

NP 13

AUSTRALIA PILOT VOLUME I

**North, north-west, west and south coasts of Australia from
the west entrance of Endeavour Strait to Green Point**

**FIRST EDITION
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PREFACE

The First Edition of *Australia Pilot Volume I* has been prepared by Commander G. D. Niven Royal Navy. 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 Notices to Mariners* are and how to use them.

This edition supersedes *Australia Pilot Volume I* and *Australia Pilot Volume V* Seventh Editions (1992) and Supplements No 3 (2001), which are cancelled.

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

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

Local Port Authorities
Port Handbooks produced by Port Authorities
Ports of Australia and New Zealand 2003
Fairplay Ports Guide 2003–2004
Ports of the World 2005
Whitaker's Almanack 2005
The Statesmans Yearbook 2005
Australian Seafarers Handbook 2004
Lloyds List

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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.

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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 maybe mentioned with limited details. Signals and buoys used in connection with these areas maybe 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 structure 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.

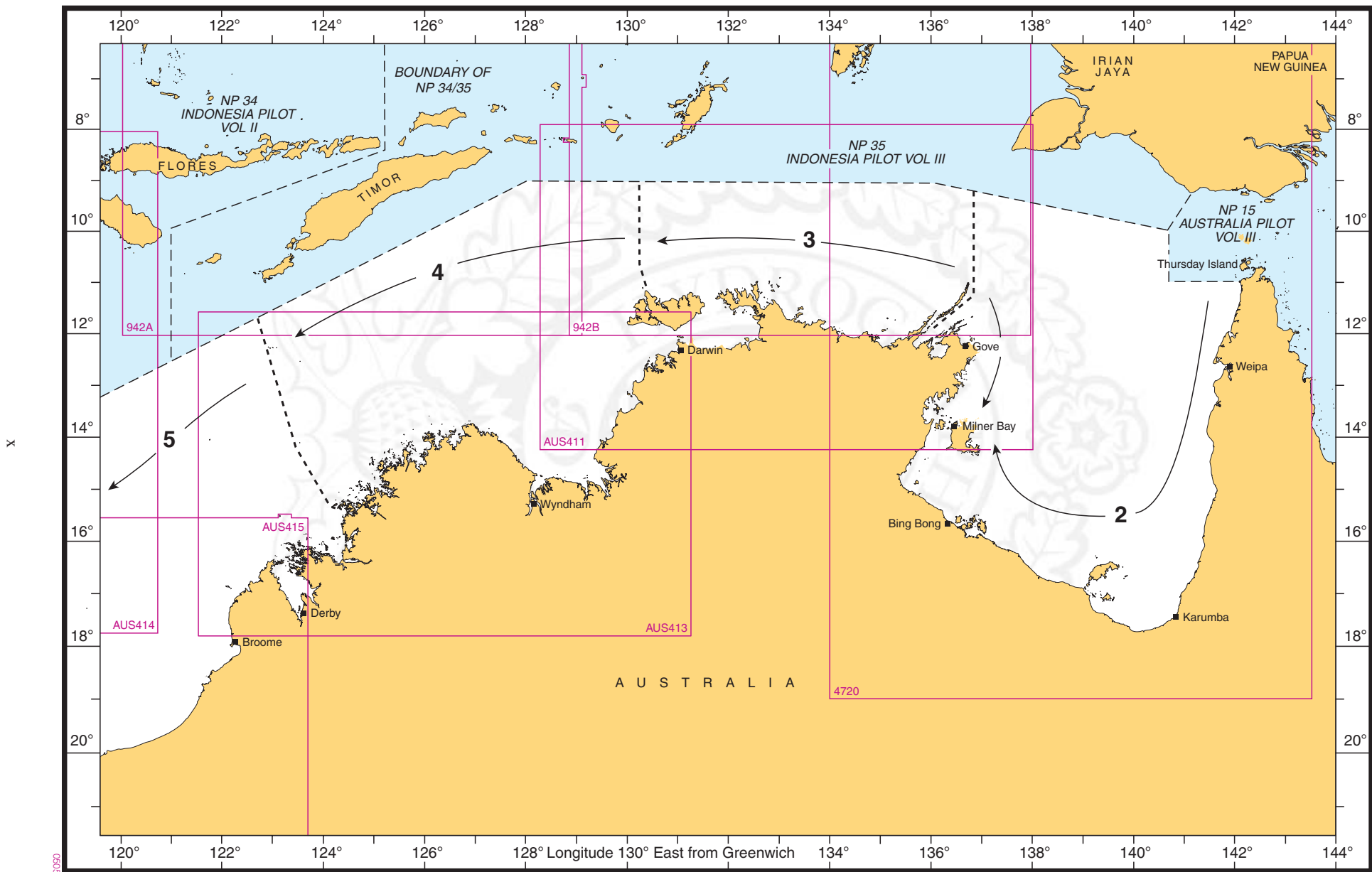
AIS	Automatic Identification System	kW	kilowatt(s)
ALC	Articulated loading column	Lanby	Large automatic navigation buoy
ALP	Articulated loading platform	LASH	Lighter Aboard Ship
AMVER	Automated Mutual Assistance Vessel Rescue System	LAT	Lowest Astronomical Tide
		LF	low frequency
°C	degrees Celsius	LHG	Liquefied Hazardous Gas
CALM	Catenary anchor leg mooring	LMT	Local Mean Time
CBM	Conventional buoy mooring	LNG	Liquefied Natural Gas
CDC	Certain Dangerous Cargo	LOA	Length overall
CVTS	Co-operative Vessel Traffic System	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
		MRCC	Maritime Rescue Co-ordination Centre
feu	forty foot equivalent unit	MRSC	Maritime Rescue Sub-Centre
fm	fathom(s)	MSI	Marine Safety Information
FPSO	Floating production storage and offloading vessel	MSL	Mean Sea Level
FPU	Floating production unit	MV	Motor Vessel
FSO	Floating storage and offloading vessel	MW	megawatt(s)
ft	foot (feet)	MY	Motor Yacht
		N	north (northerly, northward, northern, northernmost)
g/cm ³	gram per cubic centimetre	NATO	North Atlantic Treaty Organization
GMDSS	Global Maritime Distress and Safety System	Navtex	Navigational Telex System
GPS	Global Positioning System	NE	north-east
GRP	glass reinforced plastic	NNE	north-north-east
grt	gross register tonnage	NNW	north-north-west
gt	gross tonnage	No	number
		nrt	nett register tonnage
HAT	Highest Astronomical Tide	NW	north-west
HF	high frequency		
HMS	Her (His) Majesty's Ship	ODAS	Ocean Data Acquisition System
hp	horse power	PEL	Port Entry Light
hPa	hectopascal	PLEM	Pipe line end manifold
HSC	High Speed Craft	POL	Petrol, Oil & Lubricants
HW	High Water		
		RCC	Rescue Co-ordination Centre
IALA	International Association of Lighthouse Authorities	RMS	Royal Mail Ship
IHO	International Hydrographic Organization	RN	Royal Navy
IMO	International Maritime Organization	Ro-Ro	Roll-on, Roll-off
ITCZ	Intertropical Convergence Zone	RT	radio telephony
		S	south (southerly, southward, southern, southernmost)
JRCC	Joint Rescue Co-ordination Centre	SALM	Single anchor leg mooring system
kHz	kilohertz		
km	kilometre(s)		
kn	knot(s)		

ABBREVIATIONS

SALS	Single anchored leg storage system	UT	Universal Time
SAR	Search and Rescue	UTC	Co-ordinated Universal Time
Satnav	Satellite navigation		
SBM	Single buoy mooring	VDR	Voyage Data Recorder
SE	south-east	VHF	very high frequency
SPM	Single point mooring	VLCC	Very Large Crude Carrier
sq	square	VMRS	Vessel Movement Reporting System
SS	Steamship	VTC	Vessel Traffic Centre
SSE	south-south-east	VTMS	Vessel Traffic Management System
SSW	south-south-west	VTs	Vessel Traffic Services
SW	south-west		
		W	west (westerly, westward, western, westernmost)
teu	twenty foot equivalent unit	WGS	World Geodetic System
TSS	Traffic Separation Scheme	WMO	World Meteorological Organization
		WNW	west-north-west
UHF	ultra high frequency	WSW	west-south-west
UKHO	United Kingdom Hydrographic Office	WT	radio (wireless) telegraphy
ULCC	Ultra Large Crude Carrier		
UN	United Nations		

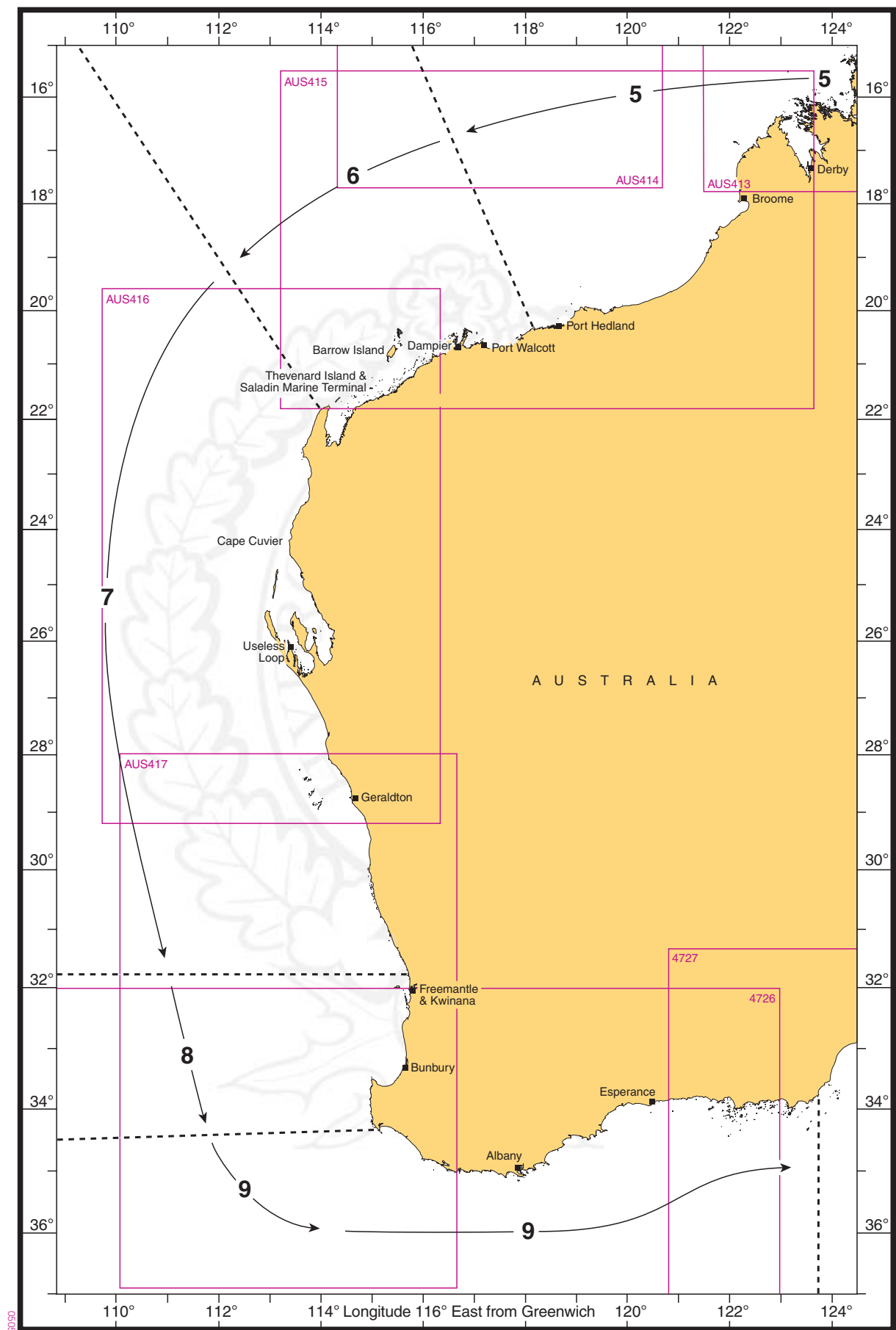


Chapter Index Diagram



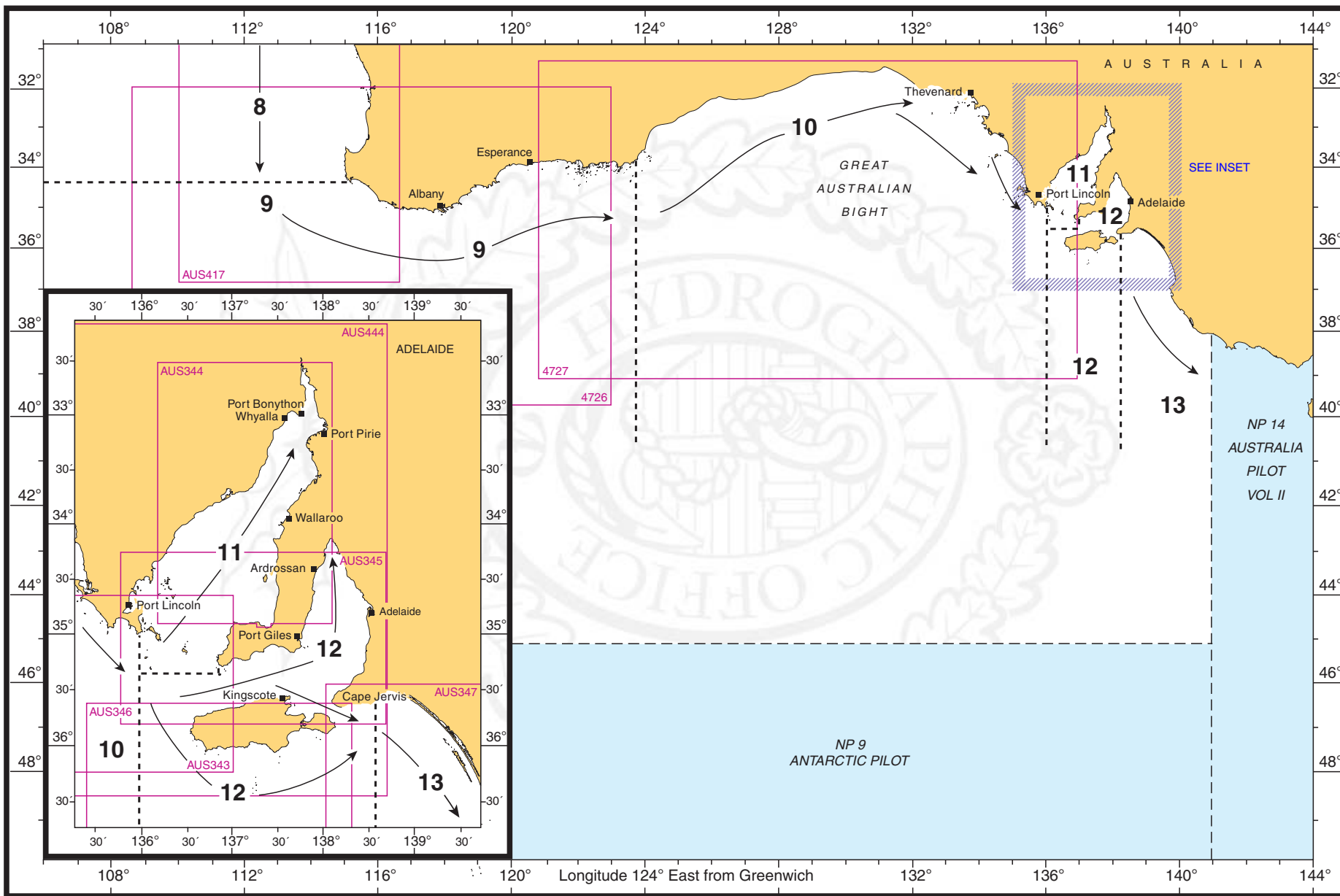
NP13(a)

Chapter Index Diagram



NP 13(b)

Chapter Index Diagram



NP 13(c)

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 I

CHAPTER 1

NAVIGATION AND REGULATIONS COUNTRY AND PORTS NATURAL CONDITIONS

NAVIGATION AND REGULATIONS

LIMITS OF THE BOOK

Charts 4603, 4708, 4709, 4073

Area covered**1.1**

- 1 This volume covers the N, NW, W and S coasts of Australia and waters contained within the limits below.

	Lat S	Long E
From Cape York Peninsula W to position;	11°00'	140°40'
Thence N to;	10°00'	140°40'
Thence WNW to;	9°00'	136°00'
Thence W to;	9°00'	128°00'
Thence WSW to;	15°00'	116°00'
Thence W to;	15°00'	90°00'
Thence S to;	45°00'	90°00'
Thence E to;	45°00'	141°00'
Thence N to (Green Point)	38°03'	140°52'

NAVIGATIONAL DANGERS AND HAZARDS

Coastal conditions**1.2**

- 1 **South Australia.** Apart from the vicinity of Esperance, Nuyts Archipelago and the approaches to Spencer Gulf and Gulf of Saint Vincent there are few islands off this part of the coast of South Australia, which is generally devoid of significant navigational marks. There are large areas where the charting is based on old surveys (1.14), but in general this should present no problem for the navigation of the area if suitable precautions are taken.

Navigation amongst coral and kelp**1.3**

- 1 Kelp is prevalent for a distance of from 1 to 4 miles offshore between Cape Banks (37°54'S 140°23'E) (13.45) and Cape Northumberland (38°04'S 140°40'E) (13.58) as mentioned in the text. For information on navigation amongst coral and kelp see *The Mariner's Handbook*.

Ice**1.4**

- 1 The limits of icebergs are well N of 40°S and come within 150 miles S of Cape Leeuwin (34°22'S 115°08'E), for further information, see 1.137.

Areas dangerous due to mines and unexploded ordnance**1.5**

- 1 An area dangerous due to mines exists in Napier Broome Bay (4.236) in the vicinity of position 14°04'S 126°40'E.

The following areas are also dangerous due to unexploded depth charges:

- NW of Darwin (4.116)
- 2 Yampi Sound (5.102)
- East of Montebello Islands (6.175)
- NW of Serrurier Island (6.277)
- NW of Rottneest Island (7.249)
- N of Rottneest Island (8.147)

- 3 **Risk.** Due to the lapse of time, navigation through these areas is now considered no more dangerous than the ordinary risks of navigation, but a danger still exists with regard to anchoring, fishing or any form of submarine or sea bed activity.

For further details, see the relevant geographical chapters and *Annual Australian Notices to Mariners*.

TRAFFIC AND OPERATIONS

Submarine exercises

Fishing

Lobster fishery

1.6

- 1 Between November and June extensive lobster fishing takes place on the continental shelf between the parallels of 24°S and 34°S. It has been reported that the lobster fisheries can be a hazard to navigation as the buoys are numerous and unlit; the buoy lines are long and there are no gaps between the lines. Mariners should keep a sharp lookout for trap markers and avoid damaging fishing gear as far as possible.
- 2 When passage permits, mariners are requested to transit the area outside the 200 m depth contour.

Extensive lobster fishing is also carried out between the months of November and June inclusive, off the coast between the vicinity of Margaret Brock Reef (36°58'S 139°36'E) and Cape Nelson (38°26'S 141°32'E), and between the shore and the 150 m (80 fm) line. Mariners are requested to keep at least 10 miles clear of Cape Banks (37°54'S 140°23'E).

Torres Strait

1.7

- 1 A Protected Zone has been established in Torres Strait to protect the traditional activities of the inhabitants. Fishing by vessels of all nationalities in the Zone is regulated by Australia and Papua New Guinea in accordance with an agreement between them.

Pearl beds

1.8

- 1 Pearl beds, which may be floating or fixed structures, and their associated moorings should be avoided. The beds are generally marked by buoys or beacons, which may be lit.

Exercise areas

Military exercises

1.9

- 1 Military exercises, including firing practices, are conducted in certain areas covered by this volume. In view of the responsibility of range authorities to avoid accidents, the limits of the practice areas are not shown on charts and descriptions of areas are not included in this volume. However, beacons, lights, and marking buoys which may be a danger to navigation, will appear on charts and, when appropriate, will be mentioned in Sailing Directions.
 - 2 General remarks about exercise areas, to alert the Mariner, are given in the relative geographical chapter, see also information on the appropriate charts.
- Full details are given in *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Area

1.10

- 1 The note Submarine Exercise Area on certain charts should not be read to mean that submarines do not exercise outside such areas. The whole of the Australian Exclusive Economic Zone (1.80) is a permanently established Australian submarine exercise area.
 - 2 **Notification.** 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.
- Full details are given in *The Mariner's Handbook*, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Marine exploitation

Oil rigs and offshore structures

1.11

- 1 Hydrocarbon exploration rigs and production platforms may be encountered off the Australian coast. Currently (2004) the main area of activity, with respect to this volume, is off the NW coast of Australia. Isolated rigs however, may be encountered in other areas.
- 2 **Locations.** The positions of production platforms are shown on the appropriate charts. The positions of exploration rigs which change their location from time to time are promulgated in AUSCOAST warnings and in *Section III* of the weekly editions of *Australian Notices to Mariners*. Rigs on locations other than those listed in the latest *Section III Summary* are the subject of Radio Navigational Warnings.
- 3 **Safety zones** extending for a radius of 500 m are established around fixed installations and entry into these safety zones is prohibited to all except authorised vessels. When navigating in the vicinity of production platforms or exploration rigs, where there is sufficient sea room, mariners should keep at least 2½ miles clear of these installations.
- 4 Attention is drawn to the restricted area of radius 5 miles established around North Rankin A platform (19°35'S 116°08'E) (6.3).

For further details, see *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

1.12

- 1 **Offshore terminals and production platforms** are described in the appropriate geographical chapters. The following are covered in this volume:
 - Jabiru Oil Terminal (11°56'S 125°00'E) (4.14), offshore oil terminal in Timor Sea.
 - Challis Oil Terminal (12°07'S 125°01'E) (4.14), offshore oil terminal in Timor Sea.
- 2 Laminaria Oil Terminal (10°37'S 126°00'E) (4.26), in Timor Sea.
 - Bayu Undan Gas Terminal (11°03'·0S 126°37'·1E) (4.31), in Timor Sea.
 - Wanaea Marine Terminal (19°35'S 116°27'E) (6.14), offshore oil terminal in the Indian Ocean.
 - Wandoo Marine Terminal (20°09'S 116°25'E) (6.19), offshore oil terminal in the Indian Ocean.
- 3 Stag Marine Terminal (20°17'S 116°16'E) (6.23), in the Indian Ocean.

Legendre Marine Terminal (19°42'S 116°43'E) (6.26),
in the Indian Ocean.

Griffin Marine Terminal (21°13'S 114°39'E) (6.212),
offshore oil terminal in the Indian Ocean.

Wells

1.13

- 1 In the course of developing an oil or gas field numerous wells are drilled. Those which will not be required again are sealed with cement below the seabed and abandoned. Other wells which may be required at a later date are known as Suspended Wells. They have their well heads capped and are left with a pipe and other equipment usually projecting from 2 to 6 m, but in some cases as much as 15 m, above the seabed. For full details see *The Mariner's Handbook*.

CHARTS

Australian and British Admiralty charts

State of charting

1.14

- 1 Generally, the ports and port approaches of N and W Australia are adequately surveyed. The charts of the ports of Weipa, Groote Eylandt, Milner Bay, Gove Harbour, Port Darwin and the ore loading ports of NW Australia, together with Clarence Strait and much of the W coast, contain modern surveys. The charts for Cape Leeuwin to King George Sound, Esperance, Spencer Gulf and Gulf of Saint Vincent, together with their respective deep-water ports and approaches, are also based on modern surveys.
- 2 Charts of the remaining areas of this volume may be subject to survey data from the nineteenth or twentieth centuries or be inadequately surveyed. In these areas caution should be exercised giving due regard to the probability of the existence of uncharted dangers and bearing in mind the advice given in *The Mariner's Handbook*.

Reliability and zone of confidence diagrams

1.15

- 1 Reliability diagrams are given on certain charts to enable the mariner to assess the limitation of the hydrographic data from which the chart is compiled. Among other information, they show the distance apart of the main lines of soundings and the date of the survey.
 - 2 On newer charts, zone of confidence diagrams depict positional, and depth accuracy as well as seafloor coverage. See *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for further details.
- On some Australian charts the limits of other unadopted charts (1.16) may be shown.

For general remarks on charts and their use as aids to navigation, see *The Mariner's Handbook*.

Unadopted Australian charts

1.16

- 1 In certain areas where the British Admiralty or Australian charts adopted into the British Admiralty series show insufficient detail for navigation close inshore these

Sailing Directions have been written using the larger scale unadopted 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.

- 2 For the following areas, not covered by Admiralty charts of adequate scale, mariners are advised to obtain the appropriate charts as follows:

Chart No	Area
Aus 6	Approaches to Karumba
Aus 13	Plans in the Northern Territory (sheet 1)
Aus 15	Plans in the Northern Territory
Aus 16	Approaches to Milingimbi Inlet
Aus 17	Approaches to Maningrida
Aus 18	Port Essington
Aus 29	Approaches to Bynoe Harbour and Port Patterson
Aus 37	Port Nelson
Aus 43	Scott Reef
Aus 45	Approaches to Derby
Aus 50	Approaches to Broome
Aus 52	Entrance Channel to Port Hedland
Aus 57	Dampier Archipelago
Aus 61	Montebello Islands
Aus 63	Mary Anne Passage
Aus 62	Approaches to Varnus Island
Aus 64	Approaches to Onslow
Aus 72	Anchorage on the West Coast of Australia
Aus 105	Wedge Island to Lancelin
Aus 110	King George Sound
Aus 111	Kwinana
Aus 116	Plans in Western Australia – West and South Coast
Aus 121	Plans in South Australia – South West Coast
Aus 127	Plans in South Australia – South East Coast
Aus 302	Archer River to Nassau River
Aus 303	Nassau River to Wellesley Islands
Aus 304	Wellesley Islands to Vanderlin Island
Aus 442	Cape Don to Cape Wessel
Aus 701	Vrilya Point to Duyfken Point
Aus 710	Vanderlin Island to Cape Beatrice
Aus 716	Gugari Rip to Cadell Strait including Arnhem Bay
Aus 720	Van Diemen Gulf
Aus 721	Port Essington to Snake Bay
Aus 722	Beagle Gulf and Clarence Strait
Aus 724	Fog Bay to Port Keats
Aus 725	Port Keats to Victoria River
Aus 726	Approaches to Cambridge Gulf

Chart No	Area
Aus 727	Rocky Island to Eclipse Islands
Aus 728	Eclipse Islands to Cape Voltaire
Aus 744	Exmouth Gulf and Approaches
Aus 745	North West Cape to Point Maude
Aus 747	Shark Bay (Northern Sheet)
Aus 748	Shark Bay (Eastern Sheet)
Aus 749	Shark Bay (Western Sheet)
Aus 751	Houtman Abrolhos and Gleevink Channel
Aus 752	Pelsaert Island to Beagle Islands
Aus 753	Beagle Islands to Lancelin
Aus 755	Cape Peron to Cape Naturaliste
Aus 756	Cape Naturaliste to Point D'Entrecasteaux
Aus 759	Point Hillier to Bald Island
Aus 763	Cape Le Grand to Cape Pasley

- 3 Details about unadopted charts can be found on the Australian Index, charts 65000 and 65001 and at www.hydro.gov.au. These charts are obtainable through Admiralty chart agents listed in NP 131, *Catalogue of Admiralty Charts and Publications*.

Australian Notices to Mariners are all repeated in *Admiralty Notices to Mariners*.

Datums

Vertical datum

1.17

- 1 Vertical datums of modern metric charts are normally based on LAT though some are based on Indian Spring Low Water. The relationship between the datums used for the earlier surveys and these levels has not been determined.

Horizontal datum

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 (2004) 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. It is advisable when transferring positions to do so by bearing and distance from a common point and not by geographical coordinates.

AIDS TO NAVIGATION

Lights

Responsible authority

1.19

- 1 Lights are the responsibility of The Commonwealth, State and Harbour Authorities.

Buoys

IALA Maritime Buoyage System

1.20

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

A full description of this system is given in *The Mariner's Handbook*.

Conventional direction of buoyage

1.21

- 1 The general direction of buoyage for the purposes of the IALA buoyage system is E to W along the S coast of Australia, N along the W coast of Australia, E along the N coast and anti-clockwise round Gulf of Carpentaria.

Special buoys

1.22

- 1 Fishing research and waverider special buoys, mainly lighted, are to be found moored or drifting in the area covered by this volume. The scientific instrumentation attached to these buoys is maintained by the Data Buoy Co-operation Panel, under the auspices of the World Meteorological Organization and the Intergovernmental Oceanographic Commission.
- 2 Mariners should keep a good lookout for such buoys and keep well clear to avoid contact or entanglement of ship's gear with buoy moorings.

For details see latest edition of *Temporary Australian Notices to Mariners*.

1.23

ODAS buoys

- 1 ODAS buoys (special) may be encountered within the area covered by this volume. These buoy systems, which vary considerably in size, are used for environmental research purposes; they are marked "ODAS" with an identification number. The large systems should be given a clearance of at least 1 mile, and in the case of vessels towing underwater gear this distance should be increased to 2½ miles.
- 2 As the buoys have no navigational significance, and as they are liable to be moved or withdrawn at short notice, they are not normally mentioned in the text of the book.

For further information see *Annual Australian Notices to Mariners* and *The Mariner's Handbook*.

PILOTAGE

General

1.24

- 1 Pilotage is compulsory at all Australian ports within the area covered by this volume where a pilotage service is provided, except unless specifically exempted or where the master holds an exemption certificate. Vessels under 35 m LOA, Commonwealth and foreign naval, military and air force vessels, are also exempted.

1.25

- 1 Information on pilotage procedures at individual ports is given in the text at the port concerned. Full details are given 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 local additional requirements should be obtained before hand.

RADIO FACILITIES

Electronic position fixing systems

Satellite navigation systems

1.26

- 1 **Global positioning system.** The Navstar 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 datum of the World Geodetic System 1984 (WGS84) 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** 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.

Beacons transmitting DGPS corrections operate from a number of locations within the area. See *Admiralty List of Radio Signals Volume 2* for details.

- 4 **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 5*.

Racons

1.27

- 1 There are several radar transponder beacons (Racons) operational within the area covered by this volume, for details see the relevant geographical chapter and *Admiralty List of Radio Signals Volume 2*.

Radio navigational warnings

NAVAREA X warnings

1.28

- 1 The area covered by this volume lies within the limits of NAVAREA X. Details of warnings and a list of those in force are issued by the MRCC, which is part of the Australian Maritime Safety Authority. NAVAREA X warnings are broadcast through:

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

For broadcast details see *Admiralty List of Radio Signals Volumes 1 (2) and 3 (2)*.

Coastal navigation warnings

1.29

- 1 Coastal navigational warnings are issued by the MRCC and are broadcast through:

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

For broadcast details see *Admiralty List of Radio Signals Volumes 1 (2) and 3 (2)*.

Local warnings

1.30

- 1 Local warnings cover the area within the limits of jurisdiction of a harbour or port authority and may be issued by those authorities. They may be issued in the national language only and supplement the coastal navigational warnings by giving information which the ocean-going ship may normally not require. For broadcast details see *Admiralty List of Radio Signals Volumes 3 (2) and 6 (4)*.

Radio weather services

METAREA X warnings/bulletins

1.31

- 1 The World Meteorological Organization (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 service AREAS (METAREAS) are identical to the 16 NAVAREAS within the World-Wide Navigational Warning Service (WWNWS).

- 2 Each METAREA has a designated National Meteorological Service responsible for issuing high seas weather warnings and bulletins. The designated authorities are not necessarily in the same country as the NAVAREA co-ordinators. Weather Warnings and routine bulletins are broadcast through:

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

For broadcast details see *Admiralty List of Radio Signals Volume 3(2)*.

Meteorological broadcasts by radio-facsimile

1.32

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

National weather services

1.33

- 1 The Australian Commonwealth Bureau of Meteorology issues national weather warnings and weather bulletins through:

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

For broadcast details see *Admiralty List of Radio Signals Volume 3(2)*.

Telephone/telefax weather information services

1.34

- 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 services

1.35

- 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

1.36

- 1 Mariners may obtain medical advice by radio through the International Radio-Medical Centre (CIRM) in Rome. For further information and for details of coast radio stations see *Admiralty List of Radio Signals Volume 1* (2).

Automatic Identification System

General

1.37

- 1 AIS 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 Mariner's Handbook* and *Admiralty List of Radio Signals Volumes 2 and 6* (4).

REGULATIONS

International regulations

Submarine cables and pipelines

1.38

- 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 can be claimed under *The Commonwealth Submarine Cables and Pipeline Protection Act of 1963*, see *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.
- 3 **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 *Australian Seafarers Handbook AHP 20*, *Annual Australian Notice to Mariners No 14* and *The Mariner's Handbook*.

