles farther W, which is the W-most of a number of reef entrances through which the open sea must be gained for the passage to Wolverine Entrance, $3\frac{1}{2}$ miles WNW of Hood Point.
- 3 **Caution.** Some of the beacons between Dedele Point and Cape Rodney do not conform to the general direction of buoyage described at 12.5.

Local knowledge, or larger scale charts, are essential for the inshore passage.

Topography

12.59

- 1 Cloudy Bay, which lies W of Dedele Point ($10^\circ14'S$ $148^\circ45'E$), is backed by mountains and foothills over which the clouds hang low during the South-east Trade Winds. Between Mariamata Point, the W entrance point to Cloudy Bay, and Cape Rodney ($14\frac{1}{2}$ miles W) the coast is low, wooded and backed by hills of moderate height. The coast then continues low and wooded as far as Kaligola Point (8 miles WNW) and lacks identifiable features, except for some wooded hills, the SE of which is saddle-shaped, lying at the head of Cheshunt Bay ($10^\circ10'S$ $148^\circ18'E$) and visible at 25 miles in clear weather. From Kaligola Point to

McFarlane Harbour, 7 miles farther WNW, the coast is high and steep.

- 2 From McFarlane Harbour ($10^\circ05'S$ $148^\circ10'E$) to Keppel Point (13 miles SW) the coast fronting the coastal plain is sandy and mostly without a fringing reef. Thence to Hood Point ($10^\circ06'S$ $147^\circ43'E$) the coast, which is flat and wooded, is backed by Macgillivray Range, moderately high, scantily wooded and sandy at its W end. Mangrove swamps extend several miles inland from Keppel Point.

Limiting draught

12.60

- 1 That part of the inshore passage from Whitish Reef ($10^\circ12'S$ $148^\circ17'E$) to Aroma Passage, 17 miles farther W, is not recommended for vessels drawing more than 5.5 m. Other draught limitations exist in Aroma Passage itself (12.76).

Barrier reef

12.61

- 1 The barrier reef, lying for the most part about 10 miles offshore, is almost continuous between Rothery Passage ($10^\circ21'S$ $148^\circ41'E$) and Aroma Passage (40 miles WNW), but has several openings in it. From Aroma Passage to Hood Point (17 miles WNW) there is no navigable channel inshore of the barrier reef, which is broken and in some places touches the coast.

Openings through the reef are described at 12.67 to 12.76.

Directions for offshore passage

(continued from 12.27)

12.62

- 1 From a position SSW of Rothery Passage Light ($10^\circ21'S$ $148^\circ41'E$) (12.27) the track leads WNW, keeping well to seaward of the general line of the barrier reef and passing: SSW of Coutance Islet ($10^\circ14'S$ $148^\circ07'E$), low and wooded; thence:

- 2 SSW of Hood Point ($10^\circ06'S$ $147^\circ43'E$), fringed by reefs extending offshore as shown on the chart, and low and wooded; a light (white framework tower, 20 m in height) stands on the point. The point is reported to be identifiable on radar to a distance of 25 miles.

(Directions continue at 12.102)

Directions for inshore passage

(continued from 12.33)

Dedele Point to Cape Rodney

12.63

- 1 From a position close N of Nell Rock, $1\frac{3}{4}$ miles WSW of Dedele Point ($10^\circ14'S$ $148^\circ45'E$) (12.33), the track leads initially W on 268° , passing (positions from Dedele Point):

S of Neutral Reef (3 miles W) (12.39), thence:
N of Flint Rock (depth 2.4 m (8 ft) (3¼ miles W), thence:

- 2 S of a beacon (port hand) (4½ miles W) marking the S side of a reef forming part of the chain of Cloudy Reefs, which extend about 5 miles SSW from the middle of Cloudy Bay.

The track then leads WNW on 295° through a narrow opening in the S part of Cloudy Reefs; the water in the vicinity is often discoloured. The track passes:

- 3 NNE of a beacon (starboard hand) (5¼ miles W), marking the N side of the adjacent reef in the chain.

The line of bearing 098° of the E of the Cloudy Reef Beacons (4½ miles W) astern, then leads W on 278° to a position about 3 cables S of a beacon (port hand) marking Weriseri Shoal (7¼ miles W).

- 4 The track then leads W to a position about 8 cables S of Cape Rodney (20½ miles W), passing:

S of black rocks forming the S edge of an area of reefs and sandbanks extending 2 miles to seaward of Sandbank Point (10 miles WNW); a beacon (port hand) (11 miles W) marks the outer edge of the rocks. Thence:

- 5 S of a bank (depth 4.2 m (14 ft)) (15¼ miles W), thence:

N of Emerald Shoal (depth 7 m (23 ft)) (16¾ miles W), the E end of which has not been examined; thence:

N of Eros Shoal (depth 4 m (13 ft)) (18½ miles W), unexamined and consisting of several patches; and:

S of two patches, with a least depth of 6.7 m (22 ft) over them, (18½ miles W). There is a width of about 4 cables in the channel between these patches and Eros Shoal. Thence:

- 6 S of Clay Shoal (depth 3 m (10 ft)) (20¼ miles W), consisting of two patches with the same depth over each, but not easily seen. Cape Rodney, 5 cables farther NNW, is a low, wooded point, difficult to identify from seaward. Otomata Plantation house (white, with a silver-coloured roof) stands 4 cables NNW of the cape; a sawmill is situated 8 cables farther NNW. An inshore channel, about 1¾ cables wide and with depths of 5.5 to 9 m (18 to 30 ft), lies between Clay Shoal and the cape.

Cape Rodney to Whitish Reef

12.64

- 1 From the position S of Cape Rodney (10°13'S 148°24'E), the track leads W on 276° through a channel which has been wire swept to a depth not less than 10.7 m (35 ft) over a least width of 4 cables. The track passes (positions from Cape Rodney):

N of Grass Patch Reef (3¼ miles WSW), distant about 3 cables. A beacon (port hand) marks the N side of the reef. Thence:

- 2 N of a patch (depth 7.9 m (26 ft)) (4 miles WSW), isolated and unexamined; thence:

S of an isolated patch, with a depth of 10.3 m (34 ft) over it, (not shown on the reference chart) (4¼ miles W), lying close N of the swept channel.

The track then leads to a position about 6 cables SW of a beacon (starboard hand) (7 miles W), marking the NW edge of Whitish Reef, passing:

- 3 S of Whitish Reef (6¼ miles W), which dries; a beacon marks the centre of the reef and another beacon (starboard hand) marks the SW edge.

The track then leads NW on 325° for 7 cables, passing:
SW of a 2.1 m (7 ft) patch (7½ miles W) distant about 3 cables, and:

NE of a 6.4 m (21 ft) coral patch (8 miles W), distant about 5 cables.

Whitish Reef to Aroma Passage

12.65

- 1 From the position W of Whitish Reef (10°12'S 148°17'E) to Aroma Passage, 17 miles farther W, the inshore passage passes through water which has not been swept by wire or sonar. The controlling draught for this leg of the passage is given at 12.60.

The line of bearing 100° of Whitish Reef NW Beacon astern leads W on 280° to a position about 2½ cables N of a beacon (10°11'3S 148°11'4E) standing on the NW extremity of Twelve Mile Sandbank. The track passes (positions from Coutance Islet (10°14'S 148°07'E)):

- 2 S of Middle Reef (7½ miles ENE), distant 3 cables.

The reef is divided by deep water into three parts; a 7.3 m (24 ft) patch lies 5 cables farther E. Thence:

N of a 1.2 m (4 ft) patch (6 miles ENE); a 2.1 m (7 ft) patch lies 5 cables farther SSW. Thence:

N of Twelve Mile Sandbank (4¾ miles ENE); the beacon should be sighted at a range of 4½ miles; and:

S of a bank, with a least charted depth of 4.9 m (16 ft) over it (5¼ miles ENE).

- 3 The track then continues W, adjusted as required to lead to a position about 2½ cables N of Howard Reef (3 miles NNE). This part of the passage is narrow and bordered by numerous reefs and shoals, the positions of which may be seen on a large scale chart of the area. The passage should be made in favourable light conditions when the shoalest patches can usually be seen; muddy water flowing out from Marshall Lagoon (8½ miles NNE) sometimes renders these patches invisible.

- 4 From Howard Reef the track leads W on 280°, on the line of bearing 100°, astern, of Twelve Mile Sandbank Beacon (see above for likely visible range), to Toveli Entrance (12.74). The same track continues farther W, if required, to the N entrance to Aroma Passage (7½ miles WNW) (12.76), passing:

Close N of a 6.1 m (20 ft) patch (5 miles NW), thence:

- 5 Over a 6.7 m (22 ft) patch (5¾ miles NW), thence:
N of Nawale Reef (6 miles WNW); a prominent mangrove lies on the N part of the reef.

Useful mark:

Toveli Hill (10°06'S 148°05'E), isolated, low, bare and dome-shaped, rising from the surrounding coastal plain.

Aroma Passage to Hood Point

12.66

- 1 From abreast the seaward entrance to Aroma Passage (10°11'S 147°59'E) (12.76) the track leads WNW in the open sea, in generally unsurveyed waters, to the vicinity of Hood Point (10°06'S 147°43'E), from where the barrier reef may be re-entered through Wolverine Entrance, 3½ miles farther WNW. The track passes (positions from Hood Point):

- 2 SSW of a reef extending about 1 mile S and 4 miles W from Keppel Point (15 miles ESE). The point is low and wooded, with mangrove swamps extending several miles inland and 7 miles NW to Hood Lagoon. Thence:

SSW of a steep-to reef extending about 3 miles SSW from Kele Iruna Point (7½ miles E), thence:

- 3 Across the entrance to Hood Bay (close E), the shores of which are low and wooded, thence: SSW of Hood Point (12.62).

Caution. During the South-east Trade Winds, small vessels proceeding E will be heading directly into wind and sea on this exposed part of the inshore passage. It is advisable to make the passage during the forenoon when the wind will not usually have attained its full strength.

(Directions continue at 12.103)

Openings in the barrier reef

Rodney Entrance

12.67

- 1 **General information.** Rodney Entrance (10°17'S 148°26'E) has an overall width of 9 cables within which there is a channel with a least width of 4 cables, wire swept to a depth of 10.7 m (35 ft) throughout its length. The entrance, which gives access to the inshore passage (12.63) S of Cape Rodney and to anchorages (12.81) within the barrier reef, is recommended in preference to entrances farther W.

12.68

- 1 **Directions.** From a position SSW of the entrance, the line of bearing 020° of a plantation house, 5 cables W of Baramata, a village situated close to Baramata Point (10°12'S 148°28'E), leads NNE midway through the entrance, passing (positions from Cape Rodney (10°13'S 148°24'E)):

WNW of the SW extremity (7 miles SSE) of the barrier reef on the E side of the entrance, thence:

- 2 ESE of the E extremity of Tagula Shoals, with depths of 5.5 m (18 ft) or less over them, (4 miles SSE), which form the NW side of the entrance and are unexamined.

When Cape Rodney (12.63) bears 313°, the track leads WNW on 298° to a position about 1¼ miles S of the cape, passing:

- 3 SSW of Eros Shoal (1¾ miles SE) (12.63); patches, with a least depth of 4.9 m (16 ft) over them, lie up to 7½ cables SE from the shoal but clear of the swept channel. Thence:
NNE of a detached reef (2 miles S).

Course may then be directed to join the inshore passage (12.63) or as otherwise required.

Paluma Entrance

12.69

- 1 **General information.** Paluma Entrance (10°17'S 148°15'E) is entered from seaward through a channel 2 cables in width which has been wire swept to a depth of 11 m (36 ft). The swept channel then continues 5 miles farther inshore, with widths between 3½ and 5 cables, to join the inshore passage SW of Whitish Reef and give access to Cheshunt Bay. The entrance is not recommended for vessels with draughts of more than 9 m and, when approaching from seaward, should only be attempted when light conditions are favourable.

12.70

- 1 **Directions.** From a position S of Paluma Entrance (10°17'S 148°15'E), the track leads N on 005° through the entrance in mid-channel, passing (positions from Paluma Entrance):

W of Ragalapara Reef (close E); a beacon (black) marking the W end of the reef, which is

moderately steep-to, should be passed at a distance of 2½ cables. And:

- 2 E of a below-water part of the barrier reef (close W), unexamined and difficult to see, which extends 2¾ miles ESE from Kailave Reef.

Thence the track leads NNE on 014°, passing:

ESE of a patch (depth 5.5 m (18 ft)) (¾ miles N), thence:

WNW of a patch (depth 5.8 m (19 ft)) (¾ miles NNE), and:

- 3 ESE of a small detached reef (¾ miles N), marked by a beacon (port hand).

With the above beacon abeam, the track then leads NNE on 023° for 11 cables to a position about 1 mile SW of the W end of Whitish Reef (5½ miles NNE) (12.64), passing:

ESE of the 6.4 m (21 ft) patch (5 miles N) (12.64).

Course may then be directed as required for the inshore passage (12.64), or for Cheshunt Bay (12.82).

Sunday Entrance

12.71

- 1 **General information.** Sunday Entrance (10°15'S 148°09'E) has an overall navigable width of about 3 cables and depths greater than 37 m (20 fm) over a width of 1½ cables in mid-channel. The entrance, which is unmarked and must be navigated by eye, affords a good exit at all times but should only be entered from seaward at LW and in favourable light conditions.

12.72

- 1 **Directions.** From a position in open waters SSE of Coutance Islet (10°14'S 148°07'E) (12.62), the track leads NNE through the entrance, favouring the E side of the channel and passing (positions from Coutance Islet):

WNW of Kailave Reef (2½ miles ESE), the NW edge of which is moderately steep-to, and:

ESE of below-water dangers (2¼ miles ESE), which form the W side of the entrance and lie up to 3 cables from the end of the reef extending from Coutance Islet.

- 2 From within the entrance the line of bearing 285° of the N edge of Coutance Islet astern leads ESE on 105°, passing:

SSW of an area of reef and shoal patches (2¾ miles E); the S edge of the area is about 1½ miles in length. And:

NNE of the inner edge of the barrier reef.

The track continues thus until N of Paluma Entrance (8 miles ESE) (12.69), when directions for that channel may be followed.

12.73

- 1 **Side channels.** From the vicinity of a position 6 miles ESE of Coutance Islet a track, which follows the line of bearing 003° of the end of a ridge extending about 1 mile ESE from Olupara (10°04'S 148°12'E), leads 4 miles N to join the inshore passage about 1¼ miles E of Twelve Mile Sandbank (12.65). Care is required to pass clear of the patches (12.65) lying 6 miles ENE of Coutance Islet.

- 2 From the vicinity of a position 7¼ miles ESE of Coutance Islet, a second track, which follows the line of bearing 048° of the E of two grass patches N of Inawaimana Point (10°11'S 142°20'E), leads 4½ miles NE to join the inshore passage about 6 cables SE of Whitish Reef (12.64). The track passes SE of the patches (12.70), ¾ miles N and ¾ miles NNE of Paluma Entrance, and NW of a dangerous patch 2 miles farther E.

Local knowledge and a suitable draught (12.60) are essential for both the above tracks.

Toveli Entrance**12.74**

- 1 **General information.** Toveli Entrance ($10^{\circ}11'S$ $148^{\circ}05'E$), which is 2 miles wide and free of dangers, gives access to the section of inshore passage between Whitish Reef and Aroma Passage, and to McFarlane Harbour ($10^{\circ}05'S$ $148^{\circ}10'E$). The entrance is deep, but see 12.60 for the controlling draught for the inshore passage.

12.75

- 1 **Directions.** From a position S of the entrance the line of bearing 010° of Toveli Hill ($10^{\circ}06'S$ $148^{\circ}05'E$) (12.65) leads N, passing (positions from Toveli Hill):
W of Coutance Islet ($7\frac{3}{4}$ miles SSE) (12.62), thence:
E of Nawale Reef (5 miles SW) (12.65), thence:
W of a bank, with a depth of 3 m (10 ft) over its NW end ($5\frac{1}{2}$ miles S).
- 2 When the coast ahead is distant 3 miles the line of bearing 068° of a beacon ($6\frac{1}{2}$ miles ESE), which gives a good radar response and marks a small drying reef, leads ENE, passing:
SSE of the patch (4 miles SSW) (12.65), and:
NNW of the bank ($5\frac{1}{2}$ miles S), thence:
NNW of a bank, with a least known depth of 2.4 m (8 ft) over it, ($5\frac{1}{2}$ miles SSE).
- 3 Course may then be directed E to follow the inshore passage (12.65), or continued ENE towards McFarlane Harbour (12.87).

Aroma Passage**12.76**

- 1 **General information.** Aroma Passage ($10^{\circ}11'S$ $147^{\circ}59'E$), which leads between reefs close offshore, is narrow and obstructed at its seaward end by a bar over which there is a least depth of 3.6 m (12 ft). The passage, marked on its W side by two beacons, and on its E side by four beacons, gives access to the inshore passage and to an anchorage in Keakoro Bay. It should not be attempted in either direction under conditions of heavy weather from SW, Toveli Entrance being used instead.

12.77

- 1 **Directions.** From a position in open water SSW of the entrance, the approximate line of bearing 018° of the S beacon on the E side of the channel (8 cables S) open slightly W of the third beacon from seaward on that side (4 cables SSE) leads NNE, passing (positions from Paramana Point ($10^{\circ}10'S$ $148^{\circ}00'E$):
WNW of the S end ($2\frac{1}{2}$ miles S) of Nawale Reef (12.65), thence:
Across the bar ($1\frac{1}{4}$ miles S), thence:
ESE of the S beacon on the W side ($1\frac{1}{4}$ miles SSW), distant not less than 2 cables. The beacon stands back from the extremity of a reef on the W side of the bar.
- The track then leads N on about 006° , passing:
W of the S beacon on the E side (8 cables S), distant $\frac{3}{4}$ cable, thence:
W of the second beacon on the E side ($4\frac{1}{2}$ cables S), distant 1 cable.
- 3 The track then leads NE into Keakoro Bay, passing:
Midway between the two beacons ($2\frac{1}{2}$ and 4 cables SSE), marking the channel off a spit extending from Paramana Point; thence:
NW of the N beacon on the E side (6 cables E). Keppel Point (2 miles W) will by then have closed behind Paramana Point.
- Course may then be directed to join the inshore passage (12.65), or as otherwise required.

Anchorage and harbours**Cloudy Bay****12.78**

- 1 **General information.** Cloudy Bay, which is fringed with mangroves and reported to be silting up from the several rivers discharging into it, is entered between Dedele Point ($10^{\circ}14'S$ $148^{\circ}45'E$) and Mariamata Point $6\frac{3}{4}$ miles farther WNW. Abau Island, on which the government station for the district is situated, lies in the middle of the bay and may be approached from S through a channel with a reported least depth of 3.6 m (12 ft) at LW.
- 2 Aivaguina River, fringed with mangroves, discharges into the NE part of the bay and leads to Robinson River Plantation where there is an airstrip.

Local knowledge is essential. The bay is unsurveyed.

12.79

- 1 **Directions** (positions from Dedele Point). From the inshore passage (12.63) in the vicinity of Neutral Reef (3 miles W), the line of bearing 012° of the W extremity of Abavi Island ($3\frac{1}{4}$ miles NNW), low and swampy but rising to Pyramid Hill, 60 m in height, at its E end, leads NNE with Neutral Reef Beacon bearing 192° astern, passing:
ESE of Cloudy Reefs ($3\frac{1}{4}$ miles WNW) (12.63).
- 2 When the passage between Abavi Island and Abau Island (4 miles NW), 61 m in height and covered with coconut palms, is distant 5 cables, the track leads N towards the middle of the passage and thence to the wharf on the E side of Abau Island.
- Berth.** Small vessels with draughts of less than 3 m are reported to be able to berth alongside the wharf. There is a boat jetty on the W side of Abau Island.
- Anchorage.** The nearest is at Dedele Anchorage ($10^{\circ}14'S$ $148^{\circ}45'E$) (12.53).

Sandbank Bay**12.80**

- 1 **General information.** Sandbank Bay lies immediately W of Sandbank Point ($10^{\circ}11'S$ $148^{\circ}35'E$) (12.63). Depths shoal gradually to 6 m (20 ft) on the W side of the bay.
- Local knowledge** is essential. The bay is unsurveyed.
- Directions.** It is reported that a safe approach to the bay may be made with Domara village, which lies on a spit on the NW side of the bay $1\frac{3}{4}$ miles WNW of Sandbank Point, on a line of bearing between N and NNE. Such a track passes WNW of the reefs and sandbanks extending from Sandbank Point (12.63).
- 2 **Anchorage** may be obtained about $1\frac{1}{4}$ miles SW of Sandbank Point, clear NW of the offlying reefs and sandbanks.
- Anchorage may also be obtained in the bay in shallow water about 3 to 4 cables offshore.
- In 1875, SS *Ellengowan* (1.8 m draught) anchored in a depth of 4 m (12 ft) off the mouth of Bamguina River, which discharges into the W end of the bay $4\frac{1}{2}$ miles W of Sandbank Point.

Rodney Entrance and Cape Rodney**12.81**

- 1 **Anchorage.** Good temporary anchorage, sheltered from the South-east Trade Winds, can be obtained in a depth of 36 m (20 fm) N of the inner edge of the barrier reef on the E side of Rodney Entrance ($10^{\circ}17'S$ $148^{\circ}26'E$) (12.67). Temporary anchorage in swept water (12.64) may also be obtained in a depth of 20 m (11 fm), 1 mile SW of Cape Rodney ($10^{\circ}13'S$ $148^{\circ}24'E$) (12.63).

There is an airstrip 2 miles NW of Cape Rodney, at the head of Kini Kini Bay.

Cheshunt Bay

12.82

- 1 **General information.** Cheshunt Bay is entered between Inawaimana Point (10°11'S 148°20'E) and Kaligola Point, 4½ miles WNW. Approach to the bay from SE is partly obstructed by a drying spit of sand and coral and by Aulakapule and Whitish Reefs, which together extend 3¾ miles WSW from Inawaimana Point.

- 2 The entrance to Auro River and Reynolds (Araki) River, which is obstructed by a bar, enters the sea at the head of the bay. Depths of 18 m (60 ft) inside the bar, and a least depth of 9 m (30 ft) 1 mile farther upstream, are reported (1963); depths of 3 m (10 ft) have been found about 6 miles upstream.

Local knowledge and a large scale chart are required.
12.83

- 1 **Directions from south** (positions from Kaligola Point (10°09'S 148°16'E)). From the inshore passage about 1 mile SW of the W end of Whitish Reef (3½ miles SSE) (12.64), the line of bearing 010° of Barragolo Island (2 cables SSE) leads N into the bay. The island, 26 m in height to the tops of the trees and difficult to identify, is the S—most of about five small, steep and densely wooded islands grouped closely around Kaligola Point. The track passes (positions continuing from Kaligola Point):

- 2 W of the 2.1 m (7 ft) patch (3½ miles S), distant 4 cables; thence:
E of the 7.3 m (24 ft) patch (3 miles SSW), lying 5 cables E of Middle Reef (12.65), thence:
W of a 2.7 m (9 ft) coral pinnacle (1¾ miles S) distant 3 cables. The danger is only visible close-to, and in favourable light conditions.

- 3 When Barragolo Island is distant about 1 mile, the track leads ENE towards the entrance to Auro River (2½ miles E), passing:

SSE of Naomou Reef (2 miles E), marked near its E end by a beacon (port hand); thence:

Across the bar, with a least charted depth of 0.3 m (1 ft) over it, (2½ miles E), marked by beacons (lateral).

Course may then be directed as required to follow the river channel.

12.84

- 1 **Directions from south-west.** From the inshore passage about 7½ cables WSW of Middle Reef (3 miles SW), the line of bearing 045° of Barragolo Island (2 cables SSE) (12.83) leads NE, passing (positions from Kaligola Point (10°09'S 148°16'E)):

NW of Middle Reef (12.65) distant 3 cables, thence:

NW of the coral pinnacle (1¾ miles S) (12.83), distant about 1 mile.

- 2 When Barragolo Island is distant about 1 mile, the track leads ENE towards the entrance to the Auro River (2½ miles E) as described at 12.83.

12.85

- 1 **Anchorages.** Cheshunt Bay anchorage, wire swept to a depth of 8.8 m (29 ft), is an area of approximate radius 5½ cables, lying close NNW of Whitish Reef and W of Aulakapule Reef, 6½ cables farther NE. The latter is a drying bank of sand and coral, marked at its NE end by a beacon (starboard hand).

Good anchorage, sheltered during the South-east Trade Winds, may also be obtained in a depth of 10 m (33 ft) 4 cables N of Aulakapule Reef.

Twelve Mile Sandbank

12.86

- 1 **Anchorage.** Good sheltered anchorage may be obtained by small vessels during the South-east Trade Winds close N of Twelve Mile Sandbank (10°11'S 148°11'E) (12.65).

McFarlane Harbour

12.87

- 1 **General information.** McFarlane Harbour (10°05'S 148°10'E) is entered through a channel, about ¾ cable in width, which leads between a coastal reef fringing the E side of the entrance and a long shallow spit extending from the W side. Within the entrance, a channel leads NNE through mud flats to wharves at Kupiano and thence to the shallow Marshall Lagoon, which extends 4 miles farther NE.

- 2 Sawn timber is exported from Kupiano. Vessels up to 1000 tonnes are reported to use the harbour.

The out-going tidal stream runs strongly through the entrance.

Local knowledge is essential.

12.88

- 1 **Directions for approach from south.** From the inshore passage 1¾ miles W of Twelve Mile Sandbank (10°11'S 148°11'E) (12.65), the recommended track leads NNE on 017°, passing (positions from the E entrance point to the harbour (10°06'S 148°10'E)):

WNW of patches (depth 7 m (23 ft)) (4 miles S).

- 2 The track then leads towards the entrance, which is narrow but identifiable from seaward and lies between a wooded bluff on the E side and a low point close W; Gavuane village, with a church and other buildings, stands on the bluff. The line of bearing 355½° of a prominent single-storey house with ridge roof (1 cable ENE) at Gavuane, seen midway between the two outer channel beacons (6 cables S), leads N, passing:

- 3 W of the beacon (3 miles SSE) (12.75), thence:
E of Pelaburumo Reef (3 miles SSW), which dries and is marked by a beacon; thence:

Midway between the outer channel beacons (6 cables S).

12.89

- 1 **Directions for approach from south-west.** From the inner part of Toveli Entrance (8½ miles SW) (12.74), the track continues ENE on the same line of bearing of the beacon (3 miles SSE) (12.75), passing (positions from the E entrance point to the harbour (10°06'S 148°10'E)):

SSE of a patch (depth 5.2 m (17 ft)) (3¾ miles SSW), distant about 1 cable, thence:

SSE of Pelaburumo Reef (3 miles SSW) (12.88), distant 1 mile.

The track then leads NE on 035° to join the approach from S described above.

12.90

- 1 **Directions for entry.** From the position between the outer channel beacons (6 cables S) the track leads generally NNW through the entrance channel, marked by beacons (lateral); thence N through the entrance, passing close W of the bluff on the E side.

- 2 The track then leads generally NNE to Kupiano in a narrow channel, with a least depth of 3.4 m (11 ft) in it, marked by beacons (lateral) and by two pairs of leading beacons (white, black stripe) situated on shore.

Caution. The second pair of leading beacons, on the W side of the channel opposite Kupiano, are near some scattered houses but are not easy to identify.

12.91

- 1 **Berths.** The Timber Company's wharf, the principal alongside berth at Kupiano, is the N of two wharves. It is 31 m long with a depth of about 5 m alongside; it is metal-faced with no fenders and reported (1980) to be in poor condition.

Government Wharf, the S of the two wharves, can accommodate small craft only.

Toveli Entrance**12.92**

- 1 **Anchorage** may be obtained temporarily in a depth of 18 m (60 ft) in the N part of Toveli Entrance (10°11'S 148°04'E) (12.74), with Toveli Hill (10°06'S 148°05'E) (12.65) bearing 010°, distant 3½ miles.

Reasonable shelter from swell during the South-east Trade Winds may be obtained in a depth of 27 m (15 fm) about 3½ miles N of Coutance Islet (10°14'S 148°07'E) (12.62).

Keakoro Bay**12.93**

- 1 **General information.** Keakoro Bay (10°09'S 148°01'E) lies close NE of Paramana Point (10°10'S 148°00'E) (12.77) and may be approached from the inshore passage (12.65) or through Toveli Entrance (12.74) or Aroma Passage (12.76). There is a government rest house and a trading store at Maopa, 1¼ miles NNE of Paramana Point, which is the principal of several villages standing on the shores of the bay.

Anchorage may be obtained in a depth of 7 m (23 ft), mud, good holding ground, 1 mile ENE of Paramana Point. Small craft can anchor closer to the shore.

Hood Bay and Hood Lagoon**12.94**

- 1 **General information.** From Hood Bay, lying on the E side of Hood Point (10°06'S 147°43'E) (12.62), a narrow channel, 7½ miles E of the point, leads between Kele Iruna Point and Karo One Point into Hood Lagoon, which is surrounded by mangroves and backed by flat wooded country. The reef extending from Kele Iruna Point (12.66), where there is a village, is marked at its NW extremity by a beacon (starboard hand); discoloured water from the lagoon renders this reef difficult to see.

The bay and lagoon are unsurveyed. A number of shoals have been reported off the reef and within 1 mile of the entrance to the lagoon.

- 2 **Local knowledge** is essential for entering Hood Lagoon.

Anchorage may be obtained outside the entrance to the lagoon in depths of 11 to 14 m (36 to 46 ft) in the lee of the reef extending from Kele Iruna Point; keeping clear of the reported shoals. Anchorage may also be obtained in a depth of 12 m (39 ft) off the village on Kele Iruna Point.

Anchorage within Hood Lagoon may be obtained about 1 mile NE of the entrance in a depth of 14 m (46 ft).

HOOD POINT TO PORT MORESBY**General information**

Chart Aus 380 (see 1.15)

Routes**12.95**

- 1 **Offshore passage.** From the vicinity of Hood Point (10°06'S 147°43'E) the offshore passage leads NW to a position to seaward of Basilisk Passage (9°32'S 147°08'E), which is the principal entrance to Port Moresby. The route

keeps well to seaward of the general line of the barrier reef, and leads through the areas preferred for navigation indicated on the chart.

- 2 **Inshore passage.** From open waters in the vicinity of Hood Point, the shelter of the inshore passage may be regained through Wolverine Entrance, 3½ miles WNW of the point. The passage then leads about 11 miles NW to Round Hill Anchorage, but the section which then passes Round Point (9°52'S 147°31'E) is shallow and tricky and should only be attempted in favourable tidal conditions. An alternative route for vessels wishing to avoid this section leads outwards through Round Hill Entrance, 8 miles S of Round Point, thence NNW to seaward of the barrier reefs before re-joining the inner passage through Two Cable Opening, 3½ miles NW of Round Point.

- 3 From Two Cable Opening the inshore passage continues NW, within the shelter of the barrier reef, to abreast Padana Nahua (9°35'S 147°17'E), which is the second principal entrance to Port Moresby.

Topography**12.96**

- 1 From Hood Point (10°06'S 147°43'E) a range of barren sandy hills extends NW to Round Point (19 miles NW); the land between these hills and the coast is low and wooded.

From Round Hill (2¾ miles ESE of Round Point), a sharp ridge of barren-looking hills covered with scrub and some trees, rises to the SE shoulder of Astrolabe Range which then extends NW for about 30 miles. In the NW part of this range there is a remarkable square flat-topped mountain which rises 7 miles ENE of Tubusereia (Tupuseleia) Head (9°34'S 147°19'E); the flat top extends 7½ miles SE and NW to terminate abruptly at each end. Near the edge or brow of Astrolabe Range are precipitous cliffs below which the land slopes gently towards the coast with numerous valleys, in which the richest vegetation may be seen. The coast between Round Point and the village of Gaile (13 mile NNW) has a bold and regular aspect; thence to Tubusereia Head it is low with hilly points and several rocky islets lying close offshore.

Barrier reef**12.97**

- 1 The barrier reef follows the trend of the coast. The part of the reef between Hood Point and Round Point lies up to 7 miles offshore and, although mostly submerged, is easily discerned by the pale green colour of the water. That part of the reef extending NW from Round Point lies about 2½ miles offshore and is mainly awash and plainly marked by breakers.

- 2 **Openings.** Wolverine Entrance (10°05'S 147°40'E), Round Hill Entrance, 12 miles farther WNW, and Two Cable Opening (9°50'S 147°27'E), are described in the course of directions for the inshore passage; Beagle Entrance (10°02'S 147°35'E) is described at 12.110.

Former mined areas**12.98**

- 1 There are former mined areas in the approaches to Padana Nahua Passage and the inshore passage to Port Moresby; see 1.5 for general remarks and Appendix II for details of the areas involved.

Submarine cable**12.99**

- 1 A submarine cable is laid generally SE from a position 7 cables NNE of Vanagi (Pyramid) Point (9°32'3S 147°14'7E), then generally S through Padana Nahua

Passage (12.139) to a position about 5 miles N of Cairns (16°55'S 145°47'E) (see 9.10).

Principal marks

12.100

1 Landmarks:

- Stranded wreck (10°05'S 147°37'E), fishing vessel type, conspicuous visually and on radar (1991).
 Paira Point (10°00'S 147°38'E), a prominent red cliff.
 Round Hill (9°53'S 147°33'E), prominent from NW and appearing as an island when seen from the vicinity of Port Moresby.
 Tubusereia Head (9°34'S 147°19'E) (12.134).
 Taurama Hill (9°32'S 147°14'E) (12.134).

Major light:

- Vabukori front Leading Light (9°29'9S 147°11'1E) (12.136).

Other aid to navigation

12.101

1 Racon:

- Basilisk Passage Light-beacon (9°32'3S 147°08'0E)

Directions for offshore passage

(continued from 12.62)

12.102

- 1 From the position SSW of Hood Point (10°06'S 147°43'E) (12.62) the track leads NW for about 53 miles, passing:

SW of a reef (10°04'S 147°36'E), the outermost part of the barrier reef between Wolverine and Beagle Entrances; a wreck (12.100) lies on the S edge of the reef. Thence:

- 2 SW of Round Hill Entrance (9°59'S 147°30'E) (12.105); Round Point, 8 miles farther N, is low and wooded and difficult to identify from outside the reefs when seen against the high, dark background. Thence:

SW of Padana Nahua (9°35'S 147°16'E) (12.139), thence:

SW of Basilisk Passage (9°33'S 147°07'E) (12.138).

(Directions continue for offshore passage at 12.158 and for Port Moresby at 12.138)

Directions for inshore passage

(continued from 12.66)

Hood Point to Round Hill Anchorage

12.103

- 1 From a position SSW of Hood Point (10°06'S 147°43'E) (12.62) the track continues WNW to a position about 3 miles SW of Wolverine Entrance (10°05'S 147°40'E).

The track then leads NE on 034° through Wolverine Entrance, which is 8 cables in width and has a bar with a depth of 8 m (26 ft) over it. The bar is steep-to from depths greater than 370 m (200 fm) on its seaward side. The track passes (positions from Hood Point):

- 2 NW of the end of a reef (3¼ miles W), which dries; beacons close to the NE side of the reef mark a boat passage (12.109). Thence:

SE of a beacon (port hand) (3½ miles WNW), distant 2 cables. The beacon marks the edge of the reef on the NW side of the entrance. Care must be taken to avoid being set E onto the shallow spit extending from Spit Point (1¼ miles NNW).

The track then leads NNE on 028° for 1 mile into Beagle Bay, passing:

- 3 ESE of a 5.2 m (17 ft) patch (3¾ miles NW).

The line of bearing 131°, astern, of Hood Point then leads NW until Garikigolo (9½ miles NNW) bears 000°.

The track then leads WNW on 295° into Round Hill Anchorage, passing:

Close NNE of a 4.6 m (15 ft) patch (6¾ miles NW), thence:

- 4 SSW of a bank, with depths less than 5.5 m (18 ft) over it, extending up to 1½ miles between S and W from Paira Point (8¼ miles NW) (12.100); Paira Beacon (not shown on the reference chart) (starboard hand), 1 mile SW of Paira Point, marks the bank. Thence:

SSW of a 4.9 m (16 ft) patch (9½ miles NW), thence: SSW of a small detached reef (11 miles NW).

Round Hill Anchorage to Two Cable Opening

12.104

- 1 The inshore and N parts of Round Hill Anchorage (9°58'S 147°32'E) are obstructed with a number of shoals and patches, the positions of which may be seen on the chart. A 1.8 m (6 ft) patch (9°56'2S 147°32'3E), at the outer end of a number of dangers extending generally W from shore, is marked by Anderson's Beacon (black and white); a buoy (black and white, spherical) is moored 2¼ miles ESE of the beacon. A drying reef known as Black Rocks, 2 miles NNW of the beacon, lies at the outer end of a drying spit extending from shore. The N part of the anchorage, between Black Rocks and the barrier reef, is strewn with shallow patches with depths between 1 and 4 m (4 and 13 ft) over them.

- 2 No directions are available for the passage (12.95) continuing inshore from Round Hill Anchorage NNW to beyond Round Point (9°52'S 147°31'E).

12.105

- 1 From a position within Round Hill Anchorage, the line of bearing 046°, astern, of the NW shoulder of Tauruba (9°54'S 147°37'E) leads SW to the open sea, passing (positions from Tauruba summit):

Through Round Hill Entrance (9 miles SW). There is a width of nearly 1 mile in the fairway between depths of 0.6 and 1.2 m (2 and 4 ft) over the ends of the below-water reefs on the SE and NW sides respectively, of the entrance.

- 2 The line of bearing 028°, astern, of Round Hill (9°53'S 147°33'E) (12.100) also leads through the same entrance.

The track then leads about 10 miles NNW to a position WSW of Two Cable Opening (9°50'S 147°27'E), keeping a prudent distance to seaward of unsurveyed waters off the outer edge of the barrier reefs and passing:

WSW of Round Point (7 miles WNW) (12.102).

Two Cable Opening to Padana Nahua

12.106

- 1 From the position in open waters WSW of Two Cable Opening the track leads ENE on 065° through the opening towards Kapakapa, a village on stilts 3½ miles farther ENE; a beacon (black) stands offshore about 7 cables WSW of the village. The track passes (positions from Cyclone Hill (9°38'S 147°26'E)):

Between beacons (lateral) (11¾ miles S), marking Two Cable Opening; thence:

- 2 SSE of a small reef awash at LW (charted as a dangerous rock) (11½ miles SSE); a beacon (port hand) marking the reef should be passed at a distance of 1½ cables.

When the beacon ahead (offshore from Kapakapa) is distant about 7 cables the track leads NNW on 345°, passing:

- 3 ENE of an unmarked dangerous rock (11 miles SSE), thence:
WSW of a reef (10¼ miles SSE); a beacon marks the S end.

The track then leads NW on 322°, passing:

SW of a small reef (10 miles SSE), marked by a beacon, thence:

SW of a reef (8½ miles SSE), marked by a beacon (starboard hand), thence:

- 4 NE of a reef, which dries 0.6 m (2 ft), (8½ miles S), marked by a beacon (port hand); thence:
NE of Tavai Reef, which dries 0.6 m (2 ft), (7 miles S), distant 2 cables. A beacon (port hand) marks the reef.

The track then leads WNW as required to bring Tavai Reef Beacon onto the line of bearing 142°, astern, from whence the track leads NW.

- 5 The alignment (322°) of Manunuha Island (9°32'3S 147°16'6E) (chart Aus 621), which from some aspects resembles a crouching lion, with an uncharted peak inland, then leads NW on the same track, passing:

SW of a dangerous rock (3 miles SW); this and another, 6 cables farther NW, are the outer of a number of dangers extending from shore. Thence:

- 6 SW of a dangerous rock (4 miles W); small detached reefs lie 5 cables and 1 mile farther N. Thence:

SW of a detached reef (5 miles WNW), thence:

SW of a patch (depth 2.1 m (7 ft)) (6 miles WNW).

When about 2 miles E of Padana Nahua (9 miles WNW) the track leads WNW towards Port Moresby, passing:

NNE of a dangerous detached rock (9 miles WNW) (12.139).

12.107

- 1 An alternative route from Round Point to abreast Padana Nahua leads closer inshore and is well-marked by beacons; it affords good shelter.

Local knowledge is essential.

(*Directions continue at 12.139*)

Anchorage

General information

12.108

- 1 **Shelter.** Except in Konebada Bay (9°35'S 147°21'E) (12.114), the coast between Hood Point and Tubusereia Head (9°34'S 147°19'E) is generally exposed to wind and sea during the NW monsoon.

Hood Point

12.109

- 1 **Anchorage** for small craft may be obtained off the W side of Hood Point (10°06'S 147°43'E) (12.62) abreast the village of Hula. The anchorage may be approached from SE through a channel in the reef fringing Hood Point, or from Wolverine Entrance (12.103) through a boat passage marked by beacons.

Cautions. Approaches to the anchorage should only be attempted in small craft of shallow draught.

The anchorage should not be used if there is a likelihood of bad weather, particularly after dark.

Beagle Bay

12.110

- 1 **Anchorage** may be obtained in Beagle Bay (10°02'S 147°40'E) in good holding ground, mud; but the bay is subject to swell.

Approach may be made through Wolverine Entrance (12.103), or from W through Beagle Entrance (10°02'S

147°35'E), which is suitable for vessels with a draught of 5.8 m or less.

Local knowledge is essential for Beagle Entrance as no documented directions are available.

Round Hill Anchorage

12.111

- 1 **Anchorage**, with good shelter in most winds, may be obtained in Round Hill Anchorage (9°58'S 147°32'E) (12.104) about 5 cables N of the reef on the SE side of Round Hill Entrance (12.105), in depths of 18 to 26 m (10 to 14 fm).

Round Point

12.112

- 1 **Anchorage** may be obtained during the South-east Trade Winds in the lee of Round Point (9°52'S 147°31'E) (12.102), in a depth of 7 m (23 ft), about 7 cables N of the point and about 3 cables offshore. The anchorage is good but a slight swell rolls in from S at HW.

The anchorage may be approached with caution either from Round Hill Anchorage (12.104), or from Two Cable Opening (12.106).

Local knowledge is essential.

Kapakapa

12.113

- 1 **Anchorage** may be obtained during the South-east Trades Winds off the village of Kapakapa (9°48'S 147°31'E) (12.106), but the swell is sometimes heavy. During the NW monsoon anchorage may also be obtained under the lee of reefs off a wharf at the village.

Konebada Bay

12.114

- 1 **Anchorage.** Konebada Bay (9°35'S 147°21'E) affords a completely sheltered anchorage during the South-east Trade Winds in depths of 13 to 16 m (43 to 53 ft) off a small beach near the village of Barakau on the S entrance point. When a strong NW wind is blowing, anchorage may be shifted to the NE arm of the bay where complete shelter is available in depths of 9 to 13 m (29 to 43 ft); this anchorage is also safer should a Guba (1.179) develop.

PORT MORESBY

General information

Charts Aus 621, Aus 622 plans of Port Moresby, and Port Moresby and Napa Napa Wharves

Position and function

12.115

- 1 **Port Moresby** (9°28'S 147°08'E), a fine natural harbour, is the second busiest port of Papua New Guinea; most of the cargoes handled are of imports. The city of Port Moresby, which is centred on the E side of the harbour, is the capital and commercial centre of the country.

The population of Port Moresby District is approximately 364 500 (2004).

Topography

12.116

- 1 Port Moresby is fronted by the coastal barrier reef which dries in places and lies from 1½ to 3½ miles offshore; the seaward edge of the reef is well-defined and is mostly plainly visible except in dull calm weather.

The coast in the vicinity of the port is hilly and wooded but not generally distinctive from seaward owing to the masses of Owen Stanley and Astrolabe Ranges in the background.



Marina

Port Moresby from NW (12.115)

Paga Point

(Original dated 1999)

- 2 The harbour is commodious, deep and generally clear of dangers except for Logolu Motu Motu and Vahunabada, two well-marked reefs, situated on the E side. The urban area of the city is concentrated on the SE side of the harbour between Paga Hill (9°28'9S 147°08'8E) and Tuaguba, 8 cables ENE; the residential part and outskirts extend along the E shore of the harbour and some distance inland.

Port limits

12.117

- 1 The port limits, which are shown on the chart, extend ESE to Tubusereia Head (9°33'7S 147°18'8E) and S to Nadeara (Nateara) Reef and Basilisk Passage. The W limit lies between Basilisk Passage and Palli Palli Point on the mainland close NW of Gemo Island.

Approach and entry

12.118

- 1 The principal approach through the barrier reef to Port Moresby from seaward is through Basilisk Passage (9°33'S 147°07'E) (12.138), which has deep water, is clear of dangers and is the channel recommended for use by the larger vessels using the port.
- 2 Approach may also be made from SE from the inshore passage (12.95) or through the opening in the barrier reef at Padana Nahua (9°35'S 147°17'E) (12.139), which is deep and clear of dangers over a width of 6½ cables. Approach from Liljeblad Passage (9°27'S 146°59'E) (12.161), and thence through the inshore passage from W, is restricted to small vessels of shallow draught.

The harbour is entered between Paga Point (9°29'0S 147°08'6E) and Gemo Island, 1½ miles farther W.

Traffic

12.119

- 1 In 2004 the port handled 529 vessels totalling 5 658 207 dwt.

Port Authority

12.120

- 1 Papua New Guinea Harbours Board, PO Box 671, Stanley Esplanade, Port Moresby, Papua New Guinea.

Limiting conditions

12.121

- 1 **Controlling depth.** Least charted depth on approach and entry is 11.2 m on the leading line through Basilisk Passage, as shown on the chart in position 9°31'8S 147°08'5E.

Under-keel clearances of 0.5 m at the Container Wharf, and 1.5 m at the oil and LPG berths, are used.

Deepest and longest berths. The deepest alongside berth is Berth 4A (Container Wharf) (9°28'4S 147°09'0E) (12.147); the longest alongside berth is a combination of Berths 1 and 2 on the N side of Main Wharf.

- 2 **Tidal levels.** See information in *Admiralty Tide Tables*. Mean maximum range about 1.8 m; mean minimum range about 0.1 m.

Density of water at the berths is 1.025 gms/cm³.

Maximum size of vessel handled. Vessels up to 62 000 dwt and a maximum LOA of 236 m and draught of 10.5 m can be accommodated alongside the main berthing area (12.147).

Maximum draught at the oil and LPG berths (12.149) is 13 m. Maximum size of vessel at Inter Oil Terminal (12.149) is 110 000 dwt.

- 3 **Local weather.** The South-east Trade Winds often blow strongly, particularly in the afternoons, and raise a short sea in the harbour which makes boatwork uncomfortable. These winds tend to funnel over the commercial part of the city between Paga Hill and Tuaguba and create difficult conditions for berthing and leaving Main Wharf; the Container Wharf is generally more sheltered. Delays in berthing may occur between March and October.

During the NW Monsoon, strong, gusty winds, known locally as Gubas (1.179), sometimes blow; generally at night.

Arrival information

12.122

- 1 **Berthing restrictions.** Vessels are normally only berthed in daylight. Tankers at the oil and LPG berths are also unberthed only by day.

Notice of ETA

12.123

- 1 The ETA at the pilot boarding position should be sent 24 and 12 hours in advance, and confirmed with the pilot station between 5 and 4 hours before arrival.

Outer anchorages

12.124

- 1 **Bootless Inlet** (9°32'S 147°16'E). Anchorage for coasters of a suitable size may be obtained in depths of 21 to 27 m, mud, in mid-channel abreast the N end of Motupore Island (9°31'5S 147°17'1E). Sheltered anchorage for small craft may be obtained in Bogoro Inlet off the ruined jetty of an abandoned copper mine, 8½ cables N of Motupore Island. Bootless Inlet is fringed with mangroves

and mostly backed by hills; the shores are fronted by extensive reefs.

- 2 **Caution.** Local knowledge and advice is required as the inlets are within a former mined area (12.132).

Directions. From a position close W of South Patch (9°34'1S 147°17'1E) (12.140), the alignment (355°) of Manunuha Island (9°32'3S 147°16'6E) (12.106) with Idumava Hill, 2 miles farther N, leads N, passing (positions from Manunuha Island):

W of Middle Patch (1¼ miles SSE); North Patch lies 3½ cables farther ENE.

- 3 The track then leads generally N, adjusted as necessary to pass:

E of foul ground (extending 8 cables S), and:

W of the reefs and shoal patches extending up to 4 cables W from Loloata Island (8 cables E), thence:

W of the reefs and shoal depths extending up to 3 cables W from Motupore Island (7½ cables NE).

- 4 **Manubada Island** (9°30'9S 147°10'7E). Anchorage during the South-east Trade Winds may be obtained in a depth of 18 m, mud, off the NW side of the island.

With prior permission, anchorage for vessels awaiting a pilot may be obtained 7 cables W of the same island in a depth of 27 m with good holding ground, mud and sand.

- 5 **Walter Bay** (9°29'S 147°10'E). Good anchorage in NW weather may be obtained by coasters of suitable size and draught between Arakuti Reef and Ela Beach, in the W part of Walter Bay. A channel, with a width of about ½ cable and a depth of 9.6 m, separates Arakuti Reef from Bigirohodobi, that part of the fringing reef fronting Paga Point (9°29'0S 147°08'6E).

- 6 Daunagena Island, the E entrance point to Walter Bay, is grassy; Lade Kone Island, a rocky islet 7 m in height, lies 5 cables farther NNW. Gabutu Mutu Mutu, an islet at the head of the bay, has buildings on it and is connected to shore by a causeway.

Local knowledge is required.

Prohibited anchorage

12.125

- 1 Anchoring is prohibited, as shown on the chart, within the vicinity of a sewer outfall which extends SSW from Paga Point (9°29'0S 147°08'6E).

Either side of a disused submarine pipeline laid across the harbour entrance; a pair of beacons (tripod; white round topmark with black stripe) (in a state of disrepair 1993), 2½ cables N of Paga Point indicates the landing place and alignment of the pipeline.

NE of Logolu Motu reef (9°28'5S 147°08'6E) in the approaches to harbour wharves.

N of Vahunabada Reef (09°27'7S 147°08'3E) in the vicinity of the oil berths.

Pilotage and tugs

12.126

- 1 **Pilotage** is compulsory for vessels over 30 m. Pilotage is available at any hour but see berthing restrictions at 12.122. Pilots board 8 cables WSW or, in bad weather, 5 cables NE of Basilisk Beacon (9°32'3S 147°08'0E), as shown on the chart. The pilot vessel was reported in 1998 to be a blue-hulled launch with orange superstructure on which "PILOT" is painted in black. For further details see *Admiralty List of Radio Signals Volume 6*(4).

See 12.124 for details of an anchorage for vessels awaiting a pilot.

Tugs. One or two tugs are normally available.

Local knowledge

12.127

- 1 Local knowledge and favourable light conditions are required for passage of Padana Nahua.

Regulations

12.128

- 1 **Restricted area.** In the vicinity of Napa Napa oil berth (12.146), a restricted area exists, which extends 6 cables N, 4 cables S and 1 cable E of the wharf, as shown on the chart.

Quarantine

12.129

- 1 Port Moresby is a first port of entry: see 1.76 and *Admiralty List of Radio Signals Volume 1*(2) for details of quarantine reports required. Radio pratique may be granted.

A quarantine anchorage (9°27'9S 147°07'9E), is established within the harbour as indicated on the chart.

Notice of medical requirements

12.130

- 1 As much notice as possible should be given.

Harbour

General layout

12.131

- 1 The principal wharves, with a marina lying 6 cables NNE, are situated in the SE corner of the harbour. The oil and LPG terminals, which consist of pipelines to offshore moorings, are situated 1½ miles farther NNW on the NE side of the bay and N of Vahunabada reef. Inter Oil Terminal lies at Napa Napa on the W side of the harbour.

Fairfax Harbour (9°26'S 147°06'E) is the NW and innermost part of the port.

Paga Hill



Port Moresby from NNW (12.131)

(Original dated 1999)

Former mined areas

12.132

- 1 There are former mined areas in the approaches to the port; see 1.5 for general remarks and Appendix II for details of the areas involved.

Natural conditions

12.133

- 1 **Tidal streams** in the approaches are generally regular but vary in direction depending on their proximity to the barrier reef openings and on the strength and direction of the prevailing wind. A N-going set with a rate of 1½ kn has been reported in Basilisk Passage on the rising tide. Small tide-rips may be experienced in Basilisk Passage and Padana Nahua, and also S of Lolorua Island (9°29'7S 147°07'1E) and off Vanagi (Pyramid) Point, 8 miles farther ESE.

There is no significant tidal stream at the principal wharves in the harbour.

Climatic table. See 1.192 and 1.206.

Principal marks

12.134

1 Landmarks for approaches:

Tubusereia (Tupuseleia) Head ($9^{\circ}33'7S$ $147^{\circ}18'8E$), a long point surrounded by reef.

Taurama hill ($9^{\circ}32'1S$ $147^{\circ}14'5E$), pyramid-shaped and rising from Vanagi (Pyramid) Point. In thick weather the hill may be the first mark identified when approaching from S.

2 Stranded wreck of SS *Pruth* (1924) ($9^{\circ}33'8S$ $147^{\circ}11'0E$) on Nadeara Reef. The wreck is slowly breaking up (1993) and large sections of it are covered at HW; from a distance it is conspicuous only on radar.

Kila Kila hill ($9^{\circ}29'3S$ $147^{\circ}11'0E$).

Paga Hill ($9^{\circ}28'9S$ $147^{\circ}08'8E$) on which a radio tower stands close SSW of the summit; numerous office buildings in the central business district of the city, close ENE, are also prominent.

3 Tovabada ($9^{\circ}23'S$ $147^{\circ}08'E$) (chart Aus 379) and Huhunama Hill (Huhunamo), 2 miles farther WSW, two wooded mountains situated about 2 miles N of the head of the port.

Boera Head ($9^{\circ}23'S$ $147^{\circ}01'E$), a red cliff 50 m in height and prominent from S lying at the S end of a short range of coastal hills; a light (white hut, 2 m in height) stands on the head.

12.135

1 Landmark for harbour entry:

Tatana Island ($9^{\circ}26'2S$ $147^{\circ}07'6E$); the W edge of the island is conspicuous from the vicinity of Lark Patch ($9^{\circ}31'5S$ $147^{\circ}08'5E$).

12.136

1 Major light:

Vabukori front Leading Light (two white rectangles with black V between, on square beacon, 3 m in height) ($9^{\circ}29'9S$ $147^{\circ}11'1E$). A rear light (similar daymark on white square concrete tower, 7 m in height) ($2\frac{1}{2}$ cables NE of the front light) provides an alignment (054°) of leading lights.

Other aid to navigation

12.137

1 Racon:

Basilisk Passage Light-beacon ($9^{\circ}32'3S$ $147^{\circ}08'0E$)

Directions for approaches

(continued from 12.102)

Charts Aus 621, Aus 380, Aus 379

Basilisk Passage

12.138

1 From a position SW of Basilisk Passage ($9^{\circ}33'S$ $147^{\circ}07'E$), Port Moresby may be identified from a distance by the number of white buildings in the city area which may be seen in clear weather. A line of bearing between NNE and NE of these buildings leads towards Basilisk Passage, which is marked on its SE side by Basilisk Light-beacon (white pile structure, 9 m in height) ($9^{\circ}32'3S$ $147^{\circ}08'0E$), standing on the NW extremity of Nadeara Reef, and on its NW side by a light ($09^{\circ}32'0S$ $147^{\circ}07'8E$), standing on the SE extremity of Sinavi Reef.

2 When Basilisk Light-beacon is identified, course should be adjusted to gain the recommended track on the

alignment (054°) of Vabukori Leading Lights ($9^{\circ}29'9S$ $147^{\circ}11'1E$) (12.136) which, on a morning approach, may be more difficult to identify than Basilisk Light-beacon, owing to the sun. An uncharted former rear leading mark (white beacon) stands on the same alignment NE of and above the present Vabukori rear Leading Light. The track then leads NE through Basilisk Passage, passing (positions from Vabukori front Light):

3 SE of the SE edge of Sinavi Reef ($3\frac{3}{4}$ miles WSW), which dries in places and is marked by a light-beacon; the seaward edge of the reef is well-defined and plainly visible in clear weather. Daugo Island with a smaller island E of it, is a coral plateau covered with grass, which lies near the middle of the reef, 3 miles from its E extremity. The island is inhabited and has an airstrip on the W part. It is reported (1998) that the S extremity of Daugo Island shows up well on radar during the approach to Basilisk Passage. Thence:

4 NW of Nadeara Reef ($3\frac{1}{2}$ miles SW), which dries in places and is marked by Basilisk Light-beacon; the seaward edge of the reef is well-defined except at the E end, where it is mostly below-water for $3\frac{1}{2}$ miles. Thence:

5 Close SE of Lark Patch, with a least depth of 3.9 m over it (3 miles WSW); see caution below. A light-beacon (white pile with red bands, 3 m in height) marks the SE side of the patch. The least charted depth for the approach (12.121) is found $2\frac{1}{2}$ cables S of the light-beacon.

6 The track continues NE to a position $6\frac{1}{2}$ cables ENE of Lark Patch Light-beacon ($9^{\circ}31'5S$ $147^{\circ}08'5E$), thence NNW to a position about $4\frac{3}{4}$ cables W of Paga Point ($9^{\circ}29'0S$ $147^{\circ}08'6E$) passing (positions from Paga Point): WSW of Daunagena Island ($2\frac{1}{4}$ miles ESE), and: WSW of the W extremity of Arakuti Reef (3 cables SE), thence:

ENE of Lolorua Island ($1\frac{1}{2}$ miles WSW). The N and S parts of the island are joined by a narrow ridge upon which lies a stranded wreck.

7 **Cautions.** After passing Basilisk Beacon inbound it is advisable to open SE from the Vabukori leading line until clear SE of Lark Patch. This course of action allows a vessel to remain in deeper water with greater clearances from Lark Patch.

On departure from the harbour entrance by day, the line of bearing 150° of the stranded wreck of SS *Pruth* ($9^{\circ}33'8S$ $147^{\circ}11'0E$) (12.134) leads SSE to the alignment of the Vabukori Leading Lights, passing well clear of Lark Patch. This track avoids a critical turn directly into Basilisk Passage, and is recommended.

Padana Nahua and the inshore passage from south-east

12.139

1 Leading marks:

Front mark, the NW extremity of Loloata Island ($9^{\circ}32'S$ $147^{\circ}17'E$).

Rear mark, Mount Sadowa ($5\frac{1}{2}$ miles N of the front mark) (charts Aus 379, Aus 380), which is often obscured by haze during the South-east Trade Winds.

2 From a position to seaward of Padana Nahua ($9^{\circ}35'S$ $147^{\circ}17'E$), the alignment (010°) of the above marks leads N to the reef opening, passing (positions from Taurama Hill ($9^{\circ}32'1S$ $147^{\circ}14'5E$) (12.134)):

Close W of the NW extremity of the barrier reef (4¼ miles SE) on the SE side of the entrance; a beacon marks the W edge of the reef.

- 3 The track is then adjusted slightly E to gain the alignment (007°) of the SE extremity of Loloata Island with Mount Sadowa. This alignment leads N to join the inshore passage (12.106) from SE, passing:

W of an isolated shoal patch (4¼ miles SE), with a depth 1.4 m over it, lying 3½ cables N of the barrier reef; thence:

- 4 E of the E extremity (3¾ miles SE) of Nadeara Reef (12.138), which should be passed with caution; there is a least charted depth of 2 m close within the submerged end of this reef.

12.140

- 1 **Leading marks:**

Front mark, the S end of Manubada Island (4 miles WNW).

Rear mark, the S end of Gemo Island, 3¾ miles farther WNW.

The alignment (297°) of the above marks then leads WNW, in continuation of the inshore passage from SE, towards the harbour entrance, passing:

- 2 SSW of South Patch (3½ miles SE), marked by a beacon (starboard hand), and:
NNE of the E end (3¾ miles SE) of Nadeara Reef (12.138). There is least width of 4 cables in the channel between South Patch and dangers off the N side of Nadeara Reef. Thence:

SSW of Vanagi Point (3½ cables SSE) (12.134).

- 3 The track then leads either side of Manubada Island (4 miles WNW), as guided by the chart, to a position S of Paga Point (6½ miles WNW). The channel NE of Manubada Island is narrow but has a depth of 22 m in the fairway. Both tracks pass:

NNE of Lark Patch (6 miles W) (12.138), and:

SSW of Arakuti Reef (5¼ miles WNW) (12.124).

12.141

- 1 **Useful mark:**

Mavarololo (9°28'0S 147°06'4E), a hill with a bare summit on the W side of the harbour entrance.

(Directions for the inshore passage continue at 12.159)

Directions for entry

Chart Aus 622 plans of Port Moresby, and Port Moresby and Napa Napa Wharves

12.142

- 1 From the position about 4¾ cables W of Paga Point (9°29'0S 147°08'6E) the track leads N into the harbour. The stranded wreck of SS *Macdhuil*, lying on its side on the edge of the coastal reef 8 cables WNW of Elevala Peninsula (9°27'4S 147°09'0E), may be obscured if there is a vessel on the SE oil berth, but is otherwise easily identified. The track passes (positions from Paga Point):

- 2 E of Gemo Island (1½ miles W), covered with grass and scrub on its W side; a buoy (special) (1¼ miles WNW) indicates the edge of the drying reef fringing the E side of the island. And:

W of Logolu (Logulu) Motu Motu (5 cables N), which dries; the reef is marked by light-beacons (white column, green band) at the S and N ends.

- 3 Approach to the alongside berths (12.147) may then be made as required, passing:

N of Logolu Motu Motu, thence:

Clear of a pinnacle rock (depth 10 m, coral) (6½ cables N), lying 1½ cables E of Logolu Motu Motu N Light-beacon.

12.143

- 1 From the position W of Logolu Motu Motu, the track leading to other berths in the harbour then leads NNW, passing:

WSW of Vahunabada Reef (1¼ miles NNW), a drying reef marked at its SE end by a light-beacon (white pile, black bands). A beacon (black pile) marking the E side of the reef is reported (1993) to lie 100 m farther W than charted; a similar beacon marks a dangerous rock which lies 1 cable off the N end of the reef.

Approach to the oil and LPG berths (12.149) may then be made, passing N of Vahunabada, or direct to Inter Oil Terminal (12.149).

12.144

- 1 From abreast of Vahunabada, the track continues NNW to the entrance to Fairfax Harbour, passing:

ENE of Esade Motu Motu (2½ miles NW), a drying reef, with a beacon standing at its S end; thence: WSW of Tatana Island (2¾ miles NNW) (12.135), which is connected to the mainland E by a causeway; and:

ENE of a buoy (special) (3 miles NW), thence:

- 2 WSW of Raven Rock (3½ miles NNW), and:
ENE of and round Idumava Point (3¾ miles NW). There is a width of 2½ cables in the channel between Raven Rock and the point.

The track then leads W into Fairfax Harbour, passing:
N of Idumava Point, and:

S of Motukea Island (4 miles NW), which is being developed.

Anchorage and berths

Anchorage

12.145

- 1 **General information.** Well sheltered anchorage, with good holding ground of mud, is afforded in the harbour for all classes of vessels at all seasons of the year. During the NW monsoon anchorage should be obtained more towards the W side of the harbour, but outside a distance of about 3½ cables in order to clear the dangers that fringe that shore.

12.146

- 1 **Specific anchorage areas:**

Between Tatana Island (9°26'2S 147°07'6E) and Abahua Head; the berth is sheltered in all weathers.

In Fairfax Harbour (9°26'0S 147°06'0E) in depths of 7 to 9 m, mud. The harbour is landlocked and remains calm in the heaviest gales but is not otherwise recommended because of the unhealthy locality.

Alongside berths

12.147

- 1 **Main Wharf** (9°28'6S 147°08'8E), with a T-shaped head 213 m in length and a mooring dolphin 18 m farther W. Berths are numbered from W to E. Berths 1 and 2, on the N side of the wharf, have depths of 8.5 m alongside (1993); Berths 3A and 3B, on the S side have lengths of 67 and 113 m, and depths of 3.8 and 4.5 m (1993), respectively.

Small Ships Wharf, also known as Berth 4B (9°28'5S 147°09'0E), berthing head 25 m in length, depth 2.5 m alongside.

- 2 **Container Wharf**, also known as Berth 4A, (9°28'5S 147°09'0E) is 125 m in length; depth alongside is 10 m (1993) but the berth is liable to silting at its S end and information on the actual depth available should be sought from the Port Authority. No shore gantry available for discharge; Ro-Ro facilities.

Lancron Wharf (9°28'2S 147°09'1E), the Defence Force Wharf. There is a heavy duty concrete ramp for landing craft at the inner end of the N side.

12.148

- 1 **Berthing and departure.** Vessels normally berth port side to where appropriate. Departure can be made between Logolu Motu Motu (9°28'5S 147°08'6E) (12.142) and Elakurukuru, a point 1½ cables SE; a 10 m coral patch lies in mid-channel.

Oil and LPG berths

12.149

- 1 Oil and LPG berths, consisting of head and stern buoy mooring patterns, are situated at the outer ends of submarine pipelines extending SW from the shore in the area N of Vahunabada Reef (9°27'7S 147°08'3E) (12.143), as shown on the chart. The SE and NW oil facilities are operated by Mobil and BP respectively. A bunker platform stands ½ cable E of the outer end of the Mobil pipeline; the end of the pipe is marked by a spar-buoy (white with spherical topmark).
- 2 A steel framework manifold platform stands at the outer end of the gas pipeline.

Vessels are normally berthed heading SE at the above moorings.

Inter Oil Terminal lies on the E shore of Napa Napa (9°27'5S 147°07'0E) and consists of two jetties at the end of a causeway. The E jetty extends 88 m, the berthing area lying N/S with a length of 35 m, mooring dolphins extend 72 m from each end of the berth; lights stand at the head of the jetty and close S of the S dolphin. The N jetty also extends 88 m, with the berthing area lying E/W with a length of 37 m, mooring dolphins extend 63 m from each end of the berth; lights stand on the E and W outer dolphins.

Port services

12.150

- 1 **Repairs:** two commercial ship repair yards; the largest of five slipways can accommodate a vessel up to 6000 tonnes; a dry dock, suitable for Panamax vessels, is under construction (2001).
- Other facilities:** government hospital; garbage disposal to shore by arrangement; no facilities for disposal of oily waste; two barge ramps.
- 2 **Supplies:** fresh provisions in moderate quantities; fresh water at wharves; diesel by pipeline at Berth 4, otherwise by road tanker or fuel lighter; bunkers for vessels of suitable size at Mobil oil berth.

Communications: Jackson International Airport lies 13 km E of main wharves; regular services by sea to other Papua New Guinea ports and Australia; some road but no rail links inland.

PORT MORESBY TO YULE ISLAND

General information

Charts Aus 379, Aus 4620

Routes

12.151

- 1 A number of routes described in *Ocean Passages for the World*, including those using the offshore passage along the S coast of Papua New Guinea, converge in the area SW of Port Moresby. The single route for Torres Strait which then leads W across Gulf of Papua to Bligh Entrance (9°14'S 144°00'E) joins that described at 2.96.
- 2 An offshore passage for vessels bound into Gulf of Papua from the vicinity of Port Moresby leads generally NW for about 57 miles to abreast Yule Island (8°49'S 146°32'E), keeping to seaward of the coastal shelf until the approach to Cape Suckling (9°02'S 146°37'E).
- 3 The inshore passage continuing NW from Port Moresby leads inside the barrier reef to the inner entrance to Liljeblad Passage abreast Haidana Island (9°27'S 147°02'E), but is only suitable for small vessels of shallow draught. From Liljeblad Passage the inshore passage then leads NNW through Caution Bay to Redscar Head (9°16'S 146°54'E), thence in more open waters to Yule Island, 33 miles farther NW.

Topography

12.152

- 1 Between Boera Head (9°23'S 147°01'E) and Cape Suckling (32 miles NW) the coast is indented by Caution Bay and then by Redscar Bay; the shores of both being low, swampy and densely wooded. Several rivers, including Vanapa River which drains a large section of Owen Stanley Range through Galley Reach, discharge into the head of Redscar Bay.
- 2 Between Cape Suckling (9°02'S 146°37'E) and the S entrance to Hall Sound, 11 miles farther NNW, the coast is backed by a range of hills of which Mount Ripachina is the highest.

Barrier reef

12.153

- 1 From Basilisk Passage (9°32'S 147°08'E), off Port Moresby, the barrier reef continues, as shown on the chart, to the vicinity of Idihi Islet 16 miles farther WNW. Liljeblad Passage (9°27'S 146°59'E) (12.161), which lies between the NW end of Sinavi Reef and foul ground S of Caution Bay, is the only opening through this part of the reef.
- 2 From Idihi Islet the barrier, which thereafter is sunken throughout, is reasonably well-defined as far as the patch 10 miles farther NW. The reef probably then continues NW, as shown on chart Aus 4620, for a further 28 miles, but its limits are uncertain.

Cautions

12.154

- 1 The reference chart is not based on adequate hydrographic surveys in all areas. Uncharted dangers may exist.

Hazards**12.155**

- 1 **Former mined area.** The inshore passage between Port Moresby and Liljeblad Passage leads through a former mined area; see 1.5 for general remarks and Appendix II for details of the area involved.

Driftwood. Quantities of driftwood from the rivers, when in flood, are often encountered off this stretch of coast and the sea has a discoloured, muddy appearance.

Local knowledge**12.156**

- 1 Local knowledge is required for the inshore passage from Port Moresby to Liljeblad Passage and for Liljeblad Passage itself. Favourable light conditions are also required.

Principal marks**12.157**

- 1 **Landmarks:**

Boera Head (9°23'5S 147°00'9E) (12.134).

Lagava (Lagaba) Island (9°16'S 146°55'E), which rises from the extensive mangrove swamps of the adjacent mainland. Redscar Head, at the NW extremity of the island, is a bold point rising to a hill with patches of cliff on its S side; a light (white hut, 3 m in height) (9°16'S 146°54'E) stands on the hill.

- 2 Mount Lolopata (8°55'S 146°41'E).

Major light:

Vabukori front Leading Light (9°29'9S 147°11'1E) (12.136).

Directions for offshore passage

(continued from 12.102)

12.158

- 1 From a position SW of Basilisk Passage (9°32'S 147°08'E) (12.138) the track leads WNW, passing (positions from Keken Rocks (9°06'S 146°49'E)):

SSW of Sinavi Reef (24½ miles SSE) (12.138), thence:

SSW of Idihi Islet (20 miles SSE), covered with scrub; a light (framework tower) stands on the S extremity of the islet. Bavo Islet, with tall pandanus trees on it, lies 3 miles farther E.

- 2 The track then leads NW, passing:

SW of a 9.1 m patch (17 miles S); a dangerous area known as Shoal Spit extends 4 miles ESE from the patch; thence:

SW of a 4.6 m patch which breaks (13½ miles SSW); other shoal parts of the sunken barrier lie between this and the patch described above; thence:

- 3 Clear of a 7.4 m patch (reported 1992) (12 miles SW), lying at the SE end of a bank with depths less than 20 m over it; thence:

SW of an 11.3 m patch (10 miles WSW), thence:

SW of Pike Shoal (11½ miles W), coral; thence:

- 4 SW of Cape Suckling (12 miles WNW), which is low. Sandhills covered with scrub rise gradually inland from the cape and form the S part of a coastal range extending towards Hall Sound, 11 miles farther NNW. Mount Boria, 2½ miles NE of Cape Suckling, which is the highest peak in the S part of this range, may assist in identification of the cape. Patches, with depths less than 10 m over them, extend to 1¼ miles WSW from the cape. The sunken barrier reef (12.153) probably lies between 7 and 9 miles to seaward of Cape Suckling. Thence:

5

SW of an 8.2 m patch (16¼ miles WNW), lying 1¼ miles offshore, thence:

NE of a 9.1 m coral shoal (22½ miles WNW), which is the probable NW termination of the sunken barrier reef. Thence:

SW of Musgrave Reef (22 miles NW), and:

NE of an 11 m shoal (25 miles WNW), thence:

6

SW of Yule Island (22½ miles NW) which has several peaks on it and forms the W side of Hall Sound (12.173); a light (white square concrete tower, 7 m in height) stands about 1 mile NNW of Mauru Point, the S extremity of the island. And: Clear of a 7.4 m shoal patch (26 miles NW).

(Directions continue at 12.187)

Directions for inshore passage

(continued from 12.141)

Charts Aus 621, Aus 379 (see 1.15)

Port Moresby to Liljeblad Passage**12.159**

- 1 From a position off the entrance to Port Moresby harbour and S of Paga Point (9°29'0S 147°08'6E) (12.142), the track leads W to the vicinity of the NW end of Daugo Island (9°31'S 147°03'E), passing (positions from the N extremity of Daugo Island):

N of Sinavi Reef (extending to 5¼ miles ESE) (12.138); depths less than 2 m extend up to 5 cables from the drying edge of the N side of the reef. And:

- 2 S of Lolorua Island (4¼ miles E) (12.138), thence: Clear of Clarke Patches, which consist of numerous patches with general depths between 3.9 and 4.8 m over them lying between Daugo Island and the reefs (2½ miles N) fringing the mainland and Haidana Island; the positions of the patches may be seen on the chart. And:

N of Daugo Island (12.138).

- 3 From the vicinity of the NW end of Daugo Island the track then leads NW to the inner end of Liljeblad Passage (4¼ miles NW), passing:

Close NE of the N edge of Sinavi Reef (extending 4 miles NW), and:

SW of Haidana Island (3 miles N), a coral plateau 8 m in height, covered with sand and grass and fringed by reef; a light-beacon (white pile) lies off the S side of the island.

12.160

- 1 **Caution.** Navigation in the vicinity of Clarke Patches and in the fairway SW of Haidana Island must be carried out by eye and in favourable light conditions to avoid the many shoals and shallow patches which abound in these waters. There are no leading marks. Small tide-rips may occur in the area.

Liljeblad Passage**12.161**

- 1 From a position to seaward of Liljeblad Passage (9°27'S 146°59'E), the line of bearing 060° of the peak of Huhunama Hill (9°24'S 147°06'E) (12.134) leads ENE through the passage, passing (positions from Huhunama Hill):

NNW of the NW extremity of Sinavi Reef (7 miles SW), distant about 3 cables.

- 2 When clear of the dangers at the inner end of the passage, the track joins the inshore passage between Port Moresby and Yule Island, or leads to an anchorage off Haidana Island.

Caution. Liljeblad Passage should only be used by small vessels of shallow draught. Tidal streams in the passage are strong.

Liljeblad Passage to Yule Island

12.162

- 1 From the inner entrance to Liljeblad Passage and close W of the reef fringing Haidana Island (9°27'S 147°02'E) (12.159), the inshore passage leads N towards Boera Head (9°23'5S 147°00'9E) (12.134), thence through Caution Bay. The S side of Caution Bay, which lies between Idihi Islet (8 miles WSW of Boera Head), Boera Head and Redscar Head 10 miles NW, is formed by the barrier reef, from which reefs and foul ground extend N and NE to within 1 mile of Boera Head as shown on the chart. Much of the central part of the bay is obstructed by Pullen Shoals, which consist of numerous patches with depths between 0.9 and 10 m over them, as shown on the chart.
- 2 From the vicinity of Boera Head, the track leads generally NW through Caution Bay, adjusted as necessary to pass (positions from Boera Head):

Between Boera Head and shoal depths (7½ cables SW) extending from the foul ground in the S part of the bay, thence:

SW of Piri Patch (2 miles NW) which lies close inshore at the N end of the passage, thence:

- 3 Clear of Pullen Shoals (bearing between W and NNW, distant 4 to 10 miles), see above; thence: SW of Lagava Island (8½ miles NW) (12.157) and of Redscar Head.

Useful mark:

Darebo Hill (8¾ miles NNW), rising abruptly from the surrounding low land; from S it appears wedged-shaped but from W and N it appears rounded.

Chart Aus 379

12.163

- 1 From the vicinity of Redscar Head (9°16'S 146°54'E) (12.157) the track continues NW across Redscar Bay, passing (positions from Keken Rocks (9°06'S 146°49'E)): SW of Vari Vari Island (9 miles SSE), which consists of two peaks, 35 and 43 m in height, joined by a narrow neck of land and appears as two islets from a distance; two rocks, the SW of which is 28 m high, lie S of the island on the surrounding reef. Thence:
- 2 SW of a dangerous rock (reported 1893) (5 miles S), position doubtful; thence: SW of Keken Rocks, three in number, lying at the W end of a coral reef which dries; the rocks are distinctive as they show above the low land of the adjacent coastline which is mostly mangrove swamp.
- 3 The track then leads WNW to join the offshore passage SW of Cape Suckling (12 miles WNW) (12.158), passing: SSW of a shoal, with a least known depth of 9.1 m over it (7 miles W); a 7.3 m patch lies 7½ cables farther NW; thence: SSW of Pike Shoal (11½ miles W) (12.158). Directions at 12.158 for the offshore passage continuing NW to the vicinity of Yule Island (22½ miles NW) may then be followed.

Anchorage and harbours

Chart Aus 621

Idlers Bay

12.164

- 1 **Anchorage.** Idlers Bay (9°28'S 147°05'E) is nearly choked with reefs, leaving anchorage space only for small craft in its E corner. The shores of the bay are fringed with mangroves.

Local knowledge and advice is required as the bay lies within a former mined area (12.155).

Haidana Island

12.165

- 1 **Anchorage**, which is well sheltered, may be obtained W of Haidana Island (9°27'S 147°02'E) (12.159) in depths of 14 to 16 m, sand and mud, with the N extremity of the island bearing 079° and the SW extremity bearing 137°.

Sheltered anchorage for small craft may also be obtained E of the island. The only approach is from S through a break in the reef between the island and the mainland.

Local knowledge is required.

Chart Aus 379

Caution Bay

12.166

- 1 **Anchorage** may be obtained in Caution Bay (9°21'S 146°55'E) (12.162) in smooth water during the South-east Trade Winds in a depth of 25 m about 1 mile NE of Idihi Islet (9°26'S 146°53'E) (12.158). Care is required in the approach, to avoid the reef extending 1 mile N from the islet and also Shoal Spit (12.158), lying between 1½ and 5½ miles NW.

Tide-rips. Strong tide-rips occur 3 miles N of Idihi Islet, as shown on the chart.

Chart Aus 379 (see 1.15)

Vari Vari Anchorage

12.167

- 1 Sheltered anchorage may be obtained during the South-east Trade Winds in a depth of about 10 m, mud and sand, between Vari Vari Island (9°14'S 146°52'E) (12.163) and Redscar Head, 2 miles farther SE (12.157). The berth is found with the hill rising from Redscar Head bearing 151°, distant 8½ cables; small craft can anchor closer inshore. During the NW monsoon the anchorage is exposed to swell and better shelter may possibly be obtained by anchoring in the lee of Vari Vari Island, in a depth of about 22 m, at a distance of 2 to 3 cables off the surrounding reef.

Caution. The reefs should be approached with care; see caution at 12.154.

Chart Aus 379

Redscar Bay

12.168

- 1 **General Information.** Redscar Bay is entered between Redscar Head (9°16'S 146°54'E) (12.157) and Hisiu Point 15½ miles farther NNW. The bay is exposed during the South-east Trade Winds.

The head of the bay is obstructed by an extensive shoal fronting Galley Reach (9°07'S 146°54'E), which forms the estuary of Laloki and Vanapa Rivers and a number of other

tributories and creeks. There is a saw mill at Manu Manu village (9°07'S 146°54'E) on the N shore of the estuary.

- 2 **Anchorage** in Redscar Bay may be obtained as convenient to seaward of the shoal at the head of the bay, avoiding depths less than 18 m.

Clearing mark. A line of bearing more than 329° of Keken Rocks (9°06'S 146°49'E) (12.163) clears W of the shoal.

12.169

- 1 **Galley Reach** is approached over a shallow bar which is liable to change, nearly always breaks and is dangerous to boats. Within the bar there are depths of 6 m, or possibly more, as shown on the chart. Vanapa River has been ascended by boat for about 40 miles but is reported to be fast-flowing, with numerous snags and boulders; the junction of the river with Galley Reach is obscured by mangroves.

Local knowledge is required.

12.170

- 1 **Directions for Galley Reach** (dated 1942). From a position in open water N of Vari Vari Island (9°14'S 146°52'E) (12.163), the line of bearing 359° of a conspicuous tall tree (see 1.20) on the coast on the N side of the entrance W of the village of Manu Manu, leads N, passing (positions from Keken Rocks (9°06'S 146°49'E) (12.163)):

- 2 Over the bar (5 miles SE); there is a width of about 2¾ cables between patches, which break, on each side.

Leading marks. The alignment (048°) of leading beacons (5¼ miles E), situated in the village of Manu Manu, then leads NE for 1.1 miles across the inner end of the bar and into Galley Reach.

- 3 The line of bearing 064° of the E point of a small island (6 miles E), lying in the mouth of a river on the N shore, then leads ENE for 9 cables.

When the front leading beacon (5¼ miles E) is abeam to port, the track leads ENE on 076° towards the SE shore of the reach; thence as guided by local knowledge.

12.171

- 1 **Prohibited anchorage** exists in Galley Reach within 500 m of a submarine cable laid from Manu Manu village to Gorohu Island, 7 cables SSE.

Hisiu Harbour

12.172

- 1 **General information.** Hisiu Harbour lies between the offshore reef terminating in Keken Rocks (9°06'S 146°49'E) (12.163) and the end of the drying coastal reef, 3¾ miles farther NW, which extends about 8 cables offshore from the vicinity of Hisiu Point. Aroa River, which discharges into the head of the harbour, is reported to dry at LW.

- 2 **Anchorage** in the harbour may be obtained in suitable weather conditions in a depth of about 5 m; the W part of the harbour is generally used.

Local knowledge is required.

Chart Aus 379 (see 1.15)

Hall Sound

12.173

- 1 **General information.** Hall Sound (8°50'S 146°34'E) is a well sheltered harbour lying between Yule Island (12.158) and the mainland. The E shore of the sound is mainly formed by the delta of Angabunga (Saint Joseph) River,

fronted by an extensive drying mud flat. A Government station is located on the SE end of Yule Island, which has a population of about 2300 (2004). The island is reported to be less healthy than the mainland, due to mosquitoes.

- 2 The main entrance to the sound, with a navigable width of 7 cables and a least charted depth in the fairway of 14.5 m, lies on the SE side of Yule Island.

An entrance at the N end of the sound, which has a width of less than 3 cables and a least charted depth of 2.3 m in the fairway, lies between a reef extending N from Roro Ituna Point, the N extremity of Yule Island, and mud flats off Au Point, low and sandy, on the mainland 9 cables farther ENE. This entrance requires local knowledge and is not recommended.

- 3 The rivers entering Hall Sound are only accessible by boat between half tides over HW.

Cautions. The water in the entrances is often thick with mud, obscuring the reefs on either side.

Considerably less water than charted may be found in Uapu Inlet, in the NE part of the sound, where the river delta is extending.

Entry by night is not recommended.

- 4 **Flow.** The effect of tidal streams and outflow from the rivers is to produce flows in the main entrance with an in-going rate of 1 kn on the rise, and an out-going rate of 1 to 2 kn on the fall of the tide. Offshore, the stream sets SE on the rising tide at rates between 1 and 2 kn.

Landmark:

White house (not shown on the reference chart) (8°50'4S 146°32'3E), situated about 7 cables SE of Yule Island Light.

12.174

- 1 **Directions from south.** From a position S of Yule Island (8°49'S 146°32'E) (12.158), the line of bearing 350° of the NW extremity of the island leads N in mid-channel, passing (positions from Yule Island Light):

W of Lokulaulau, the coastal reef extending 6 cables from Kapripata Point (3 miles SSE), which is low and wooded; and:

- 2 E of Musgrave Reef (3 miles SSW).

The line of bearing 025° of the E point (8 cables E) of Yule Island then leads NNE for a distance of about 6 cables.

When the summit (8°53'0S 146°34'5E) of Naruru (Napuru) Hill bears 106°, the track leads NE on 039° in mid-channel into the sound. The hill is the N-most high summit of the coastal range extending SSE from Hall Sound. The track passes:

- 3 SE of Mauru Mauru, a reef extending 1¼ miles SSW from Mauru Point (7 cables SSE); a light-beacon (red pile) stands on the edge of the reef 4½ cables S of the point. And:
- NW of the NW edge of Lokulaulau reef (2 miles SSE), thence:
- 4 NW of a reef (1¼ miles SE) extending 5 cables from the inner entrance point to the sound; the point rises to a hill 91 m in height standing at the N end of the coastal range extending SSE.

12.175

- 1 **Directions from west.** From a position W of Yule Island Light (8°50'S 146°32'E) (12.158), the line of bearing 106° of the summit of Naruru Hill (12.174) leads ESE to join the track from S passing (positions from Yule Island Light):

Clear of the shoal patch (4¾ miles W) (12.158), thence:

NNE of Musgrave Reef (3 miles SSW), distant 7 cables.

12.176

- 1 **Anchorage.** Good temporary anchorage outside the sound may be obtained about 1 mile W of Roro Ituna Point (8°46'S 146°30'E) in depths of 14 to 18 m, mud.

Good anchorage may be obtained within the harbour:

- 2 During the NW monsoon: off the SE end of Yule Island in a depth of 18 m, mud, with the E extremity of the island bearing 003° and Mauru Point bearing 242°. In 1993 HMAS *Flinders* anchored close to this position in a depth of 24 m, mud and clay, with the E extremity of the island bearing 353° and the head of Yule Island jetty bearing 275°, distant 4 cables.
- 3 During the South-east Trade Winds: on the S side of

the harbour in a depth of about 9 m, with the NE extremity of Yule Island bearing 321° and Mauru Point bearing 267°.

Prohibited anchorage. Anchoring and fishing are prohibited in cable areas which front the E side of Yule Island and extend between the island and the mainland NE and SE, as shown on the large scale chart (see 1.15). The anchorages described above are clear of these areas.

- 4 **Facilities:** jetty, with concrete barge ramp alongside, situated on the SE side of Yule Island, 4¼ cables NNE of Mauru Point; small airstrip, unusable and in need of repair (1993), at the S end of the island.

GULF OF PAPUA**GENERAL INFORMATION**

Charts Aus 378, Aus 379

Scope of the section**12.177**

- 1 In this section is described the coastal route from Cape Suckling (9°02'S 146°37'E) to Fly River Delta (8°41'S 143°39'E). Also described are the oil terminals of Umuda (8°40'S 144°01'E) and Kumul (8°04'S 144°34'E), together with the anchorages, bays and rivers associated with this part of the coast.

General description**12.178**

- 1 Gulf of Papua lies between Cape Suckling (9°02'S 146°37'E) and the entrances to Fly River (190 miles W). The N and W shores of the gulf consist almost entirely of large deltas formed by the mouths of three of the largest rivers in Papua New Guinea and are impeded by numerous low, swampy islands covered with mangroves, nipa palms and sago. The mouth of Fly River is one of the outstanding geographic features of the area, the river being navigable for over 550 miles.

Routes**12.179**

- 1 Destinations within the gulf may be approached from SE using the coastal route which is a continuation of the offshore and inshore passages passing Port Moresby. From abreast Yule Island (8°49'S 146°32'E) the coastal route leads NW to Kerema Bay (7°58'S 145°44'E) thence W to a position off Mira Point (7°45'S 144°50'E), the E entrance point to Deception Bay.
 - 2 From Mira Point the route continues, but leading SW and well offshore, to Bramble Cay (9°09'S 143°53'E), in the entrance to Great North East Channel.
- Destinations at the head of the gulf may also be approached on routes which lead generally N as required from open waters S. Care in the choice of track towards a suitable landfall is required.

Topography**12.180**

- 1 On the E side of the gulf the land behind the coast rises to lofty mountains contrasting in a very striking manner with the low and level country to the W. From the entrance to Aird River (7°47'S 144°18'E) to Parama Island (95 miles SW), not a single hill, or scarcely a tree more elevated than its neighbours, can be seen above the level outline of this apparently swampy country. Off this part of the coast

deposits from the delta of Fly River form a continuous series of mud flats and banks of hard, fine, black sand which, with depths of less than 5 m over their outer edges, extend from 3 to 30 miles offshore.

- 2 The nearest approach of mountainous terrain to the coast occurs N of Freshwater Bay (8°07'S 146°00'E), where the Saw Mountains and Ingham Hills rise about 10 miles inland. When viewed from SW, Saw Mountains resemble the teeth of a saw and stand apart from Ingham Hills.
- 3 With the exception of Saw Mountains in the E and Aird Hills (7°27'S 144°21'E) near the middle, the coastal belt bordering the gulf is generally low. In most places the coast itself is slightly higher than the land within it, which is low and swampy for a distance inland of 10 to 20 miles or more, not rising above sea level. The level of this swampy country is being gradually raised by silt deposits from the rivers.

Hazards**12.181**

- 1 **Traffic.** Vessels operating in the N part of the gulf include tankers at the Kumul Terminal (8°04'S 144°34'E), timber ships loading in Aiai River (7°30'S 144°31'E) and off Kerema (7°58'S 145°46'E). Numerous coastal cargo vessels (mainly barges) work in and out of Port Romilly (7°41'S 144°50'E) and Pai-a Inlet, 16 miles farther W. Locally registered prawn trawlers may also be expected in the approaches to Deception Bay (7°45'S 144°40'E).

In the W part of the gulf vessels are likely to be found working in and out of Fly River delta.

Caution**12.182**

- 1 The reference chart is not based on adequate surveys in many areas and uncharted dangers may exist. Attention is drawn to the Reliability Diagram shown on the chart. Additionally, the estuarine nature of the area may cause significant seasonal changes to coastline, channels and shoals which are unlikely to be fully reflected on the chart or in sailing directions. Examples of these changes may be found in Kerema Bay (7°58'S 145°45'E) (12.190) and in Deception Bay (7°45'S 144°40'E) (see caution at 12.215).

Natural conditions**12.183**

- 1 **Tidal streams** at a distance of 10 to 20 miles offshore between Cape Possession (8°35'S 146°23'E) (chart Aus 379) and Cape Blackwood (7°47'S 144°30'E) (chart Aus 378) are E and W-going at rates of 2 to 3 kn.

Near the head of the gulf the in-going stream sets inshore towards the rivers at a spring rate of 2 kn: the out-going stream is stronger.

- 2 **Currents.** A pronounced E-going current following the general direction of the coast was observed, between January and March 1993 in the same area between Cape Possession and Cape Blackwood, by HMAS *Flinders*.

Currents experienced off Kumul Marine Terminal (8°04'S 144°34'E) set between E and SE at up to 1.5 kn during the NW Monsoon, and between W and SW at up to 2 kn during the South-east Trade Winds.

- 3 **Discoloured water** may be encountered within 8 miles of Maclatchie Point (7°57'0S 145°24'5E) and also up to 5 miles to seaward of the river mouths of Puari Delta (7°50'S 145°00'E). Additionally, at the end of the out-going stream during spring tides, a distinct line of river flotsam may be seen out to 12 miles from the delta.

Storm surges 1 to 1.5 m in height were generated in Gulf of Papua by cyclonic conditions 500 miles S in Coral Sea during 1991.

YULE ISLAND TO KEREMA BAY

General information

Chart Aus 379

Route

12.184

- 1 Having cleared the NW termination of the sunken barrier reef, the coastal route from Yule Island (8°49'S 146°32'E) leads about 67 miles NW to Kerema Bay.

Topography

12.185

- 1 From Au Point (8°46'S 146°32'E) (12.173), for about 5 miles NW to Aviara Beach, the land is very low and covered with dense jungle. From there to Cape Possession (8°35'S 146°23'E) the coast, which is relatively well populated, consists of a sandy beach backed by wooded hills, with a strip of level land between, on which are several villages and a continuous forest of coconut palms.
- 2 From Cape Possession to Iokea village (12½ miles NNW), the coast is bolder and is backed by a ridge of hills of considerable height rising abruptly from the coast which, near the cape, consists of cliffs and valleys. Between Iokea village and the mouth of Kapuri River (10 miles NNW), the coast is backed by the low Palipala Hills. Thence to Mopu Inlet, at the head of Freshwater Bay, the shore is composed principally of mangrove swamps forming the delta of Lakekamu and Tauri Rivers with the several mouths and connecting creeks.
- 3 The N shore of Freshwater Bay between Mopu Inlet (8°06'S 146°04'E) and Cape Cupola (15 miles W) is backed by coastal hills; Saw Mountains (12.180) and Ingham Hills lie farther inland to the N.