Pollution of the seas

1.39

- 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, see also (1.43). For further details, see *The Mariner's Handbook*.

1.40

- 1 **Oily waste reception facilities** Information on such facilities is given for each port and harbour in the geographical chapters of this volume.

National regulations

Aboriginal lands

1.41

- 1 Entry to areas indicated on large scale national charts as Aboriginal Land or Reserves, without prior permission of the relevant authority, is prohibited. For Aboriginal land boundaries topographic mapping should be consulted. The land surrounding certain of the ports of Northern Territory are Aboriginal Land Trusts, previously called Reserves. Strict regulations apply to the possession of firearms and supply of alcoholic beverages.

Environment Protection

1.42

- 1 The *Environment Protection (Sea Dumping) Act 1981* applies to Australian Flag vessels anywhere and to all vessels within Australian waters, including the Australian Fishing Zone and the Exclusive Economic Zone (1.80).
- 2 The Act regulates both loading and deliberate disposal of waste. It does not apply to wastes arising from the "normal operations" of ships. Operational discharges from ships come under the control of legislation which implements *MARPOL 73/78*. For details, see *Australian Seafarers Handbook AHP 20*, *Annual Australian Notices to Mariners* and *The Mariner's Handbook*.

1.43

- 1 **Disposal of garbage at sea.** *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 it applies to Australian Flag vessels anywhere and to all vessels within Australian waters, including the Australian Fishing Zone and the Exclusive Economic Zone (1.80). For details, see *The Mariner's Handbook*.

Transfer operations at sea

1.44

- 1 The practice of transfers at sea is commonplace in some designated areas overseas where special precautions are taken to counter the associated risks of collision and pollution. 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 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

1.45

- 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).
- 3 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).
- 4 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
- 5 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.

1.46

- 1 Reports should be sent to the Manager, Environment Protection Standards, in the Australian Maritime Safety Authority MRCC through the nearest coast radio station. Detailed formats for pollution reports in Australian waters are given in *Admiralty List of Radio Signals Volume 1(2)* and in *Annual Australian Notices to Mariners*.

Port entry

Accident or damage

1.47

- 1 The following is extracted from *The Navigation Act, 1912–58, Provision 268 (1)*, Accidents, etc, to be reported. Where a ship to which Part II applies, or where, within Australia or during a voyage to a port in Australia, a ship to which Part II does not apply–
 - (a) has sustained or caused an accident occasioning loss of life or serious injury to a person;
 - 2 (b) 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;
 - (ii) the efficient operation or the safety of the boilers, machinery or fixed equipment of the ship; or
 - 3 (iii) the efficiency or completeness of the life-saving appliances or other safety equipment of the ship;
 - (c) has been in a position of great peril, either from the action of some other ship or from danger of wreck or collision;
 - (d) has been stranded or wrecked; or
 - 4 (e) 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,

- 5 or where a ship, having left a port in Australia, has put back to that port or another port in Australia, 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 on ships

1.48

- 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*. These regulations can be obtained from any Mercantile Marine Office in Australia.

Flammable cargo

1.49

- 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 *Navigation (Cargo-hazards Prevention) Regulations* referred to above. For signals to be shown by vessels with flammable liquids on board, see 1.73.

Port regulations for Queensland

1.50

- 1 Every power 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, jetty, dredged channel, beacon, buoy or other harbour improvement.

Regulations in Queensland rivers

1.51

- 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.

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

Port regulations for Western Australia

1.52

- 1 Every master of a vessel must act under the directions of the Harbour Master, and carry into effect any directions given by him in relation to the place and manner of bringing the ship to the anchorage, coming alongside or leaving any jetty or wharf, and as to securing or mooring of the ship.
- 2 No vessel shall be anchored in or near the middle of any fairway, channel or river, and any vessel detained in

the fairway, channel or river shall lie close on one side of such fairway, channel or river, nor shall any cable, chain, hawser or rope be placed across any such fairway, channel or river without permission from the Harbour Master.

- 3 No person except the Pilot or Health Officer, and boatman employed to convey them, shall, with any boat or ship whatever, be allowed alongside of, nor shall any person except the Pilot and such officers be allowed on board any ship from other than an Australian port when entering or within any port before she has been cleared by the Health Officer, nor shall any person onboard be permitted to leave such ship before she has been so cleared by the Health Officer and Customs Officer.

- 4 A person shall not moor a vessel or permit a vessel to be moored at or near a landing place so as to prevent free access to other vessels to that landing place; providing that this regulation shall not prohibit a person from mooring a vessel or permitting a vessel to be moored at or near a landing place for a reasonable time for the purpose of loading or unloading goods or passengers.

Explosive regulations 1.53

- 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, by day, at the masthead or where best seen, the appropriate signal from *The International Code of Signals* and, by night exhibit a red light which shall be visible all round the horizon.
- 2 These signals shall be exhibited until the explosives have been landed at the recognised explosive berth or until the vessel has cleared the port or anchorage.

Quarantine

General information 1.54

- 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;
 - (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
 - (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. See 1.57.
- 4 The following extracts from Statutory Rules No 85 of 1935, made under the Quarantine Act, are inserted for the guidance of vessels arriving in Australian waters; the masters of every vessel should take care to obtain a copy of these rules at the first port of call in Australia:

- 5
 6. The hours of clearance of vessels subject to quarantine shall be from sunrise to sunset. Provided that an authorized quarantine officer may, at any hour between 0500 and 2400, 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 1.55

- 1 The Australian Quarantine and Inspection Service (AQIS) requires all vessels arriving in Australia from overseas, or who 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 requires information on vessel particulars, quarantine conditions and ballast water details.
- 2 If this report is not submitted within a period of 12/48 hours prior to the vessel's arrival at the first Australian port, AQIS will not give formal quarantine clearance to enter port. Vessels will require written permission to discharge any ballast water in Australian ports or waters.
- 3 Masters are also required to complete two other AQIS forms:
 - 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).
- 4 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.
- 5 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

1.56

- 1 **Certificate of Pratique.** For all ports where radio pratique has been granted, the vessel should proceed directly to the berth if available and, as soon as possible after the vessel's arrival at the berth, a Quarantine Officer will board and obtain from the Master the completed Health Report. The Quarantine Officer will also ascertain from the Master if there has been any changes in conditions since the questionnaire was answered. If the Quarantine Officer is satisfied that the vessel is free from infection, a Certificate of Pratique to have effect in all or any Australian ports will be issued.

Ports of entry 1.57

- 1 The following are first ports of entry, referred to in the Quarantine Act, situated within the area covered by this volume: Albany (9.59); Ardrossan (12.167); Broome (5.260); Bunbury (8.169); Carnarvon (7.63); Cape Thevenard (10.56); Dampier (6.89); Darwin (4.100); Derby (5.201); Fremantle (8.6); Geraldton (7.179); Gove (2.213); Milner Bay (2.316); Port Adelaide (12.112); Port Bonython (11.163); Port Exmouth (6.300); Port Giles (12.150); Port Hedland (5.332); Port Linclon (11.32); Port Pirie (11.187); Port Walcott (6.43); Wallaroo (11.110); Weipa (2.27); Whyalla (11.140); Wyndham (4.166).

Refuse disposal**1.58**

- 1 A vessel shall, while the vessel remains in or near a declared port, make available for collection by an authorised collector all animal waste, organic refuse, galley scraps or quarantinable waste from the vessel.

Masters should ascertain the procedures on arrival at port from their agent.

Importation of animals and plants**1.59**

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

Animals may only be imported into Australia through certain ports; Fremantle and Adelaide are the only such ports in the area covered by this volume.

These prohibitions are contained in the Quarantine Act of the Commonwealth of Australia, 1908–1970 and subsequent Proclamations

Protection of historic features**Historic shipwrecks****1.60**

- 1 Under the *Historic Shipwrecks Act 1976* all shipwrecks in Australian waters aged 75 years or more are protected. Except with a permit it is then prohibited to damage, destroy, interfere with or dispose of an historic shipwreck or historic relic, or to remove an historic shipwreck or historic relic from Australia, from Australian waters, or from the waters above the continental shelf of Australia.
- 2 In addition to the above, the following wrecks and associated relics which are less than 75 years old and which lie in the area covered by this volume, are also protected:

Shipwreck	Date	Latitude S	Longitude E
Submarine I-124	1942	12°07'·20	130°06'·38
Uribes	1942	32°00'·22	115°33'·35
Portland Maru	1935	35°43'·83	136°42'·40

- 3 The area surrounding a declared shipwreck or relic may be declared to be a protected zone and the controls may be applied to activities which may occur in the area.

See also *Australian Seafarers Handbook AHP 20*.

Protection of wild life**Marine and estuarine protected areas****1.61**

- 1 Australia has established a number of marine and estuarine protected areas (MEPA) 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.

- 2 Various restrictions apply, but, the only areas in which navigation is prohibited are:

Point Labatt 33°09'·5S 134°15'·5E

Seal Beach-Bales Bay 36°00'·3S 137°19'·4E.

For details of the restrictions which do apply, see *Annual Australian Notices to Mariners and Australian Seafarers Handbook AHP 20*.

SIGNALS**International signals****Dredger signals****1.62**

- 1 Signals shown by dredgers conform to those described in *International Regulations for Preventing Collisions at Sea (1972)*.

National signals**Uniform port signals****1.63**

- 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 exhibited, shall be shown from shore installations except that the Port Closed or Channel Blocked signal may be exhibited 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.

Port traffic signals**1.64**

	Red light	Green light	
Day			
Night			
Meaning	Port closed or channel blocked.		

Storm signals**1.65**

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

Tide signals**1.66**

- 1 To be shown from the masthead:

	Red light	Green light	White light	
Day				
Night				
Meaning	Flood			
				
				
Meaning	Ebb			
				
Meaning	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

	Red light	Green light	
Day			
Night			
Meaning	1st quarter		

		2nd quarter
		3rd quarter
		
		4th quarter
		
EBB TIDE		
<i>Day</i>	<i>Night</i>	<i>Meaning</i>
		1st quarter
		2nd quarter
		
		3rd quarter
		
		4th quarter
		

When considered sufficient by local authorities, only 1st and 3rd quarter signals will be shown to indicate 1st and 2nd half tides.

Depth signals

1.67

- 1 Depth signals (Diagram 1.67) are shown at the yardarm; whole metre signals being shown at the opposite yardarm to decimal signals. The signals indicate the depth in metres above local port datum, which may differ from chart datum. Depth signals are not displayed with quarter tide signals.

 RED LIGHT	 GREEN LIGHT	 WHITE LIGHT	
<i>Day</i>	<i>Night</i>		<i>Depth(M)</i>
			NIL
			0.25
			0.50
			0.75
			1
			
			2
			

		3
		
		4
		
		5
		
		6
		
		7
		
		8
		

Datum signal

1.68

- 1 To indicate that yardarm depth signals are to be subtracted. If shown at the same time as navigational signals, it will be shown 2 m below the tide and navigational signals.

<i>Day</i>	<i>Night</i>
	

Navigational signals

1.69

- 1 To indicate danger on the bar, strong tidal currents or freshet in river, and shown 2 m below the masthead. Not shown when conditions are normal.

	Red light		Green light	
<i>Day</i>		<i>Night</i>		<i>Meaning</i>
		quick flashing		Moderate
		quick flashing		Dangerous
				

Dredger signals

1.70

- 1 See 1.62.

Submarine signals

1.71

- 1 Submarines use signals and instructions as given in *Annual Summary of Admiralty Notices to Mariners*.

Courtesy flag

1.72

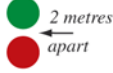
- 1 The correct courtesy flag to be flown in Australian ports is the Australian National Flag (Diagram 1.72).



Other signals

1.73

- 1 The following visual and sound signals, additional to those laid down in *The International Code of Signals* and *International Regulations for Preventing Collisions at Sea* (1972) should be used by vessels in Australian ports:

Day	Night	Meaning
		Flammable liquid(s) onboard: see 1.49.
Berthing/unberthing flag signals as may be prescribed in Port Authority Bye-Laws.		Vessel navigating with- in pilotage waters of certain ports requires priority or right of way.

Flammable liquids (1.80)

DISTRESS AND RESCUE

Search and Rescue

Global Maritime Distress and Safety Systems

1.74

- 1 For details of GMDSS see *Admiralty List of Radio Signals Volume 5*.

Automated Mutual-Assistance Vessel Rescue system

1.75

- 1 Automated Mutual-Assistance Vessel Rescue system (AMVER) operated by the United States Coast Guard, is an international maritime mutual assistance organization which provides important aid to the development and co-ordination in SAR efforts in offshore areas of the world.

Full details are given in *Admiralty List of Radio Signals Volume 1* (2), *Annual Summary of Admiralty Notices to Mariners* and *Annual Australian Notices to Mariners*.

General arrangements for Search and Rescue

1.76

- 1 (a) **Australian Maritime Safety Authority (AMSA)** through AusSAR, specifically the Rescue Co-ordination Centre Australia (RCC Australia), is responsible for SAR for all civil aircraft, merchant ships outside port limits and small craft beyond the capacity of local SAR resources. RCC Australia is located in Canberra and co-ordinates aircraft and surface vessels involved in SAR operations within the Australian (SRR)

RCC Australia is also the Australian Mission Control Centre for the international Cospas-Sarsat distress beacon detection system. RCC Australia, which is manned continuously, may be contacted through any Australian Coastal Radio Station or Inmarsat.

- 2 (b) **Coastal Radio Stations (CRS) of Telstra** keep watch on the international RTF distress frequencies. The Inmarsat Land Earth Station (LES) at Perth provides communications through both the Indian Ocean Region (IOR) and Pacific Ocean Region (POR) satellites. Details of Australian CRS can be found *Admiralty List of Radio Signals Volume 1* (2) and *International Telecommunications Union* publications.

- 3 (c) **Royal Australian Airforce** is responsible for SAR operations involving Australian and foreign military land

based aircraft, but may provide assistance to other SAR authorities.

Royal Australian Navy is responsible for SAR in respect of naval ships and shipborne aircraft, but may provide assistance to other SAR authorities.

- 4 **State and Territory Police Forces** are responsible for SAR operations involving fishing vessels and pleasure craft within the limitations of their SAR resources.

For full details see *Admiralty List of Radio Signals Volume 5*.

Reporting system

1.77

- 1 **Australian ship reporting system (AUSREP).** To facilitate SAR procedures the AUSREP system is operated by AusSAR through the MRCC, Canberra. The system is mandatory and applies to the following vessels:

All Australian registered ships engaged in trade or commerce interstate or overseas while in the AUSREP area.

- 2 Ships not registered in Australia but engaged in the coasting trade or in trade between Australia and an external territory or between external territories while in the AUSREP area.

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.

- 3 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.

Suitably equipped small craft on passage of 200 miles or more between different ports.

- 5 The entire area covered by this volume falls within the AUSREP area.

Sea Safety report for small craft. By completing an Australian Maritime Safety Authority Small Craft Particulars Form, operators of small craft proceeding offshore will be able to register details of their vessels. Registration is a prerequisite for participation in AUSREP.

Full details of the AUSREP system are given in *Admiralty List of Radio Signals Volume 1* (2), *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Operations

1.78

- 1 Guidance for Masters involved in Search and Rescue operations is contained in the *Merchant Ship SAR Manual (MERSAR)* compiled by the Maritime Safety Committee of the IMO.

Advice on operations with aircraft, including helicopters, is also given in *Annual Summary of Admiralty Notices to Mariners* and *Annual Australian Notices to Mariners*.

COUNTRY AND PORTS

AUSTRALIA

General description

Charts 4603, 4708, 4060

1.79

- 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 square km and is divided into six states and two territories.
- 2 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 Indian Ocean. The capital city is Canberra which, in 2002, had an estimated population of about 308 700.

National limits

1.80

- 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 exclusive economic zone and fishing zone with an outer limit of 200 miles from the territorial sea base line. The fishing zone limits are similar but not identical to the limit of the exclusive economic zone.
- 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 Exclusive Economic Zone 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 *Annual Australian Notices to Mariners*, *Australian Seafarers Handbook AHP 20* and *The Mariner's Handbook*.

History

Discovery and exploration

1.81

- 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 Sumatera on sixteenth century maps of the Dieppe school of Hydrography have been sited as evidence for a Portuguese discovery of Australia.

1.82

- 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.

1.83

- 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 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.

1.84

- 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 (see *Australia Pilot Volume III*).

- 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

1.85

- 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.

1.86

- 1 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.

- 2 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

1.87

- 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

1.88

- 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

1.89

- 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

1.90

- 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 and sewage.

Population

1.91

The estimated population of the country in 2002 was 19 662 000.

Language

1.92

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

Queensland

Gulf of Carpentaria

1.93

- 1 Only a small portion of the Queensland coast is included in this volume, namely, the E and SE shores of Gulf of Carpentaria, E of the meridian of 138°E.
For the general description of Queensland, see *Australia Pilot Volume III*.

Northern Territory

Area and population

1.94

- 1 Northern Territory has an area of 1 346 200 square km, four-fifths of which lies in the tropics and the remainder in the temperate zone.
The population at the census of 2002 was 198 000.
- 2 Various Aboriginal Land Trusts hold title to land previously called Reserves, totalling about one-fifth of the Northern Territory. A number of major Aboriginal

communities previously administered by the Church Mission Society and the Federal Government are now controlled by the Aboriginal people themselves through local Aboriginal Councils.

Geographical and physical features

1.95

- 1 Northern Territory comprises the central N part of Australia and adjoining islands, bounded on the N by Timor and Arafura Seas at approximately 11°S latitude and extending to the border of South Australian at the parallel of 26°S. It joins Western Australia on the W side of the meridian of 129°E and Queensland on the E side at the 138th meridian. Ashmore Islands and Cartier Islet off the NW coast of Australia are also part of Northern Territory.
- 2 Northern Territory has a coastline of about 1040 miles in length, principally sandy beaches and mangrove-fringed mud flats, indented with bays and inlets and the estuaries of numerous rivers and creeks.

Fauna

1.96

- 1 As elsewhere on the Australian continent the higher wild animals are rare in Northern Territory. Marsupials, birds, of which pigeons and quail are abundant and cockatoos are well represented. Crocodiles, fresh-water tortoises, snakes, most of which are non-venomous, and frogs abound. Butterflies and beetles are strongly represented; the white ant is a pest, anthills in the Territory sometimes attain great dimensions. Mosquitoes and sand flies are very troublesome, especially in the wet season. A mole-like marsupial is found inland, at the S end of the Territory.
- 2 Domestic animals have been introduced; buffalo formerly existed, but their number has been greatly reduced by indiscriminate shooting.

The territorial waters teem with fish, and there are many varieties of fresh-water fish and littoral mollusca.

Flora

1.97

- 1 The vegetation of the Northern Territory is N Australian in type, though with tropical grasses and sedges, mangroves on the coast, and the paper-bark tree, which forms impenetrable thickets for hundreds of miles on the banks of the rivers.
On the ranges pines, fig trees and orange trees flourish. Leichardt pines and palms form the vegetation of the tableland, which stretches across the Territory about the 14th and 15th parallels.
- 2 On the higher steppes there are a few varieties of eucalyptus and there are many indigenous species of plants.
On the wide expanse of plain country of the interior, there is little vegetation, tree growth being very scanty, consisting chiefly of stunted eucalyptus such as gimlet gum, black box and desert shea-oak.

Industry and trade

1.98

- 1 Northern Territory's economy is based on the exploitation of its natural resources of minerals, land, fisheries and tourist attractions. Mining has played a major part in the development of the Northern Territory. The beef cattle industry continues to be the major user of pastoral lands.
Significant oil and gas reserves have been discovered offshore in Timor Sea and Joseph Bonaparte Gulf areas.

Western Australia

Size and population

1.99

- 1 Western Australia has an area of 2 525 500 square km and a coastline of 6750 miles. It includes all that portion of Australia lying W of the meridian of 129°E and lies between the parallels of 14° and 35°S.

The population at the census of 2002 was 1 927 3000.

Geographical and physical features

1.100

- 1 Large areas of Western Australia for some hundreds of miles inland are hilly and even mountainous, although the altitude, so far as ascertained, rises nowhere above 1250 m in the NW region and 1073 m in the SW region. The coastal regions are undulating, with an interior slope to the central portion of the continent, which is arid and uninhabited. Kimberley Plateau (17°00'S 126°00'E) slopes N and NW to the coast in the N region of West Australia; numerous rivers flow down these slopes and into the sea from Wyndham (15°27'S 128°06'E) W to King Sound. Hammersley and Darling Ranges of the W have a seaward slope to the Indian Ocean, into which many watercourses intermittently flow, notably De Grey, Fortescue, Ashburton, Gascoyne, Murchison, Swan, Murray, Collie Blackwood and Preston Rivers.

- 2 There is grassland in the North province, principally in the Kimberleys. The desert province covers a very large area of the State. Main woodland in the SW.

The greater part of the state may be described as an immense tableland, with an average elevation of 300 to 450 m above sea level, the surface of which varies from stretches of clayey soil to the sand dunes of the far interior. Of the total area two-thirds is suitable for agricultural purposes.

Flora

1.101

- 1 The principal forest lies S of the parallel of 32°S and consists of a pure stand of jarrah on Darling Range extending parallel with the coast as far S as Latitude 34°S, below which are found forests of karri. Karri grows to a very tall tree, many specimens being over 75 m in height. Jarrah and karri timbers are among the best known hardwoods in the world.

- 2 Other trees indigenous to the State of Western Australia are, tuart a type of Eucalyptus which is a valuable hardwood, and sandalwood which was obtained in considerable quantities from the dry interior.

The flora of Western Australia consists of about six thousand species. Owing to the great range in latitude through which the state extends, it is possible to recognise three distinct types of flora, which are, the summer rainfall region in the N, the winter rainfall region in the S, and an intermediate zone of highly intermittent rainfall in arid country between these two.

- 3 The first or N zone, the region of summer rainfall, consists chiefly of woodland formation in which grass forms the principal undergrowth. The best development of woodland is found in Kimberley, where it extends to the coast, either as grass-woodland flora, or else as mangrove formation on the seaboard. The high plateau N of King Leopold Range carries fine woodland in which there are some valuable cabinet woods, e.g. Leichardt pine and ebony; cypress pine also occurs in scattered places and yields a fine timber; some of the trees exceed a height of 30 m. Grass-land occurs intermixed with the woodland,

especially in the basaltic country. The baobab tree grows here also, but never very far from the seaboard. Brilliantly flowered kurrajongs and species of hibiscus give colour and variety to the flora. The mangrove formation is extensive on the W coast of Kimberley, and is often some miles in width; it is densest in the estuaries, and although the trees extend as far S as Carnarvon, it is only in the Kimberleys that any variety of species and a forest development is to be seen. Palms, cucads and pandanus are prominent tropical features of this N zone.

- 4 The flora of the SW, the winter rainfall area, is one of the most famous in the world, especially because of the great variety of forms, and the high percentage of indigenous plants, which are unique. The more notable examples of these are the grass-trees, the kangaroo paws, and other small plants.

- 5 The intermediate arid zone, which relies principally on summer thunderstorms for its rain, has an interesting and distinctive flora, but not exclusive to Western Australia. This is the home of the mulga and spinifex, and extends E into New South Wales, and W to the coast between Beadon and Shark Bays. The region is the home of the beautiful everlastings, the Sturt pea, and several curious flannel plants, which thrive under conditions of intense aridity. The mulga trees are valuable in providing timber and top-feed for stock.

Fauna

1.102

- 1 The principal indigenous animals encountered in Western Australia are marsupials. There is also a variety of indigenous birds.

Both estuarine and fresh-water crocodiles occur in the far N. Venomous sea snakes infest tropical waters; land snakes are widely distributed and there are also lizards and frogs.

- 2 The number of species of fish occurring off the coast of Western Australia is large. Poisonous blow-fish, or tetrodon, of large size abound in Shark Bay, and the relatively warmer waters of the N; small varieties are abundant farther S.

- 3 Of crustaceans, there are crayfish, crabs, and prawns, all appearing in considerable numbers; rock and mangrove oysters occur from Shark Bay N, and they are found in lesser quantities about Houtman Abrolhos.

Whales and dolphins are found off the S and W coasts of Western Australia adjacent to the continental shelf.

Industry and Trade

1.103

- 1 The worlds greatest deposits of iron ore are in the Ashburton and Pilbora districts and the mining industry has been for many years of considerable significance in the Western Australian economy and is the major export in terms of value. Gold and diamonds are mined and undeveloped bauxite deposits exist within the State. Manufacturing is confined mainly to the Perth area.

- 2 The principal exports consist of iron ore, oil and gas, and agricultural products, whilst salt and mineral sands make important contributions.

Principal imports are general cargoes and petroleum.

South Australia

General information

1.104

- 1 The state of South Australia lies between the meridians of 129°E and 141°E, and is bounded on the N by the

parallel of latitude 26°S. It has an area of 984 377 square km.

Population 1.105

- 1 In 2002 the population of South Australia was 1 520 200 of which 1 083 900 resided in the capital city of Adelaide and its suburbs.

Physical features. 1.106

- 1 The most important physical features of South Australia are broad plains, divided longitudinally by four secondary features, which have largely determined the direction of roads and railways, the sites of towns and settlements, and the distribution of the population. These four features are Spencer Gulf, Gulf of Saint Vincent, Mount Lofty – Flinders Ranges and River Murray.

- 2 The long deeply indented coastline, which provides a few major, and numerous minor harbours, trends generally SE.

Pleasant weather conditions and good rainfall are experienced in most coastal areas.

- 3 The NW portion of the State is mostly desert, while N of latitude 32°S the country is unproductive by comparison with the fertile land which surrounds the hill country to the SE. River Murray, which flows for about 200 miles through the SE corner of the state, is the only river of importance; it is not navigable by sea-going vessels, on account of its shallow and dangerous bar. Vessels of shallow draught, however navigate the river and its tributaries above Goolwa (35°31'S 138°47'E), to far into the interior of Victoria and New South Wales. Access to the river for small craft is possible from the sea, by way of a lock in the Goolwa barrage (13.18).

Flora 1.107

- 1 Among the woods of South Australia, the various species of the eucalyptus, or gum tree, are the most numerous, the acacia ranking next. The grass tree, from its peculiar appearance, is a striking object in the landscape in many parts.

Fauna 1.108

- 1 The fauna of South Australia is comprised principally of marsupials.

Among the birds, of which it is estimated there are nearly 700 species, the emu is the largest.

Snakes of various kinds, many of them venomous, are numerous; and there is a great number and variety of insects.

- 2 There are numerous species of fish in the waters of South Australia. In Murray River, the Murray Cod and other freshwater fish are found above tidal waters. Oysters are found at Port Lincoln and Coffin Bay.

Trade and industry 1.109

- 1 Natural gas from a gasfield discovered in the N in 1967, which is piped to S and E Australia.

The principal products are agricultural and pastoral. Wheat and barley are the principal crops; oats are also cultivated.

There are 170 000 acres of man made forest, mostly of soft wood.

- 2 Fruit culture is extensively carried on, and dried fruits and wines are produced. Besides grapes, the chief fruit crops are currants, and stone fruits.

Exports include wool, grain, frozen meats and hides, fruit, lead, gypsum iron and zinc.

Imports include machinery, wood, timber and cork, iron and steel, petrol products, crude fertilisers and crude minerals.

PRINCIPAL PORTS, HARBOURS AND ANCHORAGES

1.110

Place and Position *Remarks*

Queensland

Gulf of Carpentaria

Weipa (2.27) (12°40'S 141°52'E) Commercial and fishing port; bulk loading facilities; first port of entry.

Investigator Road (2.108) (17°07'S 139°35'E) Sheltered anchorage.

Northern Territory

Gulf of Carpentaria

Karumba (2.74) (17°28'S 140°50'E) River port.

Bing Bong (2.171) (15°25'S 136°31'E) Anchorage providing bulk loading facility by barge.

Gove Harbour (2.213) (12°12'S 136°40'E) Commercial and bulk loading port; first port of entry.

Arnhem Bay (2.273) (12°15'S 136°10'E) Sheltered anchorage.

Milner Bay (2.316) (13°52'S 136°25'E) Bulk ore loading port; first port of entry.

Timor Sea and Beagle Gulf

Jabiru Oil Terminal (4.14) (11°56'S 125°00'E) FPSO *Jabiru Venture*.

Challis Oil Terminal (4.14) (12°07'S 125°01'E) FPSO *Challis Venture*.

Elang Oil Terminal (4.20) (10°52'S 126°34'E) FPSO *Modec Venture*.

Laminaria Oil Terminal (4.26) (10°37'S 125°59'E) FPSO *Northern Endeavour*.

Bayu Undan Gas Terminal (4.31) (11°03'S 126°37'E) FSO *Liberdade*.

Port Darwin (4.100) (12°28'S 130°51'E) Major commercial and fishing port; bulk loading facilities; first port of entry; naval base.

Western Australia

Cambridge Gulf

Wyndham (4.166) (15°27'S 128°06'E) Commercial port; first port of entry.

North-west coast

Cockatoo Island (5.92) (16°08'S 123°44'E) Bulk ore loading port

Broome (5.260) (18°00'S 122°13'E) Commercial port; first port of entry.

Port Hedland (5.332) (20°18'S 118°35'E) Bulk ore loading port; commercial area; first port of entry.

Wanaea Marine Terminal (6.14) (19°35'S 116°27'E)	FSPO <i>Cossack Pioneer</i> .
Wandoo Marine Terminal (6.19) (20°09'S 116°25'E)	Two production platforms and a CALM buoy.
Stag Marine Terminal (6.23) (20°17'S 116°15'E)	FSO <i>Dampier Spirit</i> .
Legendre Marine Terminal (6.26) (19°41'S 116°43'E)	Platform and CALM buoy.
Port Walcott (6.43) (20°35'S 117°12'E)	Bulk ore loading port; first port of entry.
Dampier (6.89) (20°39'S 116°43'E)	Major port; first port of entry.
Mermaid Sound S part (6.108)	Commercial port area and bulk loading facilities.
Withnell Bay Terminal (6.109) (20°35'S 116°46'E)	Liquid natural gas berth.
Varanus Island Oil Terminal (6.189) (20°38'S 115°36'E)	Offshore oil terminal.
Barrow Island Oil Terminal (6.195) (20°49'S 115°33'E)	Offshore oil terminal.
Onslow (6.243) (21°38'S 115°06'E)	Developing port associated with the Onslow Solar Salt Project.
Beadon Creek anchorage (6.249) (21°39'S 115°08'E)	Oil rig tender anchorage.
Airlie Island Marine Terminal (6.260) (21°18'S 115°10'E)	Offshore oil terminal.
Saladin Marine Terminal (6.267) (21°24'S 115°03'E)	Offshore oil terminal.
Port Exmouth (6.300) (21°49'S 114°11'E)	First port of entry.
West coast	
Carnarvon (7.63) (24°53'S 113°39'E)	First port of entry.
Cape Cuvier (7.35) (24°13'S 113°24'E)	Bulk salt export berth.
Useless Loop (7.92) (26°05'S 113°25'E)	Bulk salt and gypsum export berth.
Geraldton (7.179) (28°47'S 114°36'E)	Commercial and bulk port; first port of entry.
Fremantle (8.6) (32°03'S 115°44'E)	Major port; first port of entry.
Cockburn Sound (8.89)	Mainly specialist bulk and petroleum berths; naval base.
Bunbury (8.169) (33°19'S 115°39'E)	Commercial and bulk port; first port of entry.
South coast	
Albany (9.59) (35°02'S 117°55'E)	Natural harbour and a first port of entry.
Esperance (9.135) (33°52'S 121°53'E)	Commercial port and first port of entry.
South Australia	
Thevenard (10.56) (32°09'S 133°39'E)	Bulk loading port and first port of entry.
Port Lincoln (11.32) (34°45'S 135°53'E)	Natural harbour, and protected anchorage. A first port of entry.

Wallaroo (11.110) (33°56'S 137°37'E)	Commercial port and a first port of entry.
Whyalla (11.140) (33°02'S 137°36'E)	Commercial port with an outer and inner harbour. A first port of entry.
Port Bonython (11.163) (33°00'S 137°47'E)	Oil Terminal
Port Pirie (11.187) (33°11'S 138°01'E)	Commercial port and a first port of entry.
Port Adelaide (12.112) (34°47'S 138°30'E)	Major commercial port and a first port of entry.
Port Giles (12.150) (35°02'S 137°55'E)	Bulk grain loading port and first port of entry.
Ardrossan (12.167) (34°26'S 137°55'E)	Bulk loading port and first port of entry.

PORT SERVICES – SUMMARY

Docking facilities

1.111

- 1 **Drydock** is available at Geraldton; length 26 m, breadth 5.9 m (7.208).