Landmarks

12.186

- 1 Mount Yule (8°13'S 146°47'E), a remarkable table-topped mountain which has been seen from a distance of 117 miles.
Clump Hill (8°33'S 146°21'E), peaked and well-defined, and Wedge Hill 2½ miles farther NNW. Each forms part of a coastal ridge of hills which extends about 10 miles SE and NNW from

Clump Hill and rises to a height of more than 300 m in places.

- 2 Keauna Hills (8°00'S 145°49'E).
Radio tower (8°01'S 145°49'E), standing 1 mile NW of Cape Cupola amongst large trees on the coastal ridge of Keauna Hills; the dish aerials on the tower are distinctive from seaward.



Cape Cupola radio tower (12.186)

(Original dated 1999)

Kerema Aero Radiobeacon (7°58'S 145°47'E), an unlit mast standing above the town and readily identifiable from seaward.

The Bluff (7°57'S 145°39'E) (12.201).

Directions

(continued from 12.158)

12.187

- 1 From a position SW of Yule Island (8°49'S 146°32'E) (12.158) the track leads NW directly to Kerema Bay (7°58'S 145°44'E), passing:
Clear of isolated shoal patches of 16.5 m (8°46'S 146°20'E) and 10 m, 3½ miles farther WNW, if considered prudent; thence:
SW of Cape Possession (8°35'S 146°23'E), a steep-to, bold and cliffy point, 40 m in height, fronting the coastal ridge of hills. Thence:
- 2 SW of a reef (8°32'S 146°19'E), which breaks at LW and extends ¼ miles offshore between Clump Hill (12.186) and Wedge Hill; thence:
Across the bight of Freshwater Bay (8°07'S 146°00'E) (12.185); thence:
SW of Cape Cupola (8°02'S 145°50'E), a bold, cliffy headland more than 50 m in height, fronting Keauna Hills (12.186); thence:
- 3 SW of Ipsi Point (7°58'S 145°46'E), the E entrance point to Kerema Bay (12.190). The entrance is obstructed by sandbanks which break, particularly during weather from SE. An isolated 8.5 m patch lies 5½ miles SSW of the point; other irregular depths occur up to 7 miles W of the patch, as shown on the chart.

(Directions continue at 12.203)

Anchorages

Port Chalmers

12.188

- 1 **General information.** Port Chalmers (8°09'S 146°06'E) is a small inlet, with reported depths of more than 2 m, on the S side of the estuary of Tauri River; Alice Mead Lagoon, with depths of about 4 m, is entered about 1 mile farther NNW on the N side. A bar fronting the estuary is reported to be impassable during strong winds. A close approach is not known to have been attempted except in vessels of shallow draught. Channels are unmarked.

Anchorages for small vessels of suitable draught may be obtained in Alice Mead Lagoon.

Local knowledge is required.

Mopu Inlet

12.189

- 1 **Anchorages** has been obtained 1 mile to seaward of the bar across the entrance to Mopu Inlet (8°06'S 146°04'E). No further detail is available.

Charts Aus 378, Aus 379 (see 1.15)

Kerema Bay

12.190

- 1 **General information.** Kerema Bay, entered between Ipsi Point (7°58'S 145°46'E) (12.187) and Peto Point 8 cables N, lies in the estuary of Matupe River. A number of other rivers and creeks also flow into the bay.

The town of Kerema, standing E of Ipsi Point, is the provincial headquarters of the Gulf Province. The population of the district is about 8500. Timber is exported from the bay, being transported by barge to ships loading at anchor offshore.

- 2 Kerema Bay and the sandbanks across the entrance are subject to much silting in the form of fine grey sand, and to continual change. The HW mark off the village of Mei, 2½ miles W of Ipsi Point is reported (1991) to be advancing to seaward at a rate of up to 12 m per year; a wharf ENE of Ipsi Point, off the town of Kerema, was reported in the same year to stand high and dry about 2 m above the HW mark. The bar between the outer sandbanks is dangerous and the channels are unmarked (1991).

- 3 **Tidal levels.** Mean maximum range about 1.8 m; mean minimum level 0.4 m.

Local knowledge is essential.

12.191

- 1 **Directions.** From a position about 3½ miles SW of Ipsi Point (7°58'S 145°46'E) (12.187) the track leads NNE, or as otherwise guided by local knowledge, passing (positions from Ipsi Point):

Across the bar (2½ miles WSW), with depths less than 1 m (1991) and a width of about 3 cables between the outer sandbanks.

- 2 The track then leads ENE in depths of about 5 m towards Peto Point (1 mile NNW), passing about 2½ cables offshore and:

NNW of the outer sandbank (extending 2 miles W).

12.192

- 1 **Siloia Creek**, entered 1¾ miles ENE of Ipsi Point, is navigable by shallow-draught craft at least to Epo Wharf, 3½ miles ESE of the same point. In 1991 depths of 2 m were obtained during this passage, favouring the outer bank on the bends.

12.193

- 1 **Anchorages.** Vessels loading timber anchor about 4 miles SSW of Ipsi Point and may remain for up to 5 days.

In 1993 HMAS *Flinders* obtained anchorage in a depth of 9 m, mud, bearing 180° distant 1.7 miles from Ipsi Point. The berth is exposed.

- 2 **Anchorages**, for small vessels of a size and draught which permits crossing of the bar, may be obtained within the bay in a depth of about 3.5 m off the Government station in the town.

Berth: the large concrete wharf ENE of Ipsi Point can no longer be reached (1991). In suitable conditions a landing barge is able to land supplies over the beach adjacent to the dried out wharf.

- 3 **Facilities:** hospital; airfield providing internal services; overland track to Port Moresby, but the journey requires a suitable vehicle and is likely to take two days or more.

Supplies: fresh provisions; retail stores; petrol and diesel fuel in 200 litre drums.

Rivers

Chart Aus 379

Oreke River

12.194

- 1 Oreke River (8°42'S 146°30'E), which has the village of Aviara Beach at its mouth and shares an extensive basin with Angabanga River (12.173), gives access by boat to Bereina, the principal town of the area.

Biaru River

12.195

- 1 Biaru River (8°21'S 146°16'E) can be ascended only by boat; it has been explored for a distance of 25 miles upstream.

Lakekamu River

12.196

- 1 Lakekamu River (8°13'S 146°09'E) enters the sea through a delta of mangrove swamps and is fronted by a bar reported to be impassable in strong winds, but suitable for boats at other times. The river may be ascended by boat for a distance of at least 50 miles in depths which are reported to be never less than 2 m.

KEREMA BAY TO PARAMA ISLAND, AND RIVER DELTAS

General information

Chart Aus 378 (see 1.15)

Routes

12.197

- 1 From Kerema Bay (7°58'S 145°44'E) the coastal route leads W to a position S of Mira Point (7°45'S 144°50'E), thence SW to Bramble Cay (9°09'S 143°53'E) keeping well to seaward of the river deltas which form the NW shore of the gulf.

For vessels N-bound from Coral Sea directly to destinations at the head of the gulf the choice of route is partly governed by the need to make a suitable landfall.

Topography

12.198

- 1 From Kerema Bay the aspect of the shores of the gulf changes quickly. The hills backing the shore of Oroko Bay (7°54'S 145°18'E) are the last features of any height to approach the coast. From there on the whole of the N and W shores of the gulf are formed by the low, flat, swampy and generally featureless deltas of many rivers. Geological formations inland carry considerable quantities of ground water which well up into the rivers in addition to the

normal surface run off. The land is wooded to the coastline with trees that are generally 30 to 50 m in height. Similar country extends inland for many miles, and there is little high ground close enough to the coast to provide anything more than a very distant background. The one recognisable feature inland is that of Aird Hills (7°27'S 144°21'E) (12.201). The distance over which these may be seen from seaward tends to emphasise the low level of the intervening land.

- 2 In general the coast cannot be seen beyond 8 to 10 miles offshore but some parts may be seen on radar at 15 to 18 miles.

Local knowledge

12.199

- 1 Recent local knowledge is required in all estuaries, channels and rivers described in this sub-section.

Sea state

12.200

- 1 During the South-east Trade Winds heavy rollers are likely to occur along the whole length of the N and W shores of the gulf. Seas normally break offshore in depths of 6 m but even in calm conditions the arrival, without warning, of a long heavy swell from a distant pressure system can suddenly turn the whole shoreline into tumbling white water. Boatwork can be particularly dangerous.
- 2 In 1993, the swell generated by a cyclone in Coral Sea caused waves of 2 to 3 m in height in Deception Bay and Pai-a Inlet. The waves became steep-fronted during the out-going flow.
Storm surges (12.183) may also occur.

Principal marks

12.201

1 Landmarks:

The Bluff (7°57'S 145°39'E), a headland lying at the S end of the Ie Hills; easily identified from SE and from W.

Aird Hills (7°27'S 144°21'E), steep limestone hills rising in isolation from the low and swampy surrounding land. The hills are visible from 20 miles to seaward of Pai-a Point, 17½ miles SE, and provide a good mark for the approach to Pai-a Inlet.

- 2 Kumul Marine Terminal platform (8°04'S 144°34'E), a steel structure 31 m in height and reported (1993) to be regularly identifiable on radar at 24 miles and visually at 18 miles. Tankers using the terminal may also be conspicuous.

Bramble Cay (9°09'S 143°53'E) (13.25).

Major light:

Kumul Marine Terminal Light (8°04'S 144°34'E), displayed from the platform: see above.

Other aids to navigation

12.202

1 Racons:

Kumul Marine Terminal (8°04'S 144°34'E).

Bramble Cay Light (9°09'S 143°53'E) (13.25).

Directions

(continued from 12.187)

Kerema Bay to Mira Point

12.203

- 1 From a position off Kerema Bay (7°58'S 145°44'E) (12.190) the coastal route leads W to a position about 12½ miles S of Mira Point (7°45'S 144°50'E), passing (positions from Maclatchie Point (7°57'0S 145°24'5E)):
Clear of the isolated patch (19 miles ESE) (12.187), and of the irregular depths farther W, if considered prudent; thence:
- 2 S of The Bluff (14½ miles E) (12.201), from which rocks extend up to 1 mile S; thence:
N of a shoal, with a least charted depth of 9 m over it, (14½ miles SSE), thence:
S of a shoal, with a least charted depth of 5.5 m over it and which breaks occasionally, (3¾ miles SSE); thence:
- 3 S of Maclatchie Point, low, but the only identifiable point in the vicinity; flat and wooded hills are visible over the point when approaching from SE. Thence:
S of a shoal, with a least charted depth of 1.3 m over it, (4 miles W), which breaks and lies in the SE approach to Orokolo Bay; a second shoal (depth 3.8 m) lies 8 cables farther NNE, with apparently deeper water between the two. Orokolo Bay is otherwise clear of known dangers. Thence:
- 4 S of Puari Delta (12.210), extending W from Alele Passage (12 miles WNW); thence:
S of a bank, with depths less than 5 m over which the sea breaks, (35 miles W), which is the outer known danger from Mira Point 10½ miles farther N.

Approach to the head of the gulf from south

12.204

- 1 Approaching the head of Gulf of Papua from S a landfall is recommended near Maclatchie Point (7°57'S 145°25'E) on the E side, or on Kumul Marine Terminal platform 50 miles farther W, as no other features are sufficiently prominent. In clear weather, when within a distance of 25 to 30 miles of the land, three peaks will be seen in the W part of the mountains in the interior, about 1800 m in height; the two E-most of these stand about 35 miles NE of Aird Hills (7°27'S 144°21'E) (12.201) and are very rugged in appearance.
- 2 When closing Maclatchie Point (12.203) by day, Flat Top Hill (7°50'S 145°21'E) and the surrounding coastal range of wooded hills, lying on the NW side of Vailala River and backing the shore of Orokolo Bay, appear of uniform height with no identifiable marks. This range of hills is significant in being the W-most of any high ground near the shores of the gulf, and is a useful identifying feature for that part of the coast. From the W end of the range, on about the meridian of 145°17'E, the coastal belt is uniformly low and marshy, stretching many miles W and inland.
- 3 When closing Kumul Marine Terminal platform (8°04'S 144°34'E) (12.201), unless bound for the terminal, the track should pass clear of the surrounding cautionary area, as shown on the chart.

12.205

- 1 When closing the N and W shores of the gulf, off Aird and Fly River deltas, the low aspect land is not visible beyond a distance of about 6 to 7 miles. Discoloured water

and the indication of a hard bottom after one of mud, may be considered certain signs of the approach to shallow water. In these areas, where depths in general shoal gradually to the coastal banks, soundings are the safest guide.

Mira Point to Bramble Cay

12.206

- 1 From a position about 12½ miles S of Mira Point (7°45'S 144°50'E) (12.203), the track leads 90 miles SW across the W part of Gulf of Papua to Bligh Entrance and Great North East Channel (13.19), passing:

SE of Kumul Marine Terminal platform (8°04'S 144°34'E) (12.201), clear of the surrounding cautionary area as shown on the chart; thence:

- 2 SE of a dangerous wreck (8°30'S 144°12'E), position approximate, thence:

Either side of Bramble Cay (9°09'S 143°53'E) (13.25).

(Directions continue at 13.27)

Anchorage

General information

12.207

- 1 Extensive offshore flats prevent vessels of much draught entering the many rivers and inlets where anchorage might otherwise be obtained.

During the South-east Trade Winds the N and W shores of the gulf are dangerous lee shores.

In the NW monsoon anchorage may be sought to seaward of the river bars by feeling a way inshore with soundings. The anchorages so obtained are not good.

- 2 **Prohibited anchorage.** Anchoring and trawling are prohibited in a large area adjacent to the submarine pipeline to Kumul Marine Terminal (8°04'S 144°34'E); see 12.230 for details.

Vailala River

General information

12.208

- 1 Vailala River (7°57'S 145°25'E), which is entered on the NW side of Maclatchie Point, is fronted by a bar over which there are depths of about 2 m. There is always a channel over the bar, but it shifts and is sometimes dangerous for boats. There are coconut groves near the mouth of the river and a village on each side of the entrance.

- 2 **Local knowledge** is required.

The river provides access to the village of Ihu, situated on the W bank 3 miles N of Maclatchie Point, and has been ascended by small craft to a point 100 miles farther upstream. There is an airfield at Ihu; the population of the district is about 10 500.

Directions

12.209

- 1 From a position W of Maclatchie Point (7°57'·0S 145°24'·5E) (12.203), the track leads E across the bar, passing (positions from Maclatchie Point):

S of the shoals (4 miles W) (12.203), thence:

S of a drying bank (about 5 cables W), extending S from Aumana Point (7½ cables WNW).

N of a bank (about 1 mile W), reportedly extending from the point.

Puari Delta

General description

12.210

- 1 Puari Delta extends from Alele Passage (7°52'S 145°13'E), in the mouth of Purari River, to the entrance to Wame River 28 miles NW. The rivers and creeks entering the sea through this delta drain an extensive area of highlands inland.

Local knowledge is required.

Between Purari River and Mira Point, 21 miles WNW, the delta is unsurveyed. Sandbanks extend at least 1 mile to seaward of the river mouths on this stretch of coast.

Purari River

12.211

- 1 **General information.** The mouth of Purari River, with a maximum width of 3 miles, is divided by Ivira Island (7°50'S 145°12'E) into Alele and Aievi (Aivei) Passages. Shoals extend up to 2 miles to seaward of these passages and it is probable that seas break across the full width of the river mouth during the South-east Trade Winds. Channels and depths over the bars change with the seasons; depths over the bar of 0·6 m in Alele Passage and 0·4 m in Aievi Passage were found during a reconnaissance survey in 1974.

- 2 In September 1974 the river was ascended for a distance of 90 miles. Depths of less than 2 m were found N of Ivira Island, where Alele and Aievi Passages meet, and again in the approach to Purivo Junction (7°31'S 145°06'E) where Purari is joined by Ivo River. A tidal range of 4 m experienced on the coast reduced to zero at a distance of 35 miles upstream. A 3 kn current was experienced in the river. Bevan Rapids can be negotiated with care.

- 3 **Anchorage** may be obtained in Alele Passage in a depth of about 5 m, SSE of Alele Island (7°50'S 145°13'E), where the passage is between 2½ and 3 cables wide.

Urika and Ivo Rivers

12.212

- 1 **General information.** Urika (Urikar) River enters the sea on each side of Urika Island (7°49'S 145°01'E), on which there is a mission station. The river is a main but short waterway which extends 4 miles inland, where it then becomes Ivo River.

Ivo River is reported to be navigable by river craft to the settlement of Mapaio (7°39'S 145°03'E) and thence to Purivo Junction (7°31'S 145°06'E) (12.211).

Varoi River

12.213

- 1 **General information.** The entrance to Varoi River (7°47'S 144°58'E) is obstructed by a bar. The channel and depths over the bar change with the seasons.

The river joins Purari River about 35 miles inland. In 1974 the upper reaches of Varoi River provided a boat passage, in depths of 2 m or more, between Ivo River and Port Romilly (7°41'S 144°50'E).

Deception Bay and Aird River Delta

Deception Bay

12.214

- 1 **General description.** Deception Bay, which fronts part of Aird River Delta, is entered between Mira Point (7°45'S 144°50'E) and Cape Blackwood (18¾ miles W). Spits, with depths mostly less than 5 m over them, extend generally SSE for considerable distances from the islands and tongues of land which separate the rivers and creeks

entering the head of the bay, as shown on the chart. The spits are formed variously of sand and mud, the latter being mobile and unstable, and their outer ends are likely to break during weather from SE. With an in-going tidal stream, short and steep seas to a height of 3 m have been observed on the seaward edges of the spits, in otherwise calm conditions.

- 2 The shores of the bay are low and swampy but heavily timbered with tall trees which rise to over 30 m in height in places; coconut palms are evident in some areas, particularly along the E and W side of Pai-a Inlet.

Deception Bay and its approaches have not been adequately surveyed. The main channels lie between the spits described above.

Local knowledge is required.

12.215

- 1 **Caution.** Reports over many years suggest that the channels and banks in the approaches to Port Romilly (7°41'S 144°50'E) and to Era Bay, 9 miles farther WNW, are subject to considerable change. Continuing change was confirmed during survey operations in the area in 1993.

Aird River Delta

12.216

- 1 **General description.** Aird River Delta lies between Uramu Island (7°36'S 144°37'E) and Risk Point, the E extremity of Goaribari Island 20 miles farther WSW. The delta is formed of numerous rivers and waterways which have their confluence with the upper Kikori River about 30 miles inland. The rivers discharging through Pai-a Inlet and Bevan Sound, and Nabiu, Dua, Nakari, Aird, lower Kikori and Newberry Rivers farther W, are each part of a complex network of waterways forming the delta.

- 2 A settlement at Kikori (7°25'S 144°15'E), not shown on the chart but situated on the lower Kikori River, was formerly the district headquarters; there is a jetty there.

In 1987 a reconnaissance conducted in MV *Kulasi* (25 m LOA, 3.4 m draught, 149 grt) showed that Aird Hills (7°27'S 144°21'E) could be reached through Bevan Sound and Nabiu or Auro Rivers at HW, and that Kikori and Ivi Rivers were navigable to their junction N of the settlement at Kikori. There is a jetty at Aird Hills.

Chart Aus 378 (see 1.15)

Port Romilly

12.217

- 1 **General information.** Port Romilly (7°41'S 144°50'E), on the E side of Deception Bay, is entered across coastal flats between Mira Point, the W extremity of Kaimari Island, and Bapai Point 5¼ miles farther NW. The main approach to the harbour is from S. An approach from SE through a narrow channel formerly skirting the SW coast of Kaimari Island between Marikimiro Point (7°47'S 144°52'E) and Mira Point, 3½ miles NW, was reported in 1963 to be shoaling and may not now be navigable; see caution at 12.215. Within the harbour there is ample anchorage space in depths suitable for any vessel that can safely enter.

- 2 Pie River, which flows into the head of the harbour, has a least depth of 2.4 m (1960) as far as the government station at Baimuru (7°30'S 144°50'E). There is an airfield at Baimuru, a district population of about 8500 and regular services to Port Moresby by landing barge (1993).

A drying bank extends S from the N shore at the junction of Pie River with Wame River abreast Wami Point

(7°36'S 144°50'E); in 1974 depths of 2 m or more were found S of the drying bank and close to the S bank of Wame River.

- 3 **Tidal levels.** Mean spring range about 2.7 m; mean neap range about 0.7 m.

Caution. During the South-east Trade Winds an under-keel allowance of at least 1.5 m should be used when entering the port, on account of the scend.

12.218

- 1 **Directions.** From a position in the S approaches to Deception Bay the track leads N towards Bapai Point (7°40'S 144°46'E), passing (positions from Mira Point (7°45'S 144°50'E)):

W of the bank (10 miles S) (12.203), which extends 5 miles farther NNW; thence:

W of the banks extending 8 miles S from Mira Point (12.203), and:

- 2 E of Gully Bank, with depths less than 5 m over it, (8 miles SW) forming the outer end of the spit extending SSE from Uramu Island (11 miles WNW). The spit, which is formed mainly of sand, breaks in places in swell from SE. Thence:

E of a drying sandbank (6 miles WSW), which breaks in swell from SE; and:

W of Kaimari Island (extending 4 miles ESE).

- 3 The track then leads NNE, as guided by local knowledge and the large scale chart, in depths of about 4 m across the flats fronting the entrance to Port Romilly. From abreast Mira Point, distant about 6 cables, a channel leads NNE for 3½ miles between banks of sand and mud into the harbour; breakers occur in places over the banks.

- 4 When E of Plum Point (4 miles NNW), course may be directed as required for anchoring.

If proceeding up-river to Baimuru, the best water will be found by favouring the W bank.

12.219

- 1 **Anchorage** in charted depths from 5 to 8 m, good holding ground, may be obtained between Plum Point (4 miles NNW of Mira Point) and Wami Point, 5½ miles farther NNE. During the NW monsoon, shelter is best obtained in the S part of the anchorage and during the South-east Trade Winds in the N part, to avoid the swell. In 1993, overnight anchorage for a boat was obtained in a depth of about 4 m off the inlet in the vicinity of 7°37'S 144°50'.0E.

Tidal streams in the anchorage attain rates of 3 to 4 kn.

Era Bay

12.220

- 1 **General information.** Era Bay (7°37'S 144°41'E) (see Caution at 12.215), which is unsurveyed (1992) but has deep water and ample room, is entered between Bapai Point and the SE extremity of Uramu Island, 6 miles WNW. Era River, which discharges into the head of the bay and is 1 mile wide at its mouth, is navigable by shallow-draught small craft to a point about 33 miles upstream, where rapids are encountered. Baru and Wapo Rivers also flow into the head of the bay.

12.221

- 1 **Directions.** From a position in the S approaches to Deception Bay the track leads N towards Bapai Point (7°40'S 144°46'E), following directions at 12.218 for the S approach to Port Romilly.

When W of Kaimari Island (7°45'S 144°51'E), the track leads NW then NNW, keeping in depths greater than 5 m,

as guided by local knowledge and the large scale chart, into the W side of Era Bay.

Pai-a Inlet

12.222

- 1 **General information.** Pai-a Inlet (7°39'S 144°35'E) is entered between the SW extremity of Uramu Island and Pai-a Point, 2 miles farther SW. The inlet, about 1½ miles wide and with charted depths from 6·5 to 9 m in it, extends 8 miles N to the junction of Ivi River on the E side and Aiai River on the W. Timber is exported from Aiai River in the vicinity of Gouri village, 2½ miles NW of the junction of the two rivers. Farther upstream Aiai River connects with Aird River at the foot of Aird Hills (7°27'S 144°21'E).

- 2 Ivi River connects inland with Kikori River. By favouring the outside of bends, depths generally greater than 7 m can be found in Ivi River throughout its length but, as the junction with Kikori is approached, the river flows over a limestone area and the river bed becomes very irregular with many holes and rock pinnacles. The turbulence of the water suggests that considerable quantities of ground water enter the river in this area.

- 3 **Depths.** The channel into Pai-a Inlet is reported (1989) to be suitable for vessels with a maximum draught of 6 m. A vessel with a draught of 7 m was however observed loading timber off Gouri in 1993.

- 4 **Pilotage.** It is recommended that vessels inward bound to load timber, and others of similar draught, should embark a local pilot at least on the first occasion of entry. The recommended boarding position is midway between the SW extremity of Uramu Island and Pai-a Point; positions farther to seaward are exposed to a heavy swell in SE winds.

Tidal Streams in Pai-a Inlet are reported to run at 3 to 4 kn on both in and out-going streams.

12.223

- 1 **Directions** (confirmed 1993). From a position (8°00'·0S 144°43'·6E) to seaward of the 10 m depth contour, the line of bearing 333° of the E extremity of Pai-a Point (7°40'S 144°33'E), which is heavily wooded to a height of 33 m, leads NNW when raised, passing (positions from Pai-a Point):

ENE of a 4·2 m patch (19 miles SSE); a 5·7 m patch lies 2 miles farther NNW; thence:

- 2 WSW of Gully Bank, extending at least 11 miles SSE from Uramu Island (2 miles NE).

When Pai-a Point is distant 10 miles, the line of bearing 343° of the W extremity of Uramu Island, heavily wooded along its S coast to a height of 35 m, leads NNW, passing:

ENE of a bank, with depths less than 5 m over it, (extending nearly 8 miles SSE).

- 3 When Pai-a Point is distant 3½ miles, the line of bearing 330½° of the E extremity of a point (5¾ miles NNW) leads NNW in mid-channel, passing:

ENE of Pai-a Point; the coastal bank, with depths less than 5 m over it, extends 5 cables ENE of the point; thence:

- 4 WSW of the W extremity of Uramu Island (2 miles NE); the point has a sandy beach backed by coconut palms and is cultivated. The village of Mirimairau is situated nearby.

When the point ahead is distant about 1½ miles, the track leads NNW on the line of bearing 347° of a mark (white corrugated iron sheets on timber frame; 5 m in height) (10¼ miles NNW), standing on the W bank of the

entrance to Aiai River. The track leads in mid-channel, passing:

- 5 W of a spit, with depths less than 5 m over it, extending up to 7 cables SSW of the point (9 miles N) at the junction of the two rivers.

The track then leads NNE and round the W entrance point to Aiai River (10¼ miles NNW), favouring the outside of the bends. There are shoal depths off this point and also off the opposite E bank, N of the junction with Ivi River.

- 6 **Useful mark:**

Cape Blackwood (7°48'S 144°31'E), a low headland wooded to a height of 30 m, forming the SE extremity of Ibibubari Island. The cape is identifiable on radar at 15 miles distance.

12.224

- 1 **Anchorage.** During the South-east Trade Winds anchorage may be obtained near the entrance to the inlet, in good holding ground N of Pai-a Point (7°40'S 144°33'E). In 1993 HMAS *Flinders* anchored in a depth of 10 m, mud, with the E edge of Pai-a Point bearing 190°, distant 1·7 miles, and the S edge of Uramu Island bearing 110°. Aird Hills, 16½ miles farther NW (12.201), are clearly visible from this anchorage bearing between 310° and 316°.

- 2 Anchorage for vessels loading timber may be obtained in a depth of 24 m in midstream in Aiai River, on the approximate meridian of 144°30'·0E, SW of Gouri village and abreast the timber storage area on the S bank. Vessels are reported to remain for up to 5 days in this anchorage, loading logs from barges or directly from the river.

Bevan Sound

12.225

- 1 **General information.** Bevan Sound (7°40'S 144°28'E), which includes Port Bevan in its SW part, is entered between the S extremity of Saumao Peninsula, of which Pai-a Point is the E extremity, and Cape Blackwood 7 miles farther S. Although the sound is unsurveyed (1992) and impeded by numerous sandbanks, it provides the most direct route from sea to Aird Hills (7°27'S 144°21'E) and to Kikori (7°25'S 144°15'E) (12.216) through either Auro or Nabiu Rivers; the route has been used by vessels with draughts greater than 4 m.

Local knowledge is required.

12.226

- 1 **Directions** (used in MV *Kulasi* (12.216) in 1987) (positions from Cape Blackwood (7°48'S 144°31'E).

From a position SSE of the entrance to the sound, the line of bearing 333° of the SW edge of Saumao Peninsula (7 miles N) leads NNW through the outer approaches in a least depth encountered of 7·6 m, passing:

WSW of patches (13 and 11 miles SE) (12.223), thence:

- 2 ENE of a bank, with depths of less than 5 m over it, (extending at least 7 miles SE); breakers occur over the bank in places. Waters on the W side of the bank are unsurveyed, but depths appear to shoal gradually from S towards the cape. Thence: Clear of a shoal patch (6½ miles SE) with a least charted depth of 3·7 m.
- 3 When Cape Blackwood (12.223) is distant 5 miles, the line of bearing 286° of the observed SW edge of the cape leads WNW for 2·2 miles in a least depth of 4·3 m.

The line of bearing 310° of the NE edge of Cape Blackwood then leads NW in a least depth of 4.4 m, passing:

NE of drying patches (1½ miles SE), lying on the inner part of the bank extending SE from the cape; thence:

- 4 SW of a bank, with depths less than 2 m over it, (1¼ miles ENE), and:

Close NE of Cape Blackwood and the coastline extending NW from it.

The track then leads NNW on 345°, following a line of soundings shown on the large scale chart (1.15), to the NE side of the head of the sound. A least depth of 3.1 m was encountered (1987) on this track, which passes:

- 5 WSW of a large drying sandbank (3½ miles N), which extends NW into the sound; thence:

ENE of a drying sandbank (12 miles NNW).

The track then leads into the rivers, as guided by local knowledge.

Chart Aus 378

The delta west of Bevan Sound

12.227

- 1 **General information.** The rivers in the W part of Aird River Delta are simply water channels, with shoals in places but probable depths of about 4 m in the fairways, leading through extensive mangrove swamps with little dry land anywhere. Surveys are generally inadequate or non-existent.
- 2 The channels are regularly traversed (1987) at HW by barges of 150 tonnes and 2.2 m draught. By favouring the outside of bends vessels drawing 2 m or less could (in 1966) reach the junction of Kikori and Sirebi Rivers, 11 miles upstream of Kikori (7°25'S 144°15'E). Both rivers are then navigable for 12 to 14 miles farther upstream, but rapids and pinnacles in Kikori River 5 miles above the junction require caution; these rapids mark the limit of tidal influence in the river. Kikori River is reported to be the more violent of the two when in flood.
- 3 Approach to the rivers is normally made from SE through the waters, sometimes known as The Sound, between Goaribari Island (7°46'S 144°13'E) and Babaibari Island 3½ miles farther NE. Goaribari Island is low but covered with mangroves and tall trees; Risk Point, at the E extremity of the island, is wooded to a height of 30 m. Banks in the area which dry are reported to do so at about half tide. A route through The Sound into the river system was used by MV *Kulasi* (25 m LOA, 3.4 m draught, 149 grt) in 1987.
- 4 General depths less than 5 m extend at least 8 miles to seaward of Goaribari Island. In 1987, lines of breakers were reported to extend SSE from Babaibari Island and SE from Goaribari Island to a distance of 18 miles from the latter.

Kumul Marine Terminal

Chart Aus 378 (see 1.15)

General information

12.228

- 1 **Position and function.** The terminal, which consists of an operations platform (8°04'S 144°34'E) and a lit SBM 2 miles farther S, exports crude oil supplied by pipeline from oilfields inland.
- Approach** by tankers in ballast should be made from S.
- Traffic.** In 2004 the terminal handled 23 vessels totalling 2 284 071 dwt.

Port Authority. Chevron Niugini Pty Ltd, Port Moresby, Papua New Guinea.

Limiting conditions

12.229

- 1 **Tidal levels.** Mean spring range about 2.4 m; mean neap range about 0.6 m.

Maximum size of vessel handled. The SBM is designed to accommodate fully loaded tankers up to 150 000 dwt or partially loaded larger vessels up to a maximum of 300 000 dwt. There is a least depth of 25 m at the SBM but draught is restricted to a maximum of 17.1 m.

Arrival information

12.230

- 1 **Port operations.** Berthing and unberthing of tankers at the SBM is carried out under the direction of a mooring master appointed by the terminal operators. A vessel may not proceed within 1 mile of the SBM unless a mooring master is onboard.

Port radio. Continuous watch is maintained on VHF radio. The terminal should be called for berthing instructions when within range. See *Admiralty List of Radio Signals Volume 6(4)* for details.

- 2 **Notice of ETA** should be given on departure from previous port of call and confirmed 72, 48 and 24 hours before arrival.

Anchorage for tankers waiting to load should be taken up in the recommended anchorage centred 4 miles S of the terminal platform, as shown on the chart.

- 3 **Prohibited anchorage.** Except as required for operations at the terminal, anchoring and trawling are prohibited within 10 miles of the submarine oil pipeline extending SE to the terminal from Aird River Delta. Additionally the cautionary area within 5 miles of the terminal platform, as shown on the chart, should be avoided by vessels not involved with terminal operations. See also 1.44.

- 4 **Pilotage** is compulsory and boards 1½ miles S of the SBM. See *Admiralty List of Radio Signals Volume 6(4)* for details.

Tugs are available.

Tidal streams in the vicinity of the terminal have been reported (1993) setting variously NE and W on the rising tide and SW and E on the falling tide.

- 5 **Currents** are described at 12.183.

Principal marks:

Kumul Marine Terminal platform (8°04'S 144°34'E) (12.201) and light (12.201); a crane on the platform is marked by an obstruction light.

Directions

12.231

- 1 See 12.204 for guidance on choice of approach from S.

Facilities

12.232

- 1 Helicopter deck on the operations platform; a mooring buoy situated 3 cables N of the operations platform is for the use of tugs or service vessels. No other services or facilities are documented.

Omati River to Gama River

Chart Aus 378

Omati River and approaches

12.233

- 1 **General information.** Omati River (7°44'S 144°11'E) may be entered by passing either E or W of Goaribari Island (12.227), which fronts the entrance. Depths of about

4 m have been reported in both channels. If passing E of Goaribari Island, the river is then entered through Aumo Pass on the N side of the island.

- 2 Approach to the channel W of Goaribari Island from S crosses flats, with general depths less than 5 m over them, extending at least 11 miles to seaward of the island. Isolated drying banks and breakers are reported to occur in places over these flats; a tidal stream of 4 to 6 kn has been experienced.

Omati River has low banks covered with mangroves and depths of 1 to 4 m in the fairway, which favours the SW bank. Houses in the delta are built on piles, most of the land being barely above HW.

Paibuna River

12.234

- 1 Paibuna River enters the gulf close E of Jukes Point (7°46'S 144°05'E). No information on the river is available.

Turama River

12.235

- 1 **General information.** Turama River (7°43'S 143°50'E) is entered between Jukes Point (7°46'S 144°05'E) and Bell Point (16 miles SW). The latter may be identified by some prominent clumps of trees on it (1974) rising to a height of 20 m; the point is also identifiable on radar. The mouth of the river is divided by Morigio and Neabo Islands, which are both low and densely wooded. Turama Channel, the NE and widest of the three channels, is about 2 miles in width and has a least known depth of 4.5 m. Gawai Channel, the middle channel, has depths from 2.7 to 3.7 m with a shallow bank in the fairway at its inner end. The channel between Neabo Island and the SW shore is unnamed. A number of drying mud flats lie in mid-river between Morigio Island (7°47'S 143°55'E) and Turibomu Island, 8 miles farther NW.

- 2 The river has been ascended by small craft for a distance of 80 miles, but is mostly shallow, with numerous mudbanks.

Local knowledge is required.

12.236

- 1 **Tidal bore.** Strong tidal streams have been experienced in the river. A bore, which is dangerous to small craft, forms in Turama Channel on the first of the in-going stream and continues up-river for a distance of about 40 miles. A more detailed description of the bore occurring in Bamu River farther SW is given at 12.241.

Gama River

12.237

- 1 **General information.** Gama River is entered between Bell Point (7°59'S 143°55'E) (12.235) and a point 4 miles farther SW, on which stands the village of Ibua. The river is fronted by extensive sand and mud flats forming a bar with depths of about 1.2 m over it. Within the bar, the entrance is about 1 mile in width and has depths of about 4 m which then continue through the lower reaches of the river. Wabida Creek joins Gama River 12 miles WNW of Bell Point. Both waterways are navigable for many miles, giving access to a number of settlements on their banks.

Bamu River

Charts Aus 378, Aus 4620

General information

12.238

- 1 The mouth of the Bamu River (8°07'S 143°43'E) is entered between the unnamed point (8°03'S 143°52'E),

forming the SW entrance point to Gama River (12.237), and Korimoro Point at the E extremity of Dibiri Island, 13 miles farther SW. The approach is over a large shallow flat, with depths less than 5 m over it and areas of breakers, which extends 20 miles to seaward.

- 2 The estuary is divided by the large Naviu and Uapumba Islands into Duro, Bina and Bebea Rivers, which together form the mouths of Bamu River. Duro River is connected, by the narrow Terere Passage (8°13'S 144°37'E), to the estuary of Fly River; there is a jetty within the passage. Close W of Naviu and Uapumba Islands, Bamu River is divided by the large Aramia Island which has Dibiri River flowing on its SW side. All these islands are low, swampy, and covered with mangroves and nipa palms.

- 3 The main tributary, Arama River, joins Bamu in the vicinity of 7°55'S 143°17'E (1974), about 2½ miles downstream of the settlement of Emeti. The former junction of the two rivers, shown on the reference charts 5 miles farther ESE, is closed over. Arama River is used by river craft; there are settlements on its banks over 30 miles upstream from the junction.

In its upper reaches, Bamu divides into Wawoi and Guavi Rivers.

12.239

- 1 The main channel leading through Bebea and Bamu Rivers is navigable in small craft of shallow draught for 40 miles upstream to Emeti, (approximately 7°55'S 143°15'E) and on the S bank, where there is a government station. Bamu River Mission lies close downstream of Emeti, and another settlement at Gagoro, where there is an airstrip, lies close upstream.

12.240

- 1 **Tides and flow.** Tides at Emeti occur about 3 hours later than those at the river mouth. During the wet season of the NW monsoon, the out-going flow of the river at Emeti may attain a rate of 6 to 8 kn.

12.241

- 1 **Tidal bores,** which form a short distance upstream of the W end of Uapumba Island (8°03'S 143°35'E) about 3 to 4 hours before HW at the river mouth, are experienced in Bamu River within three days either side of spring tides. Three peak waves 100 to 200 m in length and normally between 0.5 and 2.5 m in height, but possibly higher during SE winds or when the river current is at its maximum, are followed by up to eight secondary waves and a strong in-going stream with an immediate rise in water level of between 1 and 2 m. The bore ascends the river at a speed of 10 to 15 kn and may break in midstream on the longer reaches, and on the banks, particularly on the bends. Successive bores follow at intervals of 12 to 12½ hours.

- 2 An approaching bore can normally be heard from a distance. A vessel should be in the deepest water available when a bore is expected and either at anchor, or under way and stemming the bore.

Directions (1974)

12.242

- 1 Approaching Bamu River from seaward, a landfall should be made on Bell Point (7°59'S 143°55'E) (12.235). The track then leads W across the offshore flat in a least depth of 3 m, passing:

S of the NE entrance point (8°03'S 143°52'E) to the estuary, keeping 4 miles distant from this and from the coast extending 8 miles W from the point. The coast lying between the villages of Ibua and Sibara is almost submerged and covered with mangroves.

- 2 When Uapumba Island (8°03'S 143°35'E) (12.238) is distant 6 miles, where depths are about 3 m, the track leads WNW on 300° into Bebea River, passing (positions from the W extremity of Uapumba Island):

Close NNE of a drying bank, sand and mud (11 miles ESE), thence:

SSW of the coast, distant 5 cables, abreast Sibara village (11 miles E).

- 3 The track then follows the N bank at a distance of 3 to 4 cables off, in a least known depth of 3.5 m, passing: Clear of a dangerous wreck (7 miles ENE).

When abreast Buniki village (6 miles ENE), where the bank is 6 m in height and reportedly higher than elsewhere, the track closes the N bank of the river to a distance of 2 cables, then follows the outside of the bend at the same distance off the bank in depths between 3 and 6 m.

12.243

- 1 The track then follows the course of the river to Emeti (about 19 miles WNW); the deeper water generally being found within 1 to 2 cables of the bank on the outside of the bends. Lesser depths exist on the crossings; the shoalest (11 miles WNW), being off the NW end of Aramia Island where the river must be crossed from N to S. This crossing should be made near HW as there was a depth of only 1 m there in 1974.

Facilities

12.244

- 1 Boat jetty at Bamu River Mission; two jetties at Emeti; a hard on the W bank 5 cables N of Gagoro is difficult to use with tidal heights less than 2 m because of mud and clay.

Umuda Floating Terminal

Chart Aus 378

General information

12.245

- 1 **Position and function.** Umuda Floating Terminal (8°40'S 144°01'E) is situated 17 miles SE of Umuda Island, in the outer part of Fly River delta. The terminal consists of a storage vessel, of about 45 000 grt, secured to a SBM. Copper concentrates, shipped down Fly River from Ok Tedi mines by barge, are held in bulk onboard the storage vessel for transshipment and export. In 1993 there were eight self-propelled barges involved in this operation; the barges are between 70 and 75 m LOA, with draughts of 3.6 m.
- 2 **Traffic:** in 2004 the terminal handled 3 vessels totalling 48 903 dwt.

Port Authority. Papua New Guinea Harbours Board, PO Box 671, Stanley Esplanade, Port Moresby, Papua New Guinea.

Arrival information

12.246

- 1 **Port radio.** Constant watch is maintained onboard the storage vessel; see *Admiralty List of Radio Signals Volume 6(4)* for details.

Notice of ETA should be given to Ok Tedi Mining Ltd at Tabubil, Western Province, well in advance. Changes in ETA should be notified to the mines and to the storage vessel.

- 2 **Pilotage** is not compulsory and there is no pilot boarding place in the immediate vicinity. A pilot may be obtained if required by arrangement with Queensland Coast and Torres Strait Pilotage Associations. Details of procedures and boarding places are given in *Admiralty List of Radio Signals Volume 6(4)*.

Directions

12.247

- 1 From a position in open water SE, the track leads directly NW towards the terminal (8°40'S 144°01'E) keeping in depths of more than 10 m and within an arm of the sea which extends into the outer part of Fly River delta. The track passes (positions from Umuda Island (8°28'S 143°45'E)):

SW of a spit, with depths less than 10 m over it, (extending to 22 miles ESE); an isolated shoal bank (depth 2.8 m) (14½ miles E) lies on the spit. And:

- 2 NE of a 9.4 m patch (16½ miles SE), lying near the E edge of a bank with depths less than 10 m over it. Umuda Island and an unnamed island close SE, lie together on the NW part of the bank; the islands are low, swampy and covered with mangroves and nipa palms to heights indicated on the chart.

Anchorage and berthing

12.248

- 1 **Anchorage.** None documented in the vicinity of the terminal.

Berth. Alongside the storage vessel (8°40'S 144°01'E), as directed.

Mooring. A mooring buoy situated in the channel between Umuda Island (8°28'S 143°45'E) and the smaller Sobuwabuda Island, 9 cables farther NW, provides a



Umuda Floating Terminal (12.245)

(Original dated 1999)

sheltered berth for small vessels. The mooring may be approached either from NNE or from SE.

- 2 The approach from SE leads generally NW from seaward, as guided by local knowledge and the chart, through a channel with depths of more than 5 m which skirts the SW side of the bank extending up to 18 miles SE from Umuda Island.

Fly River

Chart Aus 378

General information

12.249

- 1 **Description.** Fly River, with its estuary reaching between Korimoro Point (8°13'S 143°43'E) on Dibiri Island and Parama Island 48 miles farther SSW, is perhaps the largest river in Papua New Guinea and is of great importance as a means of reaching the interior.

From the bar S of Dibiri Island the river is navigable, in depths generally greater than 4 m (1981), for at least 458 miles to the town of Kiunga, which is the administrative centre of the large gold and copper mining complex of Ok Tedi Mining Ltd.

- 2 **Traffic.** In 2004 passages to Kiunga by sea-going vessels were made on 63 occasions, totalling 171 529 dwt. An indication of the size and type of local vessel using the river may be seen in the details of barges servicing Umuda Floating Terminal (12.245).

12.250

- 1 **Topography.** The estuary of Fly River is impeded by numerous low, flat and swampy islands, which are covered with mangroves and nipa palms and have villages and cultivated ground on them in places; the aspect of the land on each side of the estuary is similar. The principal village in the area is at Iasa (8°39'S 143°31'E), situated on the SW side of Kiwai Island, where there is a mission station.

- 2 Islands and shoals divide the estuary into three entrances; although there are depths of 7 to 9 m in these in some places, it is the depths and sea conditions over the extensive flats and shoals farther to seaward that limit entry to the river. The principal entrance is through Fly River Entrance (12.254), lying between Korimoro Point and Umuda Island, 14 miles S. North Entrance and South Entrance lie farther SW on either side of Kiwai Island (8°34'S 143°26'E), which is well wooded and the largest island in the estuary. In North Entrance, only the channel (12.248) passing close SW of Umuda Island (8°28'S 143°45'E) has been surveyed to modern standards (1987). South Entrance is unexamined but is known to be used by some local craft, generally as the most direct route between the river and Daru Island (9°05'S 143°12'E). Drying sandbanks form an extensive bar in the mouth of this entrance; Neva Pass (8°43'S 143°22'E) lies close along the SW shore.

- 3 **Caution.** The estuary has been incompletely surveyed and the charted positions of many of the islands and shoals within should not be relied upon. Other dangers may exist.

12.251

- 1 Within the estuary, Fly River itself is entered abreast Sumogi Island (8°25'S 143°02'E), where it is about 7 miles in width. Between 320 and 410 miles upstream the river forms the border between Papua New Guinea and Papua. In the final 400 miles of its approach to the sea, the river falls only 20 m and flows through interminable forests, under water for the greater part of the year, and through vast grassy plains which are probably converted into lakes during the rainy season.

12.252

- 1 **Movement reporting.** Positions and intended movements for vessels navigating the river are broadcast from Umuda Floating Terminal (12.246). Vessels meeting in the river should pass their intentions on VHF radio. See *Admiralty List of Radio Signals Volume 6(4)* for details.

12.253

- 1 **Natural conditions.** The annual rainfall in the highland region, where the river has its origins, is nearly 10 m. In the upper reaches a change of 5 to 6 m in river level within a period of 12 hours is not uncommon; a river current of about 5 kn can be expected with the river in flood.

The tidal influence is significant as far as Tidal Island, which lies about 150 miles above Sumogi Island (8°25'S 143°02'E).

- 2 At spring tides a tidal bore forms in the river abreast Gebaro Island (8°22'S 143°13'E) and ascends the river for a distance of about 80 miles. The bore is dangerous to boats. All vessels are recommended to find the deepest water when a bore is expected. A more detailed description of the bore occurring in Bamu River farther N is given at 12.241.

Directions

12.254

- 1 **Approaches.** From open waters to seaward of the delta, approaches to Fly River Entrance lead over the bar to a position (8°15'S 143°40'E) 7 cables S of Dibiri Island.

12.255

- 1 From SE an initial approach to the above position may be made following the directions given at 12.247 for Umuda Floating Terminal. From the vicinity of the terminal the track then continues NW as guided by local knowledge and the chart, passing (positions from Umuda Island (8°28'S 143°45'E)):

NE of the unnamed island (close SE), and of Umuda Island (12.247); depths less than 5 m are found up to 2¼ miles NE of both of these island. Thence: NE of Wabuda Island (2½ miles NW).

12.256

- 1 From E a track for small vessels of suitable draught leads W to position 8°22'S 143°52'E. The track crosses the coastal shelf, with depths less than 10 m over it, extending nearly 30 miles offshore, passing (positions from Umuda Island (8°28'S 143°45'E)):

N of a dangerous wreck (25 miles E) (12.206), thence: N of the isolated shoal bank (14½ miles E) (12.247), thence:

- 2 S of the breakers (16 miles NE), extending seawards from the mouth of Bamu River (12.238).

The track then leads WNW, as guided by local knowledge and the chart, to the position S of Dibiri Island, passing:

NNE of Wabuda Island (2½ miles NW).

12.257

- 1 **Fly River Entrance from Dibiri Island to Sumogi Island.** From the position S of Dibiri Island (8°13'S 143°40'E) the track leads generally W following the N bank of the river for 40 miles, as guided by local knowledge and local charts, passing N of Wabuda, Wariura, Baiabe, Gebaro, Abo and Sumogi Islands.

12.258

- 1 **River passage.** No directions are available for the passage up-river from abreast Sumogi Island (8°25'S 143°02'E), but a report from the tanker MV *Pacific Explorer* (1640 dwt, 72 m LOA, 4.2 m draught), which

negotiated the river on several occasions in 1986 loaded with distillate, provides useful guidance.

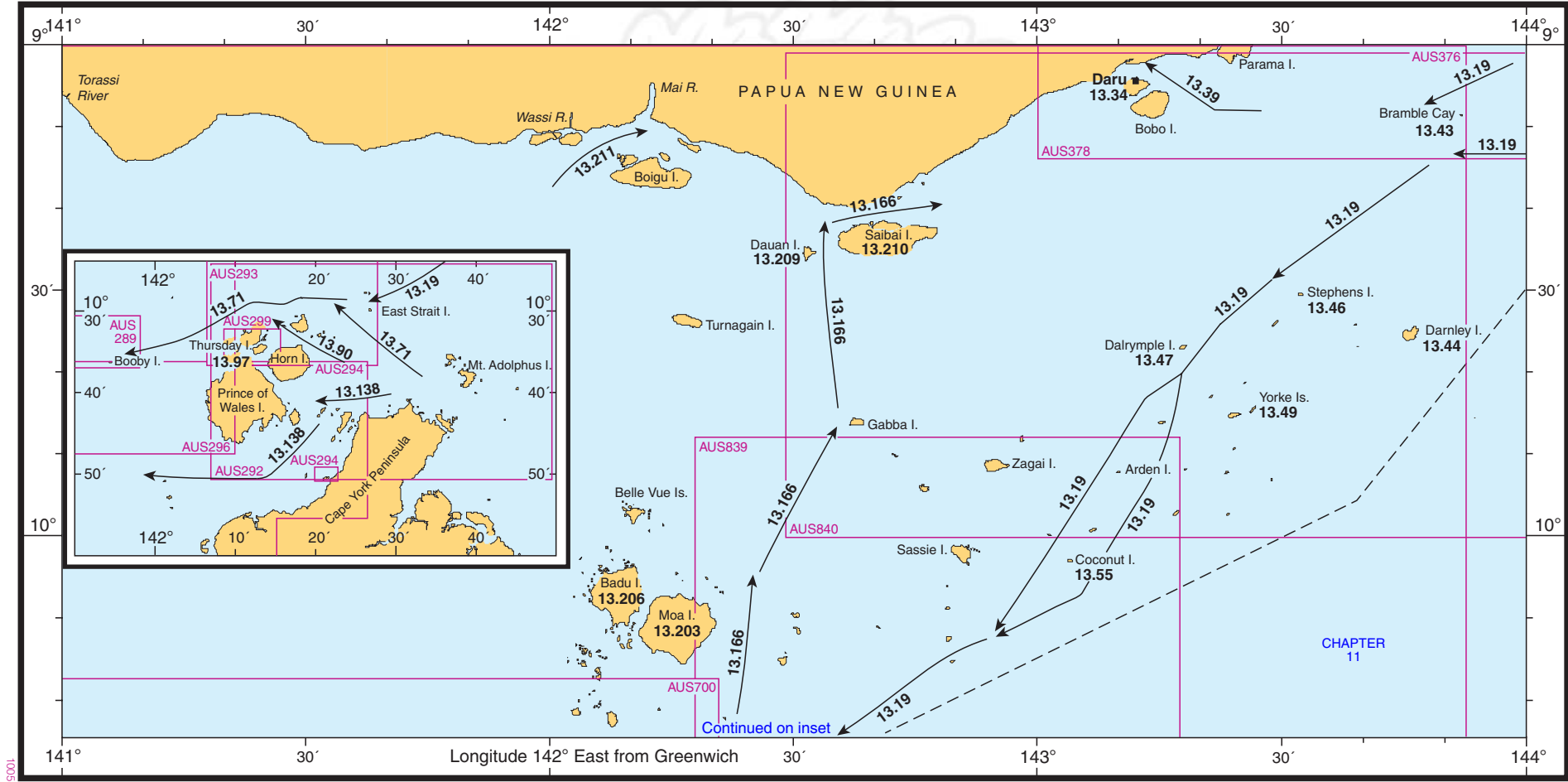
- 2 The report states that the passage to Kiunga took up to 72 hours with the vessel remaining underway by night using a searchlight and radar. Considerable pre-planning of the passage was necessary and the extensive local knowledge of pilots and masters of local craft proved invaluable. There were no navigation marks in the delta and much use was made of satnav, radar and echo sounder.

- 3 The vessel grounded on several occasions, but without damage; the river bed at each occurrence being soft mud and silt, and this was found to be acceptable. As the passage up-river progressed the width of the navigable channel narrowed and large tree trunks and rafts of floating debris became the predominant hazard. Often there was less than 1 m of water under the keel and at these times the vessel would shudder and sheer off looking for deeper water.





Chapter 13 - Torres Strait and approaches



CHAPTER 13

TORRES STRAIT AND APPROACHES

GENERAL INFORMATION

Charts Aus 376, Aus 4620

Scope of chapter**13.1**

- 1 This chapter covers the area bounded by Bramble Cay (9°09'S 143°53'E) and Cape York Peninsula in the E, and by a line from Torassi River (9°08'S 141°01'E), thence generally SSW to 11°00'S 140°40'E, thence E to Cape York Peninsula, in the W. Approaches to the area from Coral Sea are described in Chapters 2 and 12, and from the Inner Route of Great Barrier Reef in Chapter 11. Waters W of the area are described variously in *Australia Pilot Volume I* and *Indonesia Pilot Volume III*.

Description of waterway**13.2**

- 1 Torres Strait, which connects Coral and Arafura Seas, is approximately defined in the E by a line between Cape York (10°41'S 142°32'E) and Dauan Island, 75 miles N, and in the W by a line from Slade Point (10°59'S 142°08'E) to the entrance to Torassi River (9°08'S 141°01'E). The only route through the strait for vessels approaching the maximum permissible draught (see 13.4) is through Prince of Wales Channel. The approach to this channel from E is through Great North East Channel, and from SE through the Inner Route passing Cape York. Routes from the W end of Prince of Wales Channel lead W through Arafura Sea and SW into Gulf of Carpentaria.

Topography**13.3**

- 1 The S side of Torres Strait is formed by the coast of mainland Australia from Cape York (10°41'S 142°32'E) (11.127) to the vicinity of Slade Point, 30 miles SW. This stretch of coast, the larger part of which also forms the S shore of Endeavour Strait, rises generally to low wooded hills inland with few distinctive features; see 13.141 for a more detailed description.
- 2 The most significant and focal part of Torres Strait is the central section, where islands and reefs stretch N from Cape York Peninsula, between the approximate meridians of 142° and 142°25'E, to latitude 9°55'S forming a natural barrier through which there are a number of channels presenting differing degrees of intricacy and danger. Most of the islands are of granite formation and wooded, and many rise above 100 m in height.
- 3 To the N of this central section is a largely unsurveyed area of reefs and shallow flats extending to the N boundary of the strait, which is formed by the S coast of Papua New Guinea from Parama Island (9°00'S 143°25'E) to Torassi River (9°08'S 141°01'E), and thence by the coast of Papua as far as the meridian of 140°40'E. The whole of this stretch of coast is low, mostly thickly wooded with mangroves and fronted by extensive, and generally unexamined, reefs and foul ground. Several rivers, in which alligators are numerous, enter the sea along the coast. Villages, with some patches of cultivated land, are found on the banks of the rivers and along the coast.

From the central section scattered groups of islands and reefs extend E towards Great Barrier Reef.

- 4 Geologically the W part of Torres Strait may be considered as an estuary. The ocean current which flows NW along Great Barrier Reef for a large part of the year finds its outlet through the strait and has carried with it, over the centuries, a considerable quantity of silt, in the form of sand and dead coral, to create the shoals on the W side. The similarity to an estuary is clearly shown in the shoal ridges which lie N and S of Booby Island (10°36'S 141°55'E) forming a bar with the characteristics, including movement in the seabed, that would be expected at the mouth of a river. Gradual silting is taking place but hydrographic records are as yet insufficient for a full interpretation. Diving operations in the vicinity of Booby Island have confirmed that the seabed there is formed of constantly-moving sandwaves which vary from 0.3 m to about 1.8 m in height. This movement may cause difficulty in maintaining a channel should dredging be considered as a future solution for provision of a deeper-draught route.

Limiting draught**13.4**

- 1 **Maximum draught** for passage through Torres Strait to Booby Island (10°36'S 141°55'E) either from Cape Flattery (14°57'S 145°21'E) through the Inner Route of Great Barrier Reef, or from Dalrymple Island (9°37'S 143°18'E) through Great North East Channel, is 12.2 m (2005).

Least charted depths are quoted in descriptions of the channels to which they apply.

- 2 **Under-keel clearances.** The minimum permissible under-keel clearance in Gannet and Varzin Passages is 1.0 m; in Prince of Wales Channel it is 1.0 m for draughts of less than 11.9 m and 10% of draught for draughts of 11.9 m or more.

Speed reductions may be necessary to maintain clearances for deeper-draught vessels.

See *Australian Seafarers Handbook* for further details.

Hazards**13.5**

- 1 **Navigation amongst coral.** See 1.9.
- Traffic.** The volume of commercial shipping passing through Torres Strait is considerable. Additionally, a number of local craft operate between the islands.
- Fishing.** A significant level of commercial fishing takes place during the prawning season from May to September, working exclusively at night and anchoring in the lee of the islands by day. Outside the season only a small number of mackerel boats were observed to be working.
- 2 **Caution.** VHF discipline and compliance with *International Regulations for Preventing Collisions at Sea* by fishing vessels was reported in 1993 to be poor.

Pilotage**13.6**

- 1 Pilotage is not compulsory, but is recommended for passage of Torres Strait and Great North East Channel for vessels of 70 m LOA or more, and for all loaded tankers, chemical and liquefied gas carriers irrespective of size. Pilots are available when required, subject to prior notice. Boarding positions within the immediate area, 9°34'S 143°24'E for W-bound vessels and 10°34'S 142°04'E or

10°36'S 141°50'E for S and E-bound vessels, are shown on the relevant larger scale charts. Pilots may also be embarked at any other port or place by arrangement with the pilot services (1.28). See *Admiralty List of Radio Signals Volume 6(4)* and *Australian Seafarers Handbook* for details.

Local knowledge

13.7

- 1 Local knowledge is essential outside recognised main shipping routes and in areas shown on the charts not to have been adequately surveyed.

Jurisdiction

13.8

- 1 Jurisdiction over the area of Torres Strait is complex and derives from a number of sources. Guidance on national claims to territorial seas is given in *Admiralty Annual Notice to Mariners No 12*. More detailed information on Australian limits is given in *Australian Seafarers Handbook* and shown on some charts.

Protected zone

13.9

- 1 The limits of a Protected Zone, which is established to safeguard the way of life of the traditional inhabitants of the area, are shown on the charts. Fishing within the zone by vessels of all nationalities is regulated by Australia and Papua New Guinea under a treaty between those two countries.

Prohibited landing

13.10

- 1 Many of the islands in Great North East Channel and Torres Strait are inhabited and will generally have facilities and supplies sufficient for local needs. Landing on inhabited Australian islands in Torres Strait is however prohibited without prior permission. Information on whether islands are inhabited or not is included, where known, in the relevant parts of the text.

Ship reporting system

13.11

- 1 For details of Torres Strait and Great Barrier Reef ship reporting system, see 1.89 and *Admiralty List of Radio Signals Volume 6(4)*.

Natural conditions

13.12

- 1 **Tides.** The restricted channels of Torres Strait connect two areas in which the tides differ remarkably as the result of contrasting effects of semi-diurnal components. Spring tides on one side of the strait coincide with neaps on the other and, at some phases of the moon, HW on one side will coincide with LW on the other. The marked differences in level that can thus occur between the two sides cause streams to flow through the channels from the high to the low level.
- 2 In contrast to the effects of the semi-diurnal component, those of the diurnal component are more or less uniform over the whole area. Thus, if higher HW on the E side coincides with higher LW on the W then, about 12 hours later, lower HW in the E will coincide with lower LW in the W. The difference in level will be similar in both occurrences, as will be the rate of the stream.

13.13

- 1 **Tidal height broadcasts.** Actual tidal heights being recorded in Prince of Wales Channel by tide gauges at Booby Island (10°36'S 141°55'E), Goods Island, Turtle

Head and Ince Point (10°31'S 142°18'E) are broadcast on VHF radio from Hammond Hill (10°31'8S 142°13'5E) (Hammond Island), with a nominal line of sight range of about 24 miles. Details of the service are given in *Admiralty List of Radio Signals Volume 3(2)*.

Although the service is provided specifically for passages of Prince of Wales Channel, it is likely to be of benefit to navigation within the area generally.

13.14

- 1 **Tidal streams.** In contrast to the tides, which may have a relatively large diurnal component, the tidal streams in Prince of Wales and adjacent channels and their immediate approaches are predominantly semi-diurnal. Marked changes in the character of the streams may occur E and W of these channels.

It should be noted that tidal streams in these channels do not depend on, and cannot be referred to, the local tide. The narrowness or otherwise of channels causes the rate of the stream to differ greatly between channels, and in different parts of the same channel.

- 2 Throughout Prince of Wales Channel, from Twin Island (10°28'S 142°27'E) to a few miles W of Goods Island (10°34'S 142°10'E), the tidal streams can be expected to run at the times predicted for Hammond Rock Lighthouse (10°31'S 142°13'E). The rates of the stream will however decrease from those given as the channel becomes less restricted; in the entrances they are only about 30% of those predicted off the light. Off Booby Island the rates are comparatively weak and the character of the streams is quite different. The streams everywhere follow the direction of the channels through which they flow; in Prince of Wales Channel this direction is generally E/W but, in adjacent channels, it can be N/S in places.

- 3 The stream turns almost simultaneously in all the channels close to Prince of Wales Channel, and in their immediate approaches on the E side. In waters farther E, and also S of Prince of Wales Channel, the times at which tidal streams commence and reach their maximum rates can still be related to those off Hammond Rock. In Great North East Channel, in the vicinity of Harvey Rocks (10°19'S 142°41'E) and off Saddle Island 8½ miles farther N, the times are about 30 minutes earlier; in Endeavour Strait they are about 40 minutes later than those off Hammond Rock. In both cases the rates of the stream in these more open waters are weaker than those off Hammond Rock.

- 4 In the waters W of Prince of Wales Channel the streams become increasingly diurnal and rotary. The times of turn are also affected, becoming markedly and progressively earlier to the extent that those near Proudfoot Shoal (10°32'S 141°28'E) are about 4 hours earlier. Tidal stream predictions in *Admiralty Tide Tables* for Hammond Rock Lighthouse should not be used W of the channels: streams in the vicinity of Proudfoot Shoal are described at 13.75.

13.15

- 1 **Currents.** In the channels through Torres Strait the current, which depends on the wind, sets generally W almost continuously except during December, January and February, when it sets mainly E. During and after lengthy periods of strong winds from a steady direction the rate of the current may be considerable.

- 2 The tidal stream predictions for Hammond Rock Lighthouse given in *Admiralty Tide Tables* include the usual currents to be expected under normal conditions of NW monsoon or South-east Trade Winds. Neither the current itself, nor any difference between the usual current included in predictions and that actually occurring, will effect the times of maximum flow in either direction.

Marked differences from the usual conditions will however cause the times of slack water and the rates of maximum flow to vary from those predicted.

13.16

- 1 **Sandwaves** occur in both E and W entrances to Prince of Wales Channel and are a feature of the general area. Known occurrences are shown on the charts and described where appropriate in the text. The effect of the waves may be to produce depths which differ from those charted. See *The Mariner's Handbook* for more detailed information.

Local weather. The South-east Trade Winds prevail for 9 months of the year.

Coast radio stations

13.17

- 1 Coast radio stations are established at Darnley Island (9°35'S 143°46'E), Moa Island (10°11'S 142°15'E) and Thursday Island (10°35'S 142°14'E); see *Admiralty List of Radio Signals Volume 1(2)* for details.

EAST APPROACHES TO TORRES STRAIT

GENERAL INFORMATION

Charts Aus 376, Aus 377

Scope of the section

13.18

- 1 This section describes Great North East Channel from Bramble Cay (9°09'S 143°53'E) to East Strait Island (10°30'S 142°27'E) including the port of Daru (9°05'S 143°12'E), together with anchorages, harbours and passages associated with this area.

GREAT NORTH EAST CHANNEL

General information

Charts Aus 840, Aus 839, Aus 377

Description

13.19

- 1 **Entrances.** Great North East Channel may be entered from Coral Sea on either side of Bramble Cay (9°09'S 143°53'E) but Bligh Entrance, lying between Bramble Cay and Anchor Cay, 19½ miles SE, is the better entrance. The alternative entrance between Bramble Cay and the coastal shoals off Papua New Guinea, 13 miles NW, leads through unsurveyed water.

13.20

- 1 **Route.** From Bramble Cay, Great North East Channel leads generally SW for 123 miles to East Strait Island (10°30'S 142°27'E) where it joins Prince of Wales Channel. The Two-Way Route shown on the reference charts is a ships routeing measure. Its use is not mandatory, however, it does indicate the best and safest route for all vessels having regard charted depths and dangers. The tracks in the approaches to Daru (9°05'S 143°12'E) are for preferred routes which have not been surveyed to the IMO/IHO standards required for their classification as recommended tracks: see notes on the charts.

The direction of the channel favours W-bound vessels which are mostly able to proceed in good light conditions.

Surveys

13.21

- 1 Approaches to a number of listed anchorages (13.42) in the waters adjoining the SE side of Great North East Channel have not been adequately surveyed and require local knowledge.

Topography

13.22

- 1 Great North East Channel is bounded on the S and SE sides by the reefs and islands in the N part of Great Barrier Reef; on the N side by the coast of Papua New Guinea between Parama Island (9°00'S 143°27'E) and Bristow Island, 8 miles SW, and for a large part of the W side by

the extensive Warrior Reefs. From the SSW extremity of Warrior Reefs (9°49'S 143°00'E) a broken line of reefs and islands extends 32 miles farther SSW to Kirkcaldie Reef.

- 2 On a clear night the numerous densely wooded islands lying adjacent to Great North East Channel show up distinctly from a distance of 3 to 4 miles.

Depths

13.23

- 1 **Least charted depth** of 12 m, as shown on chart Aus 839, is found in the NW of the Two-Way Routes, in position 10°09'S 142°58'E; lesser depths are charted at a distance of 5 cables in the same vicinity on the edge of the Two-Way Route and in Vigilant Channel, 5 miles WSW.

Flow

13.24

- 1 **Tidal streams.** The general pattern of the tidal stream in Great North East Channel is to set W and E on the rising and falling tides respectively, but the actual direction taken is governed by that of the passage through which the stream sets. The rate of the stream is similarly affected by the narrowness of the passage.
- 2 **Caution** is required in the vicinity of Bramble Cay (9°09'S 143°53'E) and in Bligh Entrance. The stream there sets E and W but the influence of Fly River delta, 35 miles farther NW, can contribute to a flow in the vicinity of Bramble Cay which is very strong and irregular; particularly during the NW monsoon and at the changes of season. During the South-east Trade Winds, the W-going tidal stream is accelerated by the current and sets towards Bramble Cay, on which several vessels have been wrecked.
- 3 Between Stephens Islet (9°31'S 143°33'E) and Dungeness Reef, 39 miles SW, the streams are diverted by Warrior Reefs to SW and NE-going; the SW-going stream runs on the rising tide until approximately 2 hours after HW. A spring rate of 1½ to 2 kn should be allowed for in this part of the channel.
- 4 Strong tidal streams are experienced off the SE end of Bet Reef (10°10'S 142°53'E). On the rising tide the stream sets W from 2 hours after the time of LW; on the falling tide it sets ENE from approximately 2 hours after HW. The times of HW and LW appear to be the same as those at Dungeness Reef.
- 5 In the more open waters between Saddle Island (10°10'S 142°41'E) and Mount Adolphus Islands, 25½ miles S the stream sets WSW and ENE, attaining spring rates of 1½ kn in each direction. Between Saddle Island and Harvey Rocks, 8½ miles S tidal streams commence and reach their maximum rates about 30 minutes earlier than those off Hammond Rock Lighthouse (10°31'S 142°13'E). See 13.12 for details of tides and tidal streams which become increasingly complex as Prince of Wales Channel is approached.

- 6 **Current.** A W-going set of 3 kn has been experienced between Bramble Cay (9°09'S 143°53'E) and Bet Islet (10°09'S 142°49'E).

Principal marks

13.25

1 Landmarks:

Bramble Cay (9°09'S 143°53'E), known locally as Massaramcoer, a sand cay, partly covered with low grass, and with a mass of black rocks, 3 m in height, on the E and SE ends; a partially drying reef which surrounds the cay extends up to 6 cables SE. The cay is frequented by turtles and numerous sea birds and is used as a base for mackerel fishing. Bramble Cay Light (stainless steel framework tower with white GRP hut within; 17 m in height) stands on the reef 2 cables NW of the cay with a small observation hut close NW. Bramble Cay is one of the best marks for making Great North East Channel, the lighthouse being visible at a distance of 10 miles on a clear day.

Light



Bramble Cay (13.25)

(Original dated 1999)

- 2 Darnley Island, locally known as Errub or Erub, (9°35'S 143°46'E), of volcanic formation and rising to a peak, covered with vegetation, near its centre; the valleys are heavily wooded. In clear weather the island may be seen from seaward at a distance of 25 to 30 miles.
- 3 Massig radio mast (9°45'S 143°25'E), stainless steel framework mast visible from up to 15 miles in clear weather by day.
Water tower on Coconut Island (10°03'S 143°04'E), a white GRP structure situated in the middle of the island. It is clearly visible from N or S out to about 8 miles, but wooded from close W of the island; a taller white radio mast stands close E of the tower but is not conspicuous.
- 4 Water tower on Sue Islet (10°13'S 142°49'E), white in colour.
Twin Island (10°28'S 142°27'E) (13.32); the E island (61 m in height), partially covered with stunted trees and scrub, is prominent from E. Twin Island Light (white GRP hut, 6 m in height) and some boulders, stand on the summit.

Major light:

Bramble Cay Light — as above.

Other aids to navigation

13.26

1 Racons:

Bramble Cay Light (9°09'S 143°53'E) (13.25).
Dalrymple Island Light (9°37'S 143°18'E) (13.30).

Kirkcaldie Reef Light (10°20'S 142°50'E) (13.32).
For details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 2.96 or 12.206)

Bligh Entrance

13.27

- 1 From a position in Bligh Entrance between Bramble Cay (9°09'S 143°53'E) and Anchor Cay, 19½ miles SE (11.79), the track leads W in depths of more than 36 m over a sand, shell and mud bottom, passing (positions from Bramble Cay):

N of an 11.4 m patch (12½ miles SE), the N-most known shoal sounding on the S side of the entrance; thence:

S of Bramble Cay (13.25), distant about 4 miles; see 13.24 for caution on tidal streams.

Entrance north-west of Bramble Cay

13.28

- 1 Parama Island (9°00'S 143°25'E) and the adjacent coast of Papua New Guinea close NW are low and mangrove-fringed and not visible at more than 10 miles offshore, except for some trees on the island which are about 60 m in height. To avoid the shoals and heavy breakers which extend for a considerable distance off this coast it is recommended to pass as close as is convenient to Bramble Cay (9°09'S 143°53'E) (13.25); see caution on tidal streams at 13.24.
- 2 From a position in Gulf of Papua, NNE of Bramble Cay, the track leads SW as required to pass NW of the cay, thence either side of Black Rocks (13.29), 3 miles farther SW. For vessels using Great North East Channel, course should then be adjusted to join the Two-Way Route described below.

Bramble Cay to Dalrymple Island

13.29

- 1 From the position S of Bramble Cay, distant about 4 miles, the Two-Way Route leads SW as shown on the chart, passing (positions from Brown Reef (9°26'S 143°47'E):
- SE of Black Rocks (1.5 m in height) (16 miles N), lying on a small reef; there is a clear passage between the rocks and Bramble Cay. Thence:
- 2 NW of Tot Reef (6 miles NE). This reef, Brown Reef, and Laxton Reef which lies between them, all dry and can be seen at LW; at other times their positions are indicated by tide-rips or, in fine weather, by the discoloured water over them. The sea generally breaks over all three reefs. Thence: NW of Darnley Island (7½ miles S) (13.25); there is a pilot base on the island. Thence:
- 3 NW of Stephens Islet (14 miles WSW), known locally as Ugar, a small volcanic islet with an eroded, rocky appearance which rises steeply from the beach and is fringed by an extensive drying coral reef; the islet has reddish brown clay soil, is wooded and is considerably higher than neighbouring small coral islets. A village with a population of 50 (2001), stands on a small plateau on the NE side of the islet; the church is only visible from N.

- 4 NW of Campbell Island (19 miles WSW), known locally as Tappoea or as Zapker, wooded, fringed by a beach and lying on a drying reef from which a below-water coral spit, with depths less than 10 m over it, extends 8 cables N. Channels close E of Campbell Island and between it and Stephens Islet reef, 2 miles NNE, are obstructed by drying and below-water reefs and are unsuitable for use except by local craft in good conditions. Thence:
- 5 SE of Pearce Cay (29 miles W), known locally as Mallicamas or as Muraki, formed of sand and lying on a steep-to drying reef; the hull of a stranded wreck, which does not cover (1993), is clearly visible on the E end of the reef. And:
- 6 NW of Keats Island (26 miles SW), known locally as Homogar or as Pentric, uninhabited (1993), heavily wooded and lying near the NW side of a drying reef. The flattened remnants of a stranded wreck on the E part of the reef are awash at HW (1993). Thence:

Dalrymple Island to Poll Island 13.30

- 1 Abreast Dalrymple Island (9°37'S 143°18'E), known locally as Damuth or Damud, the Two-way Route splits to pass either side of Rennel Island, 9 miles farther SSW. Deeper water lies within the E route, avoiding the least charted depth in the W route (see 13.23). The W route leads initially SW then SSW as shown on the chart, passing (positions from Arden Islet (9°52'S 143°10'E)):

2 West Two-Way Route.

- NW of Marsden Island (14½ miles NE), known locally as Eegarba or Egab, uninhabited (1993), heavily wooded and lying on a steep-to coral reef which dries; a number of boulders, about 1 m in height, lie on the E and NW sides of the reef. Massig, a larger and more important island (13.49), lies 3 miles farther SE. Thence:
- 3 SE of part of Warrior Reefs (10½ miles NNW), formed by three large drying reefs which extend 38 miles SSW/NNE; the sea breaks heavily on the E edge of the reefs during the South-east Trade Winds. And:
- 4 NW of Rennel Island (7¾ miles NE), known locally as Mauar or Mauwar, heavily wooded and lying on a steep-to drying reef. Inhabited (1993); a single house and outbuilding, situated near the middle of the island, are visible from NNW.

The track continues SSW within the Two-Way Route, passing:

- 5 WNW of Arden Islet, known locally as Garboy or Garbui, uninhabited (1993), heavily wooded and lying on the NW edge of a steep-to drying reef. Arden Islet Light (white metal framework tower, 13 m in height) stands on the W end of the islet. Thence:
- 6 ESE of Jacobus West Shoal (7¾ miles W); this and a depth of 8 m, lying at the outer edge of a mud spit 2 miles farther SSW, are the outer known dangers E of Dungeness Reef, which lies 2 miles W of the shoal and dries in places. Thence:
- WNW of Roberts Islet (7½ miles SSW) (13.31), thence:
- 7 ESE of Dove Islet (11¼ miles SW), known locally as Uttu, lying at the NW end of a drying reef, is

- sparingly covered by vegetation which consists mainly of grass and low scrub; two palm trees rising above the scrub are readily identifiable from NE (1993) but less easily seen from close E. Landing is possible on a gently sloping beach on the NW side of the islet but there is no protected anchorage, due to strong tidal streams and confused seas in the area. Dove Islet Light (white GRP hut on metal framework tower, 8 m in height) stands on the E end of Dove Islet reef. Thence:
- 8 WNW of Coconut Island (12½ miles SSW), known locally as Parrema or Poruma, a sand and coral atoll which may be identified by its water tower (13.25). The island is heavily wooded and lies on a large drying reef, with Moian Reef lying close E; a village with a population of 188 (2001) is situated on the NW side of the island. Thence:
- 9 ESE of Walker Shoal (16 miles SW), the E-most known danger in the area between Sassie Reef (19 miles SW) and Bet Reef (22½ miles SW); thence:
- WNW of Richardson Reef (17 miles SSW) (11.67), thence:
- 10 ESE of Bet Reef which dries; Vin Islet, a grassy sand cay known locally as Bin (which also describes the entire reef), and a black rock, 2.4 m in height, lie on the NE edge of the reef. Bet Reef Light (white GRP hut on red framework tower, 7 m in height) stands at the SE end of the reef. A stranded wreck, MV *Wongala*, about 10 m in height with hull, superstructure and masts standing (1993), lies SW of the light and is clearly visible from up to 3 miles. Bet Reef Light is partly obscured in the sector (054°–070°) by the wreck. Thence:
- 11 ESE of Poll Island (30½ miles SW) (13.32), in the white sector (214°–205°) of Kirkaldie Reef Light (13.32), the adjacent red sector (205°–214°) covers shoal patches extending from Warraber Reef (13.32) and Poll Island.

13.31

- 1 **East Two-Way Route** which passes E of Rennel Island (13.30), has depths of between 19 to 27 m, leading initially SSW, then SW passing (positions from Dove Islet Light (10°00'S 143°02'E)):
- WNW of Marsden Island (25½ miles NE) (13.30), Thence:
- WNW of Smith Cay (21½ miles NE) (13.49), thence:
- 2 WNW of Layoak Islet (17½ miles ENE) (13.51), thence:
- ESE of Sugar-Ran Reef (12 miles ENE). A sand cay which dries 2.1 m lies at the NW end of the reef; a light-beacon (port hand, 7 m in height) stands at the SE end. Thence
- ESE of Roberts Islet (4½ miles E), known locally as Yarpar, wooded and lying on a steep-to drying reef; thence:
- 3 WNW of Newman Reef (8¼ miles ESE) (11.67), thence:
- ESE of Coconut Island (3¼ miles SSE), (13.30). Thence:
- WNW of Caldbeck Reef (9¼ miles SE) (11.67), thence:
- ESE of Richardson Reef (7¼ miles S) (11.67).
- 4 The Two-Way Route then continues SW, passing:
- NW of Meggi-Maituine Reef (18 miles SSE), a drying reef; Kai-Maituine Reef another drying reef lies 2 miles N. A sand cay (1.7 m in height) lies at

its NW edge. Both these reefs lie in unsurveyed waters. Thence:

SE of Bet Reef (11 miles SW) (13.30), thence:

To the position ESE of Poll Island (10°15'S 142°50'E) (13.32), where the E and W Two-Way Routes rejoin.

Charts Aus 839, Aus 292

Poll Island to East Strait Island 13.32

- 1 From a position about 3½ miles ESE of Poll Island (10°15'S 142°50'E) the Two-way Route continues WSW, passing (positions from Kirkcaldie Reef Light (10°20'S 142°50'E)):

SSE of Poll Island, known locally as Guijar, (4¾ miles N), wooded and lying on a drying reef, thence:

- 2 NNW of Kirkcaldie Reef, known locally as Maza, from where Kirkcaldie Reef Light (red GRP hut on white concrete column, 8 m in height) is displayed. Melanie Shoal lies 2 miles E, thence: SSE of Ackers Shoal (2 miles NW), on which stands Ackers Shoal Light (S cardinal, 6 m in height), thence:

- 3 SSE of Harvey Rocks (8¾ miles W), known locally as Yuren Kula, a group of black, above-water rocks lying on a drying reef; Harvey Rocks Light (white GRP hut on red framework tower, 8 m in height) stands on the SW end of the reef. Beagle Rocks (1¼ miles farther W), consisting of two below-water rock patches, are the outer of a number of below-water rocks lying W of Harvey Rocks. Thence:

- 4 SSE of Twin Island (24 miles WSW), known locally as Nelgee, formed of two islands lying E and W on a drying reef and nearly connected by a drying sandy neck; coral boulders lie on the S side of the reef. The E island and light are described at 13.25; the W island is wooded. Shoal patches extend up to 1 mile W from the island, the outer patch being marked by tide-rips. A rock patch (depth 11.2 m) lies 1 mile WSW of the island. And:

- 5 NNW of East Strait Island (24½ miles SW), rocky and lying near the E end of a drying reef; a below-water rock, 4 cables ENE of the island, is the outer danger on the E side. Depths less than 10 m extend up to 1¼ miles WSW from the island. Lights displayed from the island are described at 13.80.

The track then leads W, with East Strait Island astern, to join Prince of Wales Channel in the vicinity of 10°30'S 142°22'E.

(Directions continue at 13.80)

Vigilant Channel to East Strait Island 13.33

- 1 From a position about 2 miles SSE of Bet Reef Light (13.30), an alternative route leads initially WNW through Vigilant Channel, passing (positions from Harvey Rocks (10°19'S 142°41'E)):

SSW of Bet Reef (12½ miles NE); the S edge is easily seen and mostly steep-to. Thence:

- 2 NNE of a depth of 10.9 m (14 miles ENE), the least depth charted adjacent to this part of the channel; Warraber Reef, which dries, lies 1 mile farther SW.

The track then leads W towards Saddle Island (8½ miles N), fringed by a drying reef and rising to two grassy hills of similar height, which are separated by lower ground.

The hills give a saddle-shaped appearance from E or W. The track passes:

- 3 N of Sue Islet, (10 miles NE), wooded and readily identifiable by its water tower (13.25) or by its light; a village with a population of 237 (2001) stands at the NE end of the islet. Sue Islet Light (white GRP hut on white concrete column, 5 m in height) stands on the NW edge of Warraber Reef which fringes the islet; the light is obscured in the sector (288°–005°) by the islet. And:
- 4 S of Bet Islet (12¾ miles NE), known locally as Burrar, wooded and lying near the W end of Bet Reef. Panther Shoal, with a least depth of 10.3 m over it, extends NW from the W end of the reef. Thence:
N of a depth of 11.2 m (9½ miles NE), lying at the outer end of a spit extending WNW from Warraber Reef.
- 5 The track then leads SSW, passing:
ESE of Moresby Rock (8 miles N), a pinnacle; thence:
WNW of Poll Island (13.32) Thence:
ESE of Ninepin Rock (4¾ miles N), a remarkable, square, isolated and reef-fringed rock; thence:
- 6 ESE of Ibis Reefs (1 mile NNE); there is a clear channel 5 cables wide between the reefs and Harvey Rocks (13.32). Thence:
ESE of Harvey Rocks.

The track then rejoins the Two-Way Route from Kirkcaldie Reef (13.32) and leads WSW to Prince of Wales Channel.

Port of Daru

Charts Aus 840, Aus 378

General information 13.34

- 1 **Position and function.** Daru Island (9°05'S 143°12'E) is the administrative centre for the W part of Papua New Guinea and has a population of about 8000. The port of Daru handles supplies for the area.

Approach and entry. The approach is in irregular depths from SE; there is no known access from W except for boats. Vessels of suitable size and not more than 3.7 m draught may proceed beyond Daru to Oriomo River (9°02'S 143°11'E) which is navigable for a distance of about 40 miles.

- 2 **Port limits** extend offshore to latitude 9°11'S as shown on chart Aus 840, and include Parama Island (9°00'S 143°27'E).

Traffic. In 2004 the port handled 2 vessels totalling 9 727 dwt.

Port and pilotage authority: Daru Port Authority, Papua New Guinea Harbours Board, PO Box 137, Daru, Papua New Guinea.

Tidal levels

13.35

- 1 See information in *Admiralty Tide Tables*. Mean spring range about 2.5 m; mean neap range about 0.5 m.

Arrival information

13.36

- 1 **Pilotage** is not compulsory but may be arranged through Port Moresby (9°26'S 147°06'E) (12.115) at 48 hours notice; the pilot boarding position for Daru is 2½ miles ESE of Bristow Island Light (9°06'S 143°17'E). See *Admiralty List of Radio Signals Volume 6(4)* for details.

Tugs are not available.

Local knowledge is required.

Quarantine. Daru is a first port of entry; see 1.76 and *Admiralty List of Radio Signals Volume 1(2)* for details of quarantine reports required. Radio pratique may be granted.

Climate

13.37

- 1 The coast W of Daru is very unhealthy at times. For climatic table see 1.192 and 1.207.

Directions for approach

13.38

- 1 **From Bligh Entrance** the track leads W, passing S of Black Rocks (9°10'S 143°50'E) (13.29) to join the preferred route for entry (13.39).

From north-east. Vessels, apparently on passage from Fly River (12.249) to Daru, have been observed to follow a track leading WSW on 240°, passing SSE of Merrie England Shoals, before joining the preferred route for entry. Local knowledge is required for this track.

- 2 **From south** the track leads N, remaining E of longitude 143°30'E and passing E of a shoal, with a least depth of 12.8 m over it, (9°18'S 143°27'E) and with disturbed water in its vicinity. Course may then be directed NW to join the preferred route for entry.

Directions for entry

13.39

- 1 From a position about 14 miles ESE of Bristow Island Light (9°06'S 143°17'E) the preferred route for entry leads W, as shown on the charts, passing S of Merrie England Shoals; a 4.3 m patch, 10½ miles ESE of the light, is the S-most known danger. During the South-east Trade Winds the sea breaks heavily over the reefs and shoals which extend from the patch to Parama Island (13.28), 8½ miles farther N. The trees on Parama Island form the highest feature in the area.

- 2 The track then leads NW, as shown on the chart, in a least charted depth of 5.5 m to an anchorage in Daru Roads, or as otherwise required, passing (positions from Bristow Island Light):

NE of a 4 m patch (6¾ miles ESE); a 4.9 m patch lies 1¼ miles farther NW; thence:

SW of an extensive shallow flat with depths less than 5 m over it (1¼ miles E), shoaling gently towards Bampton Point (8 miles ENE); and:

NE of a 3.4 m patch (2 miles ESE), thence:

- 3 NE of Bristow Island (6 cables WSW), known locally as Bobo Island, uninhabited, low, covered in mangroves and fringed by coral ledges on its E and S sides. Bristow Island Light (white tower; 7 m in height), stands near the E extremity of the extensive off-lying shallow flat. Thence:

NE of Daru Island (3 miles WNW), lying on the same shallow flat, fertile and rising to a height of 27 m on its N side; a drying reef extends 5 cables from the N side of the island.

- 4 Course may then be directed, as guided by local knowledge, either through a narrow channel leading generally W to a berth (5 miles WNW) on the N side of Daru Island, or through a narrow channel, with a least depth of 3.4 m, leading generally WNW to the entrance to Oriomo River (7 miles NW).

Caution. A dangerous wreck, with a depth of less than 2 m over it, lies 1 cable ENE of Daru wharf; there are other below-water obstructions in the vicinity.

Berths

13.40

- 1 **Anchorage** may be obtained in Daru Roads, NE of Bristow and Daru Islands. Anchorage may also be obtained N of the government wharf (below), mud or silt bottom; small craft may obtain anchorage W of the wharf.

Alongside berth: a wharf (9°03'·8S 143°12'·5E), connected to shore by a bridge and causeway totalling 340 m in length, is situated on the N side of Daru Island; the berthing face on the N side of the wharf is 29.6 m in length, with a depth of 2.4 m alongside. Tidal streams are reported to run at up to 3 kn; a swell with a height of 1 m has been experienced during strong SE winds.

Port services

13.41

- 1 **Repairs:** none documented.

Other facilities: hospital; customs; barge ramp.

Supplies: fuel in drums; fresh water in limited quantities.

Anchorage and harbours

Charts Aus 840, Aus 839, Aus 376

General information

13.42

- 1 **Anchorage** in the event of thick weather may be obtained almost anywhere in Great North East Channel under the lee of adjacent reefs or islands as guided by the charts and local knowledge (13.7). Recognised anchorages are described below, except those in the E approaches to Cumberland Passage which are given at 11.70.

Bramble Cay

13.43

- 1 Moderately good anchorage may be obtained under the lee of Bramble Cay (9°09'S 143°53'E) (13.25) in depths of 37 m. Anchorage with no protection from any SE swell may also be found S or E of the cay in depths of 20 to 40 m, mud and sand. The bottom in the area 4 miles S of the cay consists partly of yellow clay.

Darnley Island

13.44

- 1 **General information.** The population of 375 (2001) is centred in the main and smaller villages situated on the shores of Same Bay on the S side of Darnley Island (9°35'S 143°46'E) (13.25). The narrow fringing reefs on the N, W and S sides of the island are mostly steep-to, as may be seen on the chart, and free from known dangers; an extensive drying reef lies on the E side.

- 2 Nepean Islet, known locally as Attagoy or Edgor, 6 miles W of Darnley Island, is wooded with a distinctive canopy of palm trees rising above the lower scrub; Tobin Cay, 2½ miles farther S is a sand cay. Both features lie on drying reefs within larger areas of possible shoaling.

13.45

- 1 **Anchorage,** sheltered from SE winds, may be obtained 5 cables offshore in Treacherous Bay on the N side of the island, in depths of 26 to 27 m.

Useful marks:

Daymark (9°35'·0S 143°45'·9E), a white beacon 3 m in height standing on a small bluff; the mark is a good head mark for anchoring.

- 2 Daymark (2½ cables E of the above), white pillar surmounted by a cross.

Rock (9°34'·4S 143°46'·7E), a remarkable projecting knob of rock at the E entrance point to Treacherous Bay.

Anchorage may also be obtained off the W and S sides of the island.

- 3 **Berth.** A rock and concrete landing ramp suitable for barges up to 200 tonnes is situated at the SW end of the island; an approach channel cut across the fringing reef has a depth of 2.5 m and a width of 30 m and is marked by beacons (lateral) at its seaward end.

Facilities: airstrip; medical aid post; telephone; stores; petrol and diesel in limited quantities; limited fresh water.

Stephens Islet

13.46

- 1 Anchorage during SE winds may be obtained off the NW side of the reef fringing Stephens Islet (9°31'S 143°33'E) (13.29). There is access at HW only for landing barges across the reef to a manoeuvring basin and concrete ramp on the N side of the islet; two beacons mark the approach. Access is otherwise by dinghy only.

Dalrymple Island

13.47

- 1 Anchorage during the South-east Trade Winds may be obtained bearing 282° distant 7 cables from the NE point of Dalrymple Island (9°37'S 143°18'E) (13.30) in a depth of about 20 m, sand and broken shell. The berth affords shelter in weather from 100° to 200°.

Marsden Island

13.48

- 1 Good anchorage may be obtained close off the centre of a curved beach on the NNW side of Marsden Island (9°43'S 143°22'E) (13.30) in a depth of about 23 m, good holding ground in black mud and sand. The anchorage is sheltered in winds from between E and SSW, but is subject to strong tidal streams.

Yorke Islands

13.49

- 1 **General information.** Massig or Masig (9°45'S 143°25'E), the main and larger island, and Kodall, 1 mile ENE, which form Yorke Islands, are sand and coral atolls. Both islands are wooded to a height of about 21 m and lie together on an extensive drying reef, being connected by a drying sand spit which is clearly visible at LW. The islands may be identified by the radio mast (13.25) on Massig.

- 2 The village of Massig, with a population of 288 (2001), lies on the N side of the island and is used as a support base for up to 30 trawlers during the prawning season (13.5). There is a pilot station on the island; unlit pilot boat mooring buoys, not shown on the chart, are situated close NNW and SSE of the island.

Smith Cay on which stands a light (13.50), is known locally as Rug, and lies at the NW end of a drying reef 4 miles W of Massig, dries 3.1 m and has deep and clear water on all sides.

- 3 Stewart Reef, known locally as Kos, which lies 5 miles E of Yorke Islands, should be avoided; the W side of the reef is dangerous, with extensive isolated coral patches lying up to 3 cables W of the visible edge. A sand cay, drying 2.1 m, which lies near the W end of the reef, is clearly visible when approaching from W under favourable conditions of tide and light.

13.50

- 1 **Anchorage.** During weather from SE, sheltered anchorage may be obtained N of the W end of Massig in depths of 31 to 35 m, mud and sand; a white pillar, standing on a grassy rise close ENE of the barge ramp, is clearly visible from the anchorage.