1.112

- 1 **Mechanical lift docks.** The following are available:
 - Darwin; length 42 m, breadth 14 m, lifting capacity 1140 tonnes (4.141).
 - Frances Bay; length 62.5 m, lifting capacity 2550 tonnes (4.141).
 - Fremantle; length 123 m, breadth 25 m; lifting capacity 8065 tonnes (8.60).
 - Port Adelaide; two Mechanical Lift Docks, the larger with a lifting capacity of 5248 tonnes (12.141)

1.113

- 1 **Slipways.** The following are available:
 - Darwin; length 350 m (4.141).
 - Frances Bay; slipway, cradle length 24 m, lifting capacity 350 tonnes (4.141).
 - Carnarvon; length 115 m, lifting capacity 180 tonnes (7.71).
 - Geraldton; length 83 m, lifting capacity 90–150 tonnes (7.208).
 - 2 Fremantle; marine support facility, Jervoise Bay, mechanical lift dock, platform 123 m length, 25 m breadth, lifting capacity 8065 tonnes for vessels up to 148 m length, 24.5 m breadth, 8 m draught and 14 000 dwt (8.60).
 - Albany; slipway for vessels up to 340 tonnes (9.74)
 - Port Lincoln; slipway with lifting capacity of 800 tonnes (11.56).
 - Port Adelaide; five slipways, the larger with a lifting capacity of 1 500 tonnes; (12.141).

Other facilities

Deratting

1.114

- 1 Deratting and deratting certificates:
 - Bunbury (8.169).
 - Darwin (4.100).
 - Esperance (9.135).
 - Fremantle (8.6).
 - Geraldton (7.179).
 - Thevenard (10.56).
 - Port Lincoln (11.32)

- 2

Wallaroo (11.110).
Whyalla (11.140).
Port Bonython (11.163).
Port Pirie (11.187).
Port Adelaide (12.112).
Port Giles (12.150).
Ardrossan (12.167).
- 1.115

1

Exemption certificates only:
Broome (5.260).
Carnarvon (7.63).
- 2

Dampier (6.89).
Gove (2.213).
Milner Bay (Groote Eylandt) (2.316).
Albany (9.59).
Port Hedland (5.332).
Port Walcott (6.43).
- Measured distance

1.116

1

Fremantle, Cockburn Sound (8.100).



NATURAL CONDITIONS

GENERAL INFORMATION

Scope of section

1.117

- 1 The purpose of this section is to provide information on the geophysical and meteorological conditions with significance for navigation and maritime operations in the area covered by this publication. For the purpose of dealing with this extensive area, the sub-sections may be further divided into areas covering the following

The N area – including W coast N of Perth and the whole of the N coast.

The S area – including W coast S of Perth and the S coast.

Main characteristics

1.118

- 1 The N coast of Australia and adjacent sea areas are under the influence of the NW and SE monsoons (SE trade winds) and the tropical cyclones that effect the area particularly during the summer and autumn.

The S coast of Australia lies adjacent to the Roaring Forties and Southern Ocean. The W coast is influenced by the Indian Ocean and the transition from the tropical regime to the temperate zone of Southern Ocean.

MARITIME TOPOGRAPHY

General remarks

Charts 4603, 4708, 4709, 4073

Description of area

1.119

- 1 Arafura Sea and Timor Sea, which wash the N coast of Australia from the W entrance of Torres Strait to Cape Don and thence to Cape Londonderry (13°44'S 126°58'E), respectively, cover a vast shallow bank, known as Arafura Shelf, belonging to the continental shelf surrounding Australia. From York Peninsula to the meridian of 130°E the depths generally lie between 30 and 90 m, but little is known of this area beyond the routes generally taken by vessels from Torres Strait towards Timor, and between Torres Strait and Darwin. The positions and even the existence of some of the charted shoals in this area are doubtful, and it is probable that uncharted shoals also exist. A vigilant lookout should be kept when navigating in these waters.

- 2 West of the meridian of 130°E most of the water embraced by this volume is still over the continental shelf, but its N limit extends to the edge of that shelf and to a deep trench which lies off the SE side of Timor. The edge of the continental shelf between the meridians of 130°E and 123°E is studded with shoals and reefs ranging from reefs above water to shoals with depths of up to 30 m. The shoals and reefs at the NW edge of the shelf are known collectively as Sahul Banks. As it is probable that uncharted dangers exist in this area, mariners should adhere to the recommended tracks and keep a vigilant lookout.

- 3 From Cape Leveque (16°24'S 122°56'E) to North West Cape the continental shelf narrows reducing in width from about 120 miles off the former cape to about 20 miles off the latter. Seaward of the continental shelf off this stretch of coast rise three known dangers, namely Seringapatam Reef, Scott Reef and Rowley Shoals while Exmouth Plateau, with average depths between 750 and 2000 m, lies farther W off the edge of the shelf adjacent to Montebello

Islands and North West Cape; this region has not been thoroughly surveyed.

- 4 From North West Cape to Cape Leeuwin, the S limit of this volume, the continental shelf averages about 30 to 60 miles in width, outside which the depths increase steadily to the Perth Abyssal Plain, 300 to 400 miles W of the Australian coast, with depths of over 5000 m. The only known dangers near the continental shelf on this stretch of coast are Houtman Abrolhos (7.133).

- 5 Beyond the continental shelf between Cape Naturaliste and Cape Leeuwin lies Naturaliste Plateau, with general depths of 2000 m extending about 250 miles W from the coast. The depths then increase to between 2500 and 5500 m until, about 800 miles W of Cape Leeuwin, where the depths decrease sharply, over an area of some 200 miles in extent, to between 600 and 1800 m; this submarine area is known as Broken Ridge. The S sides of Broken Ridge and Naturaliste Plateau both fall away into deep trenches, named after the vessels which located them, the Soviet research vessel *Ob* and HMAS *Diamantina*. Ob Trench skirts the S side of Broken Ridge, and Diamantina Fracture Zone continues E from Ob Trench to a point about 150 miles S of Cape Leeuwin.

- 6 The Continental shelf is over 100 miles wide off the head of the Great Australian Bight, but narrows to less than half this width to the E and W; the bottom is sandy with shells, but is lacking in mud owing to the absence of rivers.

- 7 The slope of the edge of the Continental shelf is very steep off SW Australia, where it descends to the E end of Diamantina Trench. In the central part of the area the slope descends to the South Australian Basin, also known as the Great Bight Abyssal Plain, which has a maximum depths of 5 500 m and is covered with red clay.

- 8 To the S of the South Australian Basin depths decrease gradually to the mid-ocean ridge of the Southern Ocean.

- 9 The principal features of the Continental shelf of the S coast of Australia covered in this volume are the frequent underwater canyons, throughout the entire length.

1.120

- 1 **Discoloured water.** Areas of discoloured water are charted in position 17°20'S 97°00'E (reported 1981), and near the E end of Broken Ridge in position 32°40'S 99°35'E (reported 1986).

1.121

- 1 **Significant features:**

Batavia Seamount (25°40'S 100°20'E).
Cuvier Basin (22°00'S 111°00'E).
Cuvier Plateau (24°10'S 108°20'E).
Dirk Hartog Ridge (30°30'S 105°10'E).
East Indiaman Ridge (26°00'S 99°00'E).
Eendracht Seamounts (28°35'S 102°45'E).
Gulden Draak Seamount (29°00'S 98°25'E).
Wallaby Plateau (22°10'S 104°40'E).
Wharton Basin (19°00'S 103°00'E).

CURRENTS, TIDAL STREAMS AND FLOW

Currents

General remarks

1.122

- 1 There is considerable variation in current strength and direction mainly due to wind variations. Current constancy is low with directions modified even to the extent of reversals. Observations of currents are scarce for the region.

Diagrams 1.122a to 1.122d show predominant current directions, constancy and rates for four selected periods in the year. The following interpretation is used:

- 2 Predominant Direction: the mean direction within a continuous 90° sector containing the highest proportion of observations from all sectors.
Average rate: the rate to the nearest ¼ kn of the average of the highest 50% in predominant sectors.
Rates above or below those shown may be experienced.
Constancy: a measure of persistence. Low constancy implies marked variability in rate and direction.

North coast of Australia

1.123

- 1 The SE monsoon winds from April to November are associated with the W current through Torres Strait and the WSW current through Arafura and Timor Seas. These currents join into the W beginning of the South Equatorial Current off North West Cape of Australia. During the W monsoon through December to March, a reversal occurs and the current becomes NE or E bound in Timor and Arafura seas and E through Torres Strait but is normally weak. Weak anticlockwise circulations from this current may develop in Joseph Bonaparte Gulf and Gulf of Carpentaria.

North-west coast of Australia

1.124

- 1 The monsoon winds drive the currents along the NW coast of Australia, the currents being N to NE in the period September to February and weak SW from March to August. The time of the onset of the monsoon winds vary from year to year. There is low constancy of the predominant direction and the mean rate is less than 1 kn. Flows of 2 to 3 kn have been noted sometimes against the expected direction. During the NE flow the current recurves, as a counter current, in the region of Eighty Mile Beach.

Currents east of 110°E between 20°S and 34°S

1.125

- 1 Beyond 60 miles from shore the current is E in winter and NW to NE in summer. Clockwise turning branches from the N or NE current set E or sometimes S along the coast. The set is more continuous during the winter than the summer. South towards Cape Leeuwin, there is often an onshore component of up to 2 kn but normally around ½ to 1 kn. Constancy is low.

Great Australian Bight

1.126

- 1 From October to March E winds affect the area N of 37°S. A W current, 50 to 100 miles wide with a mean rate of ¾ kn, sets across the entrance of Great Australian Bight N of about 36°S and as far W as about 120°E. Within 50 miles of the coast of S Australia, to the E of Kangaroo Island, NW currents are found. To the W, closer inshore, the current is subject to variations with W or NW-going currents to the SE of Albany and to the W of Eyre Peninsula. There is a weak clockwise circulation around the Bight. During April to September a current of ¾ kn sets E across Great Australian Bight, has low constancy and sets SE near Kangaroo Island. A W current of up to 1 kn may be encountered 70 miles off the coast between Cape Riche and Point Dover.

West of 110°E

1.127

- 1 To the W of 110°E, the counter clockwise current of the S Indian Ocean is the main driving feature. South of 28°S, the current is E-going, becoming N farther N, then NW to W, N of 20°S. Rates of between ¾ and 1 kn prevail.

Southern Ocean south of 38°S

1.128

- 1 South of 38°S between 90° and 140°E, the current sets between SE and NE at a mean rate of ¾ to 1 kn; despite the low constancy, rates of up to 3 kn have been experienced.

Effect of a tropical cyclones

1.129

- 1 Violent tropical cyclone winds generate substantial currents that significantly alter the normal pattern. Fetch area, speed of advance of the cyclone and the wind strength play a part in mobilising changes to currents. See *The Mariner's Handbook* for details of the effects to be expected.

Tidal streams

General information

1.130

- 1 Off the N coast of Australia the rising stream generally sets E and S, and the falling stream W and N. Little is known of the tidal streams in Gulf of Carpentaria.
In the approaches to Darwin the streams are mainly semi-diurnal and may attain rates of up to about 4 kn. Farther W the rates become somewhat less, but in the approaches to large bays and inlets they are considerable. They increase again in the approaches to King Sound where rates as great as 10 kn may be experienced in the narrowest parts of the channels.
- 2 Farther SW the rates decrease until off the W coast of Australia the tidal streams are generally weak and diurnal in character.
The flow is considerably affected by meteorological conditions, this being particularly noticeable off the W coast and in other areas where the tidal streams are usually weak.
- 3 On detached reefs the tidal streams usually set towards the reef from all sides during the rising tide and away from the reef during the falling tide. The streams are particularly noticeable in the channels through the reef where the rates may be considerable.

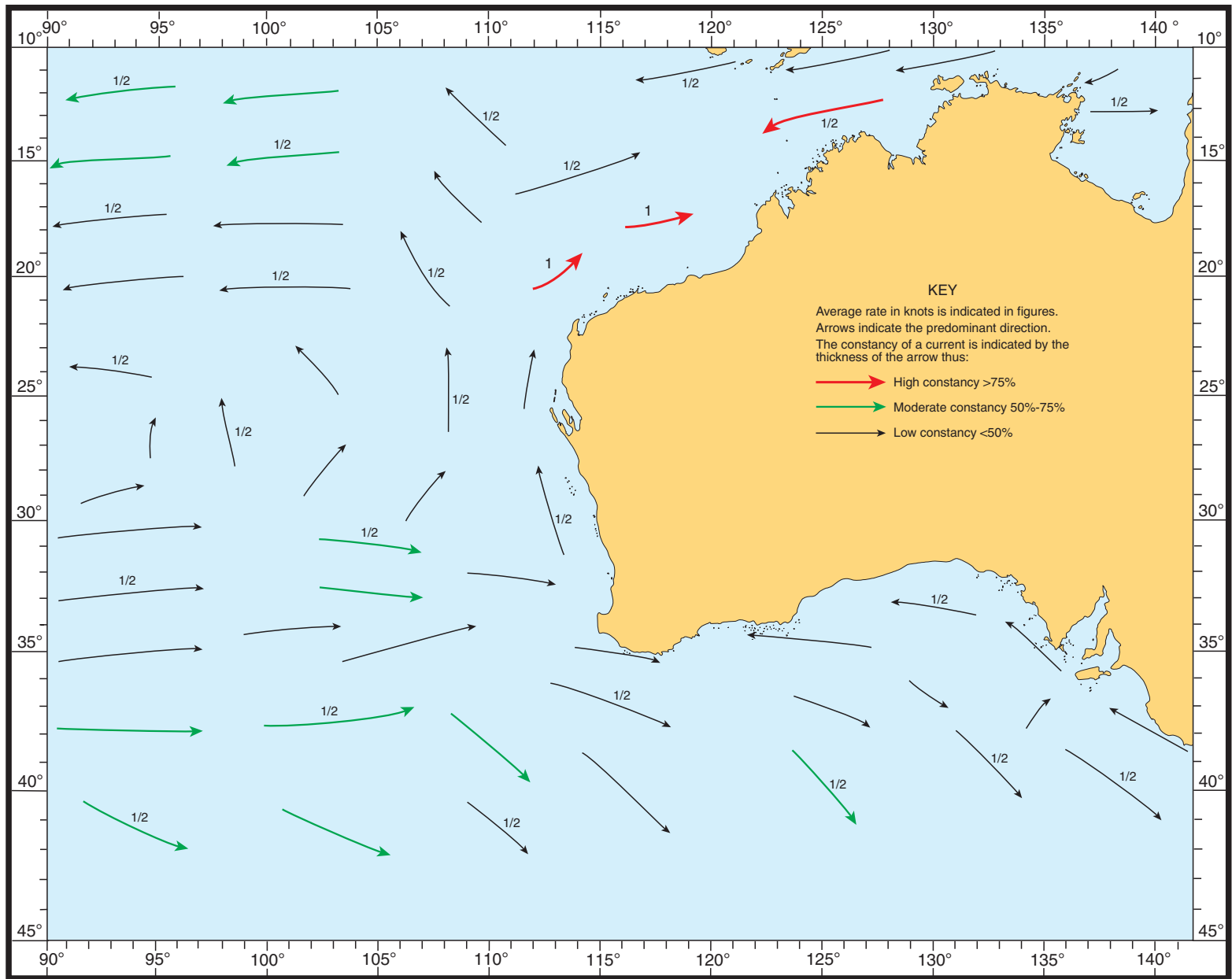
SEA LEVEL AND TIDES

Sea level

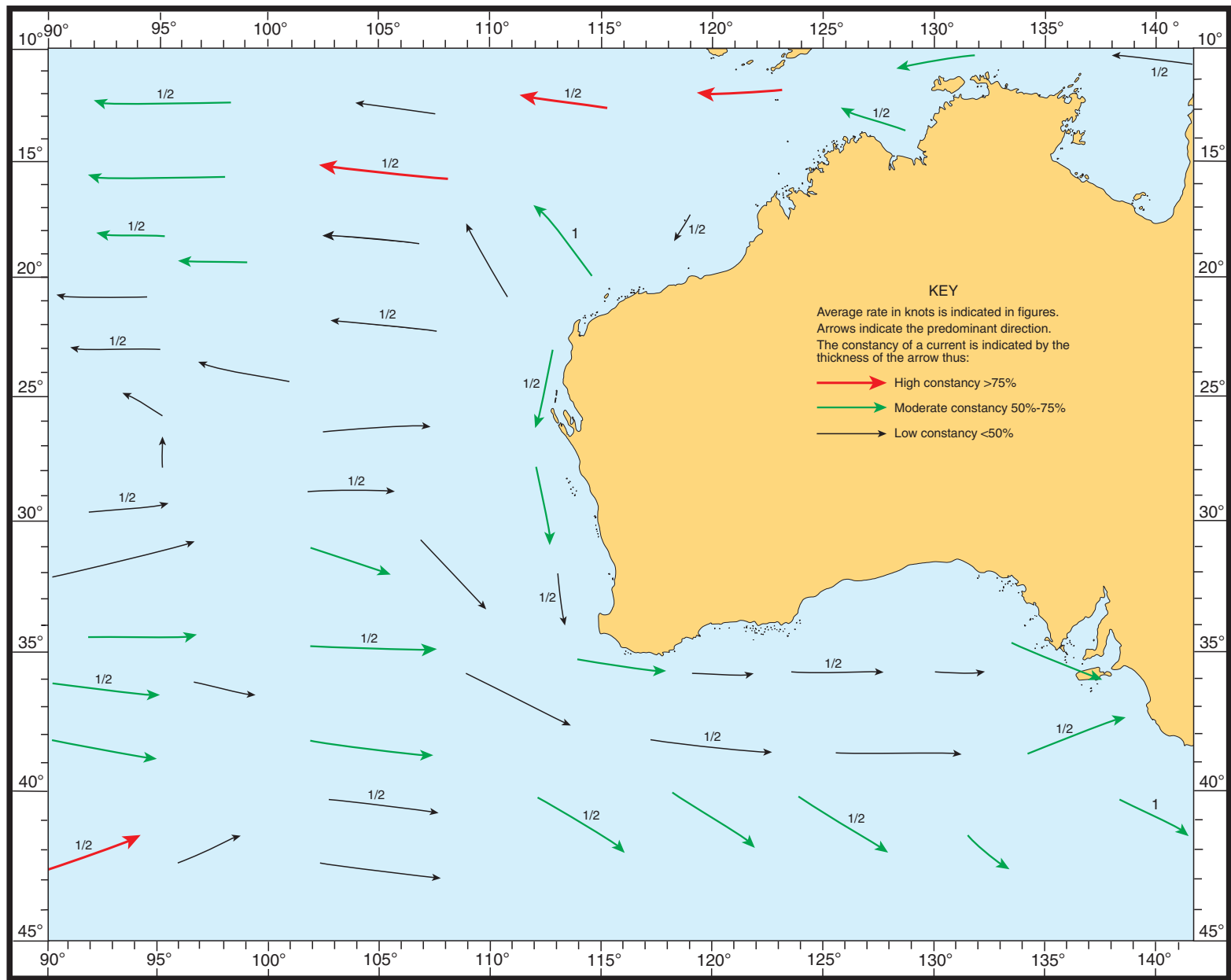
Changes in sea level

1.131

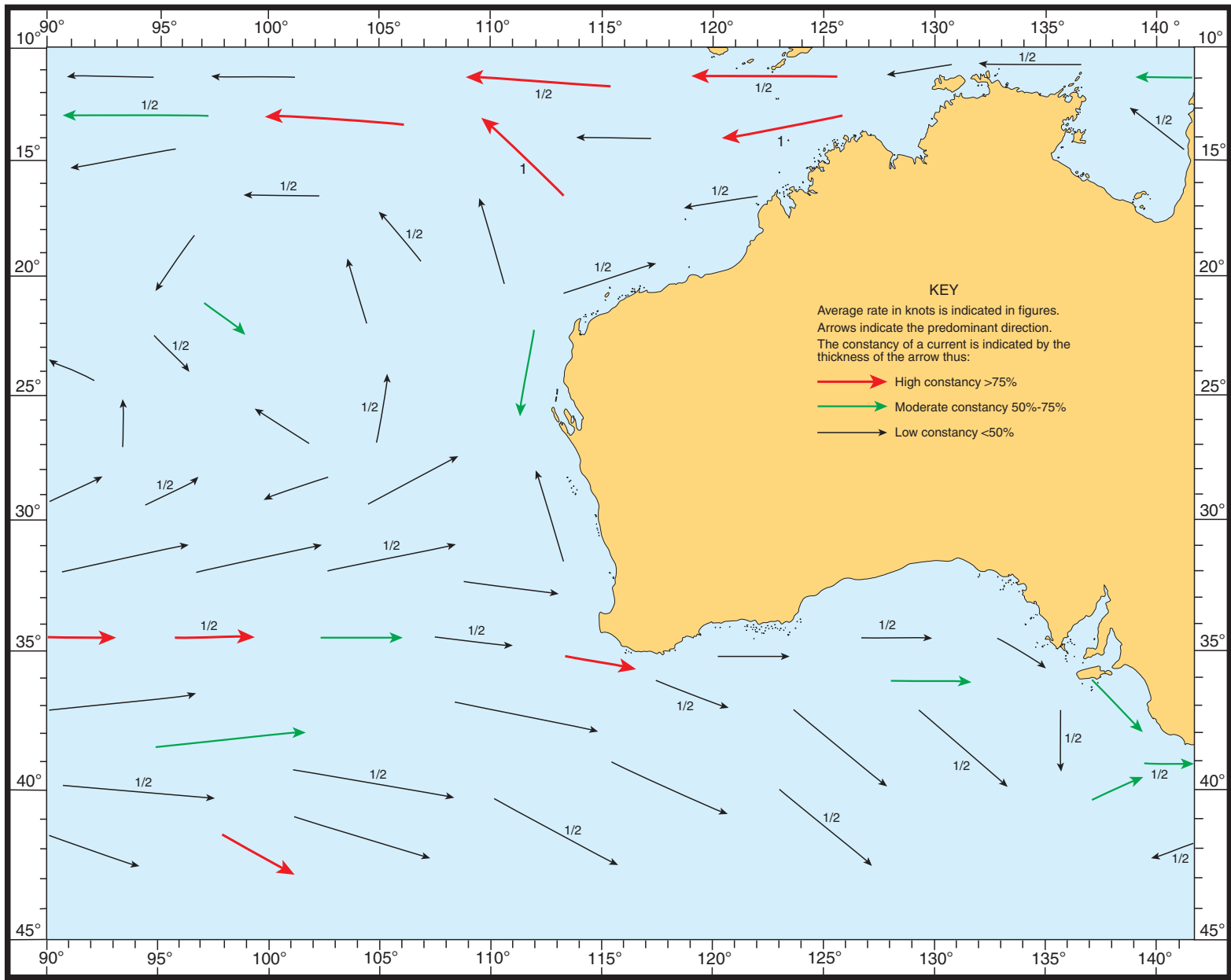
- 1 Seasonal changes in MSL vary up to between plus and minus 0.2 m. Full details are given in *Admiralty Tide Tables*.
Changes in sea level are most noticeable where range of tide is small. Seasonable changes can therefore be clearly seen on the W coast where, at some places, they exceed the range of the tide. On the NW and N coasts they can only be distinguished by the analysis of tidal observations.
- 2 On the W coast, also, offshore winds noticeably depress, and onshore winds noticeably raise, sea level. This probably also occurs on the NW and N coasts, but is not noticeable owing to the greater range of tide.



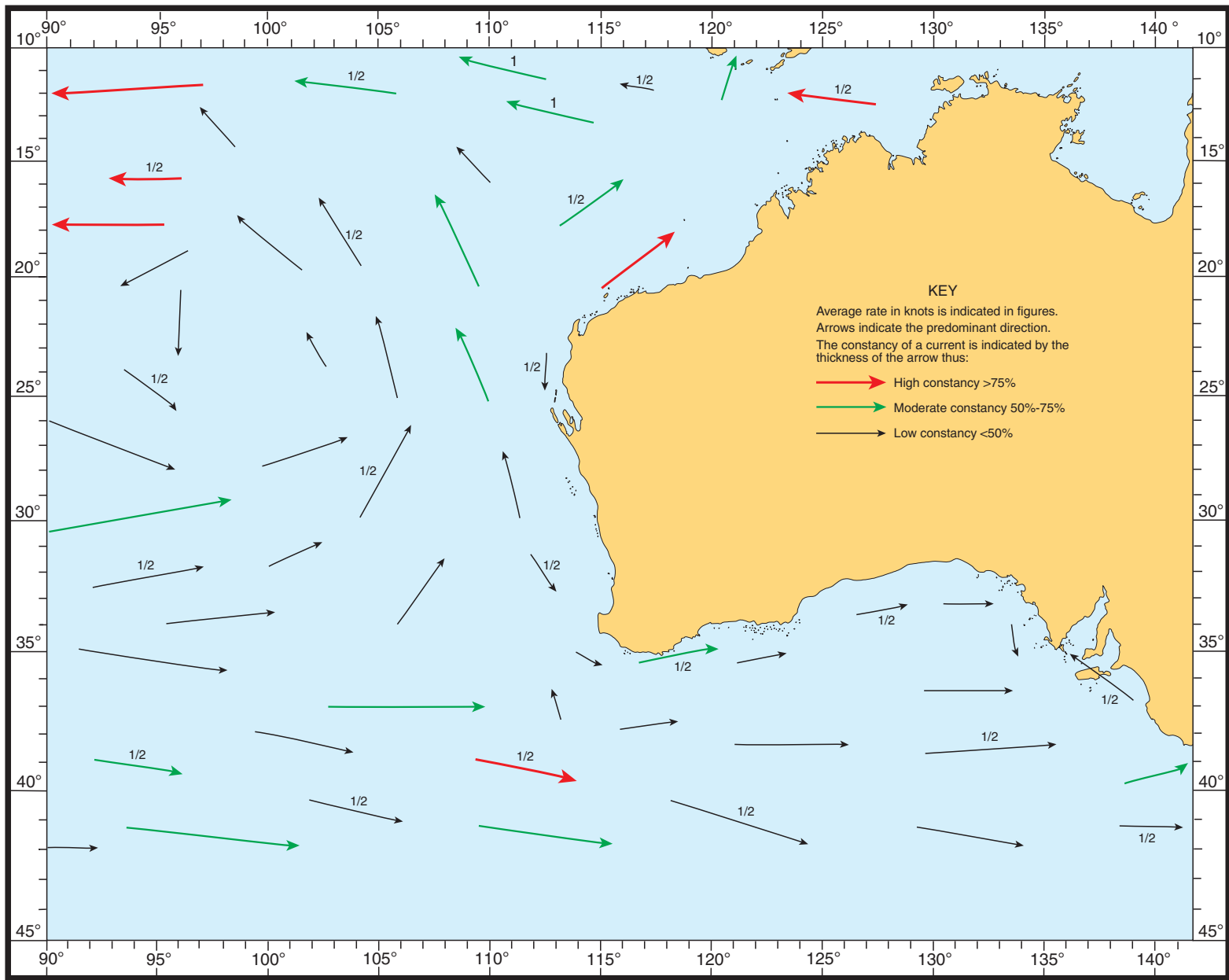
Predominant currents - direction, constancy and variability FEBRUARY (1.222a)



Predominant currents - direction, constancy and variability MAY (1.222b)



Predominant currents - direction, constancy and variability AUGUST (1.222c)



Predominant currents - direction, constancy and variability NOVEMBER (1.222d)

SEA AND SWELL

Sea conditions

Sea waves

1.132

- 1 **North of 23°S.** Between the main monsoon winds, seas are smooth or slight with occasional rough conditions associated with squalls in the doldrums. The lighter NW monsoon produces mainly slight seas. Apart from tropical cyclones, the SE trade winds produce the roughest conditions. Tropical cyclones raise very rough seas in a short period.
- 2 **West coast.** Rough conditions are a common feature. The frequent NW and SW winds linked with E bound depressions are the strongest and produce rough seas, sometimes for several days and often in association with frontal troughs. The highest seas occur in winter and spring. Depression tracks are farther N at this time but severe conditions are usually confined to S of 30°S.
- 3 **South of 34°S.** Further S, the uninterrupted W winds foster deep depressions. These produce persistent and very rough conditions especially during June to September. Zones of rough weather may accompany E-bound ships across Great Australian Bight. In summer, the established high pressure brings more moderate seas. In coastal areas on-shore breezes can be supported by the pressure gradient to create rough seas. Strong off-shore winds may give rise to short steep seas.

Freak waves

1.133

- 1 Evidence for the occurrence of freak waves grows; whilst these are rare they are known to be generated in suitable conditions with heights of around 30 m and have very steep fronts.

Swell conditions

Swell waves

1.134

- 1 Diagrams 1.134a to 1.134d show roses giving the occurrence of swell waves from selected directions for the period January, April, July and October.
- 2 **North and north-west coast.** A long W swell develops in Arafura and Timor Seas during the NW monsoon. These may reach a height of 6 to 8 m in Timor Sea and 5 to 6 m in Arafura Sea. Low E or SE swells prevail in the SE trade winds. The appearance of a long heavy NW swell may indicate the location and approach of a tropical cyclone or deep depression.
- 3 **South of 22°S.** Progressively, with S latitude, the swell becomes S then SW and heavier. The approach of a vigorous depression is frequently indicated by a change to the normal swell to the W or NW. Southern Ocean raises substantial and persistent SW swell to break on the S coast. Swell waves of 5 m are common but waves of 6 to 10 m are encountered most frequently in the winter period.

SEA WATER CHARACTERISTICS

Salinity

Surface values

1.135

- 1 Salinity is fairly uniform over the area covered by this volume, having average surface values between 34.5 and

36 in summer and between 34.5 and 35.5 in winter. There are no major fresh water rivers to affect the salinity at ports in the area. See *The Mariner's Handbook* for method of measurement.

Sea temperature

Distribution of sea temperature

1.136

- 1 **North of North West Cape.** Sea temperature off N and NW Australia and Arufura and Timor Seas remains in the range 27° to 29°C during the summer months November to February. The SE trade winds lower the temperature to 26°C in August.
- 2 **West coast.** Mean sea temperature is highest during February to March and lowest in August. The temperature decreases over the open ocean by 1°C for every 2° of latitude S. Off North West Cape mean sea temperature peaks at 27°C and is least at 22°C. Near Cape Leeuwin the peak is 21°C and the mean minimum 17°C.
- 3 **South of 34°S** Temperature continues to decrease with latitude. Summer values reach 15°C and winter values fall away to 12°C at 40°S. For selected latitudes in this area, the temperature is slightly higher in the E than in the far W by about 2°C. Warm surface water drifts SE past Cape Leeuwin and E towards Spencer Gulf. This drift increases temperature by about 3°C and is slow to retreat during the winter period.
- 4 The mean sea surface temperatures for the months of January and July are shown at Diagrams 1.136a–b.

ICE CONDITIONS

Icebergs

1.137

- 1 Icebergs drift N from Antarctica and may be of immense size. Their mean N limit, reached during the first quarter of the year, extends from a point about 150 miles S of Cape Leeuwin, E to near 130°E, then SE to about 400 miles S of Cape Northumberland.