- 2 Fishing vessels and local craft obtain anchorage close W of Kodall in depths of 12 to 27 m, broken coral and sand, inside a closely off-lying bank which provides shelter from both SE and NW. A support barge for trawlers is anchored there for the duration of the prawning season. The bank, which consists of a series of coral patches with a least depth of 0.1 m over them, extends E from a dangerous rock charted 6½ cables N of the radio mast, thence NE to a position 2.2 miles NE of the mast. From W, a track to the anchorage leads E on 090° in a least depth of 5.5 m, passing 3 cables N of Massig and midway between the edge of Yorke Islands reef and the dangerous rock, 240 m farther N. From NE a track leads SW on 216° in more open water and a least depth of 12.8 m, passing 4 cables NW of Kodall. Local knowledge is required.

- 3 During the NW monsoon, anchorage may be obtained 1.4 miles S of the E point of Massig in depths of 25 m, broken coral, sand and mud; Massig church, a white building with a small wooden spire, is prominent from between SSE and SSW out to 3 miles, but is otherwise obscured.

Useful mark:

Smith Cay Light-beacon (W cardinal, 7 m in height) (09°46'S 143°19'E).

- 4 **Berths.** A causeway situated at the NW end of Massig, adjacent to the end of the airstrip, extends to a rock and concrete landing ramp for barges, which is protected from NW by a small breakwater. An approach channel cut through the fringing reef has a depth of 2.5 m and is marked at its outer end by beacons (lateral). A wooden jetty suitable for small craft extends WNW from the SW end of the causeway.

- 5 **Facilities:** tarmac airstrip with services to Thursday Island and Cairns; medical centre; retail stores; telephones; petrol and diesel in drums; fresh water very limited and for local use only.

Bourke Isles

13.51

- 1 **General information.** Bourke Isles consist of Bourke Islet (9°53'S 143°29'E); Kabbikane Islet, 5¾ miles NW; Aukane, or Auken, Islet, 5 miles W, and Layoak Islet, known locally as Yaok, 10½ miles W. All the islets, which are uninhabited (1993), are heavily wooded sand and coral atolls surrounded by extensive, steep-to and drying coral reefs. A palm tree on Bourke Islet, rising above the surrounding canopy, is readily identifiable from 2 miles W of the islet; a similar tree on Aukane Islet is clearly visible from 2 miles S or SE.

- 2 An unnamed sand cay, known locally as Meth, which lies on a drying reef 2¾ miles NNE of Bourke Islet, should be avoided; approach to this reef is hazardous as a number of isolated coral features lie close off its W and NW sides.

13.52

- 1 **Anchorage,** sheltered in sea and swell from SE, may be obtained within 1 mile NW of any of Bourke Isles; the bottom is mostly sand and broken coral, with some mud. The anchorages are used by trawlers during the prawning season. Tidal streams, which run ENE/WSW through the anchorages, can create uncomfortable conditions at springs

when vessels may lie beam to sea. At such times an alternative anchorage farther SW off Aureed Island (13.53) or Mimi Islet (13.54) may be preferable.

- 2 During the NW monsoon, anchorage may be found on the SE sides of Bourke Isles but tidal streams at springs can again create uncomfortable conditions.

Aureed Island

13.53

- 1 **Aureed Island**, or Aurid, (9°57'S 143°17'E) is a low, sand and coral atoll, heavily wooded on its SW, NW and NE sides, with open grassland, scattered trees and low scrub on the central part of the E side; it is uninhabited (1993). The extensive drying coral reef surrounding the island is steep-to except at the SW end which is fouled by a number of isolated coral features lying close S.
- 2 **Anchorage**, sheltered from SE wind and swell, may be obtained bearing 004° distant 8 cables from the S end of the island in a depth of 25 m, mud and sand. The anchorage is comfortable in most states of sea and tide during the South-east Trade Winds and is used by a large number of trawlers during the prawning season.
- 3 During the NW monsoon an alternative anchorage may be obtained, in a depth of 30 m, bearing 166° distant 1½ miles from the SE corner of the island; this anchorage should be avoided under conditions of swell from SE and sea from NE.

Mimi Islet

13.54

- 1 **Mimi Islet** (9°57'S 143°24'E), which is uninhabited (1993), is a low, heavily wooded coral and sand atoll lying on the NW part of an extensive and steep-to drying reef. A drying reef and cay, 2 miles farther ESE, is separated from Mimi reef by a channel 8 cables wide with a depth of about 50 m. A number of isolated coral features lie close N of this second reef, which is otherwise steep-to on all sides.
- 2 **Anchorage**. Good anchorage, sheltered in sea and swell from SE, may be obtained bearing 298° distant 1.2 miles from the S end of Mimi Islet in a depth of 33 m, sand and broken coral with some mud.

Coconut Island

13.55

- 1 **Anchorage** may be obtained 1 mile N of the E extremity of Coconut Island (10°03'S 143°04'E) (13.30) in a depth of 18 m, broken coral, sand and mud. The anchorage was found to be comfortable for a vessel of 400 tonnes in any state of sea and swell from SE. In 1993 up to ten trawlers at a time were observed at anchor close in to the N limit of the reef. The least depth in the area of the anchorage is 10.8 m (charted as 11.6 m) 4 cables NW of the water tower.
- 2 **Berth**. A rock causeway extends from the NW extremity of the island to a rock and concrete landing ramp suitable for barges up to 200 tonnes; a small wooden jetty suitable for small craft extends NE from the seaward end of the causeway. A short breakwater lies close NW of the ramp. An approach channel cut through the fringing reef has a depth of 2.5 m, a width of 30 m and is marked at its outer end by beacons (lateral).
- 3 **Facilities**: tarmac airstrip with services to Thursday Island and Cairns; medical centre; telephone; retail store;

limited quantities of fuel in drums; fresh water very limited.

Sue Islet

13.56

- 1 **General information**. Sue Islet (10°13'S 142°49'E) (13.33) has an estimated population of 200. A landing ramp for barges is usable at all states of the tide; an approach channel to the ramp is marked by beacons.
- Facilities**: airstrip; medical aid post; telephone; retail store; limited stocks of drummed petrol and diesel; fresh water supplies very limited.

Chart Aus 293

Twin Island

13.57

- 1 **Anchorage** may be obtained under the lee of Twin Island (10°28'S 142°27'E) (13.32) as required, except on the W side.

Reef passages

Chart Aus 840

Missionary Passage

13.58

- 1 Missionary Passage (9°15'S 143°10'E), which is unsurveyed, lies between the N end of Warrior Reefs and extensive drying flats of mud and sand extending S from the coast of Papua New Guinea W of Bristow and Daru Islands.
- Mutacomai, Kumaderi and Parakari Reefs, which all dry, lie on the S side of the passage; Gimini Reef (9°15'S 143°01'E), which dries, lies on the N side.
- 2 A dangerous rock was reported (1997) to lie 2¼ miles W of Parakari Reef.
- Tidal streams** run strongly through the passage, as shown on the chart.

Moon Passage

13.59

- 1 Moon Passage (9°33'S 143°07'E) lies between the middle and S Warrior Reefs. A drying reef partially obstructs the E entrance to the passage.

Basilisk Passage

13.60

- 1 The fairway of Basilisk Passage (9°51'S 143°00'E) is 1½ miles wide, deep and clear of known dangers except for a reef, drying 2.7 m, which lies in mid-channel in the W entrance. The bottom in the passage is stiff mud. Tudu Island (9°48'S 142°58'E), which lies on a drying reef on the N side of the passage, is a sand cay covered with vegetation and is separated from the SW end of Warrior Reefs by Canal Mauvais, a narrow boat channel. Depths less than 5 m extend up to 1 mile W from Tudu Island, and a shoal with a least charted depth of 1 m lies ¾ miles NW of the island. Zagai Island, which lies on a drying reef 3 miles SW of Tudu, is flat, swampy and densely wooded.
- 2 **Tidal streams**. The E-going stream, obstructed by the line of Warrior Reefs, is accelerated through the passage at rates up to 5 kn at springs, as indicated on the chart. The South-east Trade Wind blowing against this stream raises a confused sea. The NW-going stream runs less strongly.
- Caution**. Particular care is required when approaching the passage from W during the NW-going stream, as this sets directly over the shoals and reefs lying immediately W and NW of Tudu Island.

Chart Aus 839

Tancred Pass

13.61

- 1 **General information.** Tancred Pass (10°01'S 142°57'E) gives access W from Great North East Channel to waters and routes on the N side of Torres Strait (13.166).

Tidal streams in the WNW entrance to the pass set NW and SE at rates up to 2½ kn.

13.62

- 1 **Directions.** From a position in Great North East Channel about 2½ miles S of Dove Islet Light (10°00'S 143°02'E) (13.30) and abreast Coconut Island (13.30), ¾ miles SSE of the light, the track leads WNW, passing (positions from Dove Islet Light):

SSW of a spit, with depths less than 10 m over it, extending 1½ miles SW from Dove Islet; and:

- 2 NNE of Walker Shoal (5 miles SW) (13.30), thence: NNE of a patch (depth 8-7 m) (5 miles WSW); Urui Reef, also known as Aurui (which dries and has a

sand cay 2 m in height on it), and other dangers, extend up to ¾ miles WNW from the patch, as shown on the chart; thence:

- 3 SSW of Dungeness Reef (¾ miles WNW) (13.30); the SE side is generally well-defined; thence: NNE of Sassie Reef (8½ miles WSW); Sassie Island, swampy in places and densely wooded, and a number of small mangrove-covered islets lying off its NE side, lie on the W part of the reef.

13.63

- 1 From the WNW end of the pass a clear channel, about 2 miles wide and with depths of more than 10 m, then leads W, passing:

S of Yam Island (9°54'S 142°47'E) (13.198) and of Cap Islet (13.198), ½ miles farther NW; thence:

N of Watson Cay (10°03'S 142°27'E) (13.191).

Caution. Although this channel has been surveyed, it should not be used by vessels exceeding 4-6 m draught, as unknown dangers may still exist.

TORRES STRAIT MAIN CHANNELS AND THURSDAY ISLAND

GENERAL INFORMATION

Charts Aus 292, Aus 293, Aus 376

Scope of the section

13.64

- 1 In this section is described Torres Strait with the associated passages and channels. Also described is the port of Thursday Island, with the islands, anchorages and harbours associated with this area of Torres Strait.

Routes

13.65

- 1 Prince of Wales Channel and Endeavour Strait, which are, respectively, the main E/W channel through Torres Strait and the most suitable alternative for lighter-draught vessels, lie immediately N and S of the large group of islands of which Prince of Wales Island (10°41'S 142°12'E), near the S-most part of Torres Strait, is the largest. The port of Thursday Island, with its several approach channels, lies centrally within the island group.

Topography

13.66

- 1 **Prince of Wales Island and adjacent islands.** Passage of Prince of Wales Channel and, to a lesser extent of Endeavour Strait, focuses attention upon Prince of Wales and adjacent islands as they are approached and passed close-to. The coast of Cape York Peninsula (13.141) farther S is more relevant to passage of Endeavour Strait, whilst features lying N of the reefs and shoals forming the N side of Prince of Wales Channel are too far distant and unlikely to be relevant to navigation of that channel.

- 2 All the larger islands of the group are of at least moderate height and rocky, but with some areas of low-lying, flat ground, and wooded in parts. Apart from Thursday Island (13.97), described separately, the total population of the group is about 750, varying from 5 on Friday Island (1987) to 450 on Horn Island (1991): Wednesday and Goods Islands are uninhabited. Prince of Wales Island, known locally as Muralug, with Cape

Cornwall (10°46'S 142°11'E) (13.150) at its S extremity, is the largest and highest of the group. The hills have flat summits, except for one peak (246 m in height) (10°39'2S 142°12'8E) (chart Aus 376) which may assist identification from W.

- 3 There is a small pearling station on Friday Island (10°36'S 142°10'E), and pearl farms in the adjacent Friday Passage and in Port Lihou (10°45'S 142°13'E).

13.67

- 1 **West approaches.** The small part of Arafura Sea lying close W of Torres Strait and within the coverage of this book lies well inside the continental shelf with depths which seldom exceed 40 m; large areas have not been adequately surveyed. Away from the tracks shown on the charts, the general impression given of the area, and reflected in the dates of some of the longer standing reported depths and shoals, is one of irregular shoal depths and unfrequented waters which are best avoided.

- 2 Cook Reef (10°22'S 141°33'E), which lies awash, was discovered by Captain Cook in 1770.

Sketty Belle Shoal (10°14'S 141°29'E), a rock which dries 1 m, was reported in 1901 by the barquentine *Sketty Belle*.

Pilotage

13.68

- 1 See 13.6.

Quarantine

13.69

- 1 Quarantine inspections for vessels on passage through Torres Strait bound for Australian ports farther S are not required until the first port of entry. Pilots embarking from Thursday Island (10°35'S 142°13'E) have dispensation.

Direction of buoyage

13.70

- 1 The general direction of buoyage is from W to E through Prince of Wales Channel, and SW and ESE into Thursday Island Harbour, as shown on chart Aus 293.

PRINCE OF WALES CHANNEL AND WEST APPROACHES

General information

Charts Aus 292, Aus 293, Aus 296, Aus 376, Aus 700

Route

13.71

- 1 Prince of Wales Channel is bounded on the S by East Strait Island (10°30'S 142°27'E) then by Wednesday, Hammond and Goods Islands, Gerard and Larpent Banks, and Booby Island (10°36'S 141°55'E). On the N the channel is bounded by Twin Island (10°28'S 142°27'E), Beresford Shoal, North West Reef and by the S side of Varzin Passage (10°32'S 141°54'E).

13.72

- 1 From SE the charted two-way route of the Inner Route leads 11½ miles NW from the end of Adolphus Channel to join Prince of Wales Channel about 4½ miles W of East Strait Island (10°30'S 142°27'E). The two-way route then continues generally WSW for 20 miles through Prince of Wales Channel, as shown on the charts, to a position about 5½ miles W of Goods Island (10°34'S 142°10'E). The purpose and use of the two-way route is described at 9.2 and in notes on the charts.

- 2 Prince of Wales Channel may also be joined from the Inner Route by vessels of suitable size and draught using Flinders Passage (10°33'S 142°17'E) (13.90).

From NE, Great North East Channel leads WSW between East Strait Island and Twin Island, 1¼ miles farther N, directly into Prince of Wales Channel. An alternative track not shown on the chart, which passes through an area of sandwaves NE of Alert Patches (10°29'S 142°21'E) (13.80) before joining the two-way route, and is less well-marked, is described at 13.81.

- 3 The W entrances to Prince of Wales Channel consist of Gannet Passage (10°35'S 141°53'E) and Varzin Passage, 3 miles farther N. Varzin Passage (13.86), established in 1989, has the greater depth with more open water and is the preferred entrance.

From a position to seaward and SW of Gannet and Varzin Passages the track leads SW for 11½ miles, thence W through Arafura Sea, WSW or SW and S into Gulf of Carpentaria, as shown on the charts.

Depths

13.73

- 1 **Least charted depths.** Within the two-way route of Prince of Wales Channel the least charted depth is 9.4 m, as shown on chart Aus 293, in position 10°30'1S 142°20'2E. Charted depths between 11 and 12 m are shown in numerous places within the two-way route.

The least charted depth in Varzin Passage is 10.4 m. This depth is found in several places at the E end (10°32'S 141°56'E) along the N side of the passage, as shown on chart Aus 289.

- 2 The least charted depth in Gannet Passage is 9.8 m, as shown on chart Aus 289, in position 10°35'2S 141°53'0E. Due to sandwave movement least actual depths of 8.8 m (1972), 9.9 m (1988) and 9.8 m (2002) and annual changes in depth of 1.0 m, have been recorded.

Maximum draught: see 13.4.

Natural conditions

13.74

- 1 Prince of Wales Channel provides a convenient point of reference for descriptions of the tides and tidal streams

throughout the whole area of Torres Strait and its approaches. See 13.12 for a general description of tides, and 13.13 for details of information on tidal heights in the channel.

13.75

- 1 **Tidal streams.** Information on tidal streams (13.14) and on the effects of currents (13.15) should be consulted when using the daily tidal stream predictions for Hammond Rock Lighthouse (10°31'S 142°13'E) given in *Admiralty Tide Tables*.

- 2 Off Proudfoot Shoal (10°32'S 141°28'E), lying W of Prince of Wales Channel, the tidal stream, which is mainly diurnal and rotary, cannot be predicted with any degree of accuracy. On average the streams run with approximate timings related to higher HW at Brisbane. The strong SW-going stream, which corresponds to the general W-going stream in the channels of Torres Strait, runs from 7 hours after higher HW Brisbane until 9½ hours before the following higher HW. The strong NE-going stream, corresponding to the strong E-going stream in the strait, then runs until 2 hours before higher HW. Between 2 hours before, and 7 hours after higher HW, streams correspond to the weak W and E-going streams in the strait and are weak and irregular.

13.76

- 1 **Water conditions.** Discoloured water, which varies with changing conditions, occurs in Prince of Wales Channel. During strong winds blowing with the tidal stream setting W, much sand is carried by the water in streaks which give the appearance of shoals. Care should be taken to avoid being misled by these streaks.

In fine weather, with an E-going tidal stream, the water is generally clear and the bottom may be visible.

Principal marks

13.77

Landmarks:

- 1 Radar tower, conspicuous, (10°31'8S 142°13'3E) on Hammond Island.
Hammond Rock, known locally as Aade, (10°31'0S 142°12'8E), standing close E of the outer end of a small bank, with depths less than 10 m over it, which extends 3½ cables N from Turtle Head (13.82); Hammond Rock Light (white GRP hut, 2 m in height) stands on the rock. See Caution below.
- 2 Booby Island Lighthouse (white round tower, red cupola; 16 m in height) (10°36'S 141°55'E), standing on the summit of the island; there is a flagstaff close NE. In the nineteenth century, before a light was established there, it was customary for passing vessels to land stores to a cave on Booby Island for the benefit of shipwrecked sailors; letters were also landed and collected.

Caution. Turtle Head, although not itself prominent, appears from a distance of 10 miles as an island and should not be mistaken for Hammond Rock, which is then approximately on the horizon.

Major light:

Booby Island Light — as above.

Other aid to navigation

13.78

Racon:

- 1 Carpentaria Shoal Light-buoy (10°45'S 141°03'E).

Directions*(continued from 11.132)**Charts Aus 292, Aus 293***Approach from Inner Route****13.79**

- 1 From a position within either leg of the charted two-way route abreast Alpha Rock (10°37'S 142°31'E) (11.131), a track leads NW within each leg of the route to join Prince of Wales Channel about 4¾ miles W of East Strait Island (10°30'S 142°27'E), passing (positions from East Strait Island):

SW of Reeves Shoal (1¾ miles SSW); Edwards Rock, 7½ cables farther N, breaks occasionally; thence: SW of East Strait Island (13.32), from where lights (13.80) are displayed. Thence:

- 2 NE of Strait Rock (5¾ miles SW), which appears brown from a distance, has some trees and scrub on the summit and lies on a drying reef; landing may be obtained at the outer end of a sandspit which extends from the rock to the W edge of the reef. Bourne Rock, 4 cables farther N, is steep-to and breaks. Depths less than 10 m lie between 7 cables NNE and 5 cables ENE of Strait Rock at the outer end of a bank which extends 3¾ miles ESE from Wednesday Island (13.80). These dangers are covered by a red sector (300°–345°) of Ince Point Light (8 miles W) (13.80). Thence:
- 3 NE of No 2 Islet, known locally as Muggi Cudulug, (6¼ miles WSW), densely wooded and surrounded by a drying reef. The islet is the ENE-most of the four Tuesday Islets, which lie on the same bank extending from Wednesday Island as Strait Rock and are covered by the same red sector of Ince Point Light. No 3 Islet, known locally as Kei Cudulug, 2½ cables W of No 2, is a round wooded knob standing on a drying reef. No 1 Islet, the largest, 1½ cables farther S and on the same reef, is wooded with two rounded summits; the E side of the islet is cliff-faced, the W and NW sides are formed by sandy beaches. A shoal with a least depth of 3·3 m lies 3 cables E of No 1 Islet. A light is displayed from No 4 Islet (13.91), 1½ miles WSW of No 2.
- 4 The track then continues NW to join Prince of Wales Channel in the vicinity of 10°30'S 142°22'E, passing E of Herald Patches (5½ miles W) (13.80).

Useful marks:

Mount Adolphus (10°38'S 142°39'E) (11.127).

Cape York (10°41'S 142°32'E) (11.127).

Twin Island (10°28'S 142°27'E) (13.32).

*Chart Aus 293***East Strait Island to Goods Island***(continued from above and from 13.32 or 13.33)***13.80**

- 1 **Caution.** Constant attention must be paid to the vessel's position throughout passage of Prince of Wales Channel. From the vicinity of 10°30'S 142°22'E the track leads W within the charted two-way route through Prince of Wales Channel, passing (positions from Ince Point (10°30'S 142°19'E)):
- 2 S of Alert Patches (1¾ miles NE), a series of patches, with depths less than 10 m over them, which extend 2¼ miles farther E; Alert Rock (2¾ miles ENE) is the shoalest part. The patches are formed partly of rock but mainly of sandwaves, over which depths may vary from those charted and which trend NE from the patches. Rock outcrops occur within the two-way route between Alert and Herald Patches, below. And:
- 3 N of Herald Patches (1¼ miles E), a series of patches, with depths less than 10 m over them, marked by a light-buoy (E cardinal) and formed by sandwaves which then trend SE from the patches; depths may vary from those charted. The least charted depth for the channel (13.73) is found close N of the patches. Thence:
- 4 Clear of a rock with a depth of 10·7 m over it (2¼ miles ENE), marked by a light-buoy (S cardinal). Vessels regarded as deep-draught for this passage should pass S of the rock. Thence:
Clear of OG Rock (2 miles ENE), as required by draught or prudence. The above dangers, between the E ends of Alert and Herald Patches and OG Rock, are covered by a red sector (195°–210°) of Tuesday No 4 Islet Light (3 miles SSE) (13.91).
- 5 **East Strait Island Leading Lights:**
Front light (white GRP hut on white concrete column, 7 m in height) (10°30'S 142°27'E), standing on the W part of reef surrounding East Strait Island (13.32).
Rear light (white GRP cabinet and red square daymark on red framework tower, 18 m in height)

Front Light*Rear Light**East Strait Island***East Strait Island Leading Lights from NNE (13.80)***(Original dated 1999)*

(545 m E of the front light), standing on the SE part of the island.

With Ince Point bearing WSW distant $1\frac{3}{4}$ miles, the track then leads W within the Two-Way Route, on the alignment (090°), astern, of the above leading lights, and within the visible sector (085°–095°) of each, to a position $1\frac{3}{4}$ miles WNW of Ince Point, passing:

- 6 N of Ince Point, fringed by a narrow reef and at the N extremity of Wednesday Island, known locally as Maururra; overfalls occur up to $1\frac{1}{4}$ miles NNW of the point as shown on the chart. Ince Point Light (white GRP hut, 6 m in height) stands on the point, with a tide gauge (13.13) $6\frac{1}{2}$ cables farther SW. From the point the land rises to a hill, 84 m in height and bare of trees, 4 cables S; the remaining high ground of the island is densely wooded and rises to a flat hill in its central part; the coast is mostly low and fringed with mangroves. Thence:
- 7 N of Hood Bank ($3\frac{1}{2}$ cables W) which dries in patches and extends $2\frac{1}{2}$ miles farther WSW, fronting the NW side of Wednesday Island. The bank, which consists of hard sand pinnacles and coral, is covered by the red sector (262°–307°) of Hammond Rock Light (10°31'0S 142°12'8E) (13.77). And:
- 8 S of two patches (2 miles NNW) (13.81), the outer of the dangers extending E from North West Reef.

Useful mark:

North West Reef Light-beacon (white GRP hut on white concrete column, 6 m in height) (10°29'S 142°15'E), standing on the SE edge of the reef.

(Directions for the two-way route continue at 13.82)

13.81

- 1 **Alternative track passing N of Alert Patches.** From a position midway between Twin Island (10°28'S 142°27'E) (13.32) and East Strait Island, $1\frac{1}{4}$ miles S, a track leads W, passing (positions from Ince Point (10°30'S 142°19'E)):
 - S of the rock patch ($7\frac{1}{4}$ miles ENE) (13.33), thence:
- 2 S of Marina Rock (5 miles ENE), a pinnacle covered by the red sector (088°–100°) of Twin Island Light (10°28'S 142°27'E) (13.25) and also by a red sector of Tuesday No 4 Islet Light (3 miles SSE) (13.91). Thence:
 - N of Alert Patches ($1\frac{3}{4}$ miles NE) (13.80), covered by the red sector (251°–259°) of Hammond Island Direction Light (10°31'4S 142°13'1E) (13.82); and:
- 3 S of Beresford Shoal (3 miles NNE), a narrow coral ledge, with depths less than 10 m over it. The S part of the shoal is also covered by the above red sector of Twin Island Light.

The track then leads WSW within the white sector of Hammond Island Direction Light to enter the charted two-way route $1\frac{1}{4}$ miles NW of Ince Point. The track passes:

- 4 NNW of Alert Patches, thence:
 - SSE of two patches, with depths of 8.7 and 8.3 m over them, (2 miles NNW), the outer dangers in an area of numerous shoal patches and overfalls which extend up to $1\frac{3}{4}$ miles from the E extremity of North West Reef; the outer patches are covered by the green sector (13.82) of Hammond Island Direction Light (10°31'4S 142°13'1E).

13.82

- 1 **Hammond Island Direction Light** (white GRP hut, 2 m in height) (10°31'4S 142°13'1E) stands on the N side of

Hammond Island, known locally as Keriri, which is densely wooded and rises to one of its highest points, on which stands a radar tower (13.77), 5 cables SSE of the light. Turtle Head, a bluff at the N extremity of the island, standing 3 cables W of the light, is 28 m in height and cliff-faced; Hammond Rock (13.77) stands $3\frac{1}{2}$ cables farther N.

- 2 From a position $1\frac{3}{4}$ miles WNW of Ince Point, the line of bearing 248° in the white sector (246°–251°) of Hammond Island Direction Light then leads WSW, passing (positions from the same light):

SSE of Pilot Knoll ($3\frac{1}{4}$ miles NE), which breaks in moderate SE winds; thence:

NNW of Pullar Rock Light-buoy (isolated danger) ($2\frac{1}{2}$ miles ENE), thence:

- 3 SSE of Nardana Patches (2 miles NE) consisting of rock patches, with a least depth of 7.4 m over them, marked by overfalls. The patches are covered by a red sector (092°–102°) of Ince Point Light and lie outside the green sector (237°–246°) of Hammond Island Direction Light; a light-beacon (white hut on white pile, 8 m in height; helicopter platform) obscured to the N (086°–250°), lying $3\frac{3}{4}$ cables SW of the patches marks the edge of the two-way route in their vicinity.

13.83

- 1 The line of bearing 088°, astern, of Ince Point Light ($5\frac{1}{2}$ miles E) (13.80) then leads W, passing:

N of Pullar Patches ($1\frac{1}{2}$ miles ENE), covered by the red sector (251°–259°) of Hammond Island Direction Light and also by the red sector of Hammond Rock Light (5 cables NW), see below. Thence:

- 2 S of North West Reef ($1\frac{3}{4}$ miles NNW), which dries and is steep-to on its S edge except where otherwise indicated on the chart. A swashway (10°29'S 142°15'E), for which local knowledge is necessary, leading from Prince of Wales Channel through the E end of North West Reef to Dayman Channel (13.173) may be used by small craft. The S entrance to the swashway is marked by North West Reef Light-beacon (13.80). Duff Rock, 4 cables SSW of the light, is marked by overfalls. And:
- 3 N of Hammond Rock (5 cables NW) (13.77); a below-water rock (depth 7.1 m) lies 2 cables farther W. A tide gauge (13.13) is situated close NW of Turtle Head (13.82) $3\frac{1}{2}$ cables S of Hammond Rock; Race Rock lies 2 cables farther ENE. Passage between Hammond and Race Rocks should not be attempted as a strong tide race and eddies occur on both streams. Overfalls, from N of Race Rock, extend across Prince of Wales Channel almost to North West Reef, as shown on the chart.

13.84

- 1 The track then leads SW keeping within the charted two-way route and passing:

NW of Round Island (2 miles SW), which is partially wooded and shows up well against the land behind when seen from W. The island marks the outer edge of the drying coastal reef off the NW side of Hammond Island. From the head of the shallow bight close E of Round Island, low tidal ground choked with mangroves extends S across Hammond Island, almost dividing the island into two parts. Thence:

- 2 NW of Mecca Reef (3¼ miles WSW), marked by a light-buoy (N cardinal). Ipili Reef, with some above-water boulders on it, lies on the same bank, 2 cables farther SSW; both reefs are marked by overfalls and are covered by the green sector (039°–063°) of Hammond Rock Light (5 cables NW) (13.77). Thence:
- 3 SE of Sunk Reefs (3¼ miles W), a dangerous and extensive area of below-water patches, small drying reefs and overfalls which extend up to 2 miles from the SW extremity of North West Reef; and:
- 4 NW of Goods Island, known locally as Palilug, (3½ miles SW); a light (white GRP hut, 2 m in height) stands on the NW side of the island, which is fringed by a steep-to drying coral reef. Goods Island Light (white round tower, red cupola, 5 m in height) stands on the summit of a partially wooded hill 3 cables from the W end of the island. Thence:
- 5 NW of Tucker Point (5 miles SW), the W extremity of Goods Island with extensive wartime fortifications nearby; a tide gauge (13.13) is situated close N of the point. An 8-8 m patch, 1 mile SW of the point, lies at the outer end of a spit of hard sand and coral, with depths less than 10 m over it, which extends from the SW side of Goods Island. And:
- 6 SE of Harrison Rock (5½ miles WSW), marked by overfalls; a light-buoy (S cardinal), moored 5 cables SSE of the rock, marks the edge of the two-way route in its vicinity.

Clearing marks. The two lights on Goods Island (10°34'S 142°09'E) above, in line bearing 199°, clear W of Mecca and Ipili Reefs.

Useful mark:

North West Reef Light-beacon (10°29'S 142°15'E) (13.80).

Chart Aus 296

Goods Island to Booby Island

13.85

- 1 From a position about 1¼ miles W of Goods Island vessels entering the port of Thursday Island through Normanby Sound should pass clear W of the spit (13.84) extending SW from Goods Island, then proceed as directed at 13.119. Otherwise the track leads W for 4½ miles to the end of the charted two-way route. The track passes (positions from Tucker Point (10°34'S 142°09'E)):
- 2 N of Gerard Bank which extends 7½ miles WSW from the W extremity of Friday Island (1¾ miles S); there are depths of less than 5 m over the bank and much of the E part dries; thence:
N of a light-buoy (N cardinal) (4½ miles WSW), marking a shoal, thence:
- 3 N of Larpent Bank (5¼ miles WSW), extending 4¾ miles farther W; the bank is formed of hard sand over which there are depths of less than 5 m.
Course may then be directed to pass through either Varzin or Gannet Passages.

Charts Aus 289, Aus 296

13.86

- 1 **Through Varzin Passage.** From the W end of the charted two-way route (10°34'S 142°03'E) the track leads WNW, passing:

SSW of a bank (depth 9-7 m) (10°32'S 141°59'E); a chain of narrow shoals and patches, with depths less than 10 m over them, extends 8¼ miles E to North West Reef and forms the N side of this part of Prince of Wales Channel; White Rocks, 4½ miles NE of the bank, are a group of bare granite rocks lying on a drying reef, with shoal patches within 5 cables SE and SW. Thence:

- 2 SSW of C4 Light-buoy (S cardinal) (10°31'·6S 141°56'·7E); this and the other light-buoys marking Varzin Passage are fitted with radar reflectors.

The track then leads W through Varzin Passage in charted depths greater than 10 m, passing (positions from Varzin Shoal (10°33'S 141°55'E)):

- 3 N of C3 Light-buoy (N cardinal) (1¼ miles NE), thence:
N of Varzin Shoal, rock, lying on an extensive bank with depths less than 10 m over it; thence:
Between C1 and C2 Light-buoys (N and S cardinal, respectively) (3 miles W).

Course may then be directed SSW as guided by the chart to join the recommended track about 4¼ miles W of Booby Island (10°36'S 141°55'E) (13.87).

13.87

- 1 **Through Gannet Passage.** From the W end of the charted two-way route (10°34'S 142°03'E) the track leads W, passing (positions from Booby Island (10°36'S 141°55'E)):

N of patches, with depths less than 10 m over them, (1¼ miles N), and:

- 2 N of Booby Island, lying on a drying reef, marked by Booby Island Light (13.77) and forming the S side of the W entrance to Prince of Wales Channel. A tide gauge (13.13) is situated on the N side of the island; a mooring buoy lies 2½ cables farther W. Banda Rock (6 cables NE) is the shoalest of a number of dangers within 1¼ miles N and E of the island. Thence:

N of an 8-6 m patch (1½ miles NNW).

- 3 The track then leads WSW and SW through Gannet Passage, with due regard to the caution below. The track passes:

WNW of Booby Island, distant about 2 miles, where the least charted depth (13.73) for the passage is found; thence:

SE of a light-buoy (S cardinal) (2¼ miles WNW) marking banks, with depths less than 10 m over them, which extend generally NNE towards Varzin Passage.

- 4 Course may then be directed SW as guided by the chart to join the recommended track (about 4¼ miles W).

Caution. Gannet Passage leads across a low ridge formed by moving sandwaves, with resulting variations in the depths available (13.73). The marking of the passage is subject to change.

Charts Aus 296, Aus 700

Routes south and west from Booby Island

13.88

- 1 **Recommended track.** From the position about 4¼ miles W of Booby Island (10°36'S 141°55'E) the recommended track leads SW for 11½ miles to a position 10°45'S 141°42'E as shown on the charts.

From there the recommended track for vessels S-bound to Gulf of Carpentaria continues SW for 13¼ miles, then S as shown on chart Aus 700.

13.89

- 1 **Preferred routes.** From the junction of tracks (10°45'S 141°42'E), preferred routes run W and WSW, as shown on the charts.

West route. For vessels W-bound through Arafura Sea the preferred route passes:

- 2 S of an 11.2 m patch (10°42'S 141°37'E), the S-most of an irregular line of shoals and patches which stretches 90 miles N to the coast of Papua New Guinea (chart Aus 376); thence:
S of Carpentaria Shoal (10°45'S 141°03'E), marked by Carpentaria Light-buoy (isolated danger), on which a landfall should be made when approaching Torres Strait from W. Thence:
3 N of a shoal (depth 18.3 m) (10°51'S 140°50'E), pebbles and black shell, over which the depth has been obtained from an early or incomplete survey. This shoal, and a patch of 29.2 m (10°42'S 140°51'E), and another of 33 m (18 fm) (reported 1990), 4½ miles farther W (charts Aus 301, Aus 410), indicate the presence of irregular depths in an area which has been only inadequately surveyed.

- 4 **West-south-west route.** For vessels bound WSW through the N area of Gulf of Carpentaria the preferred route passes:

SSE of an 11.2 m patch (10°42'S 141°37'E) (see above); thence:
SSE of Carpentaria Shoal (10°45'S 141°03'E) (see above); thence:
SSE of a shoal (depth 18.3 m) (10°51'S 140°50'E) (see above).

(Directions W and S from Booby Island continue in Australia Pilot Volume I)

Flinders Passage

Charts Aus 293, Aus 292

General information**13.90**

- 1 Flinders Passage lies between Wednesday Island (10°32'S 142°18'E) and Horn Island, 1¾ miles S. The passage provides an alternative route into Prince of Wales Channel from SE and gives access to Thursday Island Harbour from E through Ellis Channel. The least charted depth in the passage, based on old and incomplete surveys, is 5.3 m as shown on the chart in position 1½ miles W of Tuesday No 4 Islet Light (10°33'S 142°20'E). The navigable width of the passage is about 6 cables between Wednesday and Horn Islands, and 2½ cables at its NW end. It is not recommended for vessels with a draught of more than 6.1 m.

- 2 Flinders Passage is entered from SE between Horn Island and Tuesday Islets. A channel between Tuesday Islets and Wednesday Island, 1 mile NW, is 5 cables in width but has a least depth of 3 m in the fairway (see 13.106).

Tidal streams, which attain rates of 3 to 5 kn in the SE part of the passage, cause overfalls between Tuesday Islets and Horn Island as shown on the charts.

Directions**13.91**

- 1 From a convenient distance E or ESE of King Point (10°34'S 142°18'E), at the NE extremity of Horn Island, the track leads WNW as required, towards a position midway between King Point and Tuesday Islets 1¾ miles NE (13.79), passing (positions from King Point):
NNE of Asp Shoals (4½ miles SE), formed of sand over which the sea often breaks; thence:
2 NNE of Papou Point (2¾ miles SSE), the SE extremity of Horn Island, known locally as Narupai. The E coast of the island is reef-fringed and rises to Horned Hill, known locally as Diughubai (1½ miles SSE), a remarkable hill at the highest point of a range which is barren except for some sparse low scrub; an aero light is occasionally displayed from the summit. From abreast Horned Hill a gently shelving bank with depths less than 10 m over it extends 2½ miles ENE. Thence:
3 SSW of Strait Rock (4 miles ENE) (13.79).
The line of bearing 309° of the low SW point of Wednesday Island (1¾ miles N) then leads NW, passing:
SW of No 1 Tuesday Islet (2½ miles ENE) (13.79), with No 2 and No 3 Islets lying farther NE; thence:
NE of King Point, and:
4 SW of No 4 Islet (1¾ miles NE), partly covered with low scrub and lying on a drying reef; No 4 Islet Light (white GRP hut, 4 m in height) stands on the islet. A drying sand cay lies at the NW end of the reef. A coral reef, with a least depth of 0.3 m over it, lies on the shallow bank joining No 4 to No 1 and 3 Islets. Thence:
5 NE then N of Scott Rock (8 cables N), covered by the green sector (075°–086°) of No 4 Islet Light.

Leading marks:

Front mark No 4 Islet (1¾ miles NE), above.

Rear mark Strait Rock, 2¾ miles farther E, (13.79).

The alignment (091°), astern, of the above marks and the line of bearing 270° of Channel Rock, which is bare and lies on a drying reef 4½ miles W of the front mark, both lead W within a white sector (086°–094°) of No 4 Islet Light, passing:

- 6 N of King Point. A bank, with Nereid Rocks (1 miles WNW) and other irregular depths less than 5 m on it, extends 8 cables N from the point and fronts the N side of Horn Island, which is low, sandy and reef-fringed, with loose boulders inland. The N edge of the bank is covered by the same adjacent green sector of No 4 Islet Light that covers Scott Rock. And:
7 S of Wednesday Island (1¾ miles N) (13.80); depths less than 5 m extend 4 cables from the SW point. The SW side of the island is fronted by a drying bank of mud and sand over coral, which extends up to 5 cables offshore. Thence:
S of Chapman Reef (1½ miles NNW), which dries 1.2 m, steep-to and covered by the adjacent red sector (094°–101°) of No 4 Islet Light.

When 1 mile E of Channel Rock course should be altered gradually NW.

13.92**Leading marks:**

- 1 Front mark, the NE extremity (10°31'5S 142°13'4E) of Hammond Island (13.82).

Rear mark Hammond Rock (8 cables farther NW) (13.77).

The alignment (308°) of the above marks leads NW, passing (positions from Hammond Rock):

- 2 SW of Shadwell Point (4¼ miles ESE), the low W extremity of Wednesday Island; a drying sandspit, which extends 4 cables W from the point to the edge of the coastal reef, affords the only dry landing at LW on the island during the South-east Trade Winds. Thence:
- 3 NE of a spit, with depths less than 5 m over it, extending about 2½ cables ENE from Channel Rock (3½ miles SE), thence:
NE of the 5 m depth contour lying between Channel Rock and Menmuir Point (1¾ miles SE), which is the E extremity of Hammond Island. The contour is the outer edge of an area of reefs and foul ground extending from the E side of Hammond Island; thence:
- 4 SW of Wednesday Spit (1¾ miles ESE), a shallow bank of hard sand which extends 2¾ miles W from Shadwell Point and is covered by the red sector (13.80) of Hammond Rock Light; overfalls occur over the outer part of the spit as shown on the chart. And:
NE of Menmuir Point (1¾ miles SE).
- 5 With Menmuir Point then bearing 220°, the track leads NNW to join the charted two-way route E of Hammond Rock, passing:
WSW of Marie Rock (1½ miles ESE), marked by overfalls.
When clear N of the red sector of Hammond Rock Light, directions at 13.83 for Prince of Wales Channel may be followed.

Anchorage

Charts Aus 293, Aus 292

13.93

- 1 **East Strait Island.** Open anchorage E of Prince of Wales Channel is reported by pilots to be obtainable 5 miles ESE of East Strait Island (10°30'S 142°27'E) in a depth of 17 m.

Twin Island

13.94

- 1 **Anchorage** off Twin Island (10°28'S 142°27'E); see 13.57.

Tuesday Islets

13.95

- 1 **Anchorage**, with shelter, may be obtained 5 cables NNW of Tuesday No 3 Islet (10°33'S 142°21'E) (13.79) as shown on the chart in a depth of 10 m, sand. When the wind is S of ESE a good berth may also be found 5 cables NNE of the same islet.
A channel SSE of these anchorages, lying between No 3 Islet and No 2 Islet 2½ cables farther E, has a least charted depth of 4.9 m and a width of 1 cable between the reefs. The channel may be used by coasters of suitable size and draught, but requires local knowledge.

Chart Aus 296

Fairway anchorage

13.96

- 1 Anchorage may be obtained in the area lying 4½ miles W of Tucker Point (10°34'S 142°09'E) (13.84), as shown

on the chart. The area has a radius of 800 m and a least depth of 12 m.

PORT OF THURSDAY ISLAND

General information

Charts Aus 292, Aus 293, Aus 294, Aus 296, Aus 299

Position and function

13.97

- 1 Thursday Island (10°35'S 142°13'E) is centrally situated within a group of islands which form an almost land-locked harbour, with general depths of more than 5 m, in the S part of Torres Strait. The port of Thursday Island, also known as Port Kennedy, functions primarily as a transshipment port for the islands of Torres Strait and for the smaller ports of Gulf of Carpentaria; the port also serves as a base for the Queensland Coastal Pilot Service and Australian Reef Pilots.

The town of Port Kennedy, with a population of 1124 (2001), is situated on the S side of Thursday Island.

Topography

13.98

- 1 Thursday Island, known locally as Wai-ben, is generally wooded and rises to its highest point at Milman Hill (10°34'8S 142°12'5E). On all sides except S the island is fronted by a drying reef and fringed with either sandy or stony beaches or by mangroves. The middle of the S side of the island, where most of the jetties and port facilities are found, is formed by sandy beaches fronted by a mud bank covered with kelp; depths less than 5 m extend up to 2 cables offshore.

Port limits

13.99

- 1 Thursday Island pilotage area, which in general is drawn between extremities of the surrounding islands, is shown on the chart.

Approach and entry

13.100

- 1 The main and deepest approach to the harbour is from W through Normanby Sound, which is entered between Goods Island (10°34'S 142°09'E) and Friday Island, 1¼ miles S. Vessels bound for Thursday Island from E, and using Normanby Sound because of draught, must proceed initially W through a part of Prince of Wales Channel (13.71) before entering the sound.
- 2 Light-draught vessels can approach the harbour either from S through Boat Channel (13.129) on the SW side of Horn Island (10°37'S 142°17'E), or from E through Flinders Passage (13.90) thence through Ellis Channel (13.126), which lies on the NW side of Horn Island.

Traffic

13.101

- 1 In 2004, 826 vessels totalling 35 501 900 dwt called at the island.

Port authority

13.102

- 1 Ports Corporation of Queensland, PO Box 409, Brisbane, Queensland 4001.
Website: www.pcq.com.au

Limiting conditions

13.103

- 1 **Controlling depth** for passage through Normanby Sound to harbour is 5.3 m, which is found 2 cables ESE of the

head of Main Jetty (10°35'3S 142°13'2E), as shown on chart Aus 293, and is also the controlling depth for the harbour basin. The lesser depths available for entry through Boat Channel and Ellis Channel are quoted at 13.129 and 13.126 respectively.

- 2 **Deepest and longest berth.** See 13.135 for details of berths.

Tidal levels. See information in *Admiralty Tide Tables* and at 13.12 and 13.13. Maximum tidal range about 2.3 m.

Maximum size of vessel handled. The largest vessel handled in the harbour has been of 113 m LOA, 5.9 m draught.

Arrival information

Notice of ETA

13.104

- 1 For vessels requiring a pilot, details of ETA and maximum draught should be communicated 72 hours in advance of arrival.

Outer anchorages

13.105

- 1 **Normanby Sound.** A Quarantine Anchorage area is established within the W entrance to the sound between Black Rock (10°35'S 142°10'E) and a line 9½ cables farther W, as shown on the chart. Anchorage in a depth of 10 m, out of the strength of the tidal stream and sheltered from South-east Trade Winds, may be obtained 7 cables W of Black Rock as shown on the chart. The anchorage should be approached on the alignment (098°) of the S shoulder of Black Rock (13.121) with the hospital buildings on Vivien Point, 2¼ miles E (13.115). The berth also lies close to the alignment of the summits of Black Rock and Green Hill, 2¼ miles E (13.119).
- 2 Anchorage may also be obtained in an area known as Goods Island Anchorage in Bertie Bay, lying on the SE side of Goods Island between Quoin Point (10°34'3S 142°09'2E) (13.120) and Wai-Weer Islet (13.122) 1¼ miles farther E. The anchorage, in a depth of 8 m, is shown on the chart. Craft drawing 2 m or less may obtain a landing near the ruined jetty of the former pilot station at Wanetta, 6 cables ENE of Quoin Point. Waters NE of this anchorage, between Hammond and Goods Islands, are obstructed by shoals and drying reefs.
- 3 Other anchorage during strong SE winds may be obtained in a depth of 7 m on the S side of the sound, 8½ cables WNW of Kiwain Point (10°36'S 142°12'E) (13.122). Tidal streams in this position are strong and the berth is close to the N edge of the shallow bank in the entrance to Friday Passage.

13.106

- 1 **Prohibited anchorage.** Anchorage is prohibited within 3 cables E or W of Main Jetty (10°35'3S 142°13'2E) and within 1 cable S of it.

Mariners are also warned not to anchor in a number of submarine cable areas which extend from Thursday Island, N and NW to Hammond Island and SE to Horn Island, as shown on the chart.