CLIMATE AND WEATHER

General information

1.138

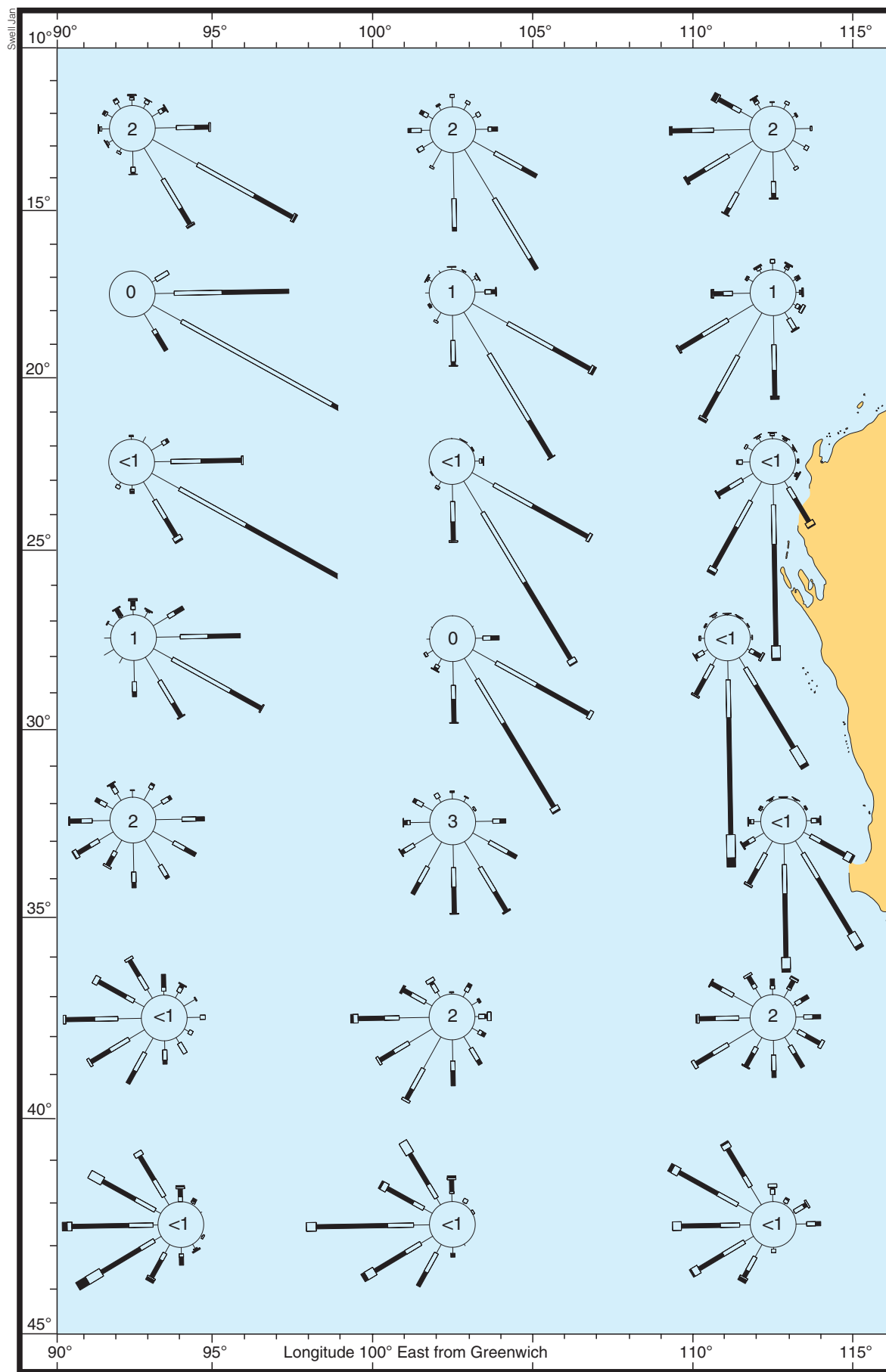
- 1 The following information should be read in conjunction with the chapters on climatology and weather in *The Mariner's Handbook*.
Weather reports and forecasts concerning the ocean areas around Australia are broadcast regularly. Schedules and details of transmissions are given in *Admiralty List of Radio Signals Volume 3 (2)*.

General conditions

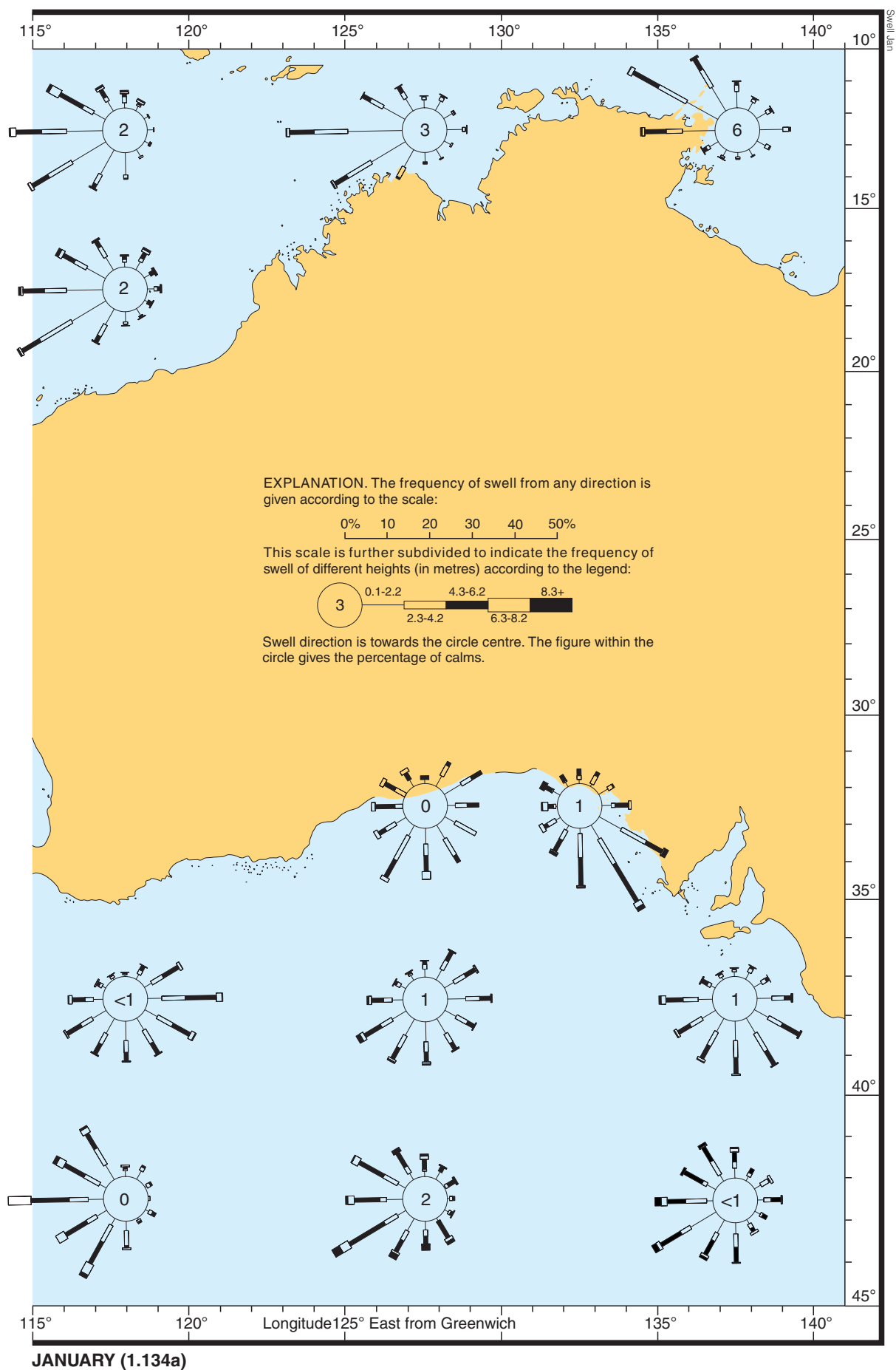
Seasons

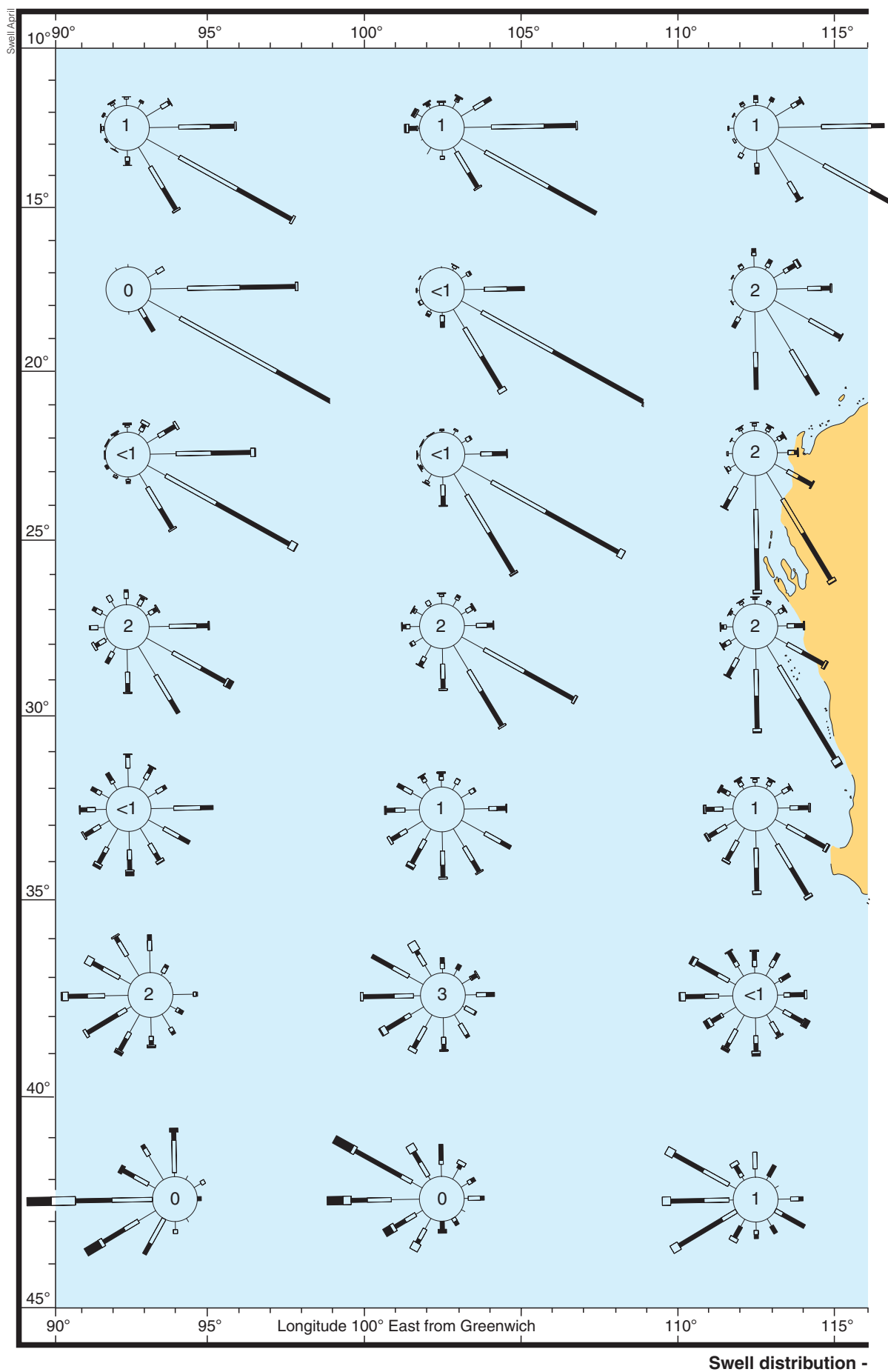
1.139

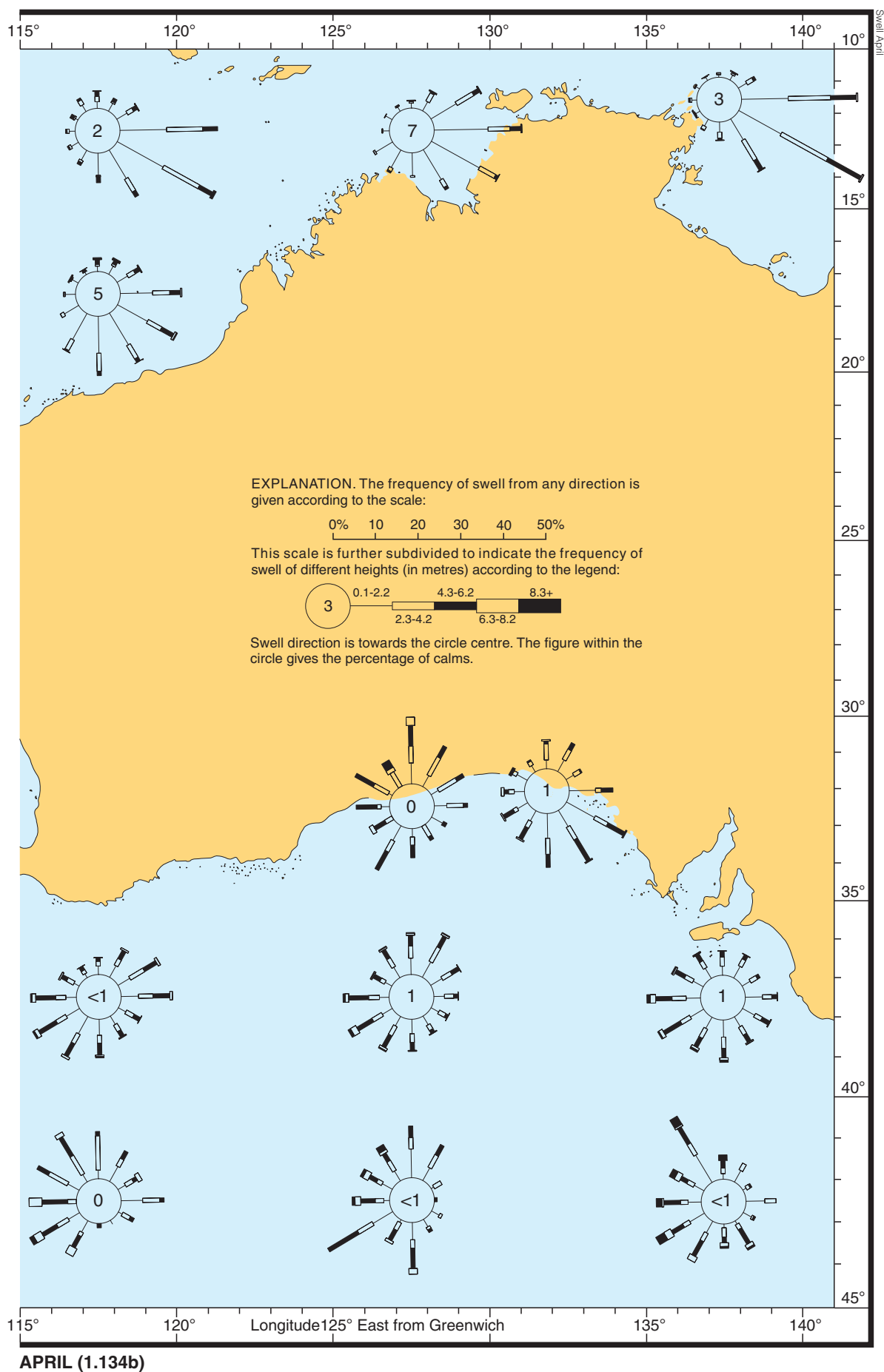
- 1 The region covered by this book extends from the tropics to Southern Ocean and includes the E fringes of the Indian Ocean. In the N, the area is affected by the monsoon winds and the occasional tropical cyclone. In the S, the W winds of Southern Ocean and the temperate zone are the dominating factors. Over Indian Ocean the subtropical anticyclone maintains a stabilising influence. The year divides into summer (November to April), and winter (May to October).

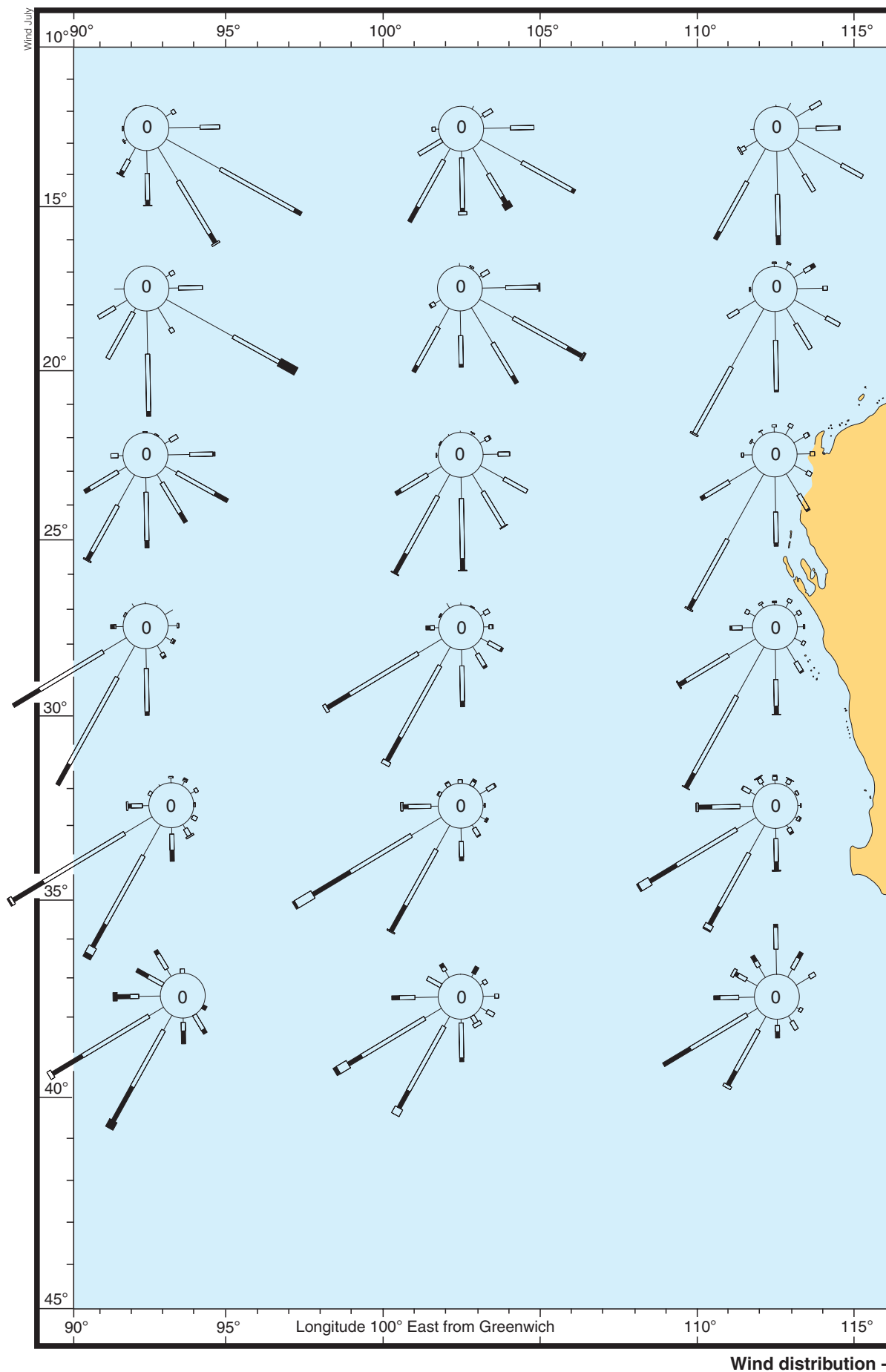


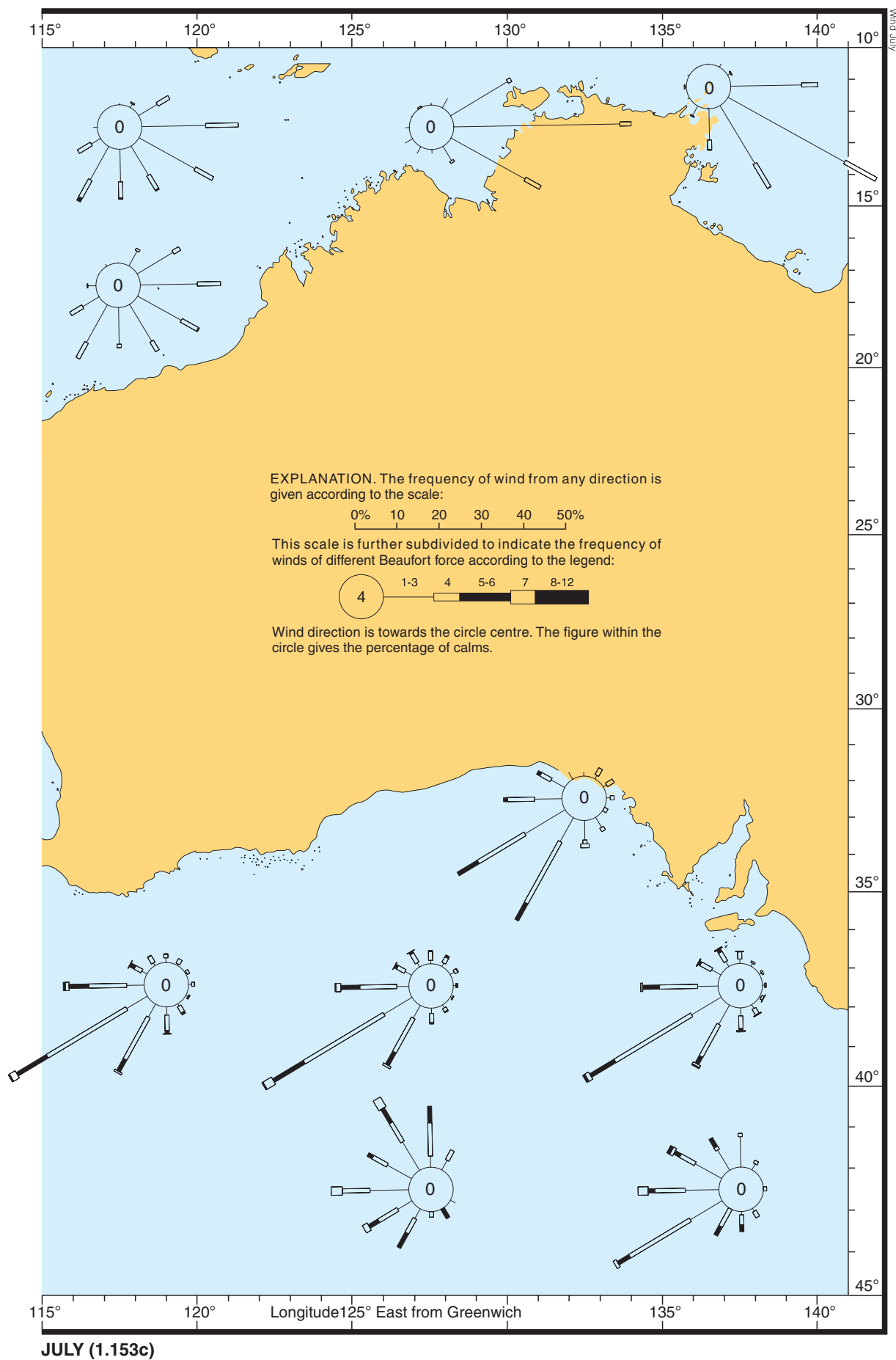
Swell distribution -

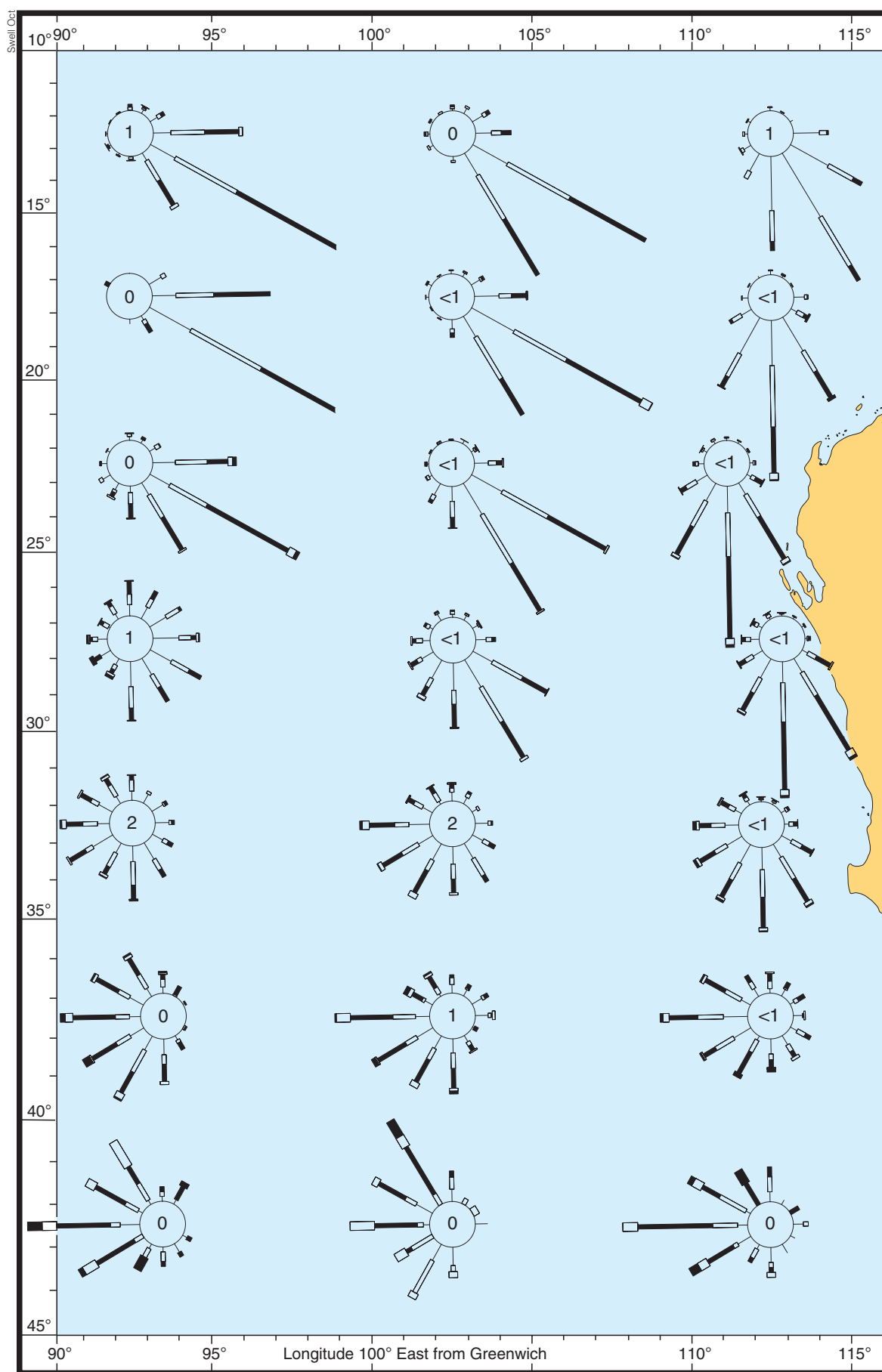




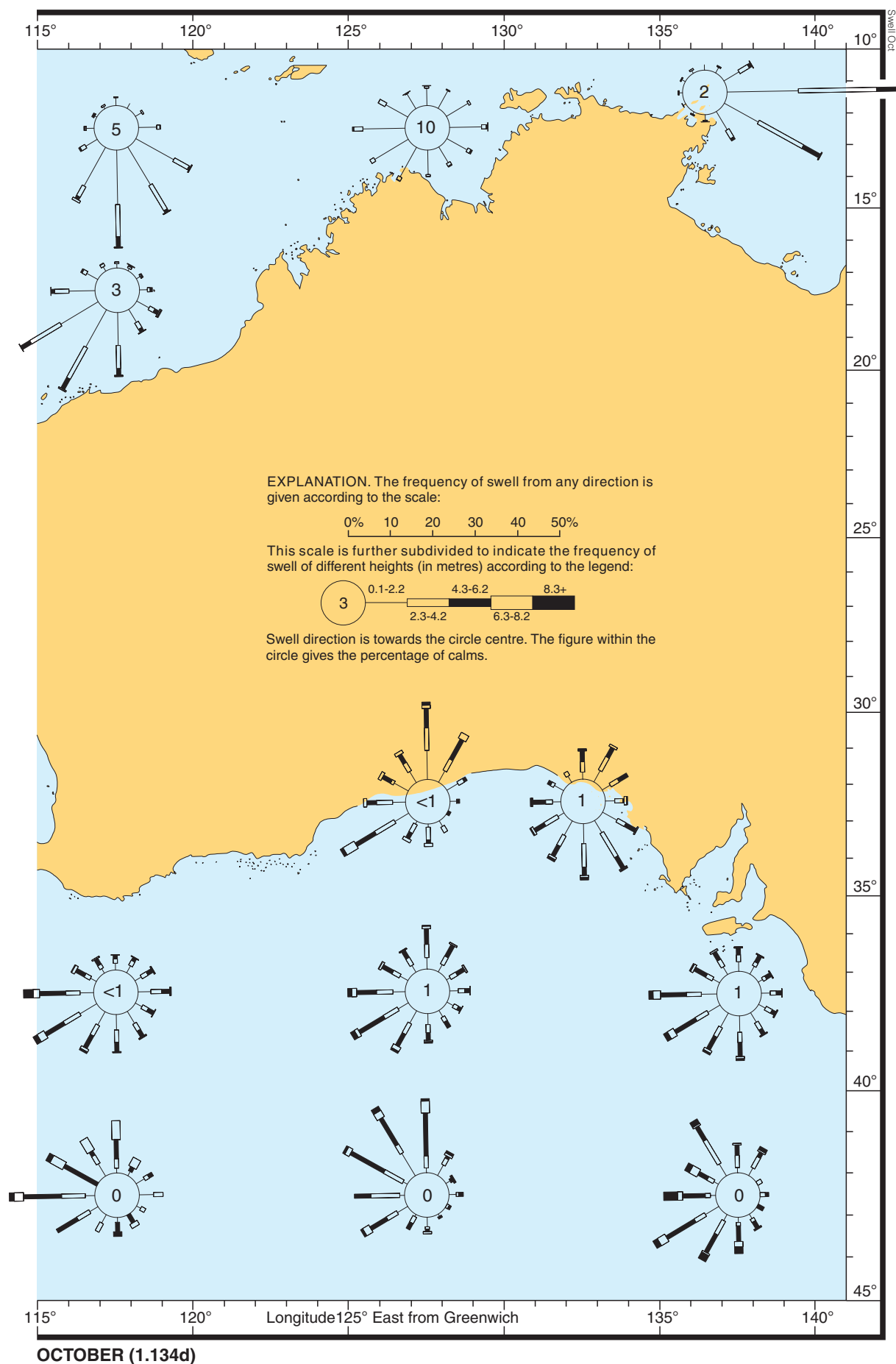


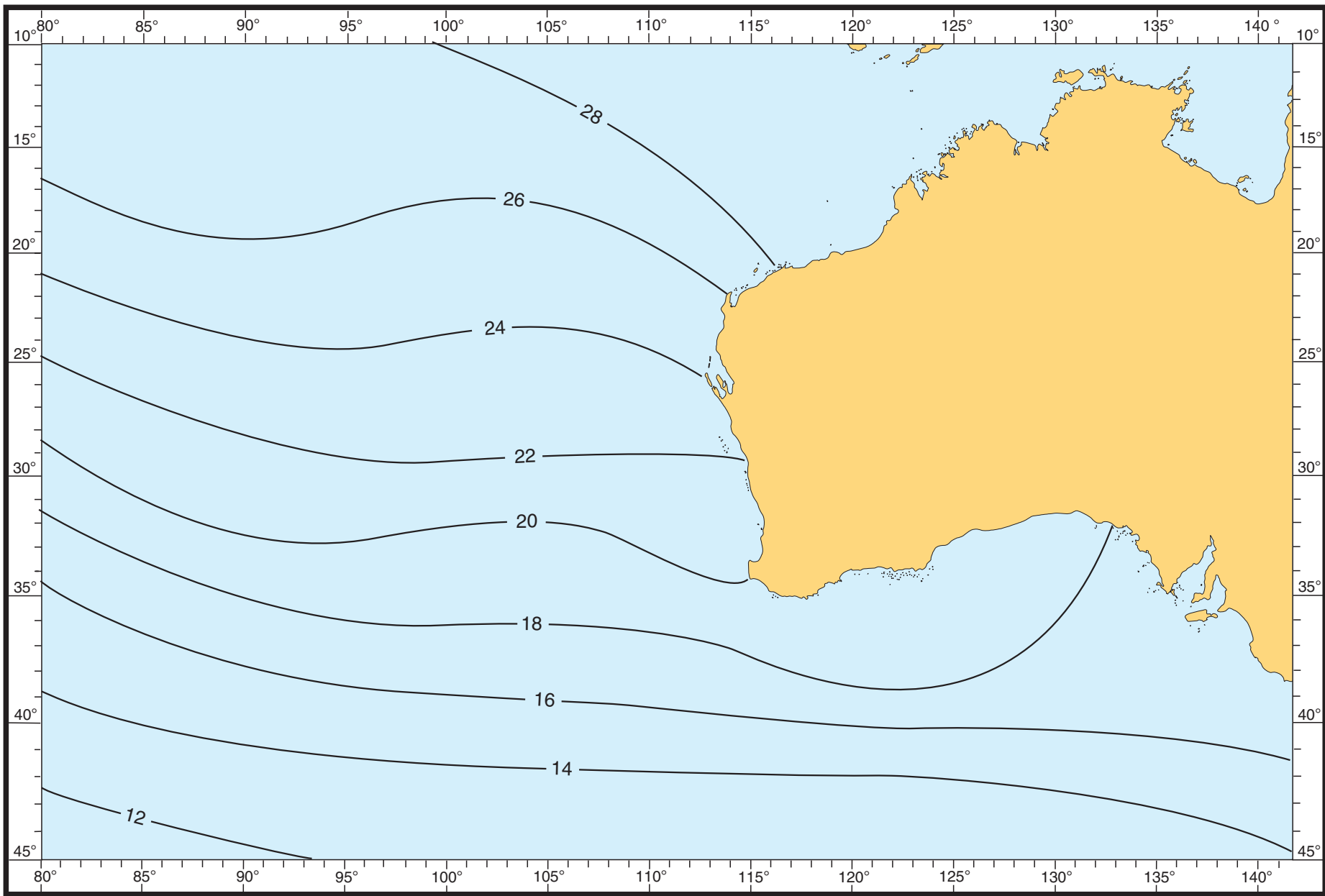




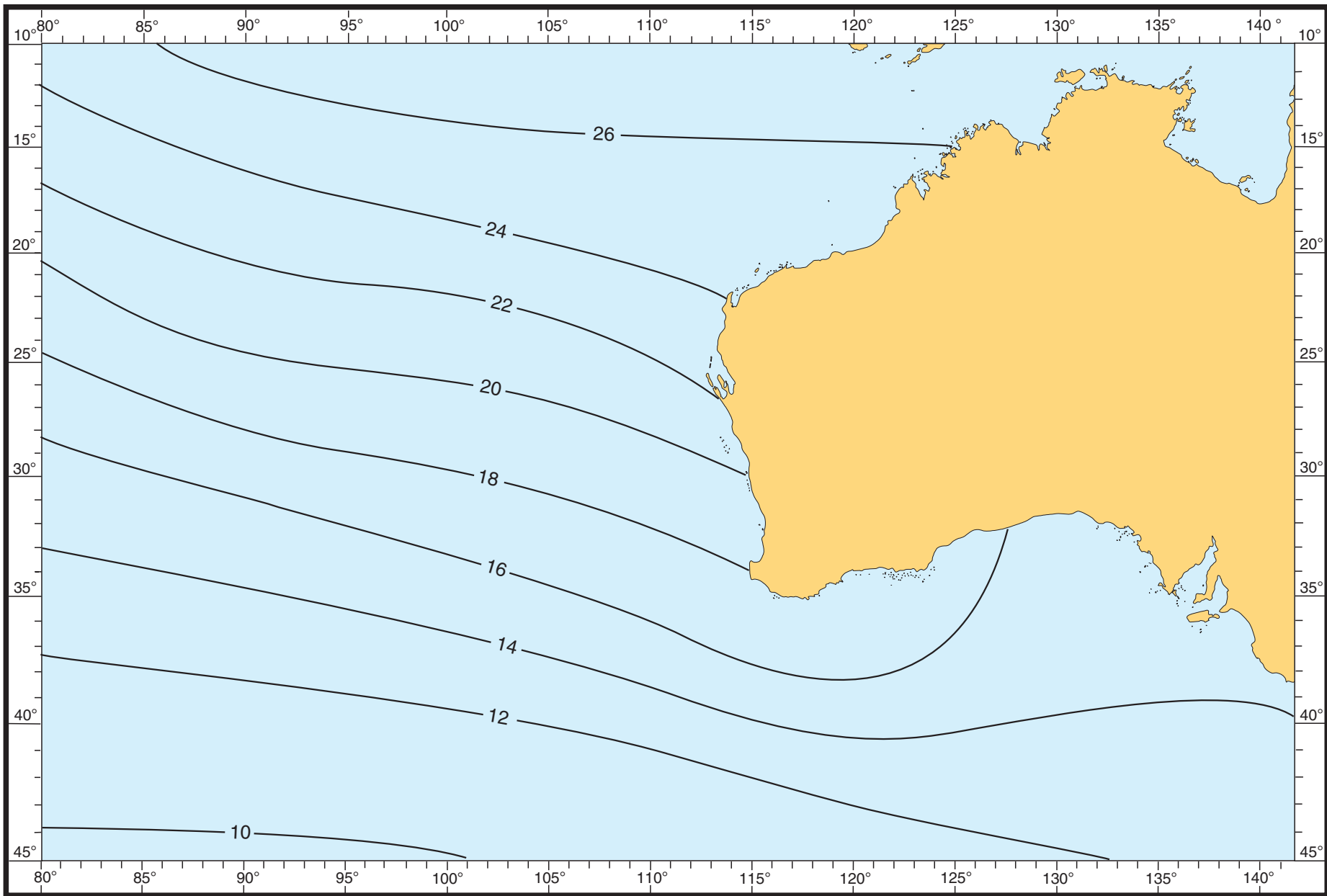


Swell distribution -





Mean sea surface temperature (°C) JANUARY (1.136a)



Mean sea surface temperature (°C) JULY (1.136b)

Northern area

1.140

- 1 In winter anticyclones move E in succession across the continent giving generally fine, hot, and dry weather in N and W Australia under the SE trade winds (also known as the SE monsoon).

- 2 In summer warm, moist, tropical air is brought to the region by the W to NW winds of the NW monsoon. This gives uncomfortable, hot, and humid conditions with plentiful rain. The NW monsoon may last from 2 weeks to 4 months. Break periods occur within the monsoon when a SE flow is re-established. About 40 days is the normal time between such breaks. Tropical cyclones affect NW and W Australia chiefly between December and March.

1.141

- 1 The seasons are determined by the annual N to S movement of the E to W high pressure belt which lies across, or just S of, Australia and extends W over the Indian Ocean. The axis of the high pressure belt moves to its summer position of 35° to 40°S in January and February.

Southern area

1.142

- 1 Occasionally a depression of tropical origin may track SE to affect the W and S shores of Western Australia. Winds to hurricane force, torrential rain, mountainous seas and abnormally high water levels can accompany these features.

In winter anticyclones drift E across the continent. Frontal depressions and troughs track E or SE on the S flank of the high. The conditions are marked by variable, mainly moderate but occasional gale force winds, mild temperatures, considerable rain in places, but arid conditions in others. Frost is unusual. Over the sea offshore, NW to SW winds are common as are gales; bands of cloud and rain cross the sea areas at regular intervals.

- 2 In summer the axis of the high is near 37°S; winds are light and the weather is fair below the extensive anticyclone. On the S coast of Australia, SE to S winds prevail and there are well marked land and sea breezes; weather is fine and warm and temperatures sometimes reach 40°C. Visibility is good and fog infrequent.

- 3 Depressions of tropical origin can affect this area with hurricane force winds and mountainous seas but they are very infrequent and are usually weakening. Offshore, the W winds persist in summer but the gales, cloud and rain move farther S.

Pressure

Average pressure distribution

1.143

- 1 The pressure distribution is given in Diagrams 1.143a to 1.143b. Pressure values within the diagrams and tables are averages. The anticyclone dominates the pattern with an E to W axis at 30°S in winter and 37°S in summer. Pressure over N Australia falls due to summer heating. Short term pressure variations under the influence of mobile depressions may be large, particularly with the passage of a tropical cyclone. An unusual rapid fall of pressure in summer, N of 36°S, may indicate that a tropical cyclone is approaching from the N or NE.

Northern area

1.144

- 1 Diurnal variation of sea level pressure is appreciable, particularly in the N of this area with a range of 2 to 3 hPa. Maxima occur at 1000 and 2200 local and minima at 0400 and 1600 local. Diurnal pressure changes may obscure the initial pressure fall associated with an approaching cyclone. When comparing successive barometric pressure observations, the following corrections should be applied to each observation so as to obtain a more accurate indication of pressure change in the latitudes between 10° to 20°S.

Local time	hPa	Local time	hPa
0001	-0.5	1200	-0.5
0100	0	1300	+0.1
0200	+0.4	1400	+0.8
0300	+0.7	1500	+1.2
0400	+0.7	1600	+1.3
0400	+0.5	1700	+1.2
0600	+0.1	1800	+0.8
0700	-0.4	1900	+0.3
0800	-0.9	2000	-0.3
0900	-1.2	2100	-0.7
1000	-1.2	2200	-0.9
1100	-1.0	2300	-0.8

- 2 **Note.** Corrections for diurnal variation must not be applied to observations of barometric pressure recorded in the log or transmitted.

North West Cape to Cape Leeuwin

1.145

- 1 Diurnal range of sea level pressure decreases with higher S latitude and in the S extremities of the area is of little significance.

Southern area

1.146

- 1 The belt of low pressure in the far S marks the path of the frequent major depression that track E across Southern Ocean. Their tracks take a more N path in winter.

Anticyclones

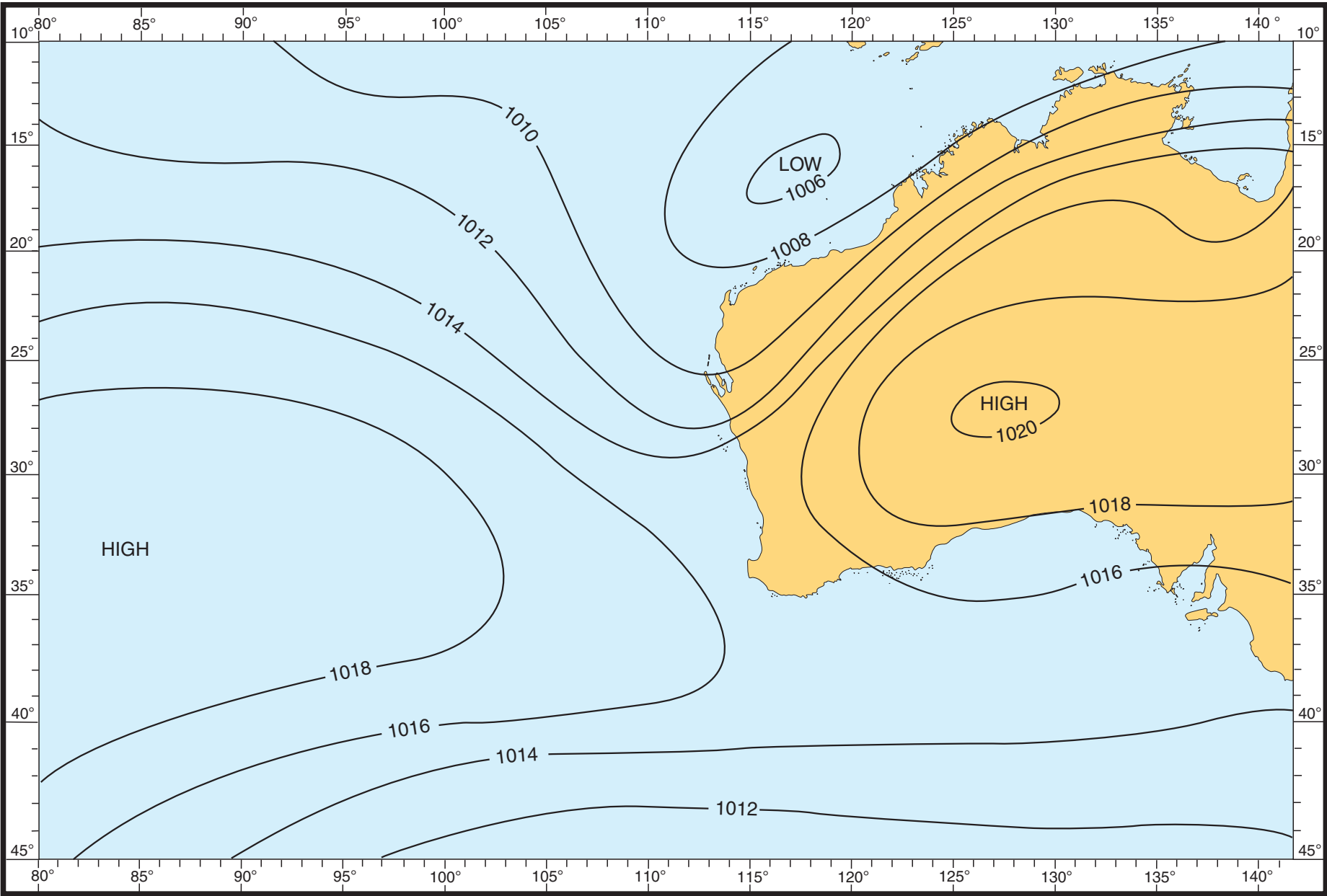
1.147

- 1 The series of mobile cells, forming the high pressure belt, move across the area at about 15 to 20 kn. The cells, with a central pressure of between 1020 to 1030 hPa, move W to E separated by troughs often linked to depression in Southern Ocean. A high pressure cell can remain stationary for several days causing a block. Normally there is a 5 to 7 day cycle in the movement process.

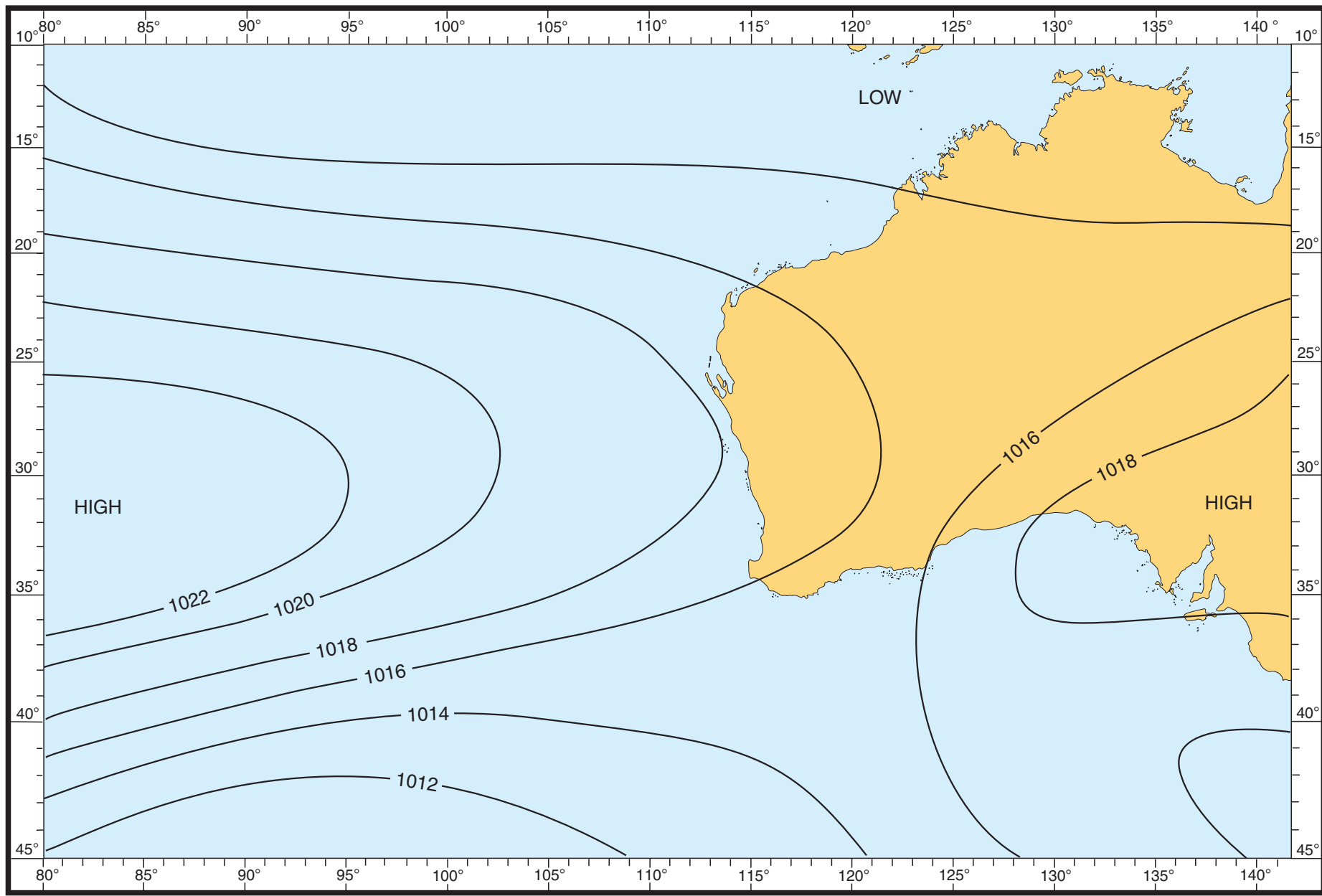
Depressions

1.148

- 1 **Frontal depressions** move in frequent succession E to SE across Southern Ocean. In summer their tracks lie well to the S of Australia. Throughout the summer, S of about 39°S, depressions bring stormy weather and active belts of cloud and rain. In winter depression tracks move farther N; frontal troughs extend to the coastal waters of Australia and bring substantial rains to SW Australia in late April or May. Activity peaks in July when three to four depressions affect the area per month. From August the depression paths move farther S.



Mean sea level barometric pressure (hPa) JANUARY (1.143a)



Mean sea level barometric pressure (hPa) JULY (1.143b)

- 2 **Tropical Origin.** One or two depressions of tropical origin reach this area annually, mainly between January and April. They may track to the W of Australia or take a land route. Where these depressions reach the sea again they can reintensify rapidly. All such depressions have the potential to bring hurricane force winds, very heavy rain and mountainous seas. The cloud bands associated with the frontal troughs and Southern Ocean depressions give considerable, dependable, and sometimes heavy rain as far N as Perth and Geraldton. The degree of activity decreases markedly with lower latitude. The affects of land heating produce enduring areas of low pressure over Cloncurry, NE Australia and Pilbara NW Australia.

Tropical cyclones

1.149

- 1 Tropical cyclones form over Timor and Arafura Seas, mainly between November and April, with most frequent occurrence in January, February and March. Isolated cases have been recorded in other months. No time of year should be considered cyclone free.
- 2 Tropical cyclones often form as minor clockwise circulations, in low latitudes, in the vicinity of the intertropical convergence zone (ITCZ). They usually move in a WSW direction. Where conditions are favourable, the cyclone will deepen and develop; others become trapped in unfavourable areas and dissipate as weak features. Some can deepen to develop winds in excess of 64 kn. A significant but small number will develop to contain winds in the circulation in excess of 125 kn.
- 3 In the Australian region tropical cyclones are rated in two categories. Tropical cyclones have winds in their circulation of between 34 kn and 63 kn and severe tropical cyclones have winds of 64 kn and above.
- Hurricane strength is reached by 30% of Australian tropical cyclones. They are often accompanied by torrential rain, mountainous seas and they may cause abnormal water levels and tsunami waves. They tend to travel W or SW off the N and NW coasts of Australia at speeds of about 5 to 10 kn and often re-curve towards the SE or S to cross the coast of NW Australia between Onslow and Broome.
- 4 Others continue to run S off the W coast of Australia and turn SE in the vicinity of Cape Leeuwin.

Tropical cyclones usually weaken rapidly over land, but may regenerate quickly on return to a sea track. They may persist for a few hours to 3 weeks but normally last for about 6 days. Isolated cyclones move inland, across the coast of NW Australia, and then track SE across Western Australia to Great Australian Bight.

- 5 Tropical cyclones seem to occur closer to the coast during ENSO (El Niño – southern oscillation) conditions than at other times. Cyclone frequency is also linked to a near two yearly cycle of upper air patterns with peak numbers occurring every 2 to 3 years.

Information showing the favoured location for tropical cyclones and some typical tracks is provided in Diagrams 1.149a to 1.149h. An indication of the occurrence of tropical cyclones is given at Diagrams 1.149i to 1.149n.

Tornadoes

1.150

- 1 Tornadoes are rare but are most often found between Fremantle and Cape Leeuwin with an average of 2 per year. They can lower pressure by 100 hPa, move at around 30 kn, be accompanied by rain and lightning and may last for 5 minutes.

Fronts

Northern area

1.151

- 1 The ITCZ is located where the NW monsoon, originating in the N hemisphere, meets SE trade winds on the N flank of the Australian high pressure belt. The ITCZ is not strictly a front but it does have some frontal characteristics within the converging and upward movement of air. This zone is also known as the Doldrums because of the light and variable winds.
- 2 Thundery showers, squalls and torrential rain are associated with the high convective cloud along the zone. The ITCZ moves S across Arafura and Timor Seas as the Australian high pressure belt migrates S in summer. The approach of the ITCZ to the N coast of the Northern Territory in October weakens the SE trade winds; calm or light winds prevail and it becomes very hot.
- 3 There is an increase in number and severity of thundery showers and by the end of November these occur almost daily. The NW monsoon becomes fully established in January, with plentiful cloud, rain and hot humid weather. The ITCZ generally moves as far S as about 21°S in this region and is in its most S position in January and February.
- 4 In March and April the ITCZ again moves N with its associated calms, variable winds and thundery squally showers. When the ITCZ leaves N Australia, cooler, drier SE trade winds arrive with fine weather.

Southern area

1.152

- 1 Warm and cold fronts associated with depressions are frequent and active in both winter and summer, particularly in the S of the area. They bring extensive belts of cloud and rain. To the N, frontal activity is much weaker, although cold fronts introduce colder and moister air from the S and inclement weather to the S coast of Australia in winter. The winds can be strong.
- 2 Frontal activity is lower and rainfall consequently meagre in the central part of Great Australian Bight. In summer the preceding very dry air ahead of frontal troughs severely limits rainfall to the E of the Bight. The N winds preceding the frontal trough are often hot and dry along the S coast of Australia.
- 3 The pressure trough, moving E between successive anticyclones, is marked by a wind change, from generally N winds on the W flank of the leading anticyclone to S, often colder winds, on the E flank of the second high.

Winds

Wind roses

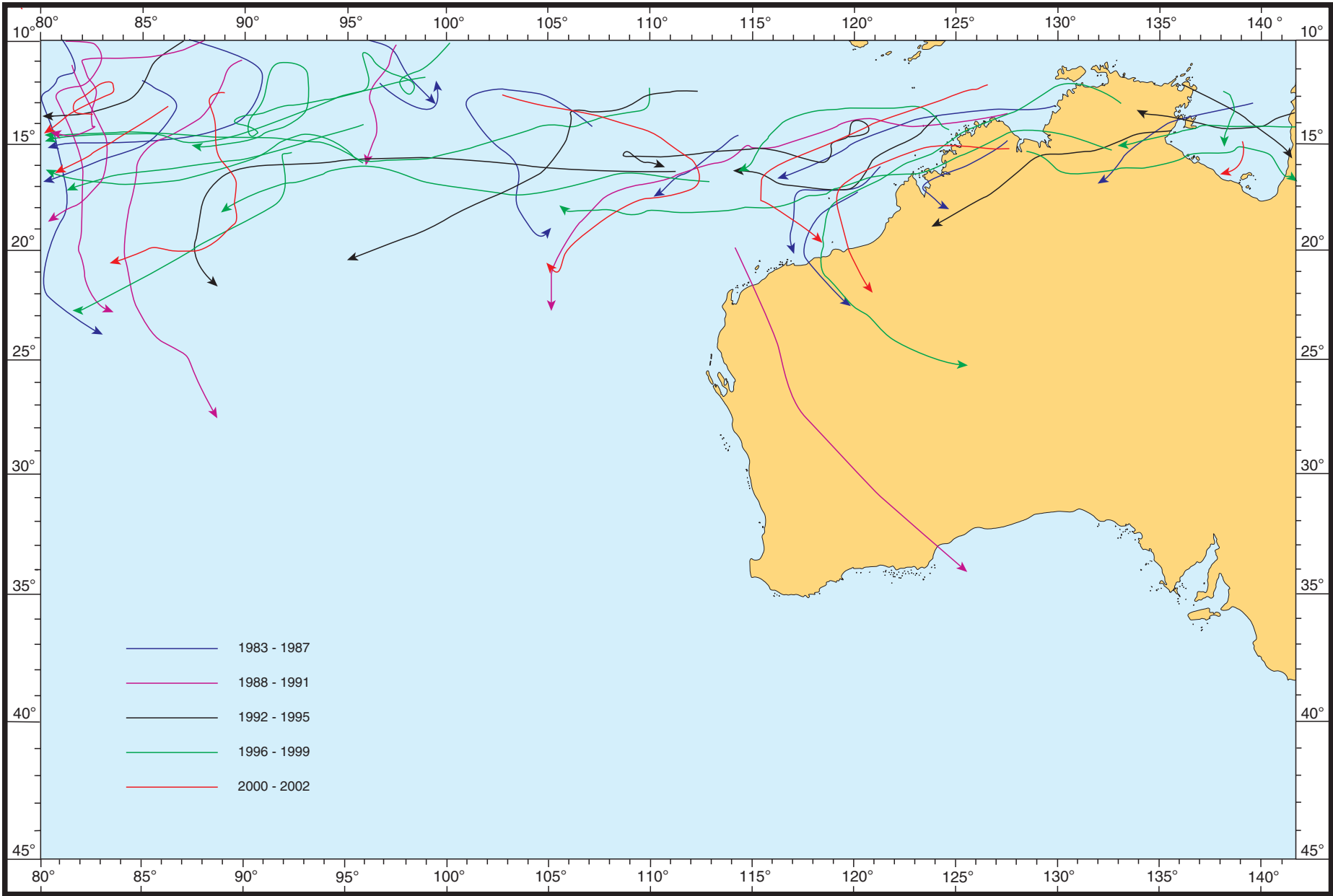
1.153

- 1 Wind roses showing occurrence of wind for selected directions and speeds for January, April, July and October are given in Diagrams 1.153a to 1.153d. Further guidance on the frequency of winds greater than Beaufort force 6 is shown in diagrams 1.153e to 1.153f.

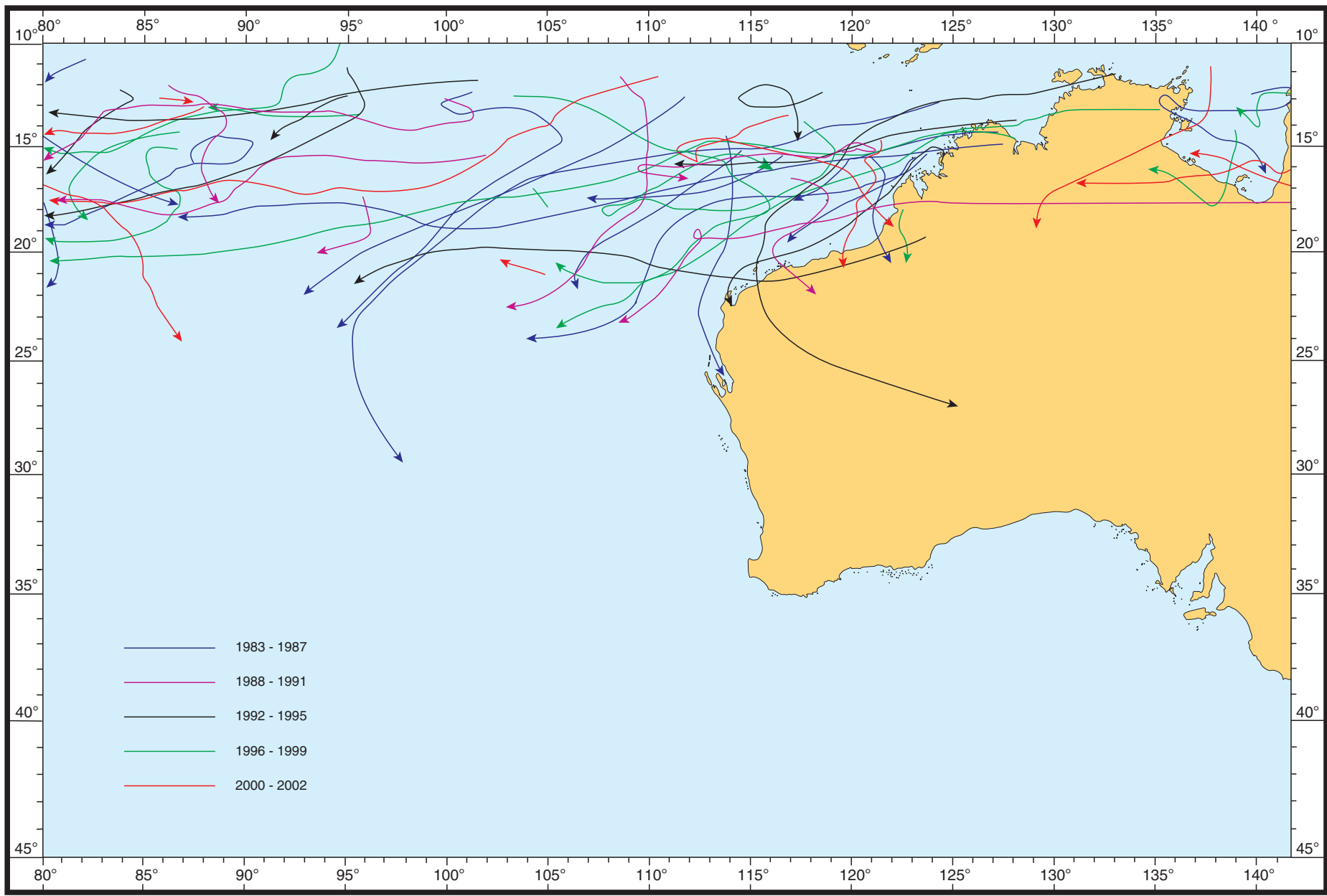
Northern area

1.154

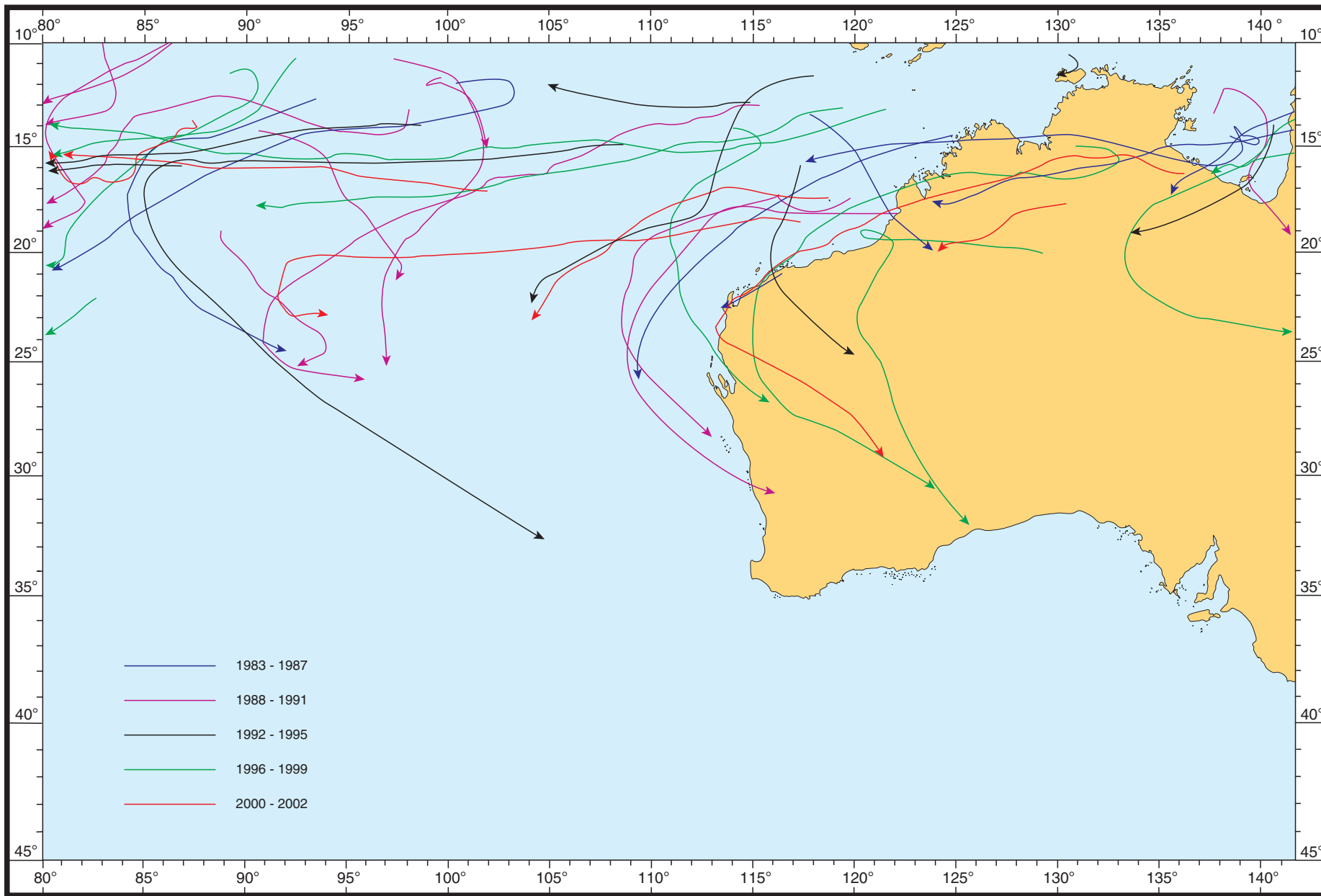
- 1 **South-east trade winds** (also known as the SE monsoon) blow from E and S on the N flank of the Australian high pressure belt. From May to October, they are predominate over the area N of 25°S and E of 105°E. Over the ocean N of 25°S and W of 105°E they prevail throughout the year. The strength is markedly steady at about force 4 to 5.