Pilotage and tugs

13.107

- 1 **Pilotage** is compulsory for all foreign vessels of 35 m LOA and over and is available during daylight hours only. Pilots for entry from W board SW of Goods Island in position 10°34'7S 142°08'7E; those for entry from E board S of Chapman Reef in the vicinity of 10°33'3S 142°17'3E; those for entry from S board in position

10°36'0S 142°12'4E, abeam of Boat Channel Light-buoy . The pilot launch has a white hull and orange superstructure. For further details see *Admiralty List of Radio Signals Volume 6(4)*.

Tugs. There are no tugs; the pilot launch has a bollard pull of 1.5 tonnes and can assist if required.

Local knowledge

13.108

- 1 Local knowledge is required for Ellis Channel (13.126).

Regulations

13.109

- 1 **Vessels carrying explosives** (1.56) must not proceed within the charted quarantine limits.

Quarantine

13.110

- 1 The port of Thursday Island is a first port of entry: see 1.64 for extracts from the Quarantine Act. Radio pratique may be granted.
The quarantine station is situated at the NW extremity of the island.

Notice of medical requirements

13.111

- 1 Advance notice of medical requirements should be sent with the ETA (13.104).

Harbour

General layout

13.112

- 1 The port facilities of Thursday Island are mostly grouped on the S side of the island. Jetties on the NW coast of Horn Island, 1½ miles farther ESE, provide ferry and service access to the airfield there.

Visual signals

13.113

- 1 **Storm signals.** A red pendant displayed at the post office (10°35'1S 142°13'2E), close to the root of Main Jetty, indicates that a storm warning has been received.

Natural conditions

13.114

- 1 **Tidal streams** within the port are dominated by the complex tides and streams (13.12 to 13.15) which affect the whole area. The strongest streams around Thursday Island are found between Vivien Point (10°35'4S 142°12'5E) and Kiwain Point, 5 cables SW, where they attain rates of 6 to 7 kn, and occasionally 9 kn. The stream between these points setting against a strong SE wind causes tide-rips which are dangerous to boats and extend across the channel, as shown on the chart. Elsewhere in Normanby Sound flow rates up to 8 kn have been reported when tidal stream and current are setting in the same direction.
- 2 Tidal streams through Aplin Pass and Friday Passage can create a strong set across the recommended track through Normanby Sound abreast Kate Point (10°34'6S 142°11'7E). Streams in the SW entrance to Aplin Pass set WSW/ENE and attain rates of 3½ to 4½ kn in each direction, as shown on the chart.
- 3 Through Thursday Island Harbour the tidal streams set generally W and E on the rise and fall of the tide, but the actual directions are much influenced by those of the channels through which they run, as indicated in a number of positions on the chart. The W-going stream attains rates of 2 to 4 kn in the S part of the harbour and 1 to 4 kn in

Milman Hill



Engineers Jetty

Main Jetty

Caltex Jetty

Thursday Island harbour (Port Kennedy) from S (13.112)

(Original dated 1999)

the N part. The E-going stream attains rates of 4 to 5 kn in the S and 1 to 3 kn in the N. Both streams set strongly through Madge Reefs and over Hovell Rock.

- 4 In the other entrances to the harbour, the rate of the stream at the SW end of Ellis Channel, over the inner bar ($10^{\circ}35'4S$ $142^{\circ}14'1E$), is 2 to 3 kn W-going and 3 kn E-going. The tidal stream through Boat Channel, entered close SE of Kiwain Point, is comparatively weak.

- 5 **Caution.** The likely effect of wind and stream on a particular vessel may be difficult to assess. Vessels in different parts of the harbour, and those of varying draughts and windage, may frequently be observed lying in widely differing directions.

Climate is healthy during the South-east Trade Winds. For climatic table see 1.192 and 1.208.

Principal marks

13.115

- 1 **Landmarks for Normanby Sound:**
Goods Island Light ($10^{\circ}34'S$ $142^{\circ}09'E$) (13.84).
Hospital buildings on Vivien Point ($10^{\circ}35'4S$ $142^{\circ}12'5E$).

13.116

- 1 **Landmarks for Thursday Island Harbour:**
Radio tower ($10^{\circ}34'8S$ $142^{\circ}13'5E$), a red and white framework tower, 33 m in height, standing on the summit of Milman Hill; two wind motors and wind sock, conspicuous, stand 1 cable NNE, and 3 cables ENE, respectively, of the tower.
- 2 Cathedral ($10^{\circ}35'1S$ $142^{\circ}12'8E$). The white spire is a good mark from the inner anchorages; a church stands $\frac{1}{2}$ cable NE.
- Tree on Bold Hill ($10^{\circ}36'6S$ $142^{\circ}12'4E$); a rock standing close to the shore, $1\frac{1}{2}$ cables farther ENE, is also prominent.

Direction of buoyage

13.117

- 1 The direction of buoyage is into harbour, as shown on the chart.

Directions

Approach and entry through Normanby Sound

13.118

- 1 **Cautions.** Great attention must be paid to leading marks throughout the passage, as tidal streams (13.114) are strong and irregular.

Entry by night is not recommended in any of the approach channels and should only be attempted in emergency.

13.119

- 1 From the offing W of the entrance, Normanby Sound may be easily distinguished from the marks described at 13.115.

Vessels from E, having passed through Prince of Wales Channel because of draught, may join the track described below from the charted two-way route (13.84) about $1\frac{1}{4}$ miles W of Tucker Point ($10^{\circ}34'S$ $142^{\circ}09'E$).

- 2 **Leading marks:**

Front mark, Black Rock ($10^{\circ}35'S$ $142^{\circ}10'E$).

Rear mark, Green Hill ($2\frac{1}{4}$ miles E of the rock); a number of radio masts stand on the slopes of the hill. A former gun emplacement stands on the summit.

- 3 From a position about 8 miles W of Tucker Point ($10^{\circ}34'S$ $142^{\circ}09'E$), the track leads E towards the entrance on the alignment (093°) of the summits of the above marks, passing (positions from Tucker Point):

N of Larpent Bank ($5\frac{1}{4}$ miles WSW) (13.85), thence:

N of the shoal ($4\frac{1}{2}$ miles WSW) (13.85), as required by draught or prudence, thence:

N of Gerard Bank (13.85), extending WSW from the W extremity of Friday Island ($1\frac{3}{4}$ miles S).

13.120

- 1 When Tucker Point (13.84) bears 040° the track then leads ENE, within an obscured sector (295° – 064°) of Goods Island Light, passing $6\frac{1}{2}$ cables S of the light and: NNW of the NW point of Friday Island ($1\frac{1}{2}$ miles S).

The island, known locally as Jealug, is mostly hilly and wooded except in the SW part which is sandy with clumps of casuarinas. Pott Point, the W

extremity, is a low and shifting sandy point. The N side of the island is formed of sandy beaches fronted by drying sandbanks intersected in the centre by reefs. Thence:

2 SSE of Tucker Point, thence:

SSE of Quoin Point (3½ cables ESE), a low, sandy point fronted by the drying reef which fringes the whole of the island.

Useful marks lying nearly ahead:

West Wai-Weer Reef Light-beacon (port hand) (10°34'4S 142°10'0E), marking the W end of West Wai-Weer Reef.

Powell Point (10°34'S 142°11'E), which is 38 m in height.

13.121

1 **Thursday Island Direction Light** (10°34'8S 142°12'4E), standing between two hillocks, known as Aplin Hills, at the NW end of Thursday Island.

From the position SSE of Quoin Point the line of bearing 094¼° in the white sector (093¾°–094¾°) of Thursday Island Direction Light then leads E, passing (positions from Kate Point (10°34'6S 142°11'7E)):

S of Cardale Patch (1¾ miles W), coral with clear water all around; thence:

2 S of West Wai-Weer Reef (1¼ miles W), which dries and is marked by a light-beacon (13.120), and:

N of Black Rock (1.4 miles WSW), reef-fringed except on its E side and lying on a detached bank, with depths less than 5 m over it, off the N side of Friday Island. A drying sand cay lies 1 cable W of the rock; a 7.3 m patch lies 2 cables NNW. Kunai Island lies 1½ cables E of the rock, near the E end of the bank.

13.122

1 **Madge Reefs Leading Light-beacons:**

Front beacon (white triangular topmark, black stripe, point up) (10°35'8S 142°13'2E), standing at the NW extremity of Madge Reefs.

Rear beacon (white rectangular daymark with black stripe) (1¼ miles ESE of the front beacon), standing on the foreshore of Horn Island.

The alignment (112¼°) of the above light-beacons then leads ESE, passing:

2 SSW of Wai-Weer Islet (1 mile WNW), surrounded by reef; a detached reef, which dries in parts, extends to 4½ cables ESE from the islet. Thence:

NNE of Ghibber Rock (1¼ miles WSW). There is a clear passage on either side, but that N of the rock is wider and much to be preferred. When covered, the rock is marked by strong tide-rips which extend SW to Black Rock. Thence:

3 NNE of Webb Point (1 mile SW), the NE extremity of Friday Island; thence:

SSW of Kate Point, which rises to about 40 m in height. An allowance for cross tidal stream (13.114) may be required in this area; thence:

SSW of a light-beacon (special) (4 cables SSE), marking the W extremity of a drying reef of sand, coral and stone which extends from Thursday Island. Thence:

NNE of Brisbane Rock (9 cables SSE), thence:

4 SSW of Vivien Point (1 mile SE), distant not less than 1¼ cables. The point, which is formed by a reef-fringed sandy beach and has a small jetty extending from it, is easily identified by the hospital buildings (13.115) and is marked additionally by a light-beacon (port hand). The

point should be passed a little SSW of the charted track in order to give the fringing reef a wider berth, particularly on the E-going stream. The charted track should be regained when clear of the point. And:

5 NNE of Devonshire Rock (depth 5.5 m) (1¼ miles SSE). Kiwain Point, 1¼ cables SW of the rock, is reef-fringed and rises to a wooded hill, 66 m in height, 2 cables farther SW.

Thursday Island Harbour

13.123

1 Thursday Island Harbour may be entered from Normanby Sound passing either N or S of Hovell Rock (10°35'6S 142°13'1E), making due allowance for the tidal stream (13.114) in each case. Longer and deeper-draught vessels are recommended to take the deeper passage S of the rock.

From abreast Vivien Point, the track continues for a short distance ESE on the alignment of Madge Reefs Leading Lights (10°35'8S 142°13'2E) (13.122).

13.124

1 **Passage north of Hovell Rock.** When the front light-beacon on Madge Reefs is distant 4¼ cables, the track leads ENE, passing (positions from the same light-beacon):

SSE of Normanby Sound Ledge (4¼ cables NW), which has a depth of less than 5 m over it and extends ½ cable S of a light-buoy (port hand); thence:

NNW of Hovell Rock (1½ cables NNW), marked by a light-buoy (special) at its W and E extremities.

13.125

1 **Passage south of Hovell Rock.** The track continues ESE on the alignment of Madge Reefs Leading Lights until the front light-beacon is distant about 2 cables. The track then leads E, passing (positions from the same light-beacon):

S of Hovell Rock (1½ cables NNW), and:

2 N of the front light-beacon, noting that the deeper water is found closer to the beacon. Madge Reefs consist of a group of drying reefs which lie off the NW side of Horn Island and form the SE limit of navigable waters of the harbour. There are passages between the reefs, but none is navigable without detailed local knowledge.

In either case, course may then be directed as required for berthing.

Entry through Ellis Channel

13.126

1 Ellis Channel is entered at its NE end at Hovell Bar (10°34'S 142°15'E), over which there is a least charted depth of 3.2 m in the fairway. The channel is bounded on its SE side by the coast of Horn Island and by the N-most of Madge Reefs and the spit extending NE from it. The NW side of the channel is formed by a bank, with depths less than 5 m over it, which extends 1¾ miles ENE from Thursday Island and by a ridge between the outer part of this bank and Wilkie Bank, about 1 mile SW. Much of the bank extending ENE from Thursday Island is formed by a large, drying sandbank. There is an inner bar between the SW end of Wilkie Bank (10°35'S 142°14'E) and the outer of Madge Reefs, 1 cable SE. Both bars are subject to change.

2 Light-buoys marking the SW end of Ellis Channel serve also to assist ferries operating between Thursday and Horn

Islands, and other vessels using Horn Island jetties (13.135).

Tidal streams over the inner bar are described at 13.114.

13.127

- 1 From a position in Flinders Passage, 2½ miles E of Channel Rock (10°33'S 142°15'E) (13.91), the line of bearing 250° of Milman Hill radio tower (13.116), 2¼ miles SW of the rock, leads WSW towards Hovell Bar, passing (positions from Channel Rock):

NNW of the bank (13.91) extending N and W from King Point (3 miles ESE), thence:

NNW of a 3.5 m patch (1¼ miles ESE), thence:

- 2 SSE of a light-buoy (S cardinal) (8 cables S), marking depths less than 2 m on the N side of Hovell Bar; thence:

Between two light-buoys (lateral). The buoys mark the fairway across Hovell Bar, which connects the coastal bank extending from Horn Island with that extending ENE from Thursday Island.

13.128

- 1 On passing the latter light-buoys, the track then turns SW to lead through Ellis Channel, passing (positions from Milman Hill radio tower (10°34'8S 142°13'5E)):

NW of Horn Island (1½ miles E). The NW coast of the island is fringed with mangroves and fronted by a drying mud bank; the land behind is low and bush-covered. And:

- 2 SE of the bank and ridge forming the NW side of the channel (13.126); thence:

SE of Wilkie Bank (7 cables ESE); and:

NW of a light-buoy (special) (1 mile ESE), marking the outer end of a coral spit, with depths less than 5 m over it, which extends NE from the N-most of Madge Reefs; thence:

- 3 NW of a light-buoy (port hand) (8 cables SE), marking the outer part of Madge Reefs and the channel over the inner bar; thence:

SE of a light-buoy (starboard hand) (7½ cables SSE), marking the end of the extension of the spit SW from Wilkie Bank.

Course may then be directed as required for berthing.

Boat Channel

13.129

- 1 Boat Channel, which separates Horn Island from Prince of Wales Island 1 mile SW, affords a good approach channel for coasters, or other small vessels of a suitable size and draught, from Endeavour Strait to Thursday Island Harbour. There is a least charted depth of 3.2 m in the fairway over the bar at the SE end of the channel.

13.130

- 1 From a position 1¾ miles S of Papou Point (10°37'S 142°20'E), and clear of Asp Shoals (13.91) 2 miles SE of the point, the track leads W on 265° through the fairway over the bar and towards Red Point (10°39'S 142°15'E). The alignment (on the same bearing) of a prominent but uncharted white rock on the coast of Prince of Wales Island near Red Point, with a prominent but uncharted black vertical scar on the distant hills farther W on the same island, may assist in identifying the track to be followed. The track passes (positions from Red Point):

- 2 S of Horn Island. The S coast of the island is generally low, wooded, fringed with mangroves and fronted by a drying reef, except for a stretch 1¾ miles NE from Sherard Osborn Point (3 miles

ENE) where the land is higher and the line of mangroves is interrupted. Thence:

N of a patch (depth 1.7 m) (2 miles E), thence:

S of Garagar Point (1¼ miles ENE), from which the drying coastal reef extends 2½ cables; thence:

N of Jardine Rock (1 mile E), which may be passed in safety at a distance of 1 cable if the edge of the reef off Garagar Point is not visible; the rock is marked by a light-beacon (port hand).

- 4 From abreast Jardine Rock, course should be altered gradually NW. The line of bearing 316° of Kiwain Point (4 miles NW) (13.122) then leads NW, passing:

NE of Prince of Wales Island; the coast from Red Point almost to Bold Hill (¾ miles NW) is fronted by a drying mud bank and fringed with mangroves; and:

- 5 SW of Bogan Banks (7 cables ENE), formed of sand, drying and extending 3½ miles farther NW. The SE end of the banks is usually marked by discoloured water but the NW end is more difficult to see. The coast of Horn Island NE of the banks, between Garagar Point and Smith Point 2¾ miles NW, is low and wooded and fronted by mangroves and a drying mud bank. A narrow channel between Bogan Banks and Horn Island can only be used by boats and requires local knowledge.

- 6 The line of bearing 300° of the tree on Bold Hill (¾ miles NW) (13.116) then leads WNW for about 1¼ miles.

13.131

- 1 **Leading marks:**

Front mark, a small group of above-water rocks lying close E of Kiwain Point (10°36'S 142°12'E) (13.122).

Rear mark, a well-defined gap in the hills E of Pig Hill (¾ miles NNW of the front mark) on Hammond Island.

The alignment (331°) of the above marks then leads NNW through The Gut, the narrow NW end of Boat Channel, passing (positions from Kiwain Point):

- 2 WSW of a light-buoy (W cardinal) (1 mile SSE), thence:

ENE of Bold Hill; the coast from thence to Kiwain Point is reef-fringed, with off-lying rocks extending up to 1¼ cables offshore. And:

WSW of the NW end of Bogan Banks (7½ cables SSE), which may not be readily seen (13.130); thence:

- 3 WSW of a light-buoy (N cardinal) (¾ cables SE), marking the NW entrance to Boat Channel.

When the outer end of Main Jetty (1.1 miles ENE) (13.135) bears 050°, keeping clear of a 4.2 m shoal patch (¾ cables SSE), course may be directed as required for Thursday Island Harbour, taking care to allow for the strength of the tidal stream which may be experienced immediately on clearing Boat Channel.

Minor channels

Aplin Pass

13.132

- 1 **General information.** Aplin Pass is entered at its NE end from Flinders Passage over a bar, with a least charted depth of 3 m, 4½ cables NW and WNW of Channel Rock (10°33'S 142°15'E) (13.91). The pass then leads WSW between the banks and foul ground extending E from Hammond Island and similar waters extending NE from Thursday Island, as shown on the chart. The SW part of

the pass separates Thursday Island from Hammond Island 4½ cables NW. The pass is between 1¼ and 3¼ cables wide between the banks and reefs on each side; it has not been fully surveyed.

Local knowledge is required.

Tidal streams: see 13.114.

Friday Passage

13.133

- 1 **General information.** Friday Passage lies between Friday Island (10°36'S 142°10'E) and Prince of Wales Island, 5 cables SE. The NE entrance to the passage is obstructed by a bank, with depths less than 2 m over it, which almost fills the entrance. A drying sand cay lies near the E end of the bank and a small drying reef near the S end. There is a narrow and shallow channel between the NW coast of Prince of Wales Island and the SE side of the above bank which then continues SW through the passage but neither this, nor the SW approach to it, has been surveyed.

Local knowledge is required.

Anchorage and berths

Anchorage

13.134

- 1 The most convenient anchorage during SE winds is obtained 1 cable N of the E end of Hovell Rock (10°35'6S 142°13'1E) (13.124) as shown on the chart. The bottom is sand and mud overlying a little clay and granite rock; the rock is exposed in places. Use of this berth allows other vessels a clear passage to proceed alongside.

Anchorage may also be obtained between Hovell Rock and Kiwain Point, 8 cables W, in depths of 8 to 9 m. This berth is most suitable for vessels of more than 6-7 m draught unable to berth or to remain alongside at LW springs.

Alongside berths

13.135

- 1 **Main Jetty** (10°35'2S 142°13'2E); berthing head 30.4 m in length with dolphins approximately 35 m off each end; depth alongside 3.1 m (2001); equipped with tide gauge; barge ramp inshore of the head; used for general cargo. Difficulty may be experienced leaving this jetty during SE winds and a W-going stream, which together tend to bind a vessel on to the berth.
- 2 **Engineers Jetty**, 1 cable W of Main Jetty; berthing head 27.5 m in length; depth alongside 4.3 m (2001); a public jetty mainly for passenger vessels up to 36 m LOA; used for inter-island and Horn Island ferries and tourism; landing stage inshore of the head. Four mooring buoys are moored from 3 cables to 6½ cables SW of the head of the jetty.
- 3 **Horn Island Jetty** (10°35'6S 142°14'6E); berthing head approximately 40 m in length with two dolphins SW; depth alongside 4.0 m (1999); barge ramp inshore of the head; pontoon passenger landing; used for ferry access to the township of Wasaga and to the airport.
A second jetty lies 1 cable farther NE; berthing for vessels up to 40 m LOA is available alongside a barge moored permanently at the head of the jetty, which is 32 m in length; a dolphin lies 30 m NE; depth alongside 3.8 m (1989); used for general cargo and bunkering.

13.136

- 1 The bottom alongside all jetties is coral sand.
Caution. Depths alongside jetties are promulgated from time to time in *Australian Temporary Notices to Mariners* but are subject to change. Up to date information should be obtained locally.

Port services

13.137

- 1 **Repairs.** Limited repair facilities for small vessels; a slipway with lifting capacity 250 tonnes can accommodate vessels up to 30 m LOA, 4.5 m draught, 8 m beam and 150 tonnes dwt; other slipways for small craft.
Other facilities. Hospital; customs board either in Normanby Sound off Black Rock or alongside Main Jetty; garbage disposal by arrangement; no facilities for reception of oily waste.
- 2 **Supplies.** Local fresh provisions in limited quantities; fresh water obtainable at all jetties but subject to local reserves and reported not available from time to time, particularly in dry season (September to January); nearest alternative source of water at Red Island Point (10°51'S 142°22'E) (13.160); fuel oil and diesel at Horn Island Jetty.
Communications. Regular air services through the airport on Horn Island.

ENDEAVOUR STRAIT AND APPROACHES

General information

Charts Aus 292, Aus 294

Description

13.138

- 1 Endeavour Strait is entered from NE between Peak Point (10°43'S 142°26'E) and Rattlesnake Point 10 miles W. The strait is the S and most extensive of the E/W channels through Torres Strait but is obstructed by shoals in its W approaches. The W end of the strait lies between Cape Cornwall (10°46'S 142°11'E), at the S extremity of Prince of Wales Island, and the mouth of Jardine River on Cape York Peninsula, 9 miles farther S. Beyond these limits, shoals and banks form an off-lying bar which extends 18 miles W from Cape Cornwall to the meridian of 141°52'E, then curves generally SE to the vicinity of Slade Point (10°59'S 142°08'E).
- 2 Vessels of suitable draught, bound for Gulf of Carpentaria, use the strait in preference to Prince of Wales Channel as there is a saving in distance of 12 miles.

Routes

13.139

- 1 The main route through Endeavour Strait from E enters between Kai-Yelubi Island (10°42'S 142°21'E) and Zuna Island, 2½ miles WSW, and leads generally SW then W through the relatively open waters of the central part of the strait before passing over the bar in the W entrance in the vicinity of 10°48'S 141°54'E. An alternative entrance from E can be made between Kai-Yelubi Island and Meddler Island, 1¼ miles E, before joining the main route.
- 2 A number of other possible routes through the NE and W entrances are described at 13.152. Small vessels W-bound for Gulf of Carpentaria generally use channels in the W entrance S of Woody Wallis Island (10°53'S

142°02'E) but there is heavy reliance on local knowledge and these channels are not recommended.

13.140

- 1 **Caution.** During the NW monsoon the sea often breaks on the outer banks in the W approaches to Endeavour Strait. Entry to the strait from W is difficult and not to be recommended, as these banks lie too far offshore to allow reliable use of shore marks.

Topography

13.141

- 1 **Mainland.** The S shore of Endeavour Strait forms a large part of the NW coast of Cape York Peninsula which extends about 30 miles SW from Cape York (10°41'S 142°32'E) (11.127). Between that cape and Peak Point, 5½ miles WSW (13.148), the coast is formed by a sandy beach which is broken only by the cliffs of Bay Point, 1¼ miles SW of Cape York. Behind the beach the land is low, rising to a wooded coastal range of hills which extends W from Carnegie Range. From the end of the cliffs 1 mile SW of Peak Point, to Red Island Point 8½ miles farther SSW, the coast is low and formed mostly by a sandy beach, except in the vicinity of Roonga Point (10°44'S 142°25'E), where it is fronted by reefs and then fringed with mangroves for a distance of 1 mile farther S. A drying sandbank, on which there are many coral patches, then fronts the whole of this part of the coast as far as Red Island Point.
 - 2 From Red Island Point to Van Speult Point (10°55'S 142°12'E), at the mouth of Jardine River, the sandy beaches continue but narrow fronting sandbanks alternate with drying reefs, and the land behind is undulating and densely wooded. Mutee Head (10°55'S 142°15'E) (13.147) is a prominent feature of the coast.
 - 3 From Van Speult Point to Slade Point, the E entrance point to Gulf of Carpentaria, 6¼ miles SW, the coast consists of low sandhills covered with scrub, behind which the land is flat and swampy, with belts of dense bush. The width of the coastal bank, which dries in parts and otherwise has depths less than 5 m over it, increases markedly from 2½ cables off Van Speult Point to 8½ miles WSW of Slade Point. This bank lies at the SE end of the numerous banks and shoals which together form the extensive bar off the W end of the strait. Crab Island, 1 mile W of Slade Point, which lies on a drying sandbank on the inner part of the coastal bank, is wooded to a height of 24 m.
The shores of Gulf of Carpentaria, S of Slade Point, are described in *Australia Pilot Volume I*.
- ### 13.142
- 1 **Prince of Wales Island** (13.66) forms the N side of Endeavour Strait and lies ahead when approaching the strait from the vicinity of Cape York (10°41'S 142°32'E). The E coast of the island, from a low sandy point (10°43'S 142°17'E) at its E extremity to Red Point 4 miles farther NNW (13.130), is fringed by a drying reef and mostly backed by mangroves; behind the coast is a steep ridge of hills. Cheropo Islet (10°41'S 142°17'E) lies on a drying reef 6 cables offshore.
 - 2 Rattlesnake Point (10°44'S 142°16'E), the SE point of Prince of Wales Island and one of the entrance points to the strait, is cliffy, rises to a height of about 30 m and is the outer end of a peninsula which is joined to the island by a low, marshy neck of land; an islet (2.6 m in height) 2½ cables SSE of the point, lies on a bank, with depths less than 5 m over it, which is the outer danger SSE of the

point. From Rattlesnake Point to Cape Cornwall, 6 miles WSW, the S coast of Prince of Wales Island is formed by a large and shallow bight divided by the relatively high peninsula of Port Lihou Island; the heads of both sides of the bight are filled with extensive drying mud flats and fringed with mangroves which almost join across the N side of the peninsula. Shifting sandbanks, which dry, and a number of islets, banks and reefs lie in the outer part of the bight. The W part of the bight is named Port Lihou, but is a port in name only; the shore is low and mangrove-fringed to within 1 mile of Cape Cornwall (13.150), where it becomes cliffy.

- 3 From Cape Cornwall (10°46'S 142°11'E) to Bampfield Head 5 miles NW, the SW coast of Prince of Wales Island is formed of sandy beaches separated by small and steep, rugged bluffs and fronted by foul ground. Bampfield Head is cliff-faced and fringed by a narrow reef; Despair and Bamfield, two hills, rise 1½ miles E and 1 mile NE of the head.

Depths

13.143

- 1 The controlling depth for the main route through Endeavour Strait is found in the W approaches over the bar lying between the W extremities of Rothsay and Red Banks in the vicinity of 10°48'S 141°55'E. There are charted depths between 5.7 and 7.2 m in the fairway over the bar in this area, but lesser depths exist on both sides.

Depths in other channels are given in the relevant parts of the text.

13.144

- 1 **Caution.** Attention is drawn to the state of surveys indicated in the reliability diagrams on the charts. Great attention should be paid to soundings throughout the strait and its approaches, as the bottom is mainly sand and the shoals are more difficult to see than is coral.

Local knowledge

13.145

- 1 Local knowledge is required for passage of the strait.

Tidal streams

13.146

- 1 The streams in Endeavour Strait commence and reach their maximum rates about 40 minutes later than those off Hammond Rock Lighthouse (10°31'S 142°13'E). Except in the more restricted parts of the strait, rates are not more than about 30% of those off the light, as indicated in a number of positions on the chart. The general descriptions of tidal streams at 13.14 and of the effects of currents at 13.15 should be consulted when using the daily tidal stream predictions for Hammond Rock Lighthouse given in *Admiralty Tide Tables*.
- 2 The greatest rates of the stream can mostly be expected in the entrances to the strait. In the NE entrance, streams run strongly through the channel (13.151) E of Kai-Yelubi Island (10°42'S 142°21'E). In the adjacent channel (13.152) between Possession Island (10°44'S 142°24'E) and Meddler Island, 8 cables NW, they attain rates of 5 kn at springs and 3½ kn at neaps, setting through in the direction of the channel. In the W entrance streams run strongly through the narrow channels (13.156) S of Woody Wallis Island (10°53'S 142°02'E). Elsewhere within the strait streams also run strongly off Red Island Point (10°51'S 142°22'E) (13.141).

Landmark**13.147**

- 1 Mutee Head (10°55'S 142°15'E), a prominent headland. The adjacent coast is formed by sandy beaches, backed by undulating and densely wooded land.

Directions**Approach from east****13.148**

- 1 From a position 1 mile N of York Island (10°41'S 142°32'E) (11.132) the track leads W on 265°, passing (positions from Dayman Island (10°46'S 142°22'E)):

- N of a drying sandbank (8½ miles ENE), lying near the outer edge of a flat, with depths less than 5 m over it, which fills the bay between York Island and Peak Point, 5½ miles farther WSW. A dangerous wreck lies 2¼ miles NNW of York Island. Thence:
- 2 N of Murangi Islet (7¾ miles ENE), steep, rocky and grass-covered. Mona Rock lies 7 cables farther SSW; both lie on the flat described above. Thence:
- N of Peak Point (4¾ miles NE), cliff-faced and rising to Peaked Hill, known locally as Carubaura, 5 cables S. Except for a short stretch of mangroves at the foot of Peaked Hill, the coast continues cliffy for 1 mile SW from the point. Thence:
- 3 N of Possession Island, known locally as Bedanug (7 cables NE), uninhabited and remarkable for the number of hummocks on it, between which the land is low, wooded and covered with grass. Most of the island is reef-fringed and the coast is formed of sandy beaches except near the N extremity and the W side of the S end of the island, where it is cliffy. Thence:
- 4 N of a 5.3 m patch (4 miles N); overfalls occur over the patch and extend some distance E from it. And:
- N of Meddler Island (3¼ miles N) distant not less than 1 mile, which clears the above patch. The island is partially wooded, reef-fringed and cliffy, except on its SW side. Thence:
- 5 N of Kai-Yelubi Island (3¼ miles NNW), wooded and fringed with mangroves on its E and SW sides; a sandy beach lies on the NW side. The SW extremity of the island is formed by a low sandy point, from which the fringing, drying reef extends 3½ cables S, almost to the neighbouring Meggi-Yelubi Island. Thence:

Useful marks:

Alpha Rock (10°37'S 142°31'E) (11.131).

White monument, standing on a cliff on the NW side of Possession Island to commemorate Captain Cook's landing in 1770, is visible at 5 miles.

Entry west of Kai-Yelubi Island**13.149**

- 1 When the summit of Kai-Yelubi Island bears 175°, the track leads SW on 220°, passing:
- NW of a 3.6 m patch (4 miles NNW), the shoalest part of a bank with depths less than 10 m over it, which lies 5 cables NNW of Kai-Yelubi Island. Thence:

- 2 NW of a 5.4 m patch (3½ miles NW); other patches, with depths of 8.3 and 7.1 m over them, lie 4 cables NE and SSW. Meggi-Yelubi Island, 5 cables farther E, is reef-fringed and cliffy except at its S end which is a low sandy point. The island is similar in aspect to Kai-Yelubi. Thence:
- 3 SE of Pym Point (4½ miles WNW), passing as close as circumstances permit in order to avoid Gibson Rock. The point is the SE extremity of Zuna Island, formerly known as Entrance Island, which is only sparsely populated (1993). The island, which is reef-fringed, is high on its E side where the coast is formed of cliffs alternating with small sandy beaches. The SW side of the island is low and fringed with mangroves; an islet and two above-water rocks lie on the reef which extends 1 mile farther SW. And:
- 4 NW of Gibson Rock (4 miles WNW), marked by overfalls; a 6 m patch lies 7 cables S of the rock; thence:
- SE of an islet (0.9 m in height) (7 miles W), one of the outer dangers off the mud flats and foul ground filling the bight on the S side of Prince of Wales Island; Turtle Island lies 5 cables NNE of the islet. Thence:
- 5 SE of a 3.7 m patch (7½ miles W); a 0.4 m patch lies 4 cables farther SSW. The S end of Port Lihou Island, 1¾ miles NNW of the patches, and the SE side of Tarilag Island close SW of it, are both cliff-faced. Thence:
- SE of Eagle Rock (8¼ miles W); Dumaralag Islet, 1½ miles NW of the rock, has some trees on it; thence:
- 6 Clear of a 6.4 m patch (8 miles WSW) as required by draught or prudence; two other patches, with depths less than 10 m over them, lie 7½ cables ENE and NW of the first.

13.150

- 1 When the N hill on Parau Island (10°50'S 142°19'E) bears about 112°, the track leads W on 271°, passing (positions from Red Wallis Islet (10°51'S 142°01'E)):
- S of a patch (depth 4.9 m) (11¾ miles ENE); Peebles Shoal lies 5 cables farther W, thence:
- S of Cape Cornwall (10¼ miles ENE), cliff-faced on its SE side; the coast to Yule Point, 1¾ miles WNW of the cape, is formed by two small bays with sandy beaches, separated by a low, sandy point. Thence:
- 2 S of Yule Point (9 miles NE), the S-most of a number of small but steep and rugged bluffs separating sandy beaches on the coast between Cape Cornwall and Bampffield Head, 5 miles NW (13.142). Foul ground fronts this part of the coast. Thence:
- 3 S of Rothsay Banks (4 miles N), extensive sandbanks, with depths less than 5 m over them, which stretch 7¼ miles NW and about 13 miles W from Yule Point, and form the N side of the W entrance to Endeavour Strait. There are depths greater than 10 m between these and Red Banks (see below) until the bar joining their W ends is reached. Thence:
- S of an isolated patch (depth 5.8 m) (3 miles NNE), thence:
- 4 N of Red Wallis Islet distant 2½ miles. A bank with a least depth of 5.7 m over it (1 mile NNE) is the outer danger on the N side. The islet, which lies

on a drying coral reef, is rocky, flat-topped and covered with grass and stunted vegetation; from a distance it appears reddish-coloured. Woody Wallis Island (1¼ miles SSE) is covered with grass and partially wooded; a sandy point at the E end of the island affords convenient landing over the surrounding reef during the NW monsoon. Thence:

5 N of Red Banks (extending 6 miles W), formed by ridges of sand, with depths less than 5 m over them.

The line of bearing (112°), astern, of Red Wallis Islet then leads WNW across the bar (7¼ miles WNW).

When Red Wallis Islet is distant 10 miles, course may be directed to follow the directions at 13.88, or as otherwise required. Booby Island Lighthouse (10°36'S 141°55'E) (13.77) is visible from this vicinity in clear weather.

*(Directions for Gulf of Carpentaria
continue in Australia Pilot Volume I)*

Entry east of Kai-Yelubi Island

13.151

1 From a position 1¼ miles NE of Kai-Yelubi Island (10°42'S 142°21'E), the line of bearing 199° of the N hill of Parau Island (10°50'S 142°19'E) seen midway between Kai-Yelubi (13.148) and Quoin Islet, which is barren and rocky, 1 mile ESE of Kai-Yelubi, leads SSW. The passage between these two islands is 1 mile wide and clear of known dangers, except as described below. The track passes (positions from Dayman Island (10°46'S 142°22'E)):

2 WNW of the patch (4 miles N) (13.148), thence:

Clear of a 6.2 m patch (3½ miles N), as required by draught or prudence; and:

WNW of Meddler Island (3¼ miles N) (13.148), thence:

ESE of Kai-Yelubi Island (3¼ miles NNW), and: WNW of Quoin Islet (2¾ miles N); a below-water rock lies on a spit which extends 4 cables NNE from the island; thence:

3 ESE of Meggi-Yelubi Island (3 miles NNW) (13.149), thence:

WNW of Dayman Island, reef-fringed and mostly barren except for a few stunted trees; a spit, with depths less than 5 m over it, extends 3 cables N. Patches of 4.7 m and 4.1 m (reported 1975) are the outer known dangers, 6 cables N and 3 cables S of the island. Thence:

ESE of Heroine Rock (2¾ miles W) distant just over 1 mile. The rock is a coral patch marked by overfalls. Thence:

4 WNW of Brady Bank, which dries in numerous places, (5 cables SE and extending to 3¾ miles SSW), an extension of the coastal shelf. Karniga Island and Wuwurrka and Markilug Islets lie near the NE end of the bank. Two above-water rocks lie 1 mile SW of Karniga Island and nearer the middle of the bank.

5 When the N hill on Parau Island (5¼ miles SW) is distant about 2 miles the track leads W to join that described at 13.150, passing:

N of a 4.5 m patch (4¼ miles SW), and:

N of Parau Island, which is reef-fringed; a detached group of coral heads (charted as a below-water rock) lies 1¼ cables NE of the N extremity of the island.

Side channels

Chart Aus 294

North-east entrance

13.152

1 **Possession Island.** A channel leading SW which passes NW of Possession Island (10°44'S 142°24'E) (13.148) and SE of Meddler Island, 1 mile WNW (13.148), and of Quoin Islet, 7 cables farther SW (13.151), is 7½ cables wide and has a least charted depth of 5.5 m in the fairway.

13.153

1 **Zuna Island** (10°43'S 142°18'E) (13.149) is separated from Prince of Wales Island, 5 cables farther W, by a channel which leads SSW with a least charted depth of 10.2 m in the fairway. The channel gives access to a small jetty on the NW side of the island, then passes ESE of the islet 2½ cables SSE of Rattlesnake Point (10°44'S 142°16'E) (13.142), as guided by the chart.

West entrance

13.154

1 **Caution:** see 13.139 for remarks on the use of these channels.

13.155

1 **Red Wallis Islet.** A channel entered between Red Wallis Islet (10°51'S 142°01'E) (13.150) and Woody Wallis Island, 1¼ miles SSE (13.150), leads W for 9½ miles between Red Banks (13.150) and Wallis Banks; the latter consist of several banks, with depths less than 5 m over them, which extend 7½ miles W from Woody Wallis Island. The E part of this channel is partly obstructed by drying rocks, 7 cables SSW of Red Wallis Islet, and by other patches with depths between 1.2 and 5 m over them, as shown on the chart.

13.156

1 **Inskip Banks** consist of extensive shallow sand ridges, which dry in places, lying between Woody Wallis Island (10°53'S 142°02'E) and the coastal bank extending from Slade Point, 8 miles SE. The N-most of the Inskip Banks is marked at its E end by a rocky islet (2.2 m in height) and a group of rocks awash, 1 mile SSE of Woody Wallis Island.

2 A channel between the N and S Inskip Banks leads generally W in a least charted depth of 8.6 m as shown on the chart in position 2¾ miles SW of Woody Wallis Island.

Another, more intricate, channel leads generally SW between the SE edge of Inskip Banks and the coastal bank, with depths less than 5 m over it, extending from Slade Point. A least charted depth of 5.8 m is found off the SW end of the channel as shown on the chart in position 8¼ miles SSW of Woody Wallis Island.

Anchorage and harbour

Possession Island anchorages

13.157

1 Good, almost landlocked anchorage may be obtained for small vessels between the N part of Possession Island (10°44'S 142°24'E) (13.148) and the mainland 1 mile ESE. The S side of the anchorage is bounded by a ridge, with depths less than 5 m over it, which connects the middle of the E side of Possession Island with the mainland. High Island, cliffy except on its S side where it is fronted by mangroves, lies on the N side of this ridge. Roko Island,

low and sandy except where mangroves fringe its N end, and Wassel Island, lie on a reef which extends nearly 1½ miles SSW from High Island. These and Little Roko Island, 3 cables farther E, all lie on the same ridge.

- 2 The anchorage should be approached from NE in a least charted depth of 4·4 m, passing:

NW of Peak Point (10°43'S 142°26'E) (13.148), distant 4½ cables, thence:

SE of the coastal reef and a spit, with depths less than 5 m over it, which together extend 6½ cables ENE from the NE extremity of Possession Island. And:

NW of two small drying reefs (1 and 1¼ miles SW of Peak Point).

13.158

- 1 Good anchorage for small vessels may also be obtained 7½ cables NW of the S extremity of Possession Island in a depth of 9 m. This anchorage is out of the strength of the tidal stream. Landing may be made from boats over the beaches on the W side of the island.

There are no documented anchorages E of the S part of Possession Island. Simpson Bay, which lies S of Wassel Island, is shallow.

Dayman Island

13.159

- 1 **Anchorage** may be obtained between Dayman Island (10°46'S 142°22'E) (13.151) and Karniga Island 7 cables ESE (13.151) in depths of 7 to 10 m. The tidal stream in this berth is less than it is off the W side of Dayman Island.

Red Island Point

13.160

- 1 **General information.** The harbour at Red Island Point (10°51'S 142°22'E) serves the town of Bamaga, which lies 3 miles farther SSE and is the administrative centre for the Northern Peninsula Area. The population of Bamaga is about 600, and that of the administered area about 1600. A ferry service from Thursday Island (10°35'S 142°13'E) operates on 4 or 5 days per week.

- 2 **Tidal streams** are reported to attain a rate of 6 kn in the channel between Red Island Point and Red Island, 1½ cables NW. On the rising tide the stream sets strongly on to the NE end of the jetty.

13.161

- 1 **Directions.** Red Island Point is approached from open waters in the vicinity of a position 1½ miles NE of Parau Island (10°50'S 142°19'E) (13.151).

Leading light-beacons:

Front beacon (white triangular topmark, point up) (10°50'S 142°23'E), standing close to the foreshore 9 cables ENE of Red Island Point.

Rear beacon (white triangular topmark, point down) (85 m ESE of the front beacon).

- 2 The alignment (112½°) of the above light-beacons leads ESE in a least charted depth of 1·9 m, passing (positions from the front beacon):

Over a 4·8 m patch (2¼ miles WNW), lying at the SW end of Brady Bank (13.151); thence:

NNE of Mouinndo Rock (1¾ miles W), reef-fringed; Tuluaa Islet lies 3½ cables farther S. Depths less than 2 m extend at least 3¼ cables NE from Mouinndo Rock. Thence:

- 3 SSW of a shoal and below-water rock (1½ miles WNW), distant ½ cable. The shoal is marked by No 2 Light-buoy (port hand). Thence:

NNE of Red Island (1 mile WSW), reef-fringed on its N and W sides and rising to a reddish-coloured hill at its W end; thence:

NNE then ESE of No 1 Light-buoy (6 cables WNW).

The track then leads SSW to the berth, passing:

- 4 ESE of Red Island. A drying mud bank extends 5 cables S from the island; another drying bank obstructs the fairway about 2 cables S of the berth. And:

WNW of a spit, with a depth of 0·4 m over it, extending ½ cable WNW from Red Island Point (9 cables WSW).

Useful mark:

Paterson Hill (10°48'S 142°24'E).

13.162

- 1 **Anchorage** in the approaches to Red Island Point may be obtained about 1¼ miles N of Red Island (10°51'S 142°22'E) and E of the SW end of Brady Bank (13.151) in depths of 7 to 9 m. The anchorage should be approached from the direction of Parau Island (10°50'S 142°19'E) (13.151), passing 6 cables NNW of Mouinndo Rock, 1¾ miles farther E (13.161).

- 2 **Berths:** jetty with T-shaped berthing head, 31 m in length; depth alongside about 2·2 m; a landing ramp with an off-lying mooring buoy lies 50 m S of the jetty.

Port services. There are minimal local facilities at Red Island Point; those listed below may be available from Bamaga by arrangement.

Facilities: minor engineering repairs; small hospital; airfield.

Supplies: fresh provisions; fresh water plentiful; petroleum products and LPG.

Van Speult Point

13.163

- 1 **Anchorage** may be obtained in depths of 10 m between 7½ cables NNE and 1½ miles ENE from Van Speult Point (10°55'S 142°12'E) (13.141).

Rivers

Cowal Creek

13.164

- 1 Cowal Creek (10°54'S 142°19'E), which is fringed with mangroves on both banks, is navigable by boats, except at LW, for a distance of 2¾ miles; beyond which there are rapids. A village lies at the E entrance point to the river.

Jardine River

13.165

- 1 Jardine River is entered between Van Speult Point (10°55'S 142°12'E) and Sunshine Point 6 cables SE; both points being narrow, sandy peninsulas. The river rises near Puddingpan Hill (11°20'S 142°48'E) on the E coast of Queensland (chart Aus 839) and is 60 miles in length. The lower reaches flow through low-lying and swampy ground which is subject to extensive flooding during the NW monsoon. Boats can only enter the river between half tides over the HW period, as the first 3 miles within the entrance consist of numerous shifting sand bars with depths not more than 0·3 m over them.

NORTH SIDE OF TORRES STRAIT

General information

Chart Aus 376

Description of area

13.166

- 1 This section describes that part of Torres Strait N of Prince of Wales Channel which lies between Warrior Reefs (9°30'S 143°07'E) in the E and the meridian of 141°01'E in the W. In general, the whole of this large area is used only by fishing vessels and by local craft plying between islands. The area is not suitable for vessels on passage transiting Torres Strait, irrespective of size.

Routes

13.167

- 1 The recognised routes through these waters are limited to a number of minor channels lying N of Prince of Wales Channel and running E/W between latitudes 10°30'S and 9°55'S and to a single route leading N near the meridian of 142°30'E which gives some access to the S coast of Papua New Guinea. None of these should be attempted by strangers without careful consideration of the risks involved.

Topography

13.168

- 1 The topography of the S part of the area is dominated by the two large islands of Moa and Badu. Moa Island (10°11'S 142°15'E) is hilly on the E side, but the W part is low, and covered with mangroves near the coast. The highest part is in the NE of the island, where three ridges branch off from the high ground of the interior to terminate in rocky points on the N coast. Mount Augustus (10°09'S 142°19'E) stands on the E end of these ridges and is the highest summit in this area. The two valleys between the ridges, which are deep, moderately wooded and covered with vegetation, present an appearance of fertility which is not seen on other islands in the area.
- 2 Badu Island, 1½ miles NW of Moa Island, has a generally low coastline rising to a high interior and to Mulgrave Peak (10°08'S 142°08'E). A broken range of stony hills extends E/W nearly across the N side of the island. The E coast, fronting the shallow channel between the two islands, is low and mostly covered with bush and mangroves.
- 3 A number of groups of smaller, but significantly high and rocky, islands also lie in the S part of the area. Hawkesbury (10°22'S 142°08'E) and Ului (West) Islands are the outer ones S of Moa and Badu. Mount Ernest, Gettulai and Suarji Islands lie 10 miles E of Moa, and Yam, Cap and Gabba Islands lie 30 miles NE. Mabuiai Island (9°58'S 142°11'E) is the outer island N of Badu, and marks the S limit of a large and generally unsurveyed area of shoals and reefs which extends 45 miles farther N to the coast of Papua New Guinea approximately between the meridians of 143°05' and 141°43'E. The extent of surveys of the outer edges of this area may be seen on the chart.
- 4 In the N of the area the only features rising above the generally low and wooded aspect of the coastline of Papua New Guinea and off-lying islands are Mabaduan Hill (9°17'S 142°44'E) (13.196) and Dauan Island (13.193), 14 miles farther SW.