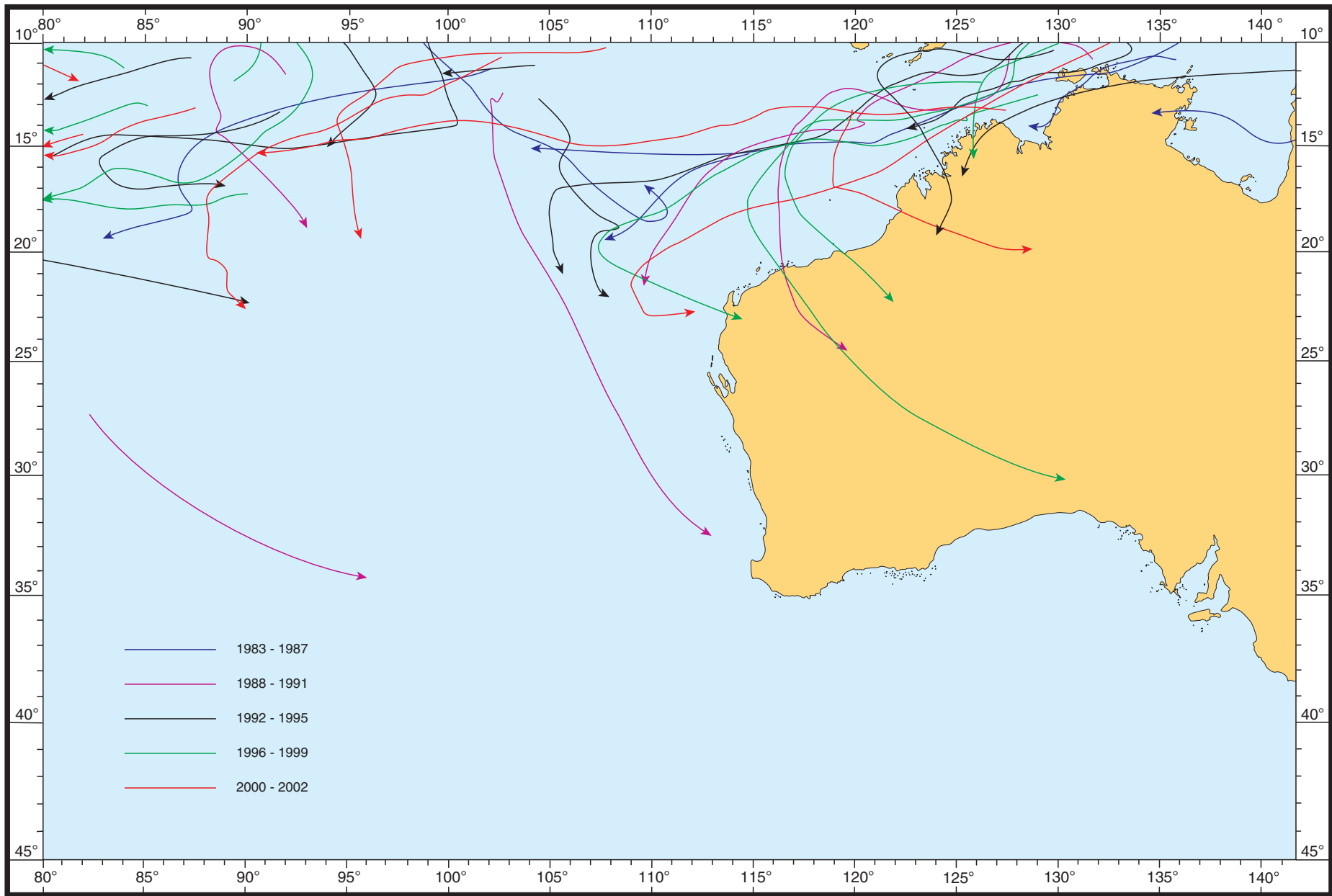
Tropical cyclone tracks JANUARY 1983-2002 (1.149a)



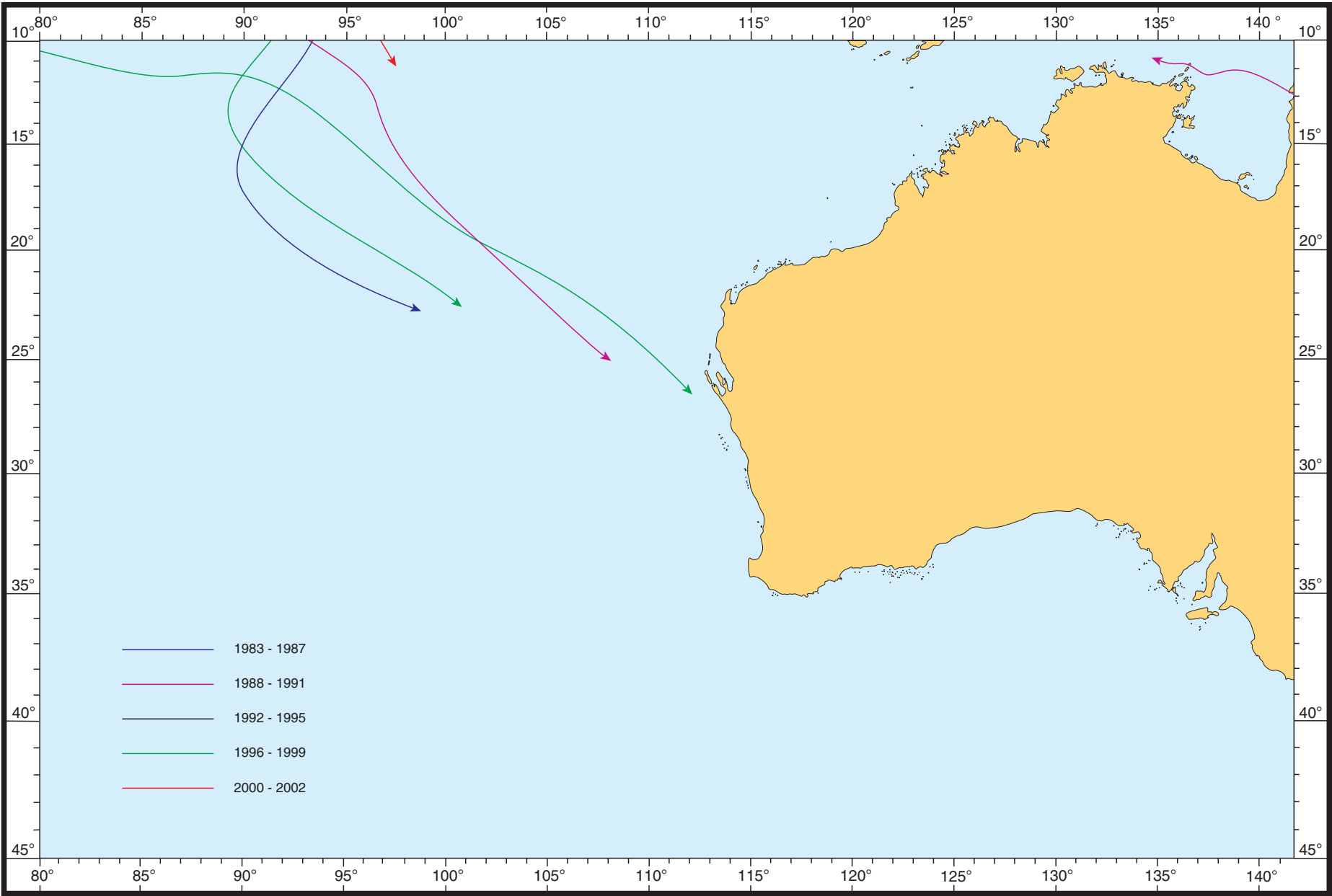
Tropical cyclone tracks FEBRUARY 1983-2002 (1.149b)



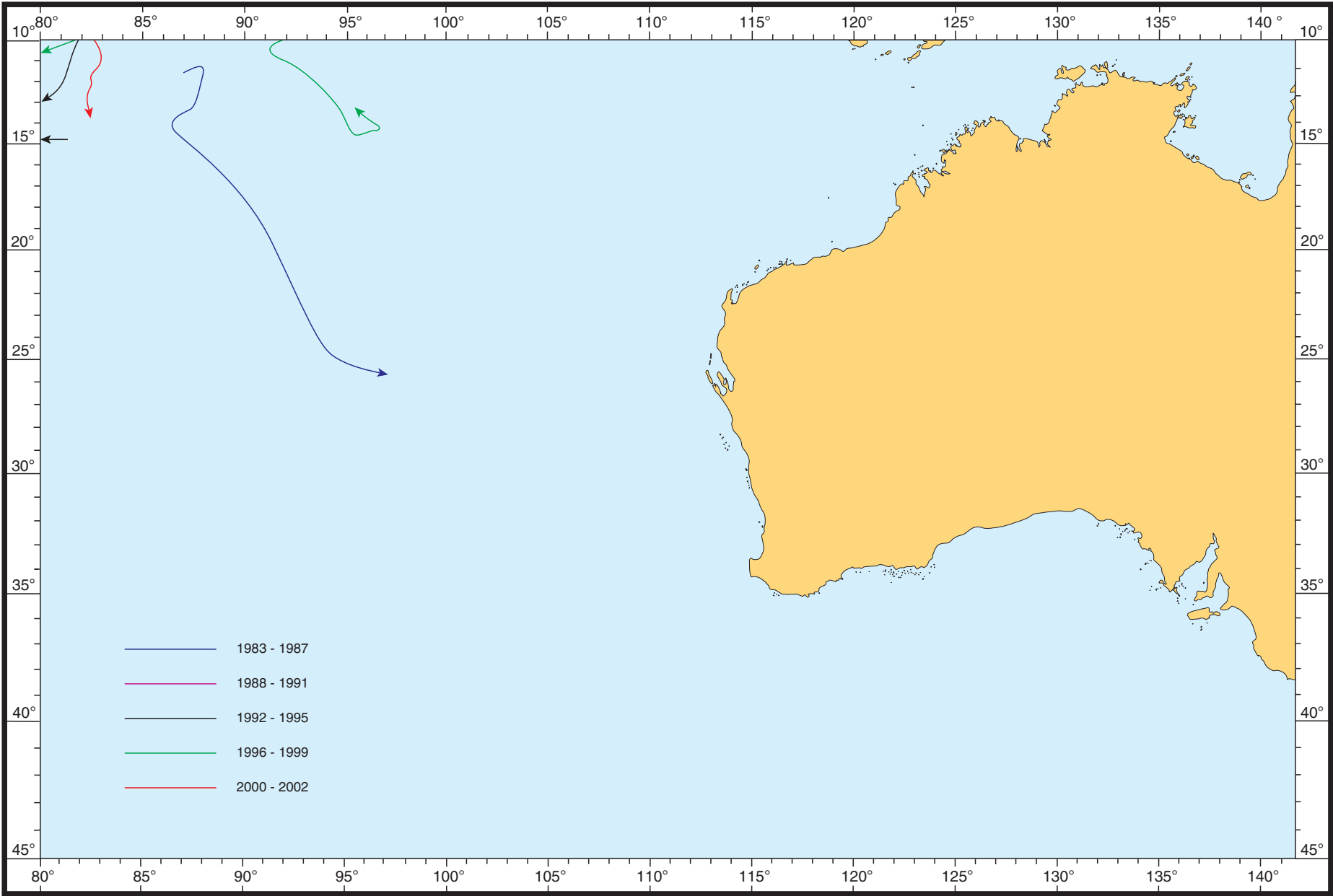
Tropical cyclone tracks MARCH 1983-2002 (1.149c)



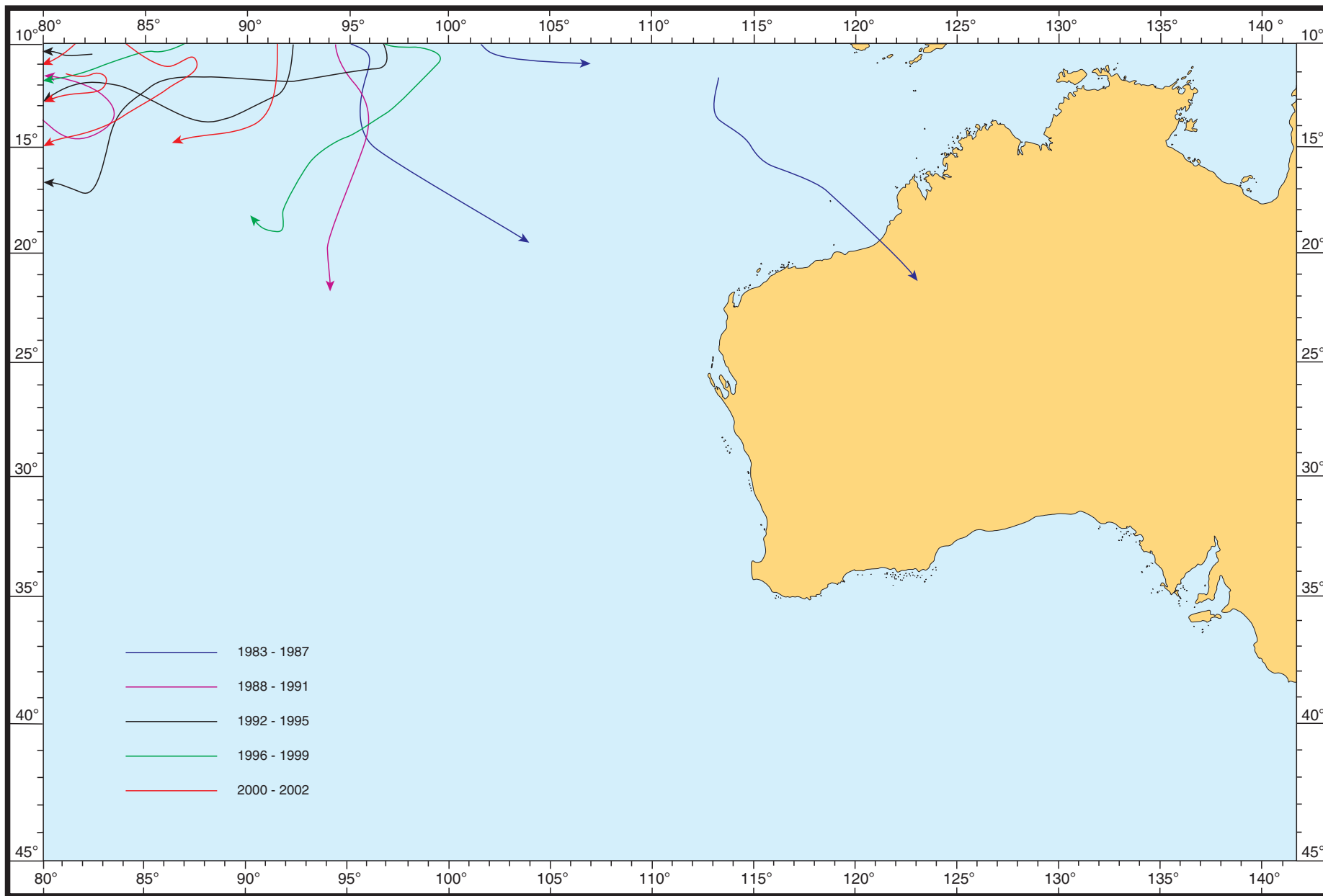
Tropical cyclone tracks APRIL 1983-2002 (1.149d)



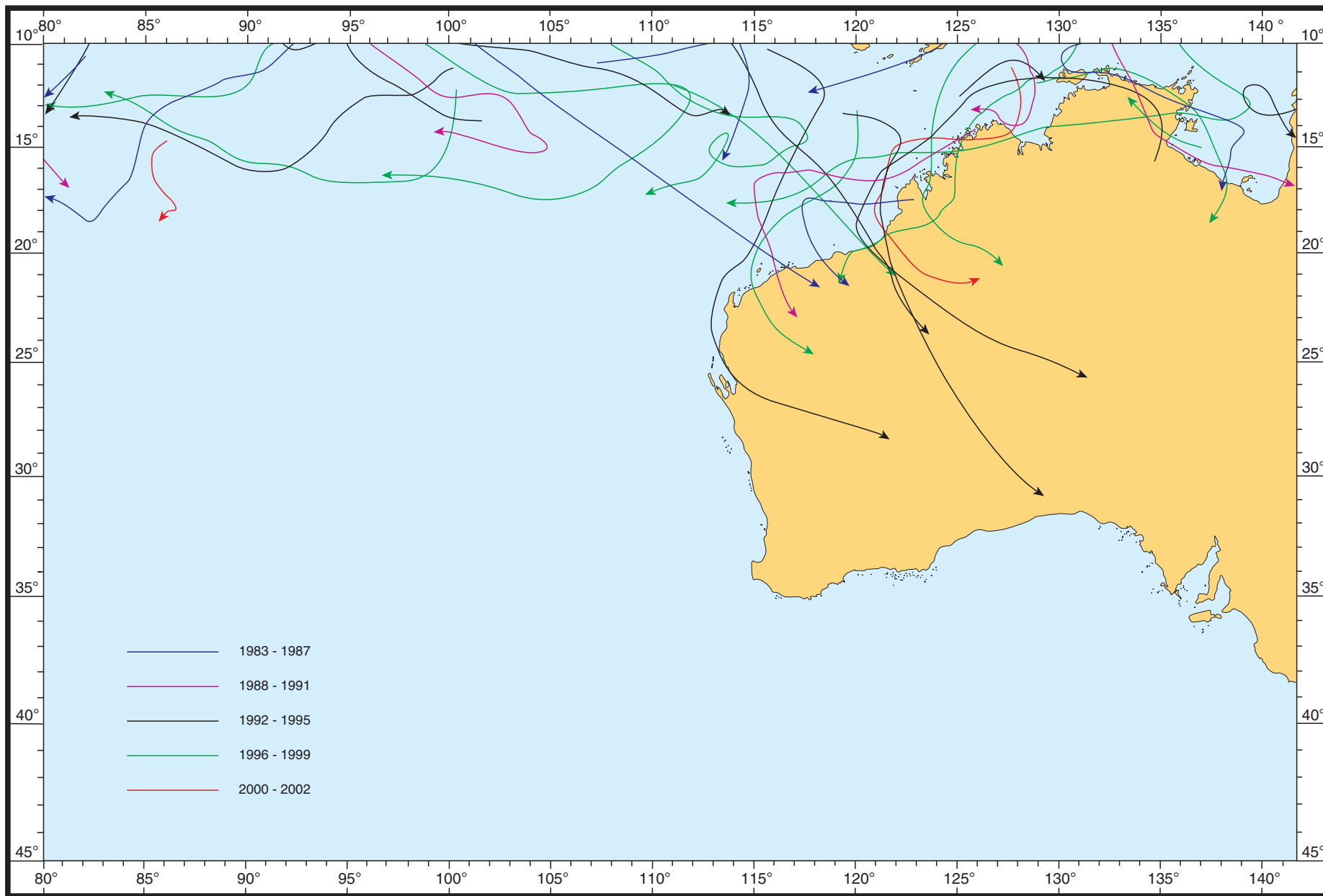
Tropical cyclone tracks MAY 1983-2002 (1.149e)



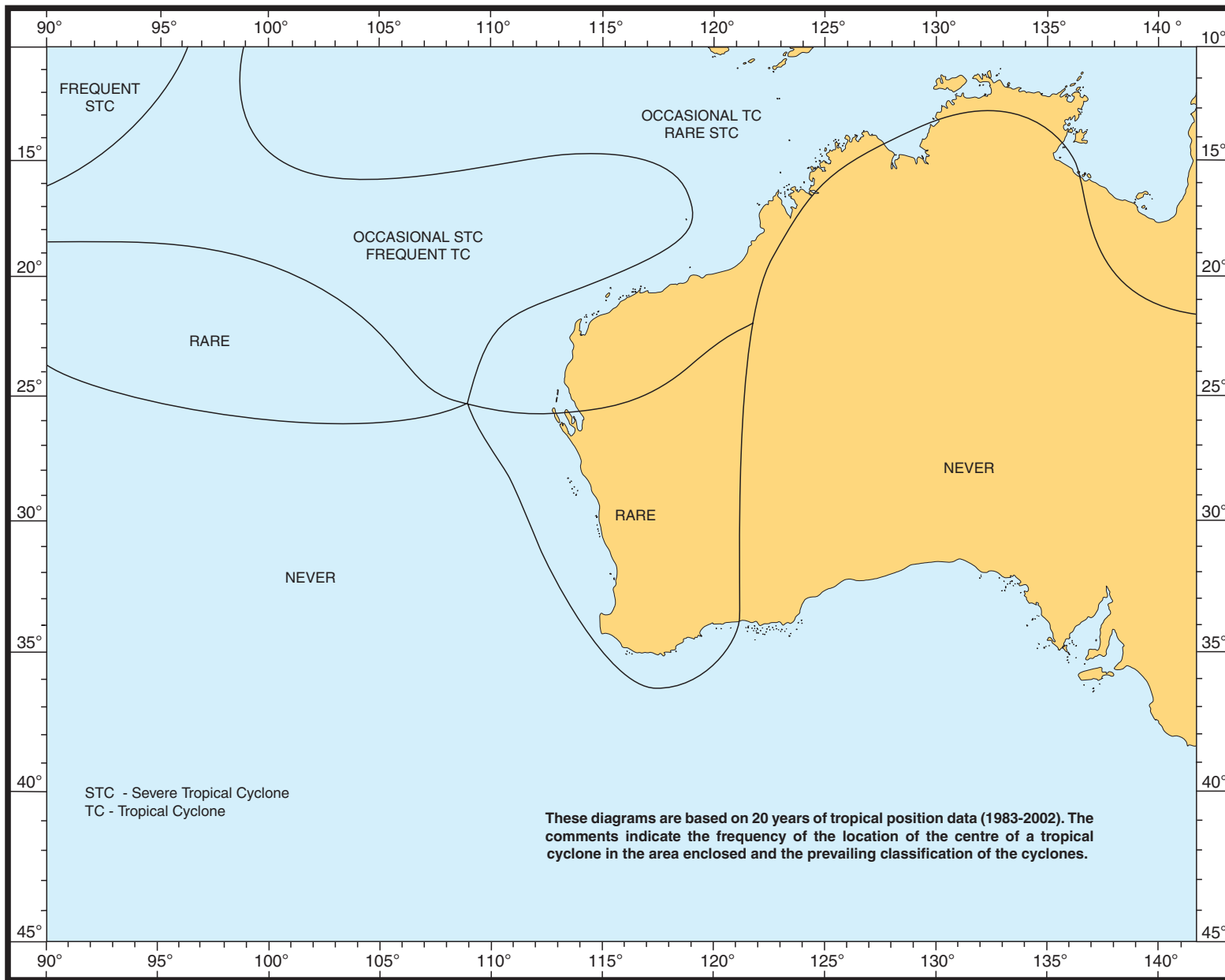
Tropical cyclone tracks OCTOBER 1983-2002 (1.149f)



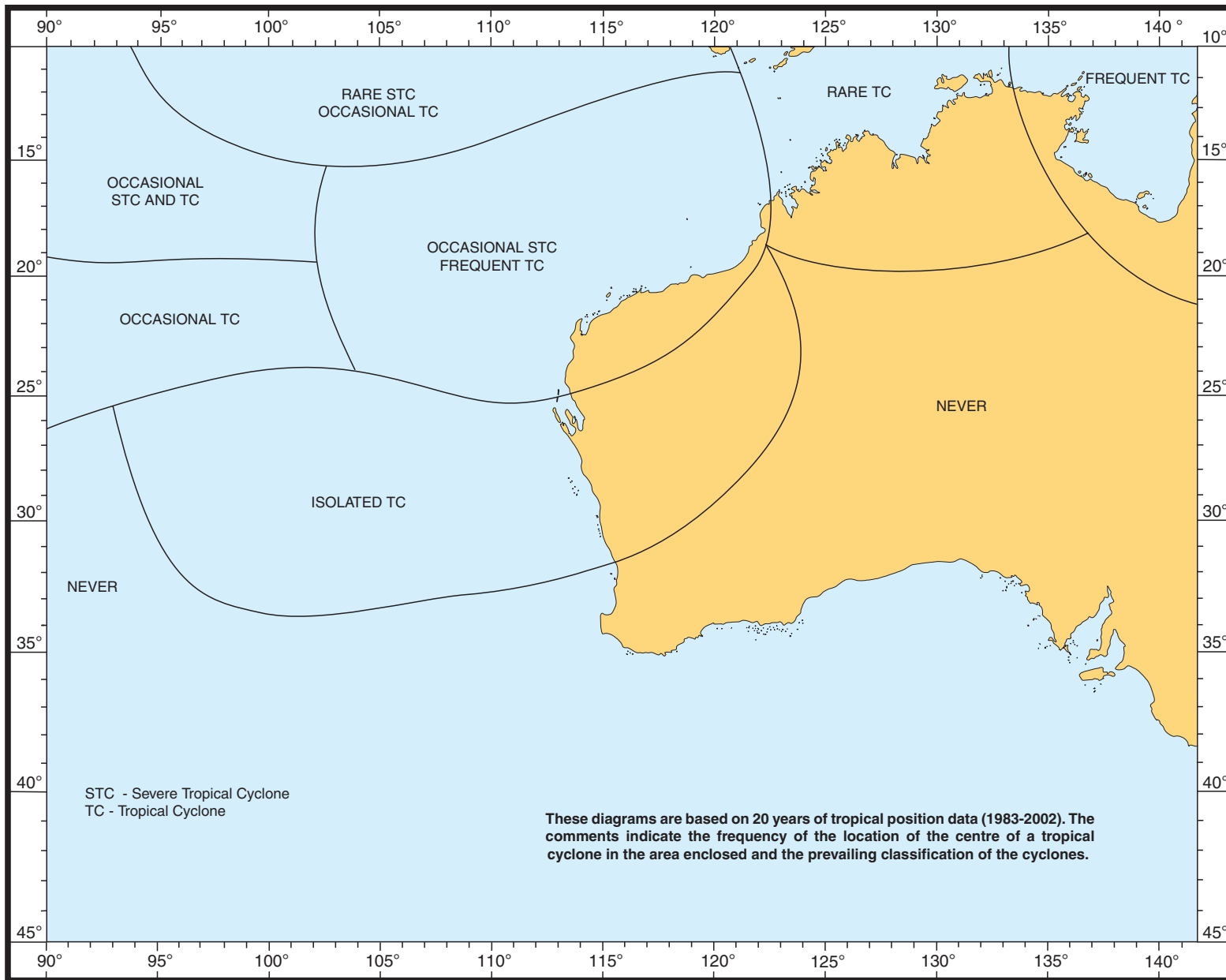
Tropical cyclone tracks NOVEMBER 1983-2002 (1.149g)



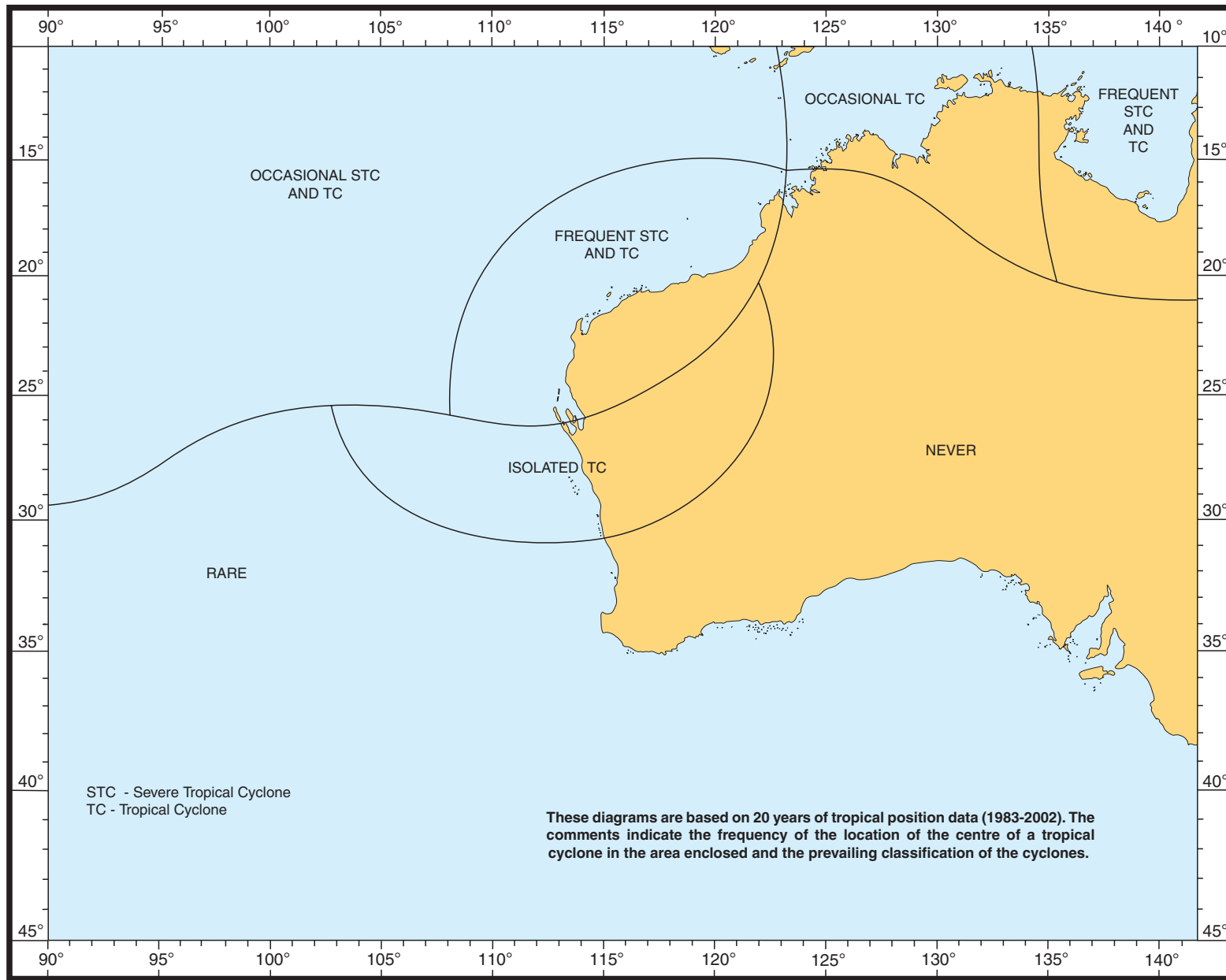
Tropical cyclone tracks DECEMBER 1983-2002 (1.149h)



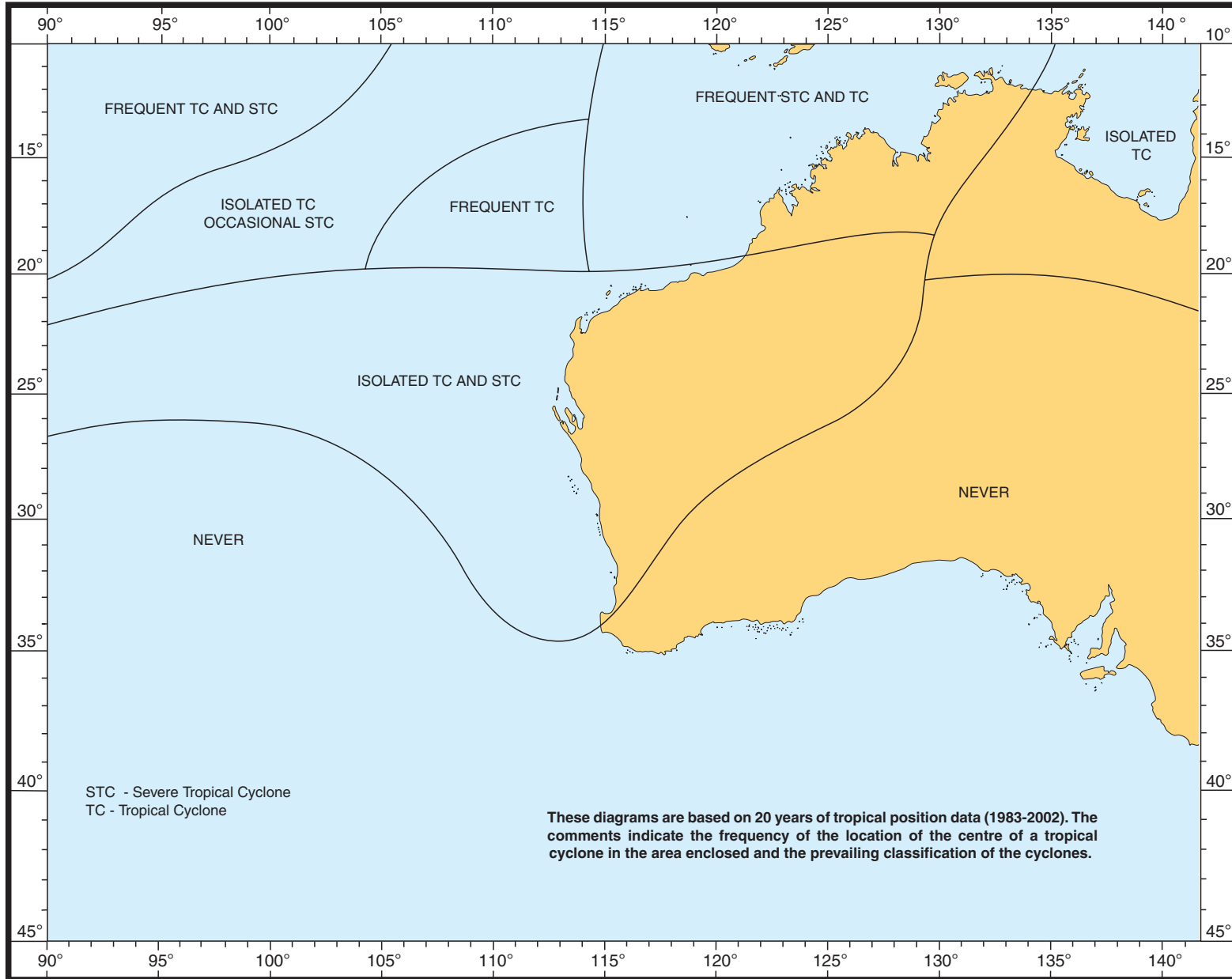
Tropical Cyclone Occurrence Diagram JANUARY (1.149i)