Local knowledge

13.169

- 1 Local knowledge is required throughout the area. The requirement is emphasised where appropriate in the text.

Natural conditions

13.170

- 1 **Tides and flow:** see 13.12 for details of the complex tides, tidal streams and currents affecting the whole area of the strait and its approaches.
Tides that are apparently diurnal may be experienced locally off Saibai Island (9°24'S 142°41'E).
Tidal streams off Turu Cay (9°50'S 141°25'E) set ENE/WSW at rates up to 1½ kn; over the flats extending SW from Unji Point (9°14'S 141°08'E) they set ESE/WNW.
- 2 **Water conditions.** During the NW monsoon the water in the N part of Torres Strait is frequently so discoloured, probably by fresh water from the rivers of Papua New Guinea, that shoals are invisible to the eye.

Landmarks

13.171

- 1 Mount Augustus (10°09'S 142°19'E) (13.168).
Boulder, standing on a hill (149 m in height) (10°07'S 142°11'E).

Minor channels leading east↔west through Torres Strait

General information

13.172

- 1 The channels described below lie parallel with and N of Prince of Wales Channel, and are unsuitable for other than light-draught vessels. Banks (13.179) and Bligh Channels (13.182) in particular are known to be shallow and intricate. Before attempting any of these passages from either direction, it is strongly recommended that boats should be sent ahead to mark the below-water dangers in the entrances. A vigilant lookout from aloft should also be kept throughout the passage and in no case should the attempt be made except in good light conditions. Well-placed marks are few.
- Tidal streams** in all the channels are strong and uncertain.

Chart Aus 293

Dayman Channel

13.173

- 1 **General information.** Dayman Channel lies between North West Reef (10°30'S 142°12'E) (13.83) and South Torres Reef, which lies 1 to 1½ miles farther N and dries up to 3 m. Below-water rocks extend up to 4 cables N from the E part of North West Reef. Two small drying reefs lie in the W part of the channel, which is also obstructed by numerous shoals, with depths less than 5 m over them, which extend from both sides as shown on the chart. There are no marks to lead through the channel.
- 2 Dayman Channel should not be attempted in poor light conditions when the reefs are covered, as they will then be difficult to see.
- Tidal streams** set strongly through both Dayman and Simpson Channels in the direction of the channels. Overfalls occur in both.

Simpson Channel

13.174

- 1 **General information.** Simpson Channel, which lies between South Torres Reef (10°28'S 142°12'E) and North Torres Reef 1 mile farther N, is also obstructed in its W part by shoals, with depths less than 5 m over them, but they are fewer than in Dayman Channel and it is the better channel. North Torres Reef dries; the S edge of the reef is well-defined and almost steep-to. The N edge is described at 13.176.

- 2 **Tidal stream:** see 13.173.

Useful mark:

Travers Island (10°22'S 142°22'E) (chart Aus 376) (13.176).

Charts Aus 293, Aus 296, Aus 839, Aus 700

Yule Channel

13.175

- 1 **General information.** Yule Channel is bounded on the N side by Hawkesbury Island (10°22'S 142°08'E) and Hawkesbury Reefs, which extend 2 miles N and 8½ miles E from the island, and on the S side by North Torres Reef, 2 miles farther S. The channel has not been closely examined and should not be attempted except in a case of necessity. A bar of irregular formation, with general depths less than 10 m over it, lies across the W entrance to the channel.

13.176

- 1 **Directions.** From a position about 14 miles E of Hawkesbury Island the track leads generally W towards the island, which is partly covered with stunted trees and scrub and rises to a ridge of craggy peaks near the S end. Squat Rock (chart Aus 296) lies 1 cable S of the island. The track passes (positions from Hawkesbury Island):
- 2 S of Travers Island (13 miles E) (chart Aus 839), rocky, with a few stunted bushes on it and lying on a drying reef which extends 5 cables W from the island. Depths less than 10 m extend up to 2 miles SE and W from the island, as shown on the chart. Strong tide-rips occur off the W end of the reef. The island is a good mark for making Yule and adjacent channels from E. Thence:
- 3 S of a 4.7 m patch (8½ miles E), lying near the E extremity of Hawkesbury Reefs; thence:
N of drying reefs and foul ground (8 miles ESE), extending from the E extremity of North Torres Reef; thence:
Clear of an 8 m patch (6½ miles E), as prudence may require; thence:
- 4 S of Channel Island (5¼ miles ENE), low, rocky, partly covered by dense scrub and lying near the N edge of Hawkesbury Reefs; and:
N of North Torres Reef (2¼ miles S) (13.174); the N side of the reef is well-defined and steep-to except at the W end. A drying sand cay lies near the middle of the N side.
- 5 The track then leads generally WSW, following the line of the N side of North Torres Reef, and passing:
SSE of a line of reefs (9 cables S), some of which are drying and some awash; the channel between these reefs and Hawkesbury Island is foul. Thence:
SSE of a 3.5 m patch (1½ miles SSW), which is the least known depth on the N side of the fairway over the bar; thence:
- 6 NNW of patches, with depths of 0.4 and 2.6 m over them, (¾ miles SSW), the outer dangers off the

W extremity of North Torres Reef; ridges with depths less than 10 m over them extend 8¼ miles farther W. Thence:

- 7 SSE of a detached reef (2½ miles WSW), thence:
SSE of Ului (West) Island (¾ miles W), uninhabited, reef-fringed and rising to two peaks; a small hill on the W extremity of the island appears from a distance as a separate islet. A bank, with depths less than 5 m over it, extends 2½ miles E from the island. West Shoal, with depths less than 5 m over it, extends to 2¼ miles W and is separated from the island by a narrow channel.
- 8 Course may then be directed as required, passing:
Clear of White Rocks (10°28'S 142°02'E) (13.86), and:
Clear of Fantome Reef (6 miles W of White Rocks).

Charts Aus 700, Aus 839, Aus 376

Bramble Channel

13.177

- 1 **General information.** Bramble Channel lies between Hawkesbury Reefs (10°21'S 142°12'E) and the S part of Long Reef, about 1½ miles farther NNE. The channel has a general width of 1 mile, but this is reduced by two small reefs in the fairway in the middle part of the channel, and another near the W end. Some parts of the channel are unsurveyed and surveys in the remaining parts, and in the approaches, are inadequate: other below-water dangers may exist.

- 2 Passage of the channel should not be attempted except in a case of necessity.

Tidal streams set through in the direction of the channel at rates up to 5 to 6 kn.

13.178

- 1 **Directions.** From the vicinity of a position about 14 miles E of Hawkesbury Island (10°22'S 142°08'E) (13.176), the track leads W, passing (positions from Hawkesbury Island):
N of Travers Island (13 miles E) (13.176), thence:
S of Muknab Rock (11 miles ENE), above water and lying on a shoal bank which has a drying coral reef on its E part; thence:
- 2 N of the patch (8½ miles E) (13.176) near the E extremity of Hawkesbury Reefs.
The track then leads generally WNW between Hawkesbury Reefs, the N edge of which is mostly unexamined, and Long Reef, which dries, passing:
NNE of Channel Island (5¼ miles ENE) (13.176), thence:
- 3 Clear of two small drying reefs (4½ miles ENE), lying in the middle of the fairway, thence:
NNE of Hawkesbury Island, thence:
NNE of Dadalai Islet (1 mile NW) lying, with some above-water rocks, on a drying reef situated about 1¼ miles SSW of the edge of Hawkesbury Reefs; and:
- 4 SSW of a small drying reef (3 miles N), thence:
SSW of Kulbai Kulbai Island (4 miles NNW), the SE-most of Duncan Islands and moderately high. This group of five rocky islands, with a few stunted bushes and grass on them and numerous islets and rocks, lies on a bank, with depths less than 5 m over it, which extends up to 6 miles W and NW from the NW end of Long Reef. Phipps Island, lying close N of Kulbai Kulbai Island and on the same drying reef, is similar to it in aspect

and extent. A number of above-water rocks lie close to Phipps Island and up to 7½ cables SW of it. Spencer Rock (below-water), is the outer danger 1 cable SW of Kulbai Kulbai Island. And:

- 5 NNE of a below-water rock (3½ miles NNW) lying 3 cables within the edge of a bank with depths less than 2 m over it. Gainaulai Island, a rocky islet 3 cables farther S lies near the middle of the bank. Tuft Rock, a second rocky islet, lies 6 cables WSW of Gainaulai on the same bank.

Course may then be directed W into more open water, passing:

- 6 S of Whale Island (6 miles NNW), which is reef-fringed and similar in appearance to Kulbai Kulbai and Phipps Islands; above-water rocks lie within 7½ cables N and NW of Whale Island. Thence:
- 7 N of Ului Island (3¾ miles W) (13.176), thence: S of a 2.7 m patch (7½ miles NW) lying at the outer end of the bank extending W from Long Reef. Logan Rocks, 1 mile NNE of the patch, are two remarkable blocks of stone and the W-most of Duncan Islands group.

Charts Aus 839, Aus 376

Banks Channel

13.179

- 1 **General information.** Banks Channel lies between Moa Island (10°11'S 142°15'E) and Badu Island, 1½ miles NW, on the N side, and Long Reef and Duncan Islands on the S side. The E part of the channel is wide, well-defined and, with one exception, clear of dangers. The W part is obstructed by islets, rocks and shoals, which make the passage intricate and dangerous. This entrance should not be attempted in bad light conditions unless the marks described at 13.181 are clearly visible.

- 2 **Tidal streams** set through in the direction of the channel and may sometimes attain a rate of 5 kn. Streams observed during survey work in the area in 1979 were reported to be similar to those predicted for Hammond Rock Lighthouse (10°31'S 142°13'E).

Principal mark:

- 3 Quoin Rock (10°13'S 142°03'E), the NW-most of Duncan Islands group (13.178). The rock is a mass of granite, wooded and prominent; numerous above and below-water rocks and reefs lie SE of Quoin Rock and around the two Wilson Islands, which are high and stony, 1¼ miles farther SE.

13.180

- 1 **Directions for approaches.** Approaches to the E end of Banks Channel from E or SE should be made passing between Mount Ernest Island (10°15'S 142°29'E) and Travers Island, 9½ miles farther SW. Mount Ernest Island, which stands 10 miles E of the entrance to Banks Channel, is high on its E side but low, sandy and wooded on the W side. The summit is formed by a sharp peak rising near the S end. A solitary hill, 85 m in height, stands at the NE extremity of the island, with Peenacar Rock (Islet) 5 cables farther N. The track leads WNW or as otherwise required, passing (positions from Mount Ernest Island):

- 2 Clear of a 5.9 m patch (3½ miles ESE); other patches, with depths less than 10 m over them, lie 1¼ miles ENE and 2½ miles S of the first patch; thence: Clear of Campbell Reef (4¼ miles S), below water; and: NNE of Travers Island (9½ miles SW) (13.176), and:

- 3 SSW of Hovell Shoal (2¼ miles SW); a number of dangers lie off the W side of Mount Ernest Island between this shoal and Var Shoal, 3 miles farther NNE, as shown on the charts. Thence: NNE of Muknab Rock (10¼ miles WSW) (13.178), thence:

- 4 SSW of a patch, with a least known depth of 7.3 m over it, (6¾ miles W); a second patch (depth 7.8 m, reported 1986) lies 2¼ miles farther W. And: NNE and N of the E end of Long Reef (9½ miles WSW) distant 5 cables. The sea breaks over the end of the reef, but smooth water should be found at this distance off.

Useful mark from east:

South Point (10°16'S 142°17'E), low and covered with a dense belt of mangroves; South Rock, above water, lies on the edge of the reef which fringes the point.

When approaching the channel from E, and having passed Hovell Shoal as described above, a track leading towards the point may be followed.

13.181

- 1 **Directions for Banks Channel.** From the E entrance the track leads W then WNW in mid-channel, passing (positions from Gibbes Head (10°14'S 142°13'E)):

S of South Point (3¾ miles ESE) (13.180), thence: SSW of Gibbes Head, a high, steep bluff, partially covered by trees and undergrowth; a village is situated on the E side of the head. Thence:

- SSW of a below-water rock (1½ miles W), marked by tide-rips; thence:
- 2 SSW of Barney Island (2½ miles WNW), the SE-most of a group of four islands, of moderate height, rocky, wooded and more fertile in appearance than Duncan Islands, 4 miles farther WSW. The islands, and rocks between them, appear to be connected by the shoals and coral reefs which fringe the group and extend nearly across the opening between Gibbes Head and Rugged Point (6 miles NW). High Island, 5 cables N of Barney Island, is the N-most of the group. Thence:

- 3 SSW of Browne Island (3½ miles W) distant 5 cables. The island, which is steep on its SW side, is the SW-most of the four islands and a good mark for clearing the S and W edges of the reefs fringing the group. And:

NNE of North West Reef (3½ miles W), a narrow detached reef, 3½ miles in length, lying close off the NW end of Long Reef.

- 4 The track then leads round Browne Island and NNW towards Green Islet (6½ miles WNW), which is rocky with a few trees, bushes and some grass on it. The S end of the islet is formed by a remarkable and nearly isolated rock. A number of above-water rocks lie between Green Islet and Rugged Point, 1 mile farther NE. The track passes:

ENE of foul ground (5 miles W), extending 1 mile NNW from the NE side of North West Reef, and:

- 5 WSW of Clarke Island (4¼ miles WNW), lying 1 mile NW of Barney Island and the last of the same group.

The track then leads generally W as required to pass: N of the foul ground extending NNW from North West Reef, and:

S of Green Islet (6½ miles WNW), see above; thence:

- 6 S of a below-water rock (6½ miles WNW), nearly awash, the S-most of the dangers off Green Islet. Messum Rock, a white rock, lies 5 cables farther N and 5 cables W of Green Islet. The channel has a width of 5 cables between these dangers and the foul ground extending NNW from North West Reef.
- 7 The line of bearing (095°), astern, of the W point of Barney Island (2½ miles WNW) then leads W, passing: N of Quoin Rock (9½ miles W) (13.179) distant 5 cables; thence:
S of a 3-6 m patch (11¼ miles WNW). South Bank, with depths less than 5 m over it, lies 1½ miles farther N and extends 8½ miles W from Badu Island.

Bligh Channel

13.182

- 1 **General information.** Bligh Channel, known locally as Alligator Passage, is an intricate and dangerous channel lying between the islets and reefs off the N side of Badu Island (10°07'S 142°08'E) and the dangers extending S from Mabuiag Reef (10°00'S 142°09'E). The channel is barely 2 cables in width at its narrowest part, 2 miles NW of North West Point (10°04'S 142°07'E), and has a least known depth of 5 m in the fairway about 5 cables NE of these narrows. Strong Tide Passage (13.187) provides an alternative but equally intricate and dangerous track from South Islet, 1¼ miles NNE of North West Point, to the W end of Bligh Channel.

- 2 The approaches from SE, ESE or NE may be used for Bligh Channel and for Napoleon Passage (13.188).

Tidal streams set through Bligh Channel and Strong Tide Passage at a great rate.

Local knowledge is essential.

13.183

- 1 **Directions for approach from south-east.** The line of bearing 307° of the NE edge of Bond Island (10°04'S 142°16'E), which is wooded on its NW side, leads NW from open water through a channel 1½ miles in width, passing (positions from Bond Island):

NE of a 7-1 m patch (7-3 m on chart Aus 376) (8 miles SE), thence:

- 2 NE of East Point (7½ miles SE), reef-fringed and projecting 4 cables NE from an isolated hill 116 m in height; the bight close NW of the point affords no shelter from SE winds. A village lies 1 mile SSW and a red and white radio tower stands 1¼ miles SSW of the point. The coast of Moa Island extending generally NW from East Point consists of a number of rocky points, from which the land rises to ridges of high ground and to Mount Augustus (5½ miles SSE) (13.168). Thence:

- 3 SW of Portlock Island (6 miles ESE), wooded and lying near the SE end of a drying reef which extends 1¼ miles NW/SE. The reef has not been closely examined; Tobin Island, a rock with a few bushes and grass on it, lies near its NW end. Thence:

SW of North Possession Island (3¾ miles E), wooded and lying on a drying reef; a spit, with depths less than 5 m over it, extends 1 mile NW from the island.

- 4 The line of bearing 330° of Passage Island (6 miles NNW), rocky, covered with stunted vegetation and lying on a coral reef, then leads NNW, passing:

ENE of Bond Island. The island and a below-water rock (6 cables SSE) lie on Bond Reef, with depths less than 5 m over it, which extends 7½ cables SE and 2 miles W from the island but has not been fully delineated.

13.184

- 1 **Directions for approach from east-south-east.** From a position in open water E of Bond Island (10°04'S 142°16'E) (13.183) the track leads WNW, passing (positions from Bond Island):

NNE of Portlock and Tobin Islands (6 miles ESE) (13.183), thence:

NNE of North Possession Island (3¾ miles E) (13.183) and of the spit extending NW from it; and:

SSW of Providence Shoal, with depths between 1-6 and 5 m over it, (3¾ miles NE); thence:

NNE of Bond Island.

13.185

- 1 **Directions for approach from north-east.** From unsurveyed water SE of Orman Reefs (9°50'S 142°20'E) (13.192) the line of bearing 215° of Bond Island (10°04'S 142°16'E) (13.183) leads SW, passing (positions from Bond Island):

- 2 SE of Basilisk Bank (4½ miles NNE), lying near the outer end of a spit, composed of sand and mud and with depths less than 5 m over it, which extends 4½ miles ESE from Passage Island (13.183); the spit is subject to change and breaks in strong SE winds. Passage between Basilisk Bank and Passage Island is not recommended. And:

NW of Providence Shoal (3¾ miles NE) (13.184).

(Directions for Napoleon Passage are given at 13.189).

13.186

- 1 **Directions for Bligh Channel.** From a position about 2¼ miles N of Bond Island, the track leads W, passing (positions from North West Point (10°04'S 142°07'E)):

S of a 4-5 m patch (9 miles ENE); a 3-6 m patch (position doubtful) lies 1½ miles farther W. These are the outer known shoal patches SE of Mabuiag Reef. Thence:

- 2 N of a 4-5 m patch (7 miles E); Black Rock (4 m in height), which is steep-to, lies 1 mile SE of the patch. Thence:

N of Round Rock Point (4 miles E), the NE extremity of Badu Island. The point is higher than the mangroves which fringe much of the island, and is backed by a ridge of stony hills of moderate height. Thence:

- 3 N of Castle Island (3 miles ENE), high, rugged and covered with stunted bushes and grass, which lies at the N end of Castle Reef, a partly drying reef, extending 1½ miles N from Badu Island. And:

S of North Patch (depth 1-2 m) (3¾ miles NE), which is formed of coral; there is a width of 2 cables in the channel between the patch and Castle Reef.

The track then continues W towards Farewell Islets (3 miles WNW), the larger of which is of moderate height and densely wooded; the smaller is composed of large masses of granite and has only a few trees on it. The track passes:

- 4 N of South Islet (1¼ miles NNE), rocky, partially wooded and fringed with a reef which is steep-to on its N side. Strong Tide Passage (13.187) separates the islet from the E end of an extensive bank, with depths less than 5 m over it, extending

about 1½ miles farther W; the N edge of the bank is formed by a coral reef which dries in places. And:

- 5 S of North Island (2½ miles NNE), moderately high, covered with scrub and lying near the S edge of a coral reef, with above-water rocks on it, which extends 1½ miles S from the middle of Mabuiag Reef.

Leading marks:

Front mark, North Island, see above.

Rear mark, the summit of Passage Island (7¼ miles ENE of North Island) (13.183).

- 6 The highest part of the front mark just open S of the rear mark bearing 065°, astern, then leads WSW through the narrowest and most intricate part of the channel, being guided by local knowledge and passing:

SSE of foul ground extending between North Island (2½ miles NNE) and Farewell Islets, 3¾ miles farther WSW; and:

Close NNW of Mid Reefs (2 miles NW), drying coral; thence:

Clear of patches, with a least known depth of 1.2 m over them, (2¼ miles WNW); thence:

- 7 Midway between Farewell Islets (3 miles WNW), which lie near the S edge of the foul ground extending WSW from North Island, and Tree Islet (9 m in height) (2½ miles W), which is rocky, with some trees on it, and lies on a drying reef at the ENE end of North Bank.

When the alignment of Tree Islet with Coconut Point, on the W side of Badu Island 3½ miles farther SSE, bears 165°, the track leads W into more open, but inadequately surveyed, waters clear of Bligh Channel, passing:

- 8 N of North Bank, with depths less than 5 m over it, distant 5 cables. The bank extends 4¼ miles WSW from Tree Islet. Middle Bank, also with depths less than 5 m over it, lies about 7 cables S of North Bank and extends 5½ miles W from Badu Island; Asp Rock (0.6 m in height) (5 miles SW) is the W-most of a number of islets and above and below-water rocks lying on the inner end of Middle Bank. The channel between North and Middle Banks has only been partially examined.

13.187

- 1 **Directions for Strong Tide Passage.** From a position in Bligh Channel N of South Islet, 1¼ miles NNE of North West Point (10°04'S 142°07'E), the track leads generally SW, passing (positions from North West Point):

Between South Islet (13.186) and the extensive bank W of the islet, keeping SE and S of the same bank; thence:

- 2 NW of a high island (5 cables NE); some above-water rocks lie between it and Badu Island; a chain of rocks extends 7½ cables SW from an above-water rock close NW of the island. Thence: NW of North West Point, a low and rocky projection.

The track then leads generally W, passing:

S of an islet (7½ cables NW), lying close off the SE end of the extensive bank W of South Islet; Midway Rocks, a group of above-water rocks, lie on the same bank N of the islet. Thence:

- 3 N of Round Islet (1¼ miles WSW), 34 m in height and wooded; a chain of rocks and below-water patches lies on a flat which extends up to 1 mile NE and 5 cables NW from the islet. There is a

narrow channel between North West Point and the islet.

Directions for the W part of Bligh Channel may then be followed, passing between Farewell Islets (3 miles WNW) (13.186) and Tree Islet (2½ miles W).

Napoleon Passage

13.188

- 1 **General information.** Napoleon Passage lies between the line of reefs and dangers extending ESE and W from Mabuiag Island (9°58'S 142°11'E) and the N edge of Mabuiag Reef about 5 cables farther S. The passage, which is the N-most of the known navigable passages through Torres Strait, has its narrowest parts abreast Hamelin Boulders, midway through the channel, and in its W entrance; there are otherwise widths between 4 and 7½ cables.

- 2 **Tidal streams** through the passage are very strong, attaining the same rates and changing at approximately the same times as the streams off Hammond Rock Lighthouse (10°31'S 142°13'E). With an E-going stream and fresh SE winds, a strong tide-rip occurs between the E end of Mabuiag Reef and the reefs extending WSW from Passage Islet (9°59'S 142°14'E).

13.189

- 1 **Directions** (*continued from 13.185*). From a position about 2¾ miles N of Bond Island (10°04'S 142°16'E) (13.183) the track leads NNW on the same line of bearing (see 13.183) of Passage Island, 6 miles farther NNW. The track passes (positions from Susie Point (9°58'S 142°11'E), the S extremity of Mabuiag Island):

WSW of Basilisk Bank (7½ miles ESE) (13.185), thence:

- 2 Across the E-most of the outer patches (5½ miles ESE) (13.186) lying SE of Mabuiag Reef, thence: ENE of the E end of Mabuiag Reef (3½ miles ESE).

The line of bearing 295° of Mount Jervis (149 m in height) (8 cables N), which is the highest summit of Mabuiag Island and appears as a sharp peak from all directions, then leads WNW, passing:

- 3 SSW of a below-water reef, with depths less than 1 m over it, which extends 1½ miles WSW from Passage Island (3½ miles E). Depths less than 5 m occur off the S edge of the reef.

The line of bearing 280° of Susie Point, which is fringed by a drying coral reef, then leads W. Tide-rips (13.188), if present, may be avoided by favouring the N side of the fairway, close to the reef extending WSW from Passage Island. The track passes:

- 4 N of two uncharted coral patches (2¼ miles ESE), with a depth of 0.6 m over each, which break heavily. The patches lie 6 cables SSE of Minnie Rock, see below. The N edge of Mabuiag Reef, in the area close S of these patches, is broken by a number of shallow channels extending SW across the reef. Thence:

- 5 S of Minnie Rock (2 miles E), which dries 2.1 m; Mobil Island, lying 2½ cables farther NE, is 7 m in height and lies near the W end of the reef extending WSW from Passage Island. A chain of islands, rocks and other dangers extends 1¾ miles N from Mobil Island to abreast Ada Point (1¾ miles NE), the E extremity of Mabuiag Island.

There is a village and a church on the S side of Ada Point.

- 6 The line of bearing $089\frac{1}{2}^{\circ}$, astern, of the S edge of Passage Island then leads W, passing:

S of a ledge, with depths less than 1 m over it (1 mile E), which extend 5 cables to seaward of the edge of the drying coral reef which fills the bight of Mabuia Island between Susie Point and Ada Point ($1\frac{3}{4}$ miles NE). Thence:

S of Susie Point, where the passage is 4 cables in width.

- 7 When clear W of Susie Point the track leads NW on 306° , favouring the SW side of the passage and passing:

SW of Meipa Island (1 mile NW), covered with mangroves. Pulu Island, 5 cables farther N and lying close off the W extremity of Mabuia Island, is 29 m in height, rocky and covered with stunted vegetation; there are numerous rocks in its vicinity. Thence:

- 8 SW of Hamelin Boulders ($1\frac{1}{2}$ miles WNW) distant about 1 cable. The boulders are above water and lie in mid-channel; a coral reef extends 5 cables NW from the boulders and another reef lies between them and Pulu Island, 1 mile farther NNE. On no account should the passage NE of the boulders be attempted.

- 9 When clear of Hamelin Boulders and the reef extending NW the track leads W, initially on 280° on the line of bearing 100° , astern, of the summit of Mount Jervis; there is a width of $7\frac{1}{2}$ cables between foul ground on each side for a distance of $3\frac{1}{2}$ miles farther W.

The line of bearing 086° , astern, of a saddle, distinctive from W, formed by two hills in the N part of Mabuia Island, the higher being 126 m in height, then leads W and clear of Napoleon Passage on 266° , passing:

- 10 N of several detached patches, with depths of 1-8 to 5 m over them, ($5\frac{1}{4}$ miles WNW), which restrict the width of the channel on its S side; thence: N of the W extremity of Mabuia Reef (7 miles W); a bank, with a least known depth of 3-6 m over it, lies 7 cables farther W. Waters which are generally shoal extend up to 12 miles W from Mabuia Reef, as shown on the chart. And:

- 11 S of an almost unbroken line of reefs and shoals, with depths less than 5 m over them, which extend up to 15 miles W from Pulu Island ($1\frac{3}{4}$ miles NNW).

The line of bearing 116° , astern, of the larger of the Farewell Islets (8 miles WSW) (13.186) then leads WNW if required. Course may otherwise be directed as guided by the chart, noting that surveys in this area are inadequate.

Approach to Saibai Island and adjacent coast of Papua New Guinea

Charts Aus 839, Aus 840, Aus 376

General information

13.190

- 1 **Route.** From the area N of Twin Island ($10^{\circ}28'S$ $142^{\circ}27'E$) a single route leads N through the E approaches to the minor channels from Dayman Channel (13.173) to Napoleon Passage (13.188). The same route then continues generally N to the S coast of Papua New Guinea, where it gives some access to communities on the coast and off-lying islands.

Local knowledge. Use of the route is generally appropriate only to fishing vessels and local craft.

Directions

13.191

- 1 **From south to Watson Cay.** From a position 4 miles E of Travers Island ($10^{\circ}22'S$ $142^{\circ}22'E$) (13.176), the track leads N for 20 miles to a position 3 miles W of Watson Cay ($10^{\circ}03'S$ $142^{\circ}27'E$). The channel is 3 miles wide, clear and has general depths of 10 to 11 m. The track passes (positions from Watson Cay):

W of Campbell Reef ($17\frac{1}{2}$ miles S) (13.180), thence: W of Hovell Shoal ($14\frac{1}{2}$ miles S) (13.180), thence: W of Mount Ernest Island (12 miles S) (13.180), and: E of a patch (13 miles SSW) (13.180), thence:

- 2 W of Gettulai Island ($8\frac{3}{4}$ miles SSE), fringed by a coral reef. A rocky ridge, covered with trees and bushes, slopes gradually from the summit at the SE end of the island to its NW extremity, from where a low sandy spit extends WNW. A ledge, with depths less than 10 m over it, which extends up to 2 miles W from the island, has not been fully examined and should be given a wide berth. A small islet (0-6 m in height) lies on a smaller, detached drying reef 5 cables NE of Gettulai Island; there is a narrow but safe channel with depths of 9-2 m between the two reefs. Thence:

- 3 E of East Point ($9\frac{1}{2}$ miles SW) (13.183), thence: W of Suarji Island ($7\frac{1}{4}$ miles SSE), reef-fringed and rising to a rocky peak covered with bushes. The NW side of the island is low and terminates in a spit. Patches, with depths less than 5 m over them, which lie on spits extending up to 2 miles WSW and WNW from the island, are the outer dangers on the W side. And:

- 4 W of Pinnacle Reef ($4\frac{1}{4}$ miles SSE), which dries 2-6 m and has a sand cay on it; a spit, with depths less than 5 m over it, extends 9 cables WNW from the reef. And:

E of Portlock Island ($6\frac{3}{4}$ miles SW) (13.183), thence: W of Watson Cay, a drying sand cay lying on a drying reef; a 3-2 m patch $7\frac{1}{2}$ cables WNW of the cay is the outermost danger.

13.192

- 1 **From Watson Cay to Gabba Island.** From the position 3 miles W of Watson Cay to a position 6 miles W of Gabba Island ($9^{\circ}46'S$ $142^{\circ}38'E$) there is a clear channel 2 miles wide, with general depths of 8 to 12 m, through Kai Passage. The channel is joined from E by a channel (13.63) from Tancred Pass ($10^{\circ}01'S$ $142^{\circ}57'E$) which passes N of Watson Cay. The track through Kai Passage leads NNE for 18 miles, passing (positions from Hastings Reef ($9^{\circ}51'S$ $142^{\circ}33'E$)):

- 2 ESE of Orman Reefs ($7\frac{1}{2}$ miles W), which lie on the SE side of the large unsurveyed area of reefs extending from Mabuia Island ($9^{\circ}58'S$ $142^{\circ}11'E$) to the coast of Papua New Guinea 45 miles farther N. The SE edges of the reefs lie in unsurveyed water but have been traced from Mabuia Island to the NE end of Kai Reef, 17 miles farther NE; from there the edge appears to turn NNW towards Turnagain Island ($9^{\circ}34'S$ $142^{\circ}17'E$). And:

- 3 WNW of a 1-6 m patch ($3\frac{3}{4}$ miles WSW); other patches, with depths less than 5 m over them, extend at least $4\frac{1}{4}$ miles farther SE. Thence:

WNW of Hastings Reef, on which there are large drying boulders; thence:

- 4 W of Gabba Island (5¾ miles NE), uninhabited, reef-fringed and rising to two hills, the higher being on the N side of the island. Mourilyan Reef, which dries, lies 1¼ miles S of the island. Slade Rock and other dangers, as shown on the chart, lie on either side of a channel between Gabba Island and the reef.

13.193

- 1 **From Gabba Island to Saibai Island.** From the position 6 miles W of Gabba Island, the track leads generally N for 25 miles to a position about 2¼ miles NW of Saibai Island (9°24'S 142°41'E). The least known depth in the fairway is 4.6 m, as shown on the chart in position 9°31'·5S 142°33'·4E. The track passes (positions from Dauan Island (9°25'S 142°32'E)):

- 2 W of a 1.8 m patch (13¼ miles S), thence:
W of a 4.3 m patch (8¼ miles SSE), thence:
W of a 4.5 m patch (6¼ miles SSE), the outer known danger NW of Adrian and Phipi (Phili) Reefs, both of which are drying reefs and lie 1 and 2 miles farther SE. Thence:
Clear of a 4.6 m patch (5½ miles SSE), thence:
E of a sand cay (4¾ miles S), which dries; foul ground extends W from the cay; thence:
Clear of a 4.9 m patch (3¾ miles SSE), as required; thence:
- 3 W of a 4 m patch (3 miles SE); a line of patches, with depths less than 5 m over them, extends 2¼ miles farther N on the E side of the fairway.

The track then continues N, in charted depths of more than 5 m, between a series of patches and shallow banks which lie E of Dauan Island and W of the W end of Sabai Island (3 miles ENE). Dauan Island on which stands a light, is inhabited, and dominated by Mount Cornwallis.

- 4 There is a fishing station at Churum, near the W extremity of Saibai Island. A church in the village of Sabai, on the NW side of the island, is conspicuous. The village is fronted by South Bank (3½ miles NE), which extends up to 1¼ miles offshore; a drying reef lies near the outer end of the bank.
- 5 The N end of the channel between Dauan and Sabai Islands lies between North Reef (4¼ miles NNE), which dries, and a bank of foul ground, 1¼ miles farther ESE; a cay (1 m in height) lies on the W of two drying reefs near the E end of the bank. There is a narrow channel, with a least known depth of 3.6 m, between this and South Bank, 3 cables SSE.

13.194

- 1 **Passage north of Saibai Island.** From the vicinity of North Reef (9°21'S 142°34'E) a channel leads E between Saibai Island and the coast of Papua New Guinea. Depths are irregular, but the channel is suitable for vessels of draught not more than 3.7 m and gives access to Pahoturi River (9°17'S 142°45'E) (13.196) and to Binaturi River (9°09'S 142°57'E) (13.197). For the first 10 miles E from North Reef there is a width of 1 mile between the coastal banks on each side and a least known depth of 5.7 m: from thence, and for 8 miles farther E, the channel is narrow, shallow in places, much obstructed by rocks and shoals, and the water discoloured. The track passes (positions from Buiaimuba Point (9°20'S 142°38'E)):

- 2 N of the foul ground and cay (2¼ miles WSW) (13.193), thence:
S of Buiaimuba Point, thence:

N of Kaumag Island (2¾ miles SE), formed mostly of mangrove swamp; thence:

- N of a reef (6 miles E), thence:
S of a drying rock (6¼ miles E), lying at the E limit of the deeper part of the passage; and:
S of a 1.6 m shoal patch (reported 1998) (8 miles E), thence:
N of a below-water rock (9 miles E).

Side channels

13.195

- 1 **Tancred Pass to Watson Cay.** See 13.63.

13.196

- 1 **Pahoturi River.** The entrance to Pahoturi River (9°17'S 142°45'E) is approached through a shallow channel across drying coastal sandbanks which extend up to 1¼ miles offshore. The approach channel may be subject to change and was reported in 1980 to pass N of Marakara Island (9°17'S 142°46'E) and E of Paho Island, 1¼ miles farther W, with a least depth of 2 m. Within the entrance a stony bar, with depths less than 1.8 m over it, extends upstream for 3 miles, beyond which the river is deep for many miles. Marakara Island and Sogeri Island, 3½ miles farther WSW, are both covered with mangroves.

- 2 **Local knowledge** is essential.

Useful marks:

Mabaduan (Mabudawane) (a hill 55 m in height) (9°17'S 142°44'E), which is grass-covered and rises W of the entrance, is the only feature of any height on the coast between Parama Island (9°00'S 143°25'E) and Torassi River (9°08'S 141°01'E) (chart Aus 376). A white concrete church, standing on the S slope of the hill, is clearly visible from SE; Mabaduan village lies at the foot of the hill and at the W entrance point to the river.

13.197

- 1 **Binaturi River.** The entrance to Binaturi River (9°09'S 142°57'E) may be reached from the channel (13.194) passing N of Saibai Island (9°24'S 142°41'E) by vessels with a draught of not more than 3.7 m. From the E end of Saibai Island channel the final approach to the river entrance, 11½ miles farther NNE, passes through water which is unsurveyed and may also be too discoloured to allow shoals to be readily identified.

Local knowledge

- 2 The river entrance is fronted by a shallow bar from which a spit, with depths less than 5 m over it, extends about 5 miles SSE to an area of foul ground which lies between the spit and Gimini Reef, 1½ miles farther SSE. The village of Mawata lies on the W side of the entrance.

Within the entrance the river can be navigated by boats for a distance of 8 miles. The banks are of mud, covered with scrub and coconut palms. The water in the river is fresh at half tide on the out-going stream.

Anchorage and landings

Charts Aus 839, Aus 840

Yam Island

13.198

- 1 **General information.** Yam Island (9°54'S 142°47'E) is of granite formation, hilly, densely wooded and fringed by mangroves and a drying reef. There is a population of 400 (2001). The village is situated on a sandy strip at the NW

extremity of the island. A red and white radio mast stands in the NE part of the island.

- 2 **Approach** to the island may be made as guided by the charts, noting the varying reliability of surveys. The caution at 13.63 on maximum draught for the channel between Tancred Pass (10°01'S 142°57'E) and Watson Cay, 29 miles farther W, should also be noted. Cap Islet, known locally as Muquar, lying 4½ miles NW of Yam Island, is a rounded mass of granite covered with sparse vegetation and reef-fringed; there is a sandy spit at the NW end of the island. Sereu Rock, with a depth of 2 m over it, lies midway between the two islands.

- 3 **Anchorage**, with shelter from SE winds, may be obtained close off the NW extremity of Yam Island in a depth of 15 m.

Berths. A concrete barge ramp and basin can be used at all states of the tide, but access is frequently difficult during the NW monsoon. A small jetty is also available.

Facilities: airstrip; medical aid post; telephones; retail store; limited fresh water for local use only.

Gabba Island

13.199

- 1 **Anchorage** may be obtained N of the reef off the W side of Gabba Island (9°46'S 142°38'E) (13.192) in depths of 11 to 13 m. Sinclairs Reef, which dries, lies 1½ miles NE of the island. Small boats may be beached anywhere on the reef fringing Gabba Island, the safest access being on the N or NW sides.

Chart Aus 839

Mount Ernest Island

13.200

- 1 **Anchorage** may be obtained 1½ miles NW or SW of Mount Ernest Island (10°15'S 142°29'E) (13.180) in depths of 11 to 14 m, taking care to avoid Var and Hovell Shoals and the dangers lying between.

Good anchorage may also be obtained 9 cables NNW of the summit of the island in a depth of less than 10 m, coarse sand and small broken coral. This berth lies between Peenacar Rock and the below-water rock 9 cables SW. There is a deep passage between the reefs fringing Pennacar Rock and Mount Ernest Island.

Charts Aus 296, Aus 700

Ului Island

13.201

- 1 **Anchorage** may be obtained 1 mile NW of Ului Island (10°21'S 142°03'E) (13.176) in depths of 10 m. The N extremity of the island is formed by a low, wooded point; some above-water rocks, 5 cables N of the point, are steep-to on the S and W sides but shoal depths extend about 7 cables E from the rocks. Landing from boats may be made on the NW side of the island.

Chart Aus 376

Banks Channel

13.202

- 1 **Anchorage**, sheltered from wind from any direction, may be obtained in almost any part of Banks Channel (10°15'S 142°11'E) (13.179), but the tidal streams are strong.

For anchorages off Gibbes Head (10°14'S 142°13'E) see below.

Moa Island

13.203

- 1 **Gibbes Head landing.** The village of Kubin, situated on elevated rocky ground on the E side of Gibbes Head (10°14'S 142°13'E) (13.181), has a population of 210 (2001). A barge ramp and a small jetty provide access from seaward.

Approach is made through Banks Channel (13.179).

- 2 **Anchorage** may be obtained 2½ cables SW of Gibbes Head in a depth of 11 m. HMAS *Barbette* (146 tonnes, 2.2 m draught) is reported (1979) to have anchored in a depth of 5.5 m, good holding ground, with Gibbes Head bearing 135° distant 1½ miles. The tidal stream in this berth set N/S at about 5 kn.

Facilities: airstrip; medical aid post; telephones; retail store; limited fresh water for local use only; petrol and diesel fuel in small quantities.

Chart Aus 839

13.204

- 1 **East Point landing.** Saint Paul's Community, a village lying 1 mile SSW of East Point (10°10'S 142°20'E) (13.183), has a population of 350 (2001). The village is served by a barge ramp and a small jetty, but access is limited by the size of the channel over the fringing reef.

Facilities: helicopter pad; medical aid post; telephones; retail food store; limited fresh water for local use only.

Chart Aus 376

13.205

- 1 **Anchorages.** Convenient temporary anchorage may be obtained, in smooth water during SE winds, WNW of a point 1¾ miles NW of Mount Augustus (10°09'S 142°19'E) (13.168). Caution is necessary as the coastal reef and the 5 m depth contour extending WNW from it, are both steep-to.

- 2 Moderate shelter from SE winds may also be obtained farther WNW in depths of 5 to 7 m, mud, between Bond Island (10°04'S 142°16'E) (13.183) and the flats and banks, 1¾ miles SW, lying between Moa and Badu Islands. There is a width of 5 cables between the 5 m depth contour of these banks and the W end of Bond Reef (13.183).

Anchorage may also be obtained in a depth of 9 to 10 m, coarse sand, 4 cables N of Bond Island. There is a landing on the sandspit extending SW from the island.

Badu Island

13.206

- 1 **General information.** Badu Island (10°07'S 142°09'E) has a population of 825 (2001). A village on the E side of the island, lying about 2½ miles NE of Rugged Point (10°11'S 142°08'E), can be reached from seaward.

Approach. The village is approached through Banks Channel (13.179), thence through a boat channel used by local craft, with a depth of about 2.7 m in it, which leads generally N through the waters separating Moa and Badu Islands, keeping mostly close to Moa Island. The waters between the two islands, which are mainly shallow, contain numerous rocks, awash, and are subject to eddies.

- 2 **Berths.** A stone barge ramp can be used at all states of the tide; barges can also use a small sandy beach close S of the ramp. There is a small jetty. The tidal stream sets SW on the rising tide, with a spring rate of 2 kn.

Facilities: light engineering workshop; airstrip; medical aid post; telephones; retail stores; limited fresh water for local use only; petrol and diesel fuel in small quantities.

Bligh Channel**13.207**

- 1 **Anchorage** may be obtained temporarily 5 cables NNW of Castle Island (10°03'0S 142°09'4E) (13.186) in depths of 11 to 16 m.

Temporary anchorage may also be obtained 5 cables NE of Tree Islet (10°04'4S 142°04'2E) (13.186) in a depth of 11 m.

Neither of the above anchorages is recommended owing to the strong tidal streams.

Mabuiag Island**13.208**

- 1 **General information.** The population of Mabuiag Island (9°58'S 142°11'E), is 210 (2001) persons, is centred on the village on the S side of Ada Point (13.189), at the E extremity of the island. The village is served by a barge ramp. Philip Harbour lies S of the village, between the SE side of Mabuiag Island and the chain of islands and rocks extending N from Mobil Island (13.189), 1½ miles SSE of Ada Point.

- 2 There are boat channels, used by local craft, between Belle Vue Islands off the N coast of Mabuiag Island. The islands are partially wooded and surrounded by reefs; tidal streams set strongly between them.

Approaches. The barge ramp is approached through a boat channel which leads between Ada Point and the N-most of the rocks extending N from Mobil Island. Local knowledge is essential.

- 3 Philip Harbour is approached from Napoleon Passage (13.188) and is entered between Mobil Island and the ledge 1 mile farther W (13.189).

Anchorage may be obtained in a depth of 9 m in Philip Harbour, 9 cables SSE of Ada Point. The berth is out of the main strength of the tidal streams, which otherwise attain rates of 3 to 4½ kn in the harbour.

Facilities: small airstrip; medical aid post; telephones; retail store; fresh water limited and for local use only; petrol and diesel fuel in small quantities.

*Chart Aus 840***Dauan Island****13.209**

- 1 **General information.** Dauan Island (9°25'S 142°32'E) (13.193) has a population of about 164.

Approach from S may be made as described at 13.193. Currents around the island are strong.

Berth. The island is served by a barge ramp and boat access to a small jetty; passenger ferries run to Saibai Island, 3 miles ENE.

Facilities: helicopter landing pad for emergency use only; medical aid post; telephones; retail store; limited fresh water.

Saibai Island**13.210**

- 1 **General information.** Saibai Island (9°24'S 142°41'E) is a low mud island with extensive salt and fresh water swamps and largely covered with mangroves. The village of Saibai, with a population of 379 (2001), lies on a low and narrow clay embankment on the NW side of the island. The NW part of the island is cultivated.

Approach. The village is initially approached from S through the channel (13.193) between Saibai Island and

Dauan Island, 3 miles WSW; thence as dictated by local knowledge.

- 2 **Anchorage** for small vessels may be obtained about 2½ miles ENE of the village, between Saibai Island and the small islet W of Kaumag Island (9°22'S 142°42'E) (13.194). Prior to 1973 the narrow channel between Saibai and Kaumag Islands was known to be deep except at the E end, where it was nearly blocked by a flat. Local knowledge is essential for this channel.

- 3 **Berths.** Access channel to a barge ramp and small jetty; both can be used at all states of the tide. The LW mark is about 500 m from shore.

Facilities: airstrip; medical aid post; telephones; retail store; fresh water.

*Chart Aus 376***Boigu Island and Mai and Wassi Rivers****13.211**

- 1 **General information.** Boigu Island (9°16'S 142°13'E), which is the largest of Talbot Islands, is low and swampy, mostly uninhabitable, except at the N extremity, where there is a village and cultivated ground, and on the S side where there are two fishing stations. The total population of the island is 340 (2001).

- 2 The island lies to seaward of the entrances to Mai River (9°09'S 142°12'E) and to Wassi River, 9 miles farther W. These two rivers are arms of the sea which extend about 15 miles inland to form outlets for Wassi Kussa River (8°56'S 142°00'E) (not charted) on either side of Strachan Island (9°07'S 142°07'E). There are depths from 9 to 18 m in each arm as far as the junction with Wassi Kussa River but the approaches from seaward are unsurveyed. Strachan Island is low, swampy and covered with mangroves and eucalyptus; the shores of the two arms are mostly fringed with mangroves.

- 3 The extent of surveys in the vicinity of Boigu Island may be seen from the chart. The only documented directions are for a channel between the NW side of the island and Strachan Island, 5 miles NNW.

Local knowledge is essential.

13.212

- 1 **Directions for the channel north-west of Boigu Island.** Having reached a position SW of Black Reef (9°15'S 142°04'E), as guided by local knowledge, a track then leads generally ENE, passing (positions from Black Reef):

NNW of Red Sands (1 mile S), which dry, are subject to change and lie at the outer end of an unexamined drying bank of mud and rock extending 8 miles WSW from Boigu Island. Thence:

- 2 SSE of Black Reef, which dries. Mata Kawa Island (3 miles N) is low and fringed with mangroves; Kawa Island lies 5 cables farther W. Thence: NNW of foul ground extending up to 3 miles W from Boigu Island (4 miles E), and: SSE of foul ground which lies between Black Reef and Aubussi Reef (7 miles ENE), and:
- 3 NNW of foul ground extending up to 1¾ miles W from Aubussi Island (5¾ miles E); a number of islets lie within 1 mile W of the island.

The track then leads E, passing:

N of Aubussi Island (5¾ miles E), and:

S of Aubussi Reef (7 miles ENE), which dries at its E and W extremities; a beacon marks the W end of the reef.

Thence as guided by local knowledge.

- 4 **Berth.** The island is served by a barge ramp and small jetty, but access is poor and limited to suitable HW periods only.

Facilities: airstrip; medical aid post; telephones; retail store; fresh water.

Deliverance Island

13.213

- 1 **General information.** Deliverance Island (9°31'S 141°34'E), 31 m in height, covered with high trees, is uninhabited and lies near the middle of a drying reef; access across the reef is only possible by dinghy or similar craft. Deliverance Island and Kerr Islet, a tree-covered sand cay on a drying reef 5 miles farther S lie near the W edge of the extensive shallow flats lying in the unsurveyed area N of Napoleon Passage (9°57'S 142°10'E); numerous shoal patches in the general area of the two islands are shown on the chart.

- 2 **Anchorage** for small vessels of suitable draught may be obtained 2¼ miles ESE of Deliverance Island as shown on the chart. Anchorage may also be obtained 4 miles E and 2 miles S of the island, both in depths of 5 m.

Morehead River and approaches

13.214

- 1 **General information.** Morehead River, known locally as Tatogabe, (9°09'S 141°20'E) flows into Health Bay which is shallow, with drying flats of sand and mud extending up to 2½ miles offshore. The entrance to the river, which is very narrow and difficult to identify, has depths of 7 to 9 m, but entry should not be attempted in vessels of more than 1.8 m draught until the approaches are examined. A village lies on the coast about 3½ miles SW of the entrance. The river has been ascended for a distance of

120 miles; the banks are low and fringed with mangroves for the first 30 miles, but beyond this the banks are higher. The river current in February has been reported to be 2 to 3 kn; only one tide in 24 hours was observed at the time.

- 2 **Approaches.** The large area of flats, with depths less than 5 m, which extends up to 24 miles SW from Unji Point (9°14'S 141°08'E) has been inadequately surveyed.

The deepest water in the approaches to Morehead River is likely to be found when approaching from S as guided by the chart, passing E of the above flats and W of Deliverance Island (9°31'S 141°34'E) (13.213).

Outer anchorage. Anchorage may be obtained 8½ miles SSE of the entrance to the river, in a depth of 7 m.

- 3 **Landing** from shallow-draught vessels may be effected off Walater Point (9°13'S 141°38'E) where the coastal flat recedes appreciably inshore. The point is easily identified by its red colour and the coconut palms on it. The shore of Thomson Bay, extending 15 miles E of the point, is formed mainly by mangroves and a sandy beach backed by coconut palms, behind which there is dense forest. The shore of Jerai Bay, immediately W of Walater Point, is fringed with mangroves which continue to the entrance to Morehead River.

Charts 3528, Aus 376

Torassi River

13.215

- 1 Torassi River (9°08'S 141°01'E) is navigable by boats for approximately 100 miles. Approach to the river entails passage over some part of the flats extending SW from Unji Point (9°14'S 141°08'E) (13.214). The entrance is very narrow and is marked by Sungai Torassi Light (white beacon) (9°08'S 141°01'E). The river narrows even more 3 miles upstream, and has many sharp bends and numerous obstructions.

APPENDIX I

COMMONWEALTH OF AUSTRALIA

Control of Naval Waters Regulations.**Citation**

1. These Regulations may be cited as the Control of Naval Waters Regulations.¹

Regulations do not apply to exempt vessels

3. These Regulations shall not, unless the contrary intention appears, apply to exempt vessels.

Entry into, or onto the foreshore of, naval waters

4. (1) Where the superintendent of naval waters is satisfied that it is in the interests of:

- (a) public safety; or
- (b) the safety of property; or
- (c) the defence of the Commonwealth:

the superintendent may, by notice, prohibit or restrict the entry of:

- (d) vessels or persons into the naval waters or any specified part of the naval waters; or
- (e) vehicles or persons onto the foreshore of the naval waters or any specified part of that foreshore.

(2) A prohibition or restriction under sub-regulation (1) may be:

- (a) absolute; or
- (b) subject to any approval given by the superintendent by notice; or
- (c) subject to any conditions imposed by the superintendent by notice.

(3) The superintendent of naval waters must cause a notice under sub-regulation (1) or paragraph (2)(b) or (c) to be given to such person or persons, in such manner, at such time and in such place as is reasonably required for the protection of the public, or any person who may be affected by the use by the Commonwealth of the naval waters, as the case may be, having regard to:

- (a) the purpose for which those waters are used by the Commonwealth; and
- (b) the time when those waters are so used; and
- (c) the risk of injury to persons; and
- (d) the risk of damage to, or interference with, Commonwealth or other property; and
- (e) the forms of communication and the time available for giving the notice.

(4) A person must not, knowingly or recklessly, contravene the requirements of a notice given under this regulation.

Penalty: \$500.

(5) Nothing in regulation 6, 7, 9, 10, 11, 12, 15, 16, 28, 30 or 31 affects the operation of this regulation.

Removal from naval waters or the foreshore of naval waters

5. The superintendent of naval waters may cause to be removed from, or from the foreshore of, those waters:

- (a) persons who, in those waters or on that foreshore, have contravened these Regulations; or

- (b) persons who, by entering into those waters or onto that foreshore, have contravened these Regulations.

Vessels not to impede approaches

6. The master of a vessel shall not, without reasonable excuse, permit the vessel to lie, or be moored or anchored, in naval waters in such a position that it impedes the approach to any installation.

Penalty: \$1,000.

Making vessels fast to forts etc.

7. (1) The master of a vessel shall not, without permission from the superintendent of naval waters, without reasonable excuse, make the vessel fast to any fort, Commonwealth moorings, buoys, breakwaters, jetties, piles, vessels, or exempt vessels in those waters.

Penalty: \$500.

(2) The superintendent may in his discretion grant or withhold permission under this regulation or may grant permission subject to such terms and conditions as he thinks fit.

(3) The terms and conditions upon which permission may be granted may, subject to the approval of the Minister, include the imposition of a charge for making a vessel fast to any fort, Commonwealth moorings, buoys, breakwater, jetties, piles, vessels, or exempt vessels in naval waters.

(4) A master of a vessel must not without reasonable excuse contravene a term or condition of a permission granted under this regulation.

Penalty: \$500.

Superintendent of naval waters to place moorings in naval waters

8. The superintendent of naval waters shall place in those waters moorings for naval ships, mark buoys, and other aids to navigation, and such other buoys as are required for any purposes in connection with naval or military operations from time to time.

Vessels not to anchor near Commonwealth moorings

9. The master of a vessel shall not, without reasonable excuse anchor or permit the vessel to be anchored or moored within 180 metres, or such distance as the superintendent specifies, from the centre of any Commonwealth moorings, nor in such a position as to be liable to foul any exempt vessels at these moorings.

Penalty: \$1,000.

Vessels not to anchor near navigable channels in naval waters

10. The master of a vessel which is of greater length than 10 metres over all shall not, without reasonable excuse cause or permit the vessel to be anchored in or near any of the navigable channels of any naval waters, or permit the vessel to be left at any time without a ship-keeper.

Penalty: \$1,000.

Vessels or persons not to be near installations etc.

11. (1) The master of a vessel shall not, without reasonable excuse cause or permit the vessel to dredge,

loiter, or anchor within 100 metres of an installation, exempt vessel or any other vessel in any naval waters without permission in writing from the superintendent of those waters.

Penalty: \$1,000.

(2) The master of a vessel must not, without reasonable excuse, cause or permit the vessel or a person under his or her control to interfere with an installation in naval waters without the permission in writing of the superintendent of those waters.

Penalty: \$1,000.

(3) A person must not, without reasonable excuse:

- (a) enter, or remain in, any naval waters within 100 metres of any installation, exempt vessel or any other vessel in the naval waters or on the foreshore of the naval waters; or
- (b) enter onto, or remain on, the foreshore of any naval waters within 100 metres of any installation, exempt vessel or any other vessel in the naval waters or on that foreshore, without the permission in writing of the superintendent of those waters.

Penalty: \$500.

(4) A person must not, without reasonable excuse, interfere with an installation in naval waters or on the foreshore of naval waters without the permission in writing of the superintendent of those waters.

Penalty: \$1,000.

Vessel not to approach installations

12. The master of a vessel must not, without permission in writing of the superintendent, without reasonable excuse cause or permit the vessel to approach within 30 metres of an installation, exempt vessel or any other vessel, in naval waters, unless proceeding on Commonwealth business to or from the installation or vessel.

Penalty: \$500.

Moorings not to be laid in naval waters without permission

13. (1) A person must not, without reasonable excuse lay moorings in any naval waters except with the permission in writing of the superintendent of those waters, and in such positions as he directs.

Penalty: \$500.

(2) Any moorings laid in pursuance of sub-regulation (1) shall, on notice in writing from the superintendent, be removed by the person who is for the time being the owner of the moorings.

Vessels or moorings may be moved in naval waters by superintendent

14. Where, in pursuance of these Regulations, a vessel or mooring is required by the superintendent of naval waters to be removed from any position in those waters to some other position, and the vessel or mooring is not moved accordingly, the superintendent may remove the vessel or mooring, and the master or owner of the vessel or mooring shall pay to the superintendent the cost of the removal.

Vessels not to anchor near electric cables in naval waters

15. The master of a vessel shall not anchor within 180 metres of the line of any electric cable laid down in naval waters, and indicated by discernable marks erected onshore.

Penalty: \$500.

Objects hooking moorings etc. to be cleared under directions of superintendent

16. Should at any time the anchor of, or any other object that is part of or attached to any vessel hook any moorings, electric cables, or moorings of buoys in naval waters, the master of the vessel shall not unhook the anchor, but shall forthwith give notice of the occurrence to the superintendent of those waters, and shall comply with the directions of the superintendent as to the method of clearing the moorings or cables.

Crew numbers

22. (1) The master of every vessel at anchor in naval waters must, if required by the superintendent of those waters by notice in writing at all times have a sufficient number of men available to perform any services required for the safety of his vessel.

(2) The master of every vessel lying in naval waters must, if required by the superintendent of those waters by notice in writing have at least one man on watch on deck by day and by night.

Refuse etc. not to be deposited in or near naval waters

25. The master of any vessel in naval waters or any other person shall not, without reasonable excuse, cause or permit any ballast, stones, sand, earth, clay, refuse, ashes, timber, carcasses, rubbish, dust, fuel, oil or pollutant of any description, or refuse from any quarry, mine or pit, or any other material, to be unladen, cast, or allowed to fall into, or placed in such a position as to be washed into, any naval waters, except in such places as are directed by the superintendent of those waters.

Vessels not to be cleaned without permission

26. The master of a vessel shall not, without reasonable excuse cause or permit the vessel to be breamed, careened, or cleaned, in naval waters, except with the permission of and in the place and manner directed by, the superintendent of those waters.

Penalty: \$1,000

Speed of vessels in naval waters

28. (1) Where the superintendent of naval waters is satisfied that it is in the interests of:

- (a) public safety; or
 - (b) the safety of property; or
 - (c) the defence of the Commonwealth; the superintendent may, by notice, give directions concerning the speed of vessels in naval waters or any specified part of naval waters.
- (2) A direction under sub-regulation (1) may be:
- (a) absolute; or
 - (b) subject to any approval given by the superintendent by notice; or
 - (c) subject to any conditions imposed by the superintendent by notice.

(3) The superintendent of naval waters must cause a notice under sub-regulation (1) or paragraph (2)(b) or (c) to be given to such person or persons, in such manner, at such time and in such place as it is reasonably required for the protection of the public, or any person who may be affected by the use by the Commonwealth of the naval waters, as the case may be, having regard to:

- (a) the purpose for which those waters are used by the Commonwealth; and
- (b) the time when those waters are so used; and
- (c) the risk of injury to persons; and
- (d) the risk of damage to, or interference with, Commonwealth or other property; and

(e) the forms of communication and the time available for giving the notice.

(4) A person must not, knowingly or recklessly, contravene the requirements of a notice given under this regulation.

Penalty: \$500.

Guns not to be discharged

29. (1) A person must not, knowingly or recklessly, discharge a gun, firearm or air-gun over naval waters from a boat or vessel or from the shore.

Penalty: \$500.

(2) Sub-regulation (1) shall not apply to a member of the Defence Force, a Commonwealth Police Officer or a member of the Police Force of a State or Territory engaged within the limits of naval waters.

Vessels with dangerous cargoes not to enter naval waters without permission

30. (1) The master of any vessel carrying explosives, oil or vitriol, petroleum, or any other goods of a dangerous nature, must not, without reasonable excuse, bring the vessel into naval waters without first obtaining permission in writing from the superintendent of those waters.

Penalty: \$1,000.

(2) Any permission granted under this regulation may be granted for such period, and be accompanied by such conditions as to berthing, and the discharge of cargo or otherwise, as the superintendent thinks fit, and the failure of the master to comply with any such conditions shall be deemed to be a breach of this regulation.

(3) The superintendent may at any time cancel any permission granted under this regulation.

Vessels carrying dangerous cargoes to display signals

31. The master of any vessel carrying, loading, or unloading any explosives or other goods of a dangerous nature shall not, without reasonable excuse while in naval waters, fail to prominently display a large red flag or burgee between sunrise and sunset, and a red light, visible in clear weather for at least 3 kilometres, between sunset and sunrise.

Penalty: \$500.

Construction in, or on the foreshore of, naval waters

34. (1) The Minister may, by notice in writing, prohibit the erection of any jetty, wharf, building, or structure, in, or on the foreshore of, any naval waters.

(2) Any person to whom notice has been given under the foregoing sub-regulation who erects in, or on the

foreshore of, any naval waters any structure prohibited by the notice shall remove any such structure, or should he fail to do so, it may be removed by the superintendent of those waters and the person who constructed it, or cause it to be constructed, shall pay to the superintendent the cost of such removal.

Examination of vessels in naval waters

35. The master of any vessel in naval waters shall do the utmost in his power to facilitate the search or examination of the vessel by the superintendent of those waters or by a person or persons acting on his behalf.

Delegation

35A. The superintendent of naval waters may, by instrument in writing, delegate to an officer of the Defence Force holding a rank not below that of Lieutenant-Commander, Major or Squadron-Leader all or any of his or her powers and functions under these Regulations in relation to those waters.

NOTE

1. The Control of Naval Waters Regulations, in force under the *Control of Naval Waters Act 1918*, comprise Statutory Rules 1922 No.74 as amended by the other Statutory Rules specified in the following list:
Statutory Rules number 1922 No.74; 1927 No.147; 1931 No.7; 1935 No.92; 1937 No.12; 1938 No.43; 1941 No.145; 1943 Nos.71, 216 and 310; 1947 Nos.45 and 117; 1948 No.148; 1953 No.60; 1955 No.22; 1959 No.32; 1969 No.171; 1975 No.178; 1976 No.25; 1990 No.206.

SCHEDULE

The waters more particularly described in the following Schedule are naval waters within the meaning of the *Control of Naval Waters Act, 1918*, by the reason of the existence thereof of a Naval Establishment or other naval property.

Broken Bay, New South Wales

Chart Aus 197 (see 1.15)

Naval diving training area, Pittwater. All those waters within an area commencing at a point on the high water mark bearing approximately 072° distance 176 metres from P.M. Taylors Point (33°38'13"·44S 151°18'18"·17E) and bounded thence by lines bearing 006° distance 1100 metres; bearing 276° distance 390 metres; bearing 186° distance 1200 metres and bearing 096° to the high water mark on the western shore of Taylors Point; thence generally northerly and easterly along the high water mark to the point of commencement.

APPENDIX II

FORMER MINED AREAS

The following areas were declared dangerous due to mines laid during the War 1941–1945. Owing to the elapse of time, the risk in these areas to surface navigation is considered no more dangerous than the ordinary risks of navigation, but a very real risk still exists with regard to anchoring, fishing, trawling, or any form of submarine or seabed activity. These areas are also promulgated in *Australian Annual Notices to Mariners*.

Australia**Moreton Bay**

(Chart Aus 236)

The area within a circle of radius 1 mile centred on 27°14'58S 153°21'08E is dangerous.

Great Barrier Reef

(Charts Aus 373, Aus 374, Aus 375, Aus 828, Aus 829, Aus 830, Aus 831, Aus 832, Aus 833, Aus 834, Aus 835)

All passages from seaward through Great Barrier Reef between 19°07'S and 11°40'S have been swept and are

open to surface navigation only. They are not safe for anchoring, trawling, or bottoming by submarines, owing to mines.

Papua New Guinea**Port Moresby and approaches**

(Charts Aus 621, Aus 379, Aus 380)

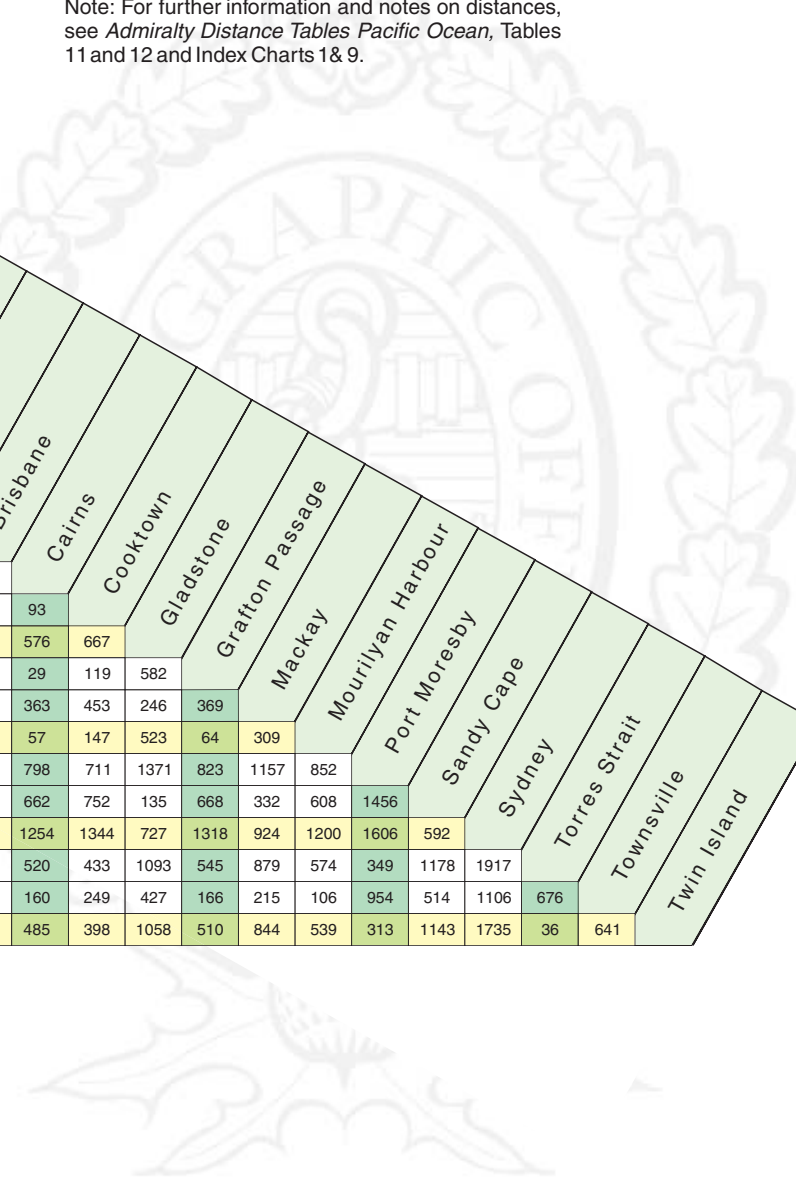
The following areas are considered safe for surface navigation but are not safe for anchoring etc:

- (i) (a) 09°32'00S 147°03'00E.
- (b) 09°32'00S 147°07'50E.
- (c) 09°31'03S 147°07'38E.
- (d) 09°30'32S 147°05'52E.
- (e) 09°29'50S 147°05'50E.
- (f) 09°29'52S 147°07'18E.
- (g) 09°28'00S 147°07'00E.
- (h) 09°28'00S 147°03'00E.

(ii) The area bounded by the land, the parallel of 9°36'S and the meridians of 147°11'E and 147°18'E.

Distance table - Coral and Tasman Seas

Note: For further information and notes on distances, see *Admiralty Distance Tables Pacific Ocean*, Tables 11 and 12 and Index Charts 1&9.



Bligh Entrance	Bowen	Brisbane	Cairns	Cooktown	Gladstone	Grafton Passage	Mackay	Mourilyan Harbour	Port Moresby	Sandy Cape	Sydney	Torres Strait	Townsville	Twin Island
853														
1411	563													
604	252	802												
517	342	892	93											
1185	337	275	576	667										
630	258	808	29	119	582									
964	125	472	363	453	246	369								
658	199	749	57	147	523	64	309							
186	1047	1597	798	711	1371	823	1157	852						
1263	422	140	662	752	135	668	332	608	1456					
1753	1014	469	1254	1344	727	1318	924	1200	1606	592				
163	769	1319	520	433	1093	545	879	574	349	1178	1917			
769	104	654	160	249	427	166	215	106	954	514	1106	676		
128	734	1284	485	398	1058	510	844	539	313	1143	1735	36	641	

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Names without a paragraph number are for gazetteer purposes only

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Abavi Island	12.79	America Bay	3.48	Ashby dry dock	3.223
Abbey Peak	9.154	Amity Bank	3.257	Ashmore Banks	11.49
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 Rocky Islet: Cape Weymouth 11.92
 Rocky Islets: Bathurst Bay 10.86
 Rocky Islets: Cape Flattery 9.147
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 Rocky Point: (17°22'S 146°02'E)
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 Rocky Point: Fitzroy River 5.239
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 Rocky Point Island 9.153
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 Rocky Ponds Creek: (19°49'S 147°40'E)
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 Rocky Shelf Bay 6.62
 Rodda Reef 10.30
 Rodds Bay 5.141
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 Rodney, Cape 12.63
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 Rodney Island 11.109
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 Rollingstone Creek: (19°01'S 146°24'E)
 Roma Peak 7.81
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 Romilly, Port 12.217
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 Rose Hill: (10°34'S 142°13'E)
 Roseric Shoal: 7.103
 Rosewood Island 6.124
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 Ross Creek: Townsville 8.118
 Ross Creek Canal: (27°31'S 153°17'E)
 Ross Islet 7.122
 Ross, Point 2.64
 Ross Range 5.232
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 Ross River 8.119
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 Rosser Reef: (15°37'S 145°31'E)
 Rosslyn Bay 5.269
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Light	12.27	Saltwater Creek: Burdekin River	7.182	Second Three Mile Opening	10.38
Rothsay Banks	13.150	Saltwater Creek: (19°05'S 146°29'E)		Selae Doudou	12.50
Round Head	7.89	Samarai	12.9	Selfridge Bank	2.187
Round Hill: (14°48'S 145°00'E)	9.151	Same Bay	13.44	Senrab Point	9.71
Round Hill: (09°53'S 147°33'E)	12.100	Samourgassi, Mount	6.150	Sentry Rock	10.84
Anchorage	12.104	San Roche Pass	12.43	Seo Reef	11.75
Entrance	12.105	Anchorage	12.41	Separation Banks	6.88
Round Hill: Bustard Bay	5.73	Sana Rock	11.132	Sereu Rock	13.198
Creek	5.142	Sand Bank Bay: Broad Sound	6.128	Settlement Point: Gladstone	5.190
Head	5.142	Sand Bay	7.72	Settlement Point: Hastings River	3.177
Round Hill: Gladstone	5.183	Sand Hill	9.151	Seu Seu Islet	12.20
Round Hill: Hinchinbrook Channel	8.61	Sand Island	9.152	Seudre, Bancs de la	2.83
Round Island: Hammond Island	13.84	Sand Point: Ballina	3.231	Seuseu Islet	12.20
Round Island: Port Clinton	5.261	Sand Point: Pittwater	3.54	Seven Mile Creek	5.143
Round Islet: Badu Island	13.187	Sandbank Bay: (10°11'S 148°34'E)	12.80	Seven Reefs: (10°19'S 143°42'E)	
Round Islet: Frankland Islands	8.140	Sandbank Point	12.63	Seventeen Seventy	5.142
Round Mountain: Embley Range	10.67	Sandbrook Inlet	3.46	Sextant Rock	11.132
Round Mountain: (28°20'S 153°33'E)		Sandfly Hillock	5.238	Seymour Point	11.145
Round Point: (13°01'S 143°31'E)	10.114	Sandon Bluffs	3.207	Seymour Range	8.139
Round Point: (9°52'S 147°31'E)	12.102	Sandon River	3.225	Seymour River	8.67
Anchorage	12.112	Sandon Shoal	3.211	Shadwell Peak	11.127
Round Point: Shelburne Bay	11.109	Sandpiper Reef	6.55	Shadwell Point: (11°00'S 142°45'E)	11.128
Round Reef: (19°58'S 149°38'E)		Sandringham Bay	6.150	Shadwell Point:	
Round Rock: Keppel Bay	5.246	Sandwich, Cape	8.37	Wednesday Island	13.92
Round Rock Ledges: (22°22'S 150°27'E)		Sandy Cape	5.41	Shadwell Reef	11.56
Round Rock Point	13.186	Light	5.39	Shafston Reach	4.107
Round Rock: (22°20'S 150°28'E)		Shoal	5.41	Shag Rock: near Camden Head	3.167
Round Top Island	6.198	Sandy Islet	10.115	Shag Rock:	
Roundback, Mount	7.167	Sandy Point: Norah Head	3.71	Northumberland Isles	6.140
Rounded Hill	9.32	Sandy Point: Port Stephens	3.154	Shag Rock: Point Lookout	3.258
Roundhill Point	7.139	Sandy Shoals	6.140	Shag Rocks: Port Stephens	3.156
Roundish Islet	6.121	Sappho Roads	6.67	Shallow Bay: (10°44'S 142°34'E)	
Rous Channel	3.257	Sarek Reefs	11.73	Shark Island: (30°53'S 153°01'E)	
Roux Islands	12.20	Sarina Inlet	6.146	Shark Reef	2.172
Rowes Bay: (19°14'S 146°48'E)		Sassie Island	13.62	Shark Spit	4.52
Roxburgh Reef: (18°25'S 147°03'E)		Sassie Reef	13.62	Sharland Reef: (13°23'S 143°36'E)	
Ruby Reef	9.28	Satellite Reef	9.80	Sharon Shoal: Geranium Passage	8.21
Rudder Reef	9.82	Saucer Reef: (18°40'S 147°36'E)		Sharon Shoal:	
Rug	13.49	Saumao Peninsula	12.225	Hydrographers Passage	6.38
Rugged Head	12.15	Saumarez Reefs	2.118	Sharp Eliot	8.28
Rugged Point	13.181	Saunders Islet	11.109	Sharp, Mount	7.91
Rundle Islands	5.219	Saunders, Mount	9.110	Sharp Point	11.128
Russell Heads	8.167	Saunders, Point	9.126	Shaw Island	7.55
Russell Island: Moreton Bay	4.14	Saw Mountains	12.180	Shaw Peak	7.107
Russell Island: Frankland Islands	8.140	Sawtell	3.187	Shelburne Bay	11.105
Russell River	8.167	Sawtell Shoal	3.187	Shell Point	5.235
		Sawyers Point: (32°39'S 151°58'E)		Shell Reef: (19°03'S 148°11'E)	
Sabina Point	6.89	Saxon Reef: (16°28'S 145°59'E)		Shelter Spit	5.140
Sabiribo Doudou	12.48	Scarborough: (27°12'S 153°07'E)		Shepherd Bay: (18°13'S 146°16'E)	
Sable Chief Rocks	5.179	Scawfell Island	6.55	Shepherds Hill	3.107
Sachs Spit	9.129	Schnapper Rock	3.167	Sherard Osborn Point	13.130
Sadd Point	11.128	Schooner Channel	3.155	Sheridan, Mount: (16°58'S 145°43'E)	
Saddle Hill: (11°56'S 143°08'E)		Schooner Rock	7.62	Sherrard Island	10.113
Saddle Island	13.33	Scotland Island	3.52	Anchorage	10.120
Saddle Mountain: (19°27'S 147°01'E)	8.28	Scott Reef	8.25	Sherrard Reef	10.113
Saddle Mountain: (16°49'S 145°40'E)		Scott Rock	13.91	Shields Island	6.57
Saddleback Island	7.103	Scotts Head: (30°45'S 153°00'E)		Anchorage	6.61
Sadowa, Mount	12.139	Scraggy Point	8.61	Shingle Bank: (29°56'S 153°17'E)	
Safe Entrance	11.35	Sea Channel: Townsville	8.113	Ship Channel	5.107
Saibai Island	13.210	Sea Hill Point	5.235	Ship Hill	5.183
Sail Rock: (21°48'S 150°09'E)	6.57	Sea Hound Hard	5.262	Ship Patch	4.30
Sail Rock: Lord Howe Island	2.38	Sea Reach: Bundaberg	5.133	Ship Rock	5.219
Sail Rock: (29°07'S 167°57'E)		Sea Reach: Rockhampton	5.235	Shoal Bay: Port Stephens	3.157
Sail Rock: Rockingham Bay	8.58	Seabird Islet	9.161	Shoal Bay: Gladstone	5.204
Saint Bees Island	7.54	Seaforth Channel	8.66	Shoal Bay: (23°12'S 150°48'E)	
Saint Crispin Reef	9.16	Seaforth Island	7.90	Shoal Patches	11.65
Saint Helen Rock	7.55	Anchorage	7.110	Shoal Point	7.57
Saint Helens Bay	7.76	Seagull Island	3.140	Shoal Spit	12.158
Saint Helens Creek	7.75	Seagull Reef: (19°31'S 148°59'E)		Shoal Water Bay: Bowen	7.141
Saint Joseph River	12.173	Seal Rocks: Gladstone	5.178	Shoalwater Bay: Cape Townshend	6.83
Saint Paul's Community	13.204	Seal Rocks: Sugarloaf Point	3.140	Military Training Area	5.214
Saint Paul's Hill	9.154	Passage inshore of	3.145	Sholl Bank	4.57
Salamander Bank	4.25	Sealark Patch	7.127	Shorncliffe Pier: (27°19'S 153°05'E)	
Salamander Bay	3.157	Searles Point	2.38	Shortland Reef	11.128
Salamander Reef:		Second Lump	5.232	Shoulder Point	5.110
Blackwood Channel	11.48	Second Point	3.34	Showers Reef: (19°29'S 148°54'E)	
Salamander Reef: Cape Cleveland	8.109	Second Red Rocky Point	10.114	Shrewsbury Rock	6.66
Salter Island	11.150	Second Small Reef: (12°35'S 143°48'E)		Shrimp Reef	7.24

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Shute Harbour	7.118
Shute Island	7.101
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Sibara village	12.242
Sidmouth, Cape	10.112
Sidney Island	7.90
Sidney Shoal	3.210
Sigabaduru: (9°20'S 142°36'E)	
Signal Point	2.31
Sillago Island	7.33
Silloth Rocks: (20°46'S 149°26'E)	
Siloia Creek	12.192
Silversmith Island	7.55
Silvio Reefs	12.39
Sim Reef	9.148
Simpson Bay	13.158
Simpson Channel	13.174
Simpson Hill: (12°31'S 143°16'E)	
Simpson Rock	10.73
Simpsons Creek	3.247
Sinavi Reef	12.138
Light	12.138
Sinballa Point	8.36
Sinclair Bay	7.141
Sinclair Head	7.146
Sinclair Island: (14°33'S 144°54'E)	
Sinclair Islet: (11°07'S 143°01'E)	11.137
Anchorage	11.142
Sinclairs Reef	13.199
Singapore Rock	7.59
Single Rock	5.250
Single Rock Entrance	11.36
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Sir Charles Hardy Islands	11.29
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Sisters Island	8.139
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Six Fathom Bank	7.127
Skeleton Rocks	3.166
Sketty Belle Shoal	13.67
Skiddaw Peak	7.54
Skillion, The	3.63
Skirmish Banks	4.42
Skirmish Passage	4.42
Skirmish Point	4.42
Skull Islands	6.88
Skull Knob	7.75
Skull Rock	6.55
Slade Islet	6.198
Slade Point: Mackay	6.201
Slade Point: Endeavour Strait	13.141
Slade Rock: Mackay	6.201
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Slashers Reefs, The	8.17
Slattery Shoal	6.19
Slaughter Bay: (29°04'S 167°58'E)	
Sleipner, Mount	5.211
Slip Cliff Point	9.78
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Smith Bluff	6.63
Smith Cay	13.49
Smith Island	8.37
Smith Lake: (32°23'S 152°39'E)	
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Smith Point	13.130
Smith Rock: Cape Moreton	3.255
Smith Rock: Dedele Point	12.54
Smiths Creek: Broken Bay	3.50
Smiths Creek: Cairns	9.71
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Smoky Cape	3.168
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Smythe Shoals	6.17

Snake Cays	6.132
Snake Reef	9.157
Snapper Creek	5.55
Snapper Island: Cape Kimberley	9.82
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Snapper Island: Port Stephens	3.156
Snare Peak Island	6.55
Snare Rocks	6.55
Snout Point	5.48
Sobuwabuda Island	12.248
Sogeri Island	13.196
Solder Island	7.54
Soldier Spit	3.156
Soldiers Cap	2.38
Soldiers Point: (32°42'S 152°04'E)	3.156
Soldiers Point: (33°36'S 151°18'E)	
Solitary Islands	3.203
Solomon Sea	2.99
Solway Passage	7.40
Somerset Bay	11.144
Somerset, Mount: (16°25'S 145°22'E)	
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Soopun Island	8.39
Sorrow, Mount: (16°05'S 145°26'E)	
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South Arm: Port Clinton	5.259
South Bank: Badu Island	13.181
South Bank: Saibai Island	13.193
South Barnard Islands	8.139
Anchorage	8.156
South Barren Islet	6.112
South Barrow Island Light	9.153
South Bay Point	9.147
South Bellona Reefs	2.84
South Brisbane Reach	4.109
South Broken Passage	10.24
South Brother: Diamond Head	3.169
South Brother:	
Adolphus Channel	11.130
South Cape	12.12
South Cape Bedford	9.110
South Channel: Fitzroy River	5.238
South Channel: Gladstone	5.181
South Channel: Gold Coast Seaway	3.264
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South Channel:	
Stonehaven Anchorage	7.127
South Coffs Island: (30°19'S 153°09'E)	
South Diamond Islet	2.137
South Direction Island	9.147
South East Cape	8.36
South East Elbow:	
Saumarez Reefs	2.118
South East Islets: Percy Isles	6.56
South East Rock	2.47
South Entrance: Bowen	7.146
South Entrance: Fly River	12.250
South Evans Reef	3.207
South Flinders Reefs	2.158
South Grafton	3.222
South Head Light	5.128
South Head Shoal	5.235
South Head: Bowen	7.141
South Head: Long Island	7.91
South Head: Mary River	5.111
South Head: Wooli Wooli River	3.224
South Hill: Port Alma	5.235
South Island: Brook Islands	8.37
South Island: Lizard Island	9.147
South Island: Percy Isles	6.57
South Islet: Bligh Channel	13.186
South Islet: (31°30'S 159°04'E)	
South Islet: Willis Islets	2.148
South Ledge	11.129
South Mission Beach	8.78
South Molle Island	7.91
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South Overfall Rock	6.60

South Pacific Ocean,	
Southern Route	2.18
South Passage Island	5.188
South Passage: Moreton Bay	3.257
South Passage: Willis Islets	2.152
South Patch: Broad Sound	6.116
South Patch: Padana Nahua	12.140
South Pinnacle	8.39
South Pint Patch	11.92
South Point: (27°06'S 153°10'E)	
South Point: Moa Island	13.180
South Point: Woody Island	5.107
South Red Bluff	6.124
South Reef: Home Islands	11.94
South Reef: (27°16'S 153°07'E)	
South Rock:	
Broughton Islands	3.160
South Rock: Moa Island	13.180
South Rock: Phillip Island	2.56
South Sail Rock	6.57
South Solitary Island	3.207
Light	3.206
South Stradbroke Island	3.250
South Sub-tropical Current	1.147
South Tangalooma Road	4.48
South Torres Reef	13.173
South Trees Inlet	5.203
South Trees Point	5.181
South Warden Reef	9.153
South West Cay: Herald Cays	2.145
South West Cay: Lihou Reef	2.136
South West Cay: Saumarez Reefs	2.118
South West Islet: Coringa Islets	2.143
South West Reef: Flinders Reefs	2.160
South-west Roadstead:	
Lord Howe Island	2.43
South West Rocks: (30°53'S 153°03'E)	
South West Rocks, town	3.190
Creek	3.192
South West Rocks: (27°31'S 153°20'E)	
South West Spit: (21°10'S 149°14'E)	
South West Spit: Moreton Bay	4.40
South Western Extreme:	
Kenn Reefs	2.185
South White Cliffs	5.96
South Woody Peak	3.166
South-east Trade Wind	1.175
South-west Arm	3.47
Southend	5.208
Channel	5.208
Southerly Buster	1.174
Southern Small Detached Reef	10.12
Southport	3.259
Bar	3.260
Southport Hill	6.104
Specie Shoal	7.60
Spencer: (33°28'S 151°09'E)	
Spencer Rock	13.178
Sphinx Islet	6.56
Spiers Rock	8.139
Spin Bay: (29°08'S 167°57'E)	
Spit End	5.141
Spit Point: Whitsunday Passage	7.97
Spit Point: Hood Point	12.103
Spitfire Banks	4.24
Spitfire Channel	4.24
Spitfire Reefs: (16°01'S 145°38'E)	
Spitfire Rock	7.90
Split Island	5.220
Split Rock	5.232
Split Solitary Island	3.207
Spoon Reef: (18°39'S 147°34'E)	
Spoon Rocks	3.63
Springcliff: (20°54'S 148°58'E)	
Springfield	5.94
Spur Bay	6.63
Spur Reef	9.26
Square Reef: (20°04'S 149°49'E)	
Square Rocks: (23°06'S 150°53'E)	

Squat Rock	13.176	Stuart Shoal	5.17	Tail Point	5.204
St Helena Island	4.112	Stuarts Island: (30°39'S 153°00'E)		Tail Rock	6.117
St Lawrence	6.124	Stuckey, Mount	9.151	Taiwan Shoal	10.73
Stack Rock	3.210	Styx River	6.124	Talbot Islands	13.211
Stafford Point: (16°56'S 145°47'E)		Suarji Island	13.191	Tam O' Shanter, Mount: (17°55'S 146°02'E)	
Stagg Patches	8.140	Suau Island	12.17	Tam O' Shanter Point	8.79
Stainer Island	10.73	Sub-tropical anticyclone	1.171	Tambourine Mountain: (27°55'S 153°10'E)	
Stainer Rock	10.84	Suckling, Cape	12.158	Tanby Point	5.245
Stanage Bay	6.88	Suckling, Mount	12.24	Tancred Island	7.119
Stanage Point	6.88	Sudaubo Bay	12.15	Tancred Pass	13.61
Stanley Hill: (12°27'S 143°16'E)		Sudbury Reef	8.25	Tangalooma Point	4.5
Stanley Island	10.79	Sue Islet	13.33	Tangalooma Rock	4.57
Anchorage	10.92	Landing	13.56	Tannadice Reef and Shoal	10.115
Stanley, Mount	5.175	Sugar-Ran Reef	13.31	Tannum Sands: (23°57'S 151°22'E)	
Stanley Point	7.131	Sugarloaf Bay anchorage	3.170	Tappoea	13.30
Stanley Reef	7.25	Sugarloaf Island	2.38	Targinie Channel	5.188
Stapleton Island	9.43	Sugarloaf, Mount	3.61	Tarilag Island	13.149
Stapylton, Mount: (27°43'S 153°15'E)		Sugarloaf Passage	2.37	Taroba Rock	6.189
Star Reef: (11°57'S 143°52'E)		Sugarloaf Point	3.140	Tarudaru Point: (9°12'S 141°31'E)	
Starcke River	9.160	Light	3.139	Tasman Abyssal Plain	1.141
Startle Reefs	9.32	Sugarloaf, The	2.38	Tasman Sea	2.1
Station Hill: Cape Upstart	7.35	Sullivan Rock	6.56	North part	2.9
Station Hill: Hervey Bay	5.93	Sullivan Shoal	10.72	Tatana Island	12.135
Station Point: (23°27'S 151°01'E)		Sumogi Island	12.251	Anchorage	12.146
Statis Rock	3.140	Sun Island	6.88	Tatogabe	13.214
Stead Passage	11.37	Sunday Entrance	12.71	Taupo radio	2.8
Steamer Passage	8.39	Sunday Island	11.109	Taupo Seamount	2.15
Steeles Point	2.70	Anchorage	11.113	Taurama hill	12.134
Steelworks Channel	3.118	Sungai Torassi Light	13.215	Tauri River	12.188
Steep Island	6.57	Sunk Reef: Cape Direction	10.117	Tauruba	12.105
Steff Rock: (20°45'S 149°25'E)		Sunk Reefs:		Tautauwata Islet	12.29
Stephens Island:		Prince of Wales Channel	13.84	Anchorage	12.41
South Barnard Islands	8.139	Sunken Barrier Reef	12.4	Tauwalhia Bay	12.15
Stephens Islet: Torres Strait	13.29	Sunken Rock	8.97	Tavai Reef	12.106
Anchorage	13.46	Sunset Rock	6.88	Tawasuari, Cape	12.21
Stephens, Mount	3.140	Sunshine Point	13.165	Taylor Point: Cairns	9.48
Stephens Peak	3.152	Sunter Island	10.122	Taylor Point: Broken Bay	3.53
Stephens, Point	3.140	Sunter, Mount	7.81	Tea Gardens	3.158
Light	3.139	Supply Bay	6.92	Teague Island	7.40
Anchorages	3.157	Surfers Paradise	3.250	Teebar Creek	5.55
Stevens Point	2.38	Surprise Rock: (20°21'S 149°02'E)		Telegraph Rock	3.167
Stevens Reef	6.40	Suprise Shoal: (17°36'S 146°25'E)		Telegraph Shoal	3.140
Stewart Island	5.119	Susie Point	13.189	Tempest, Mount: (27°09'S 153°24'E)	
Stewart Peninsula	7.49	Susur Reef: (10°25'S 143°15'E)		Temple Bay	11.86
Stewart, Port	10.103	Suva	2.16	Anchorage	11.102
Stewart Reef	13.49	Swain Reefs	5.24	Temple Hill	9.153
Stewart River:		Swallows Landing	9.65	Temple Island	6.140
Princess Charlotte Bay	10.103	Swan Island	6.88	Temple Shoal	6.140
Stewart Shoal: (14°37'S 145°28'E)		Swan Shoal: (10°16'S 141°32'E)		Ten Pin Rock: (22°13'S 150°21'E)	
Stewarts River: (31°43'S 152°39'E)		Swansea	3.72	Tenth of June Islet: (31°30'S 159°05'E)	
Still Islet	6.58	Swing Basin Reach	4.91	Terere Passage	12.238
Stingaree Reefs: (17°57'S 146°09'E)		Swinger Reef	9.32	Tern Cliff	11.128
Stinky Point	3.63	Anchorage	9.132	Tern Island: Penrith Island	6.55
Stockton	3.136	Switzer Reef	9.158	Tern Islet: Shadwell Point	11.128
Bight	3.136	Sydney Bay	2.63	Terranora Inlet	3.248
Bridge	3.84	Sydney Harbour	3.11	Terrigal Haven	3.68
Channel	3.119	Sydney, Mount	7.127	Tessy Head: (10°33'S 142°10'E)	
Stockyard Point: (22°49'S 150°49'E)		Sykes Reef: Cape Direction	10.113	Tetley Islets	11.129
Stokes Bay	10.92	Sykes Reef: Capricorn Group	5.21	Tewantin	5.45
Stokes Point: (33°37'S 151°19'E)		Sykes Rock	5.233	The; see proper name	
Stone Island	7.141			Thetford Reef	9.23
Stonehaven Anchorage	7.125	Table Bay	12.30	Thimble Shoal	8.17
Stonor Patch	9.105	Table Gorge	3.61	Third Point	3.34
Stony Shoal	6.140	Table Hill	5.180	Thirsty Sound	6.82
Stork Reef	10.113	Table Mountain: (16°10'S 145°26'E)		Thomas Island: Edgecumbe Bay	7.146
Story Bridge	4.86	Table Mountain: (13°20'S 143°28'E)		Thomas Island: Lindeman Group	7.70
Stover Bay	11.135	Table Point	12.30	Thomas, Mount	9.109
Strachan Island	13.211	Table Rock	6.78	Thomas Point: (15°42'S 145°21'E)	
Stradbroke Seamount	2.18	Table Top Hill	12.24	Thompson Creek	7.78
Strait Rock	13.79	Table Top Range	12.30	Thompson Islet	11.128
Straloch, Mount	8.37	Tabubil	12.246	Thompson, Mount	12.24
Strickland Reef: (15°04'S 145°31'E)		Tacking Point	3.167	Thompson Point	8.163
Stripe Point	7.98	Light	3.165	Thomson Bay	13.214
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