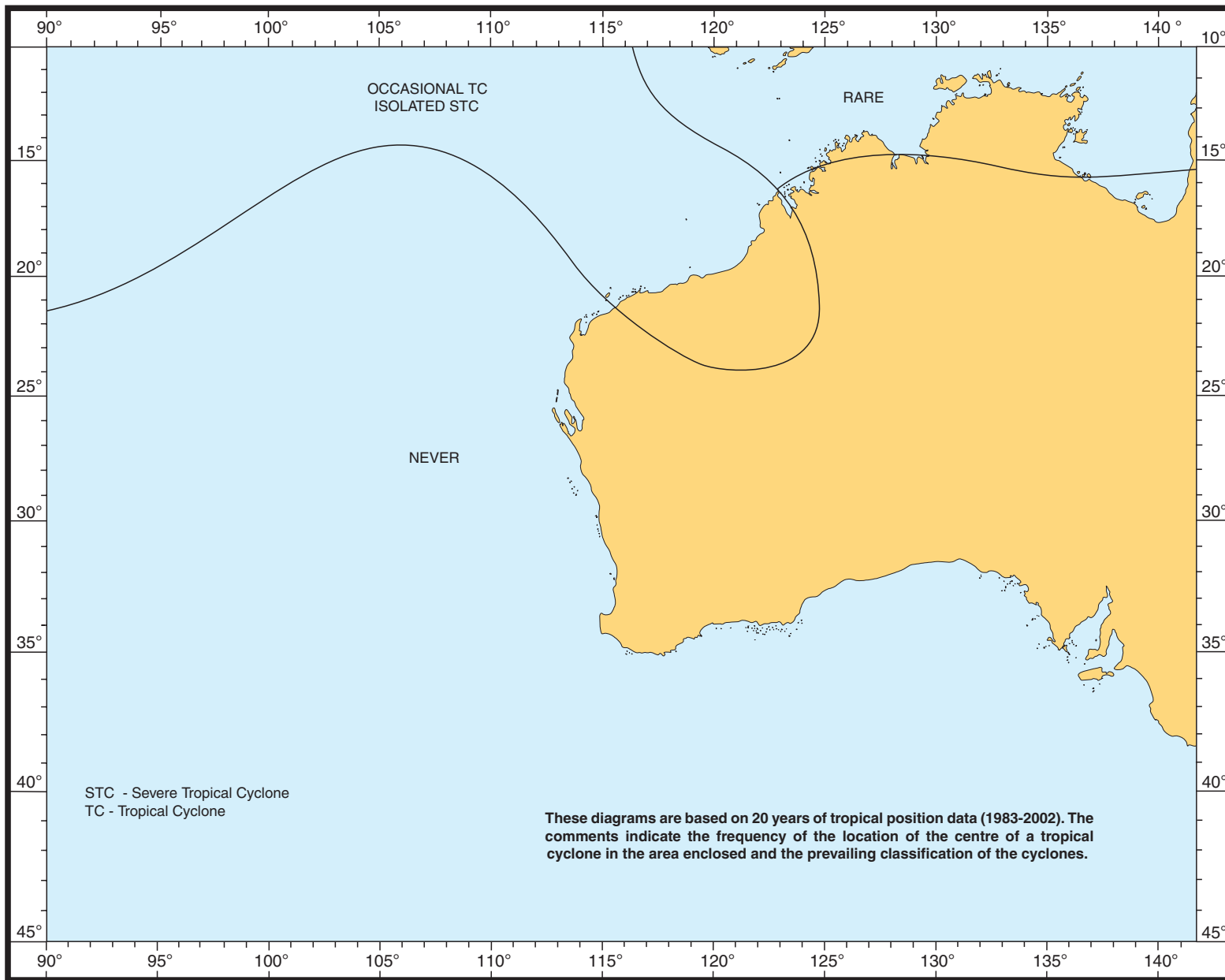
Tropical Cyclone Occurrence Diagram FEBRUARY (1.149j)



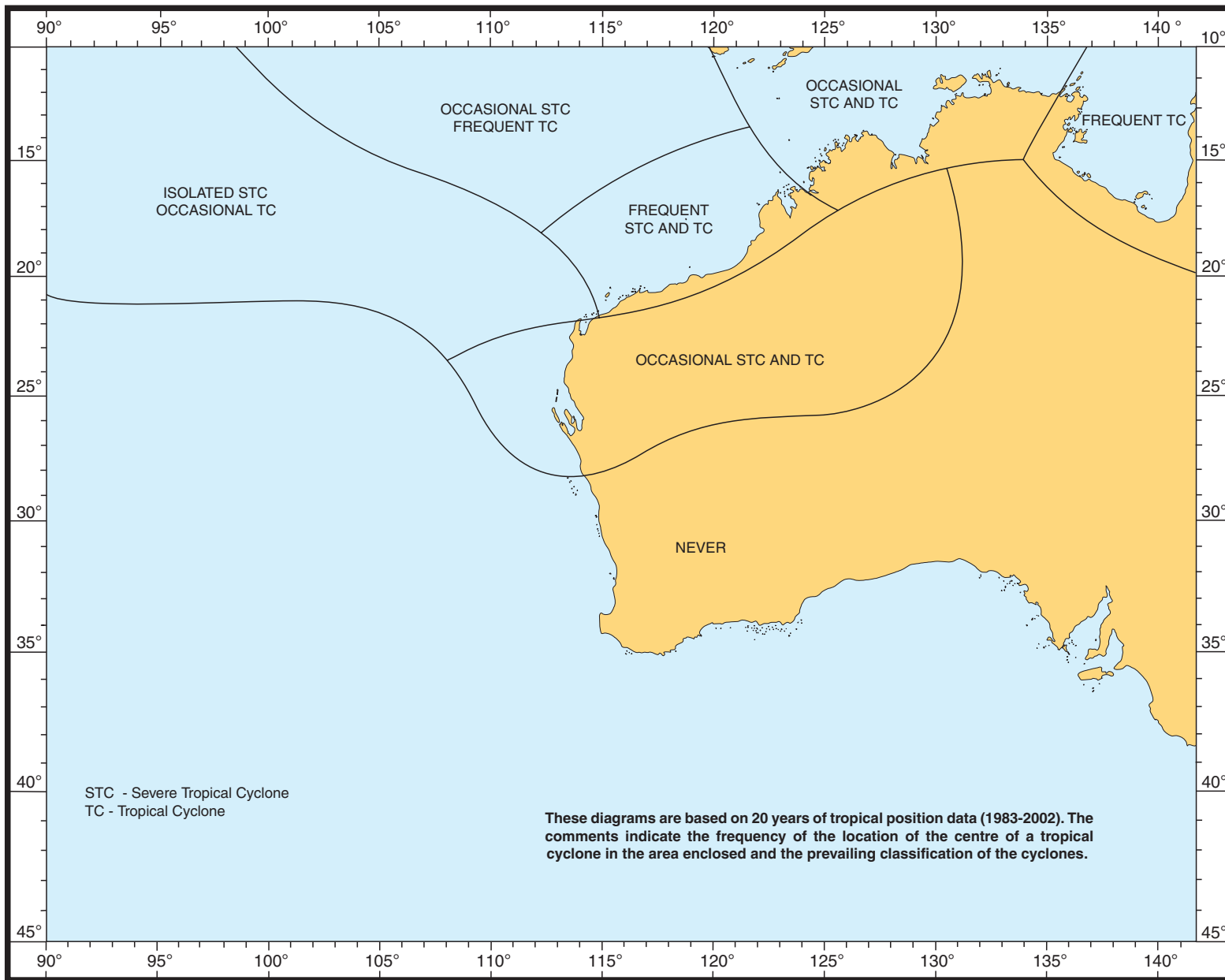
Tropical Cyclone Occurrence Diagram MARCH (1.149k)



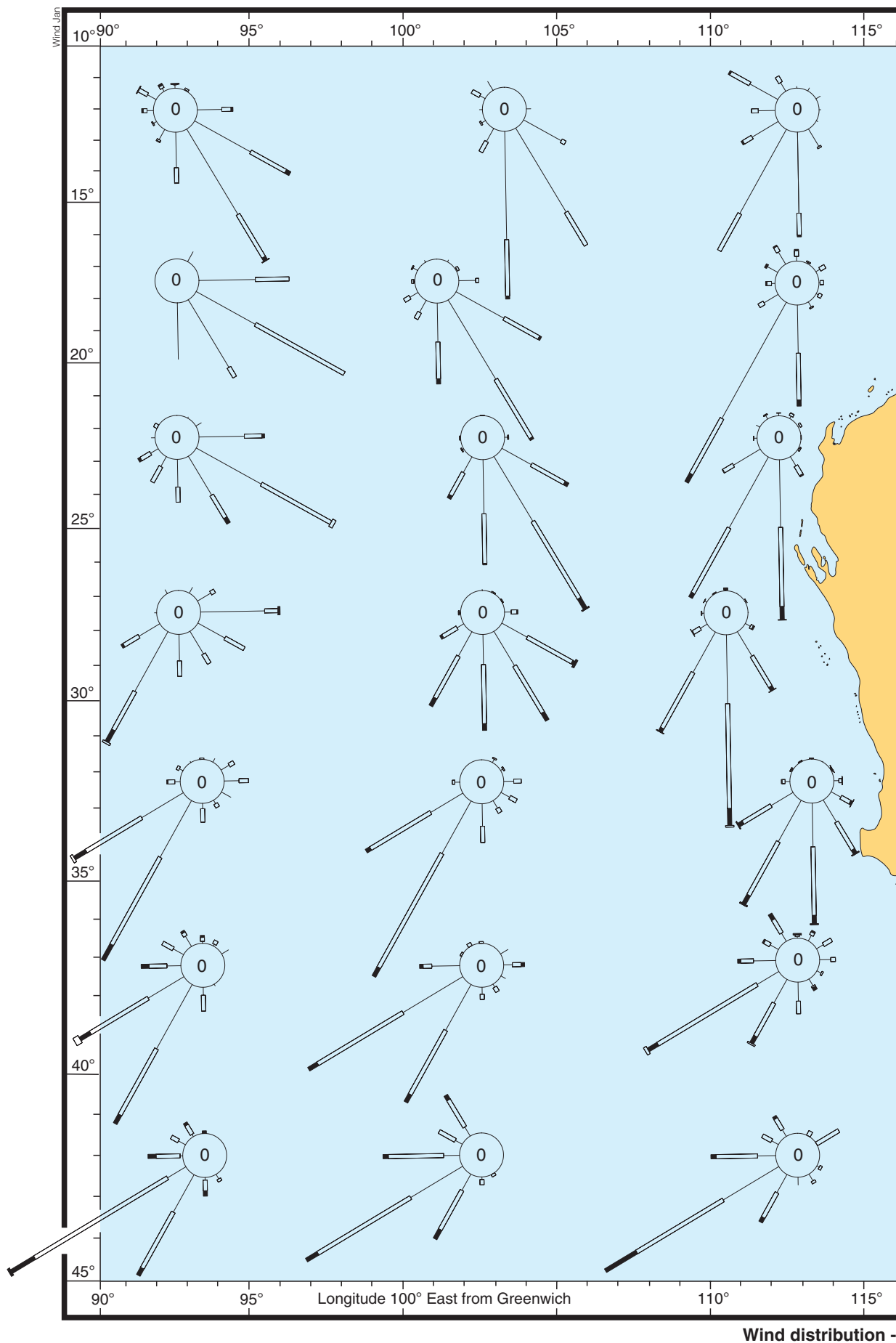
Tropical Cyclone Occurrence Diagram APRIL (1.149I)

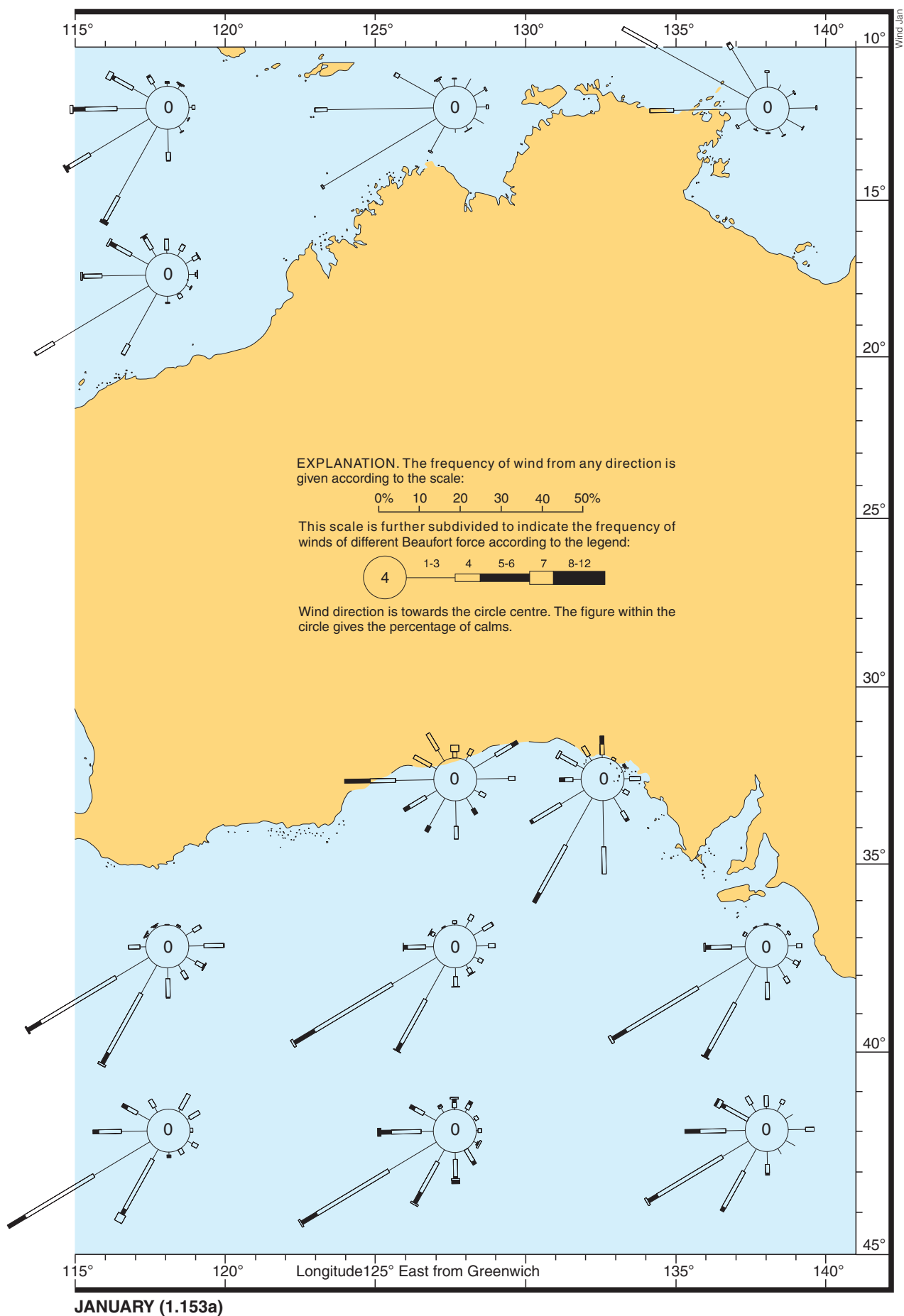


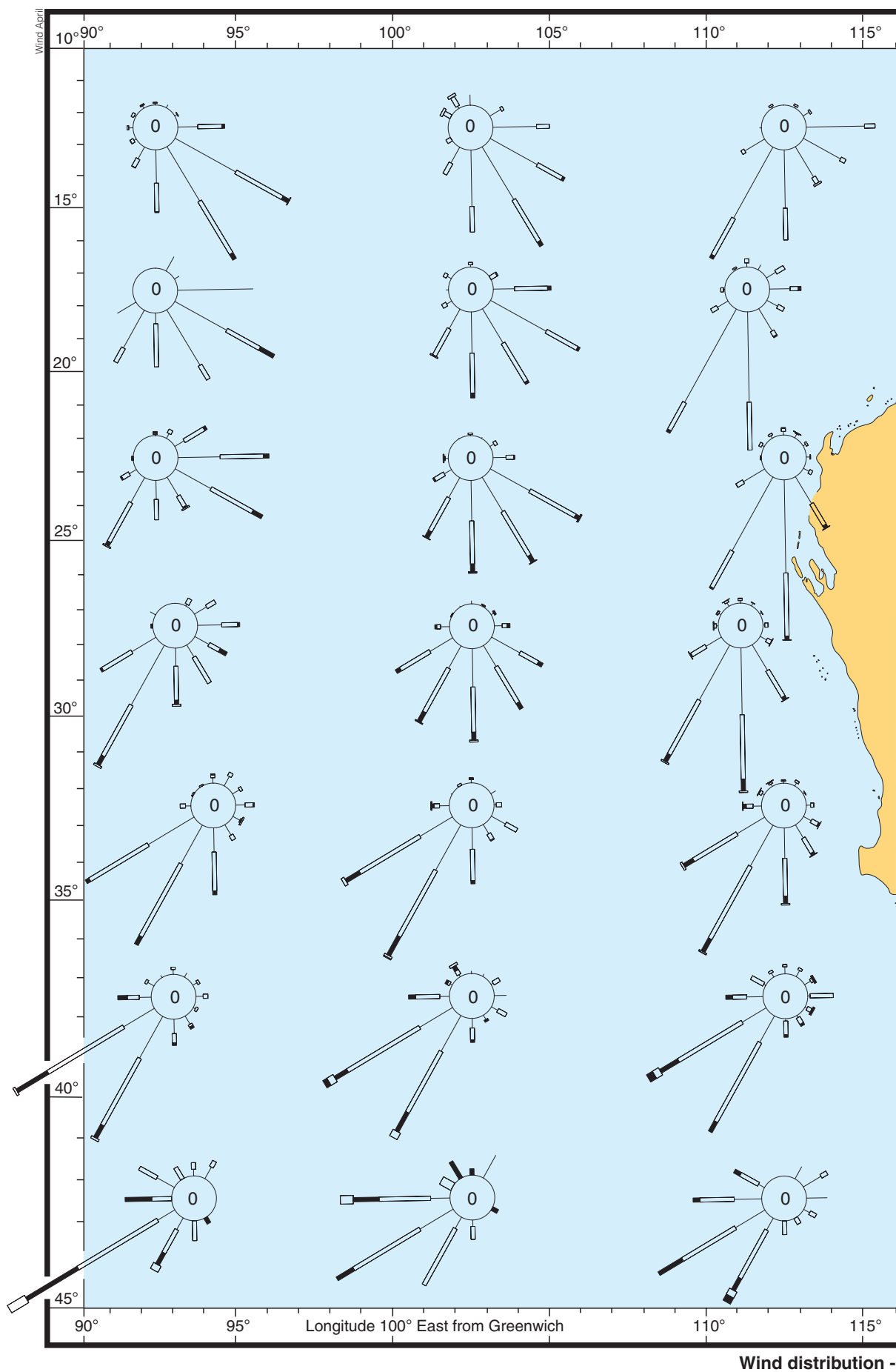
Tropical Cyclone Occurrence Diagram NOVEMBER (1.149m)

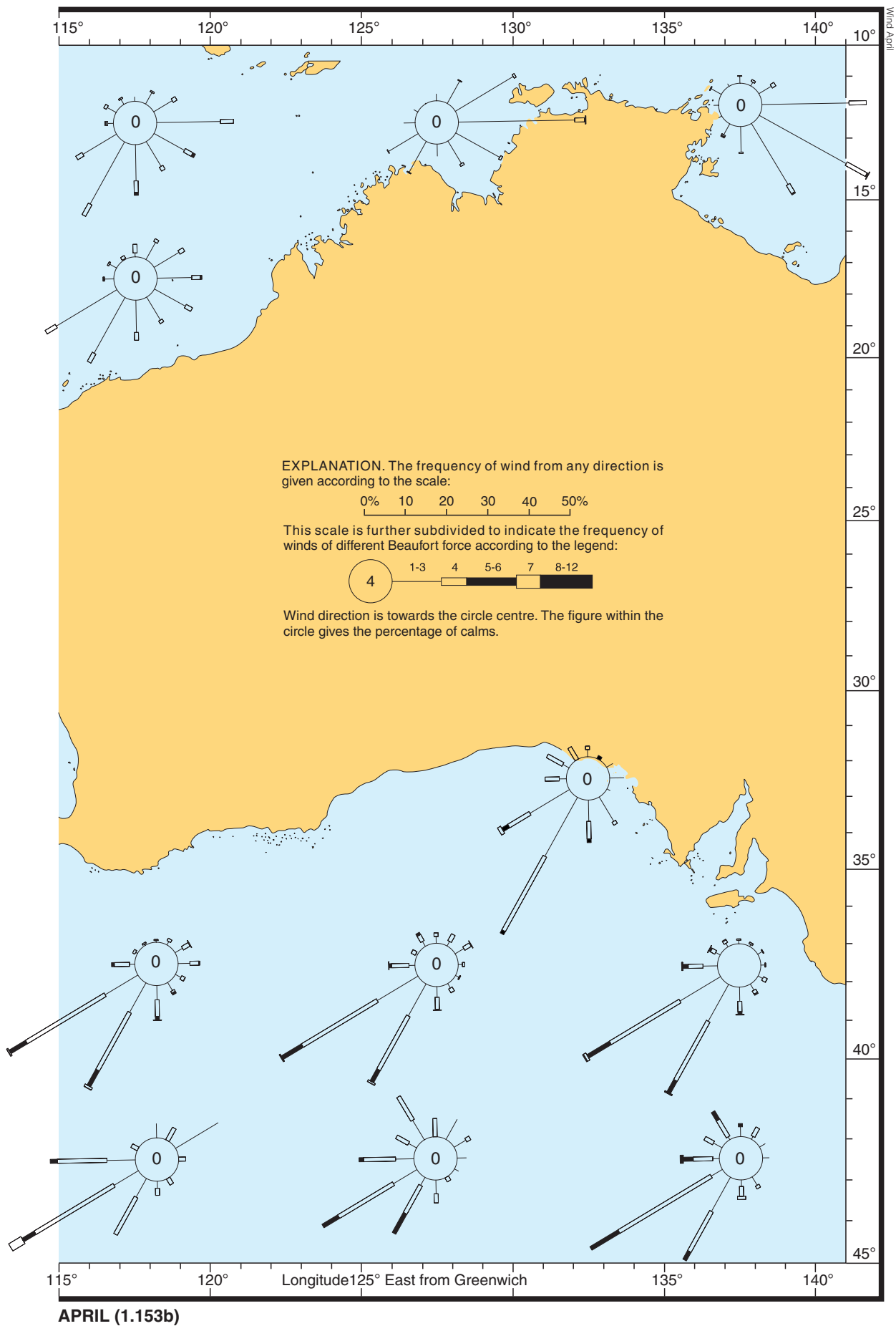


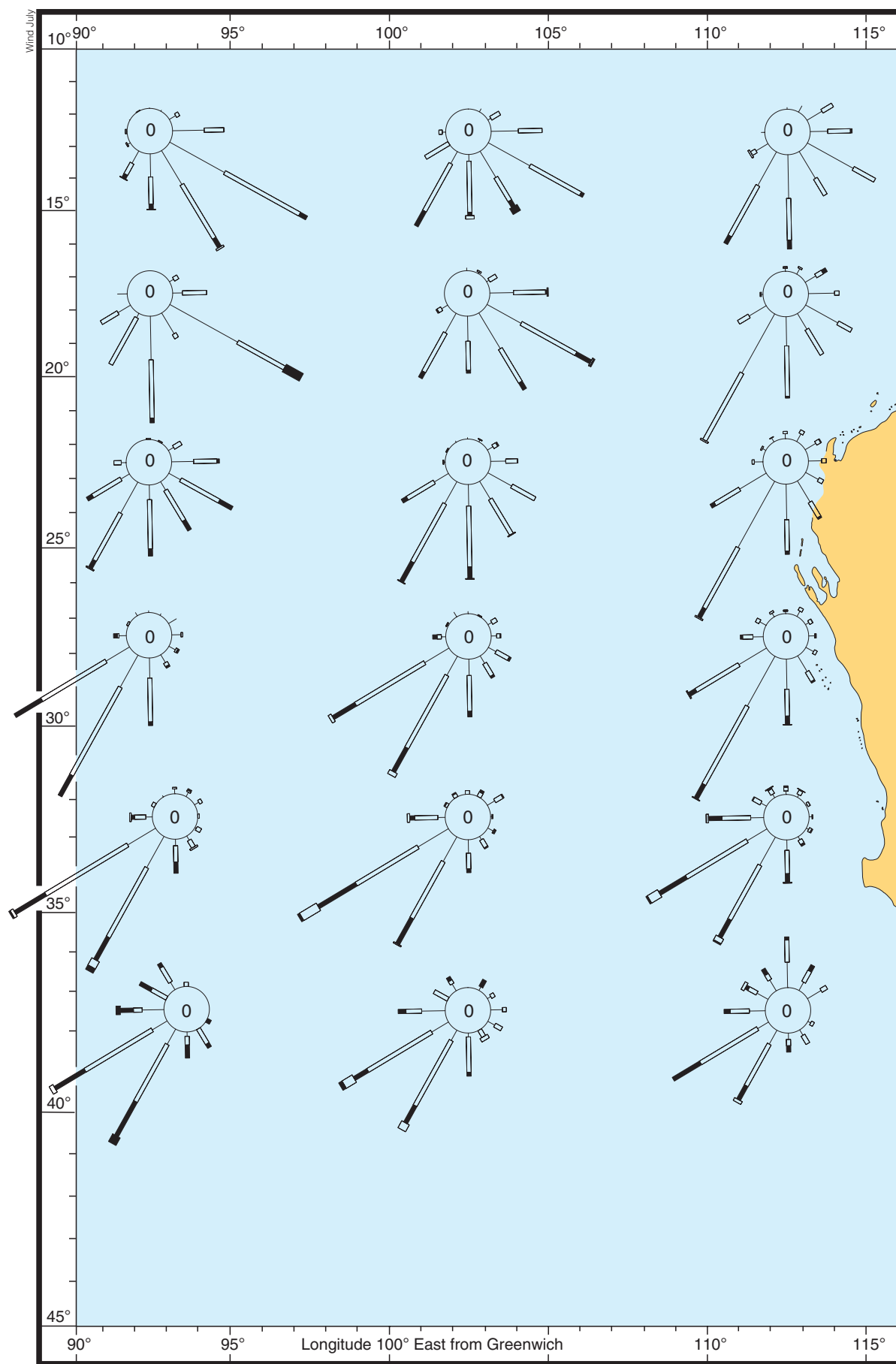
Tropical Cyclone Occurrence Diagram DECEMBER (1.149n)



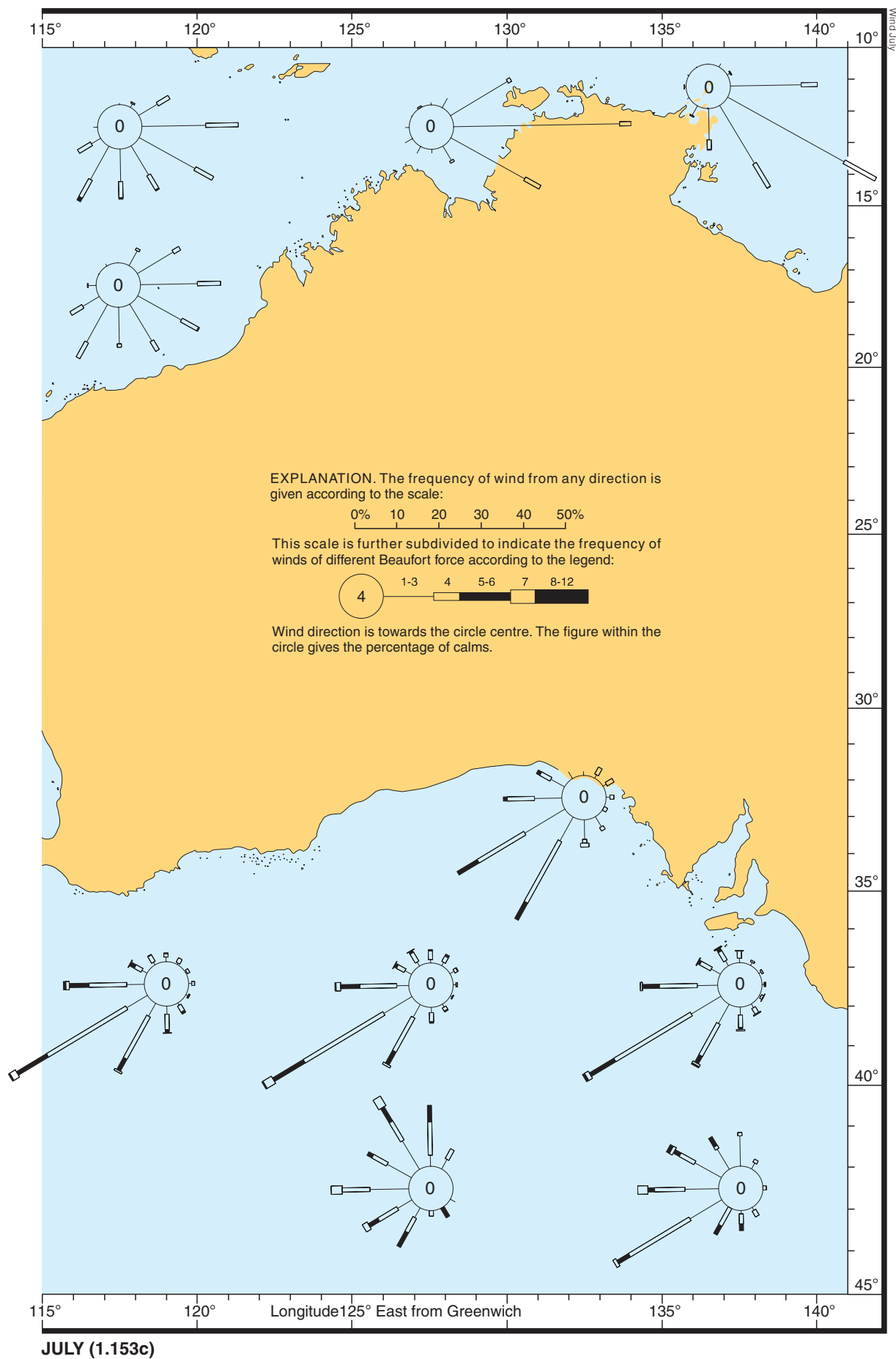


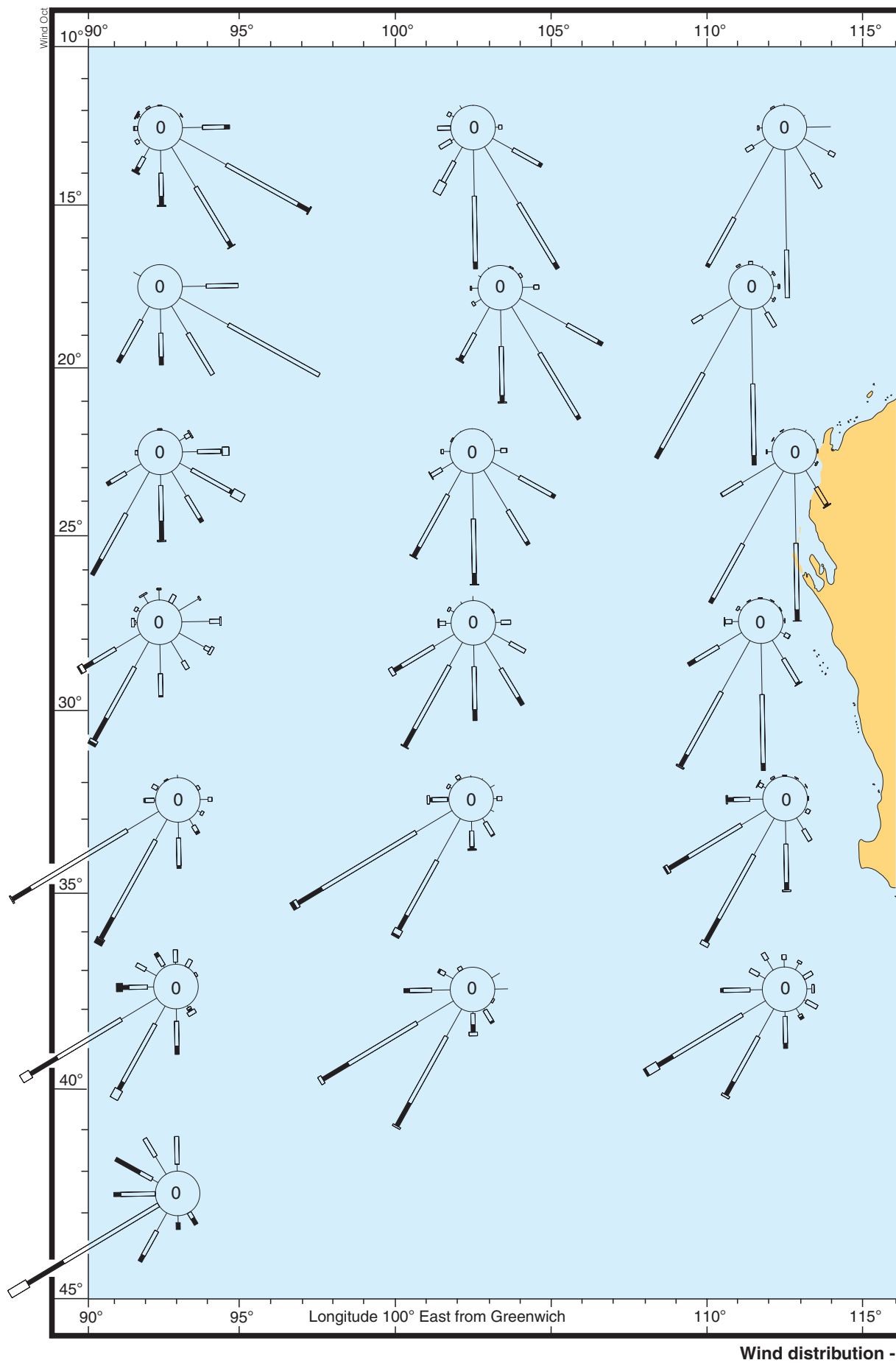


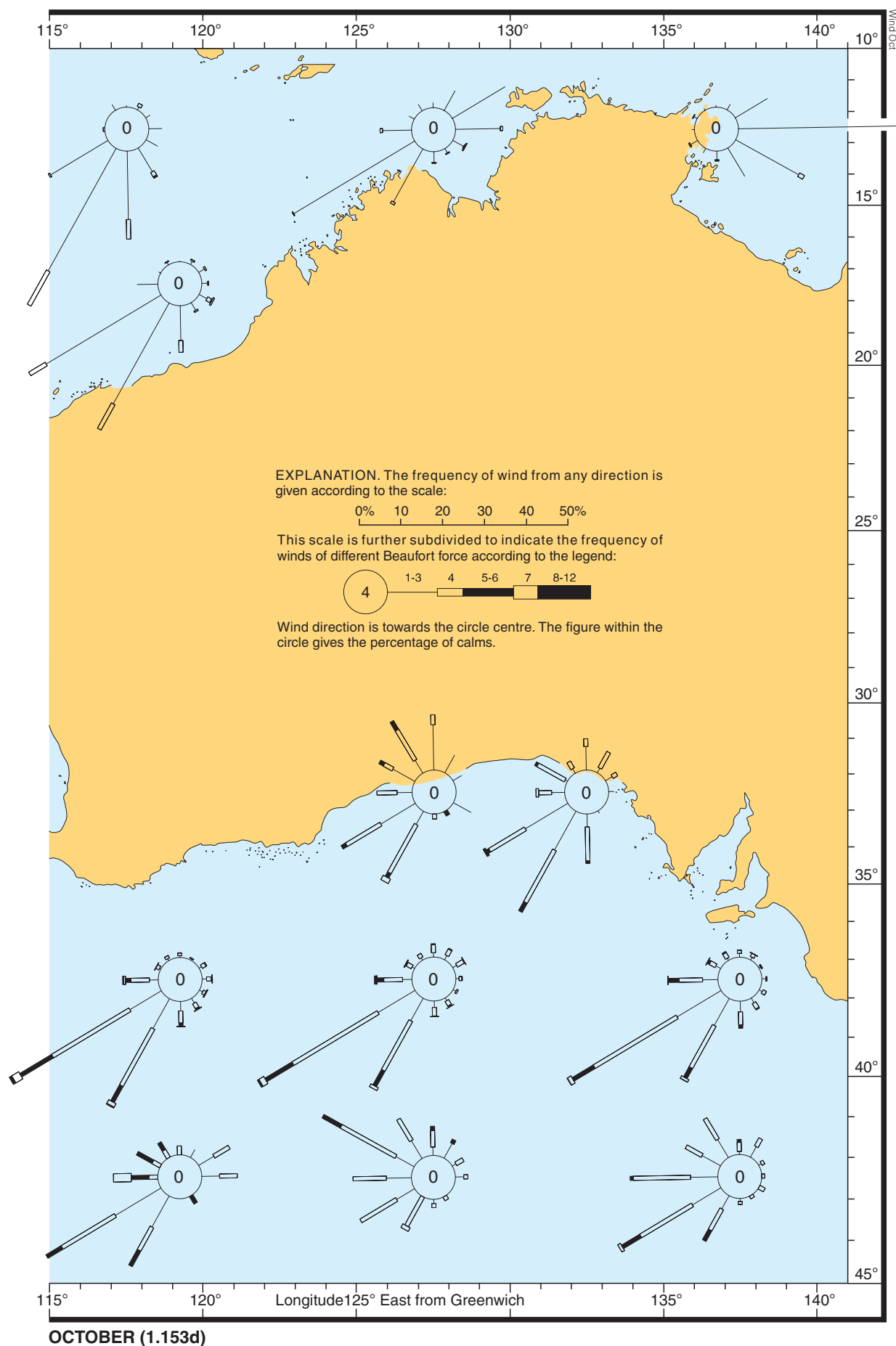


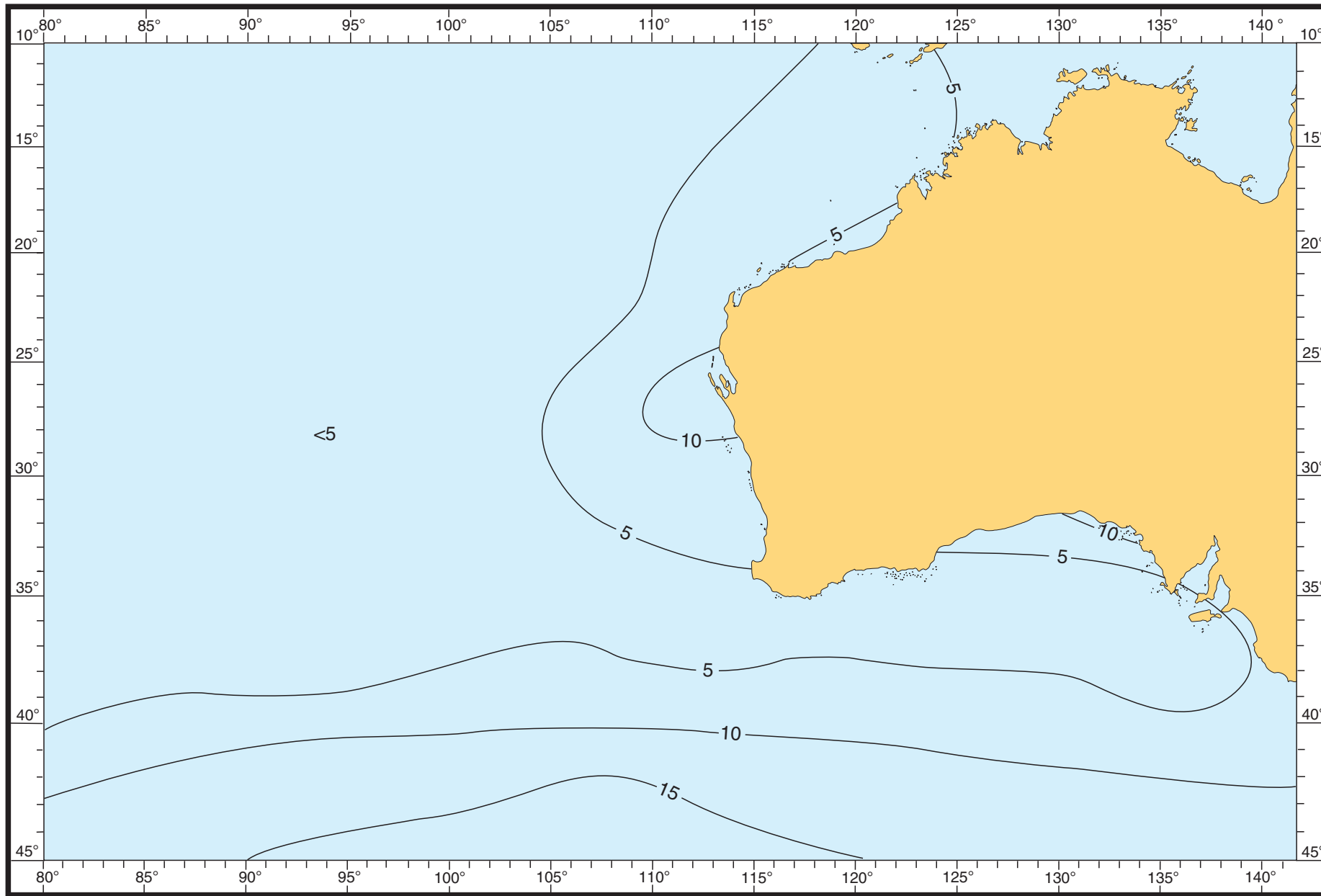


Wind distribution -

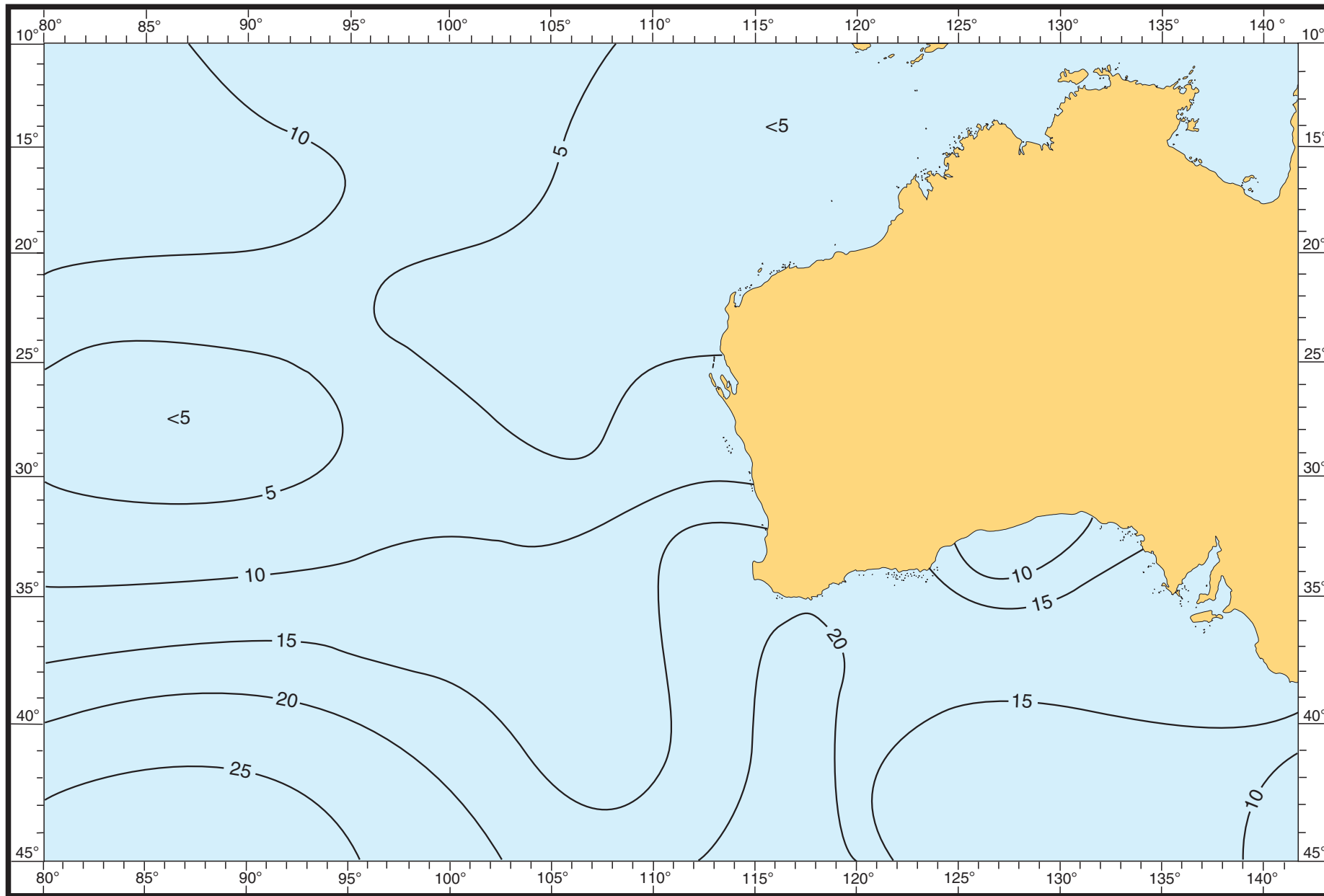








Percentage frequency of winds more than Beaufort force 6 - JANUARY (1.153e)



Percentage frequency of winds more than Beaufort force 6 - JULY (1.153f)

- 2 The SE trade winds are strongest when an intense anticyclone moves E; winds of force 6, 7 or even 8 can be experienced, especially on the NE shoulder of the high. Winds are stronger at night than by day. Between November and April, the SE trade winds to the W of Australia are weaker and less steady than in winter. They are generally associated with fine weather.
- 3 **Monsoon.** NW or W monsoon prevails in the N of this region from December to February. The winds are usually light or moderate with periods of variable winds, calms and squalls. It affects Arafura and Timor Seas and the coastal waters of the Northern Territory including Gulf of Carpentaria and Western Australia as far S as Exmouth Gulf.
- 4 Associated weather is hot and very humid with heavy thundery showers and squalls. The transitional periods between the SE trade winds and the NW monsoon are in October to December and in March to April. There is no abrupt change from one to the other. For a period of several weeks light S winds, interspersed by squalls, predominate.
- 5 The development of heat lows overland, early in the hot season, can unexpectedly induce W or NW winds on the tropical coast of NW Australia in November and October well before the arrival of the ITCZ and the NW monsoon.

Local conditions

1.155

- 1 Sea breezes, setting onshore, are most active in summer, develop during the late forenoon and increase until mid-afternoon up to a force 4. The sea breeze fades soon after dusk. The effects may extend 15 to 20 miles offshore and 10 to 15 miles inland.
- 2 Land breeze is an offshore wind, lighter than a sea breeze and forms towards midnight and dies after sunrise. The land and sea breezes are most significant in otherwise calm or light wind conditions. These diurnal winds may enhance, oppose or divert the prevailing wind and the orientation of the coastline is significant.

Where the monsoon is weak, the sea breeze can form the prevailing wind.

Squalls – north and north-west waters

1.156

- 1 These are a common feature, especially in N and NW Australian waters and coastal areas during the hot and transitional periods. The hot season of the NW monsoon is preceded by sharp, short-lived squalls of increasing frequency and intensity; these can bring gale force winds and thunderstorms.
- 2 They have cold front characteristics with a long low threatening arch or roll cloud which may be turbulent. Astern of the cloud there may be a sharp drop in temperature, rise in pressure and strong gusts. Waterspouts and dust devils may accompany these features.
- 3 Early morning squalls on the S shores of Gulf of Carpentaria occur frequently in September, October and November, and occasionally in April. Known locally as morning glory, the squall approaches from ENE towards WSW usually between 0300 and 0700.
- 4 At the base of a very low cumulus cloud, an arch of cloud, about 100 m wide and extending from horizon to horizon, produces a squall of force 5 to 6. Before and after passage of morning glory, conditions are usually calm and clear. A sudden drop in temperature and occasionally a little light rain may occur.

- 5 There are usually two rolls of cloud, separated by a few hundred metres, but up to eight have been observed. Gales are infrequent in the N areas, except for those associated with tropical cyclones.

Southern area

1.157

- 1 Winds are controlled by the subtropical high lying over Australia and adjacent waters and the depressions moving E across Southern Ocean. In summer, on the N flank of the high, winds are mainly SE or E and affect the coast and offshore sea areas S of Australia. Within the high pressure zone, winds are light or moderate, occasionally reaching strong, whilst direction varies as the anticyclone moves E.
- 2 On the S flank of the high, closer to the E bound depressions, W winds, reaching strong or gale force, are common. The direction of the wind ranges mainly from SW to NW. The area S of 40°S is known as the roaring forties, although in winter their influence extends N of this latitude. Coastal waters, and the topography of the coast, influence the wind strength and direction and introduce local anomalies. On the coast the wind is between S and E in summer and between N and W in winter. Changes in pattern occur in April/May and September/October.
- 3 On the S coast between Cape Leeuwin and Esperance, gusts of great strength may be encountered when the wind direction at sea is between S and W; conditions can be especially severe near Bald Head and Limestone Head. As the high pressure belt migrates N in winter, W winds affect the seas W of Australia as far N as about 35°S, and the coast of Western Australia to Perth or occasionally Geraldton.
- 4 **In winter.** Along the S coast of Australia, winds of force 7 or more comprise 5–10% of the observations, the greatest frequency near Cape Leeuwin. South of 42°S occurrence of gales exceed 25%; N to NE gales are occasionally recorded in July in the NE sector of Great Australian Bight. **In summer.** Along the coast occurrence of gales decreases significantly to around 5%. Gales are observed 15% of the time S of 45°S.

Cloud

Northern area

1.158

- 1 Cloud amounts are least in a wide coastal belt from around Cambridge Gulf to North West Cape where, from April to November, there is little or no cloud. Cloud is greater along the N coast of Australia to the E of Darwin in winter, but amounts are small. Except for the N part of York Peninsula, where rather cloudy conditions persist throughout the year, average amounts do not exceed 3 oktas.
- 2 During the start of the wet season from October to December, cloud increases in the N regions. Large cumulus or cumulonimbus clouds increase in size and number as the season progresses; extensive medium and high cloud is found in the vicinity of the ITCZ. The NW monsoon season has cloudy skies; cloud amounts are greatest over land by day; decreasing and dispersing over land and developing over sea by night.
- 3 At sea, well away from the coast, there is little diurnal variation in cloud amounts. With the onset of the SE trade winds, cloud reduces to be well-broken. From North West Cape to about 30°S, cloud in coastal areas at all seasons is sparse.

Southern area

1.159

- 1 Winter is the cloudiest season. The most prolonged and extensive cloud is to be found in the S. Farther N, frontal cloud is less dense and broken but the SE coast can have prolonged cloud. The N shores of Great Australian Bight enjoy the least cloudy conditions although elsewhere along the coast cloud is well-broken.
- 2 On the coast, cloud develops by day to disperse during the evening. Summer brings the anticyclone farther S and cloud amounts are reduced. On the N flank of the high and around the coast, well-broken clouds are usual. Cloud in the early morning tends to decrease by afternoon and evening.
- 3 Cloud amounts to the S are sustained in the frontal troughs associated with Southern Ocean depressions. In the coastal waters off the SW corner of Western Australia, skies are cloudy throughout the year, especially in winter when depressions and troughs bring cloud and rain. The Cape Leeuwin area is very cloudy. During the summer, despite little rain, cloud amounts remain considerable.

Precipitation

Northern area

1.160

- 1 The N Australian coast, E of Broome, has the wet season from December to March in the NW monsoon. Rainfall is greatest in places exposed to W or NW winds and is mainly accompanied by heavy thunder. Falls average 1000 mm or more in the Northern Territory and York Peninsula, N of about 15°S.
Rain falls on 2 out of 3 days in Darwin (annual average 1500 mm) and Thursday Island (1700 mm). In Torres Strait the wet season extends into April, often with more rainfall than in December.
- 2 The SE trade winds run from April to September. Rainfall is very low and there are prolonged periods of little or no rain. The coastal waters from 20°S to Shark Bay are very dry with annual averages of 250 to 300 mm. Tropical cyclones, however, bring torrential rain and the associated 24 hour fall may exceed the average annual total. Some tropical cyclones can deposit 3000 mm of rain through their life.
- 3 South of North West Cape the wettest months are May, June and July.
ENSO (El Niño – southern oscillation) is responsible for extending drought periods and for an increased incidence of bush fires depending upon the strength of the ENSO.

1.161

- 1 **Over the open sea.** Arafura Sea is the wettest region with estimated annual falls of 1500 to 2000 mm. Farther to the W over Timor Sea, averages are lower at about 1000 to 1500 mm per year and amounts continue to decrease farther W. In the vicinity of Broome annual falls average about 750 mm.
 - 2 Most rainfall occurs during the NW monsoon from November to April. In the SE trade winds in Timor Sea, rain between April and October is usually limited to a few rain storms of brief duration in June or July. The months of August and September have least rain.
- 1.162**
- 1 **Thunderstorms** are frequent in the NW monsoon particularly in the Northern Territory and around Darwin. They appear on 80 days per year with 80% to 95%

occurring between November and March. Frequency decreases farther SW along the coast. Around Port Hedland they occur 10 to 20 days per year.

- 2 **Coastal waters – Shark Bay to Cape Leeuwin.** There is a rapid increase in rainfall with increasing S latitude. During May to October, rain is plentiful and regular from Perth to Cape Leeuwin. June and July are the wettest months. Annual falls average about 1000 mm. In summer, when the high pressure belt moves S over the area, the troughs are fewer and weaker and little rain falls.

Southern area

1.163

- 1 **Rain and snow.** Most rainfall is associated with S depressions or their troughs. Highest amounts are received in winter and early spring. Intermittent rain spells may last for 2 to 5 days. Very heavy rain may be encountered within depressions of tropical origin.
Wet winters, with prolonged rain at times, contrast with dry summers over SW Australia. Similarly on the SE coast. Rainfall decreases from W to E towards the Bight; the coast between Eucla and Ceduna are arid with annual falls of 250 mm.
- 2 Between Cape Leeuwin and Eclipse Island annual precipitation average 1000 mm and can be up to 1500 mm. Esperance has 700mm. The SE coast of South Australia averages 600mm; the main accumulations are in winter. Inland the rainfall decreases rapidly with Port Augusta receiving half that of Adelaide. Rain is frequent in winter in the ocean area to the W of Cape Leeuwin where annual falls are estimated at 700 to 1000 mm.
- 3 Snow can be expected once every 3 to 4 years on the hills near Albany but does not reach sea level. Snow rarely occurs N of 40°S, but occurs more frequently in the far SW of the area mainly between July and October.
- 4 **Thunderstorms** occur regularly and may appear in any season. In the SW of Australia they are most frequent between May and August and are often associated with the passage of a cold front. Thunder can be expected no more than 2 days per month and is some times accompanied by small hail.

Visibility

Northern area

1.164

- 1 On the NW coast, radiation fog develops occasionally in the dry season but has usually dispersed by 0900. Heavy rain may reduce visibility below fog limits. Smoke and dust haze causes much reduced visibility in the coastal waters of N and NW Australia. From June smoke from bush fires is carried seaward on the E or SE winds. In Timor Sea the haze is most dense in August, September and October and can extend for long distances. In drought years, haze can be particularly thick giving visibility as low as 1 mile and extending as high as 3000 m.

Southern area

1.165

- 1 Fog is most frequent, 5% to 10% of the time, over the SW area in May and June. Occasional banks of fog are found in coastal waters and some radiation fog drifts seaward with the density at a maximum around dawn when it is reported in around 5% to 10% of observations; otherwise frequencies are below 2%.
- 2 The coast between Eucla and Streaky Bay experiences fog 3 days per month between April and September. Cape Leeuwin occasionally experiences fog at night or early

morning between January and April. Heavy rain causes visibility to fall below 1000 m at times.

- 3 Dust reduces visibility in summer in the coastal area of Albany. With an offshore wind this reduction can spread a considerable distance to sea. Dust storms affect Port Augusta in summer and these can be severe. Industrial haze adversely affects visibility near Adelaide.

Air temperature

Northern area

1.166

- 1 **Summer.** In the hot, coastal region of NW Australia, highest temperatures occur in January and February. From North West Cape to Port Hedland the average daily maximum temperature is 36°C; extreme values of 48°C have been recorded. Farther E, lower values are normal. From North West Cape to Cape York mean daily maximum temperatures are 32° to 34°C in mid-summer.

- 2 Night minimum temperatures to the E of North West Cape average around 25°C. Farther S, along the W coast of Australia, temperatures decrease gradually with higher latitude. In January and February daily maxima average at 30°C, with a night minima of 19°C as far S as Perth; extreme temperature of 44°C has been recorded

Land and sea breezes have a moderating effect on temperatures in coastal areas. A fall in temperature occurs at onset of sea breeze and cooling may be produced by land breeze where the track is across relatively cool land.

- 3 **Winter.** Coldest time of year is July and August. Farther N, temperatures become progressively higher. Winter daily temperatures at North West Cape reach 24°C and, on average, fall to 12°C at night. From Broome, E to Cape York, there is little variability in the dry season coastal average temperature, which has daily maxima of about 29°C and night minima of 16°C.

Southern area

1.167

- 1 Air temperature is usually 1°C colder than the sea temperature over the open sea throughout the year. Greatest variability occurs in coastal waters. Highest average temperatures occur offshore and in coastal waters in January and February with 17° to 19°C at 35°S and 10° to 12°C at 45°S. Lowest averages occur in July and August with 14° to 15°C at 35°S and 8° to 9°C at 45°S.

- 2 The warmest areas are along the shores of Great Australian Bight and Spencer Gulf where the average daily maxima range between 25° to 30°C. Occasionally temperatures exceed 40°C in mid-summer; night values fall to 16°C.

Along the SW coast and the SE, more modest summer temperatures are encountered. Average night minima of 14° to 17°C and maxima of 20° to 23°C prevail. Inland the daily range of temperature increases with distance from the coast.

- 3 Extended periods of hot weather, with daily temperatures breaking through 40°C, occur frequently in summer although near the coast these rarely last more than 3 successive days.

July and August brings the lowest average daily maximum temperatures of around 16° to 18°C. In the SE

the equivalent is 13° to 15°C. Night minima averages set at 7° to 9°C but these may occasionally fall to 2° to 5°C. Frost is rare on the coast but more frequent inland.

- 4 The passage of a cold front can bring about a change of 10° to 15°C. Temperatures may fall to near freezing in the vicinity of Cape Leeuwin but this is most likely inland and frost has not been recorded on the coast.

In the SW corner of Western Australia daily temperatures rise on average to 17°C and fall at night to around 10°C.

Humidity

Northern area

1.168

- 1 The range of humidity over the open sea is small and humidity remains high throughout the year in Arafura and Timor Seas. At the onset of the NW monsoon, humidity on the N and NW Australian coast increases gradually through October, November and December. Seasonal variation is closely related to prevailing wind. In the dry season the SE trade winds blowing offshore bring appreciable lower humidity to the N coast and on occasions extremely low values are recorded. An abrupt decrease may occur between March and April. Relative humidity in the dry season is lower by 20% than in the NW monsoon.

- 2 Winds with a long continental path may produce some remarkably low values of relative humidity; 20% is common and 10% is sometimes observed. These are most frequent in the NW near Port Hedland and Roebourne, otherwise all along the NW coast these winds are associated with fine, cloudless weather.

Diurnal variation is appreciable in the N of the region but at sea, and in the far S, it is of small significance.

Southern area

1.169

- 1 At sea the relative humidity averages 80% but in wet weather and in the S the relative humidity rises to 90%. Along the coast maximum relative humidity occurs around dawn; the minimum occurs in the afternoon. In summer humidity is low along the coast especially in the N and E of Great Australian Bight where early morning maxima are around 60% to 65%. In the afternoon the humidity is usually about 5% to 10% lower. Sea breezes may bring moist onshore winds to prevent this daily drying process.

- 2 In SW Australia the maritime exposure maintains the humidity to around 70% to 80%. A relative humidity of 10% may be encountered when hot dry interior air blows offshore and, values of 100% with low winter temperatures, in fog and drizzle.

Climatic tables

1.170

- 1 The tables which follow present data for stations spread along the coast. These data are relevant to the location of the observing station. Topography has an important influence on the local weather conditions; variations can occur within a short distance.

Weather differences between conditions at sea and land stations can be considerable.

The accompanying diagram (1.170) shows the position of the climatic stations.



Location of climatic stations (1.170)

1.171

WMO No 94150

GOVE AIRPORT (12° 17' S 136° 49' E) Height above MSL – 53 m

Climatic Table compiled from observations 1985 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa 1007	°C 32	°C 25	°C 34	°C 24	% 75	% 72	Oktas		mm 289	17	11	10	17	6	4	4	23	23	2	26	15	17	3	3	2	7	26	1	Knots		8	9	0	1	11
February	1006	31	25	34	23	79	77			282	17	12	5	4	2	4	4	32	32	5	19	7	7	3	2	2	14	45	1	8	9	0	1	9		
March	1008	31	24	33	22	76	71			228	16	13	10	27	12	9	3	16	7	3	18	17	26	15	4	2	6	11	1	7	9	0	1	6		
April	1010	31	23	33	22	74	70			197	15	2	7	48	36	3	1	0	1	2	2	8	45	39	3	1	1	0	1	10	10	0	1	2		
May	1012	30	23	31	20	66	64			117	11	1	2	30	61	5	0	1	0	0	1	1	23	63	11	0	0	1	0	12	12	0	1	0		
June	1013	28	21	30	20	65	64			32	9	0	1	18	75	6	0	0	0	0	0	2	15	66	16	1	0	0	0	13	12	0	1	0		
July	1014	28	20	29	18	63	60			18	7	0	1	19	74	5	0	0	1	0	0	0	20	70	10	0	0	0	0	13	13	0	2	0		
August	1014	29	18	31	16	59	56			5	3	6	3	34	50	7	0	0	0	0	5	3	31	54	7	0	0	0	0	11	12	0	6	0		
September	1013	31	20	33	19	61	57			1	1	4	17	53	22	1	0	0	3	0	4	14	61	20	1	0	0	0	0	11	11	0	10	0		
October	1011	32	22	34	20	61	57			8	2	14	27	39	9	1	1	5	3	1	16	23	41	19	1	0	0	0	0	9	11	0	5	0		
November	1009	33	23	35	21	62	63			23	3	16	24	28	9	5	1	7	9	1	17	22	38	13	4	3	2	1	0	8	10	0	1	5		
December	1007	33	25	35	23	68	66			192	11	18	19	12	3	3	1	19	24	1	33	22	15	3	3	1	6	17	0	8	10	0	1	9		
Means	1010	31	22	36*	17§	67	65			–	–	8	11	27	30	4	1	9	9	1	12	11	28	31	6	1	3	8	0	10	11	–	–	–		
Totals	–	–	–	–	–	–	–	–		1392	112	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	31	42			
Extreme values	–	–	–	37†	13‡	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
No. of years observations	20	20				20				20	20	20										20										20		20	20	

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.172

WMO No 94122

CAPE FOURCROY (11° 47' S 130° 1' E) Height above MSL – 7 m

Climatic Table compiled from observations 1985 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with			
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder	
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm								
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																											
February	1007	32	26	34	23	78	74			311	18	13	8	5	4	8	11	34	14	3	12	2	4	0	5	18	42	15	2	7	9	0	2	0	0		
March	1007	31	26	33	23	81	77			407	20	10	8	4	3	7	13	34	19	2	9	3	1	1	6	16	42	21	1	9	9	0	3	0	0		
April	1009	32	25	33	22	79	73			310	18	11	12	17	11	8	10	18	8	5	15	5	4	6	10	21	26	12	1	6	7	1	2	0	0		
May	1010	32	24	34	21	73	63			132	12	6	16	40	21	7	2	4	1	3	8	6	18	31	18	6	7	5	1	4	6	0	1	0	0		
June	1012	31	22	33	18	68	54			70	6	4	10	49	25	6	1	2	0	3	5	3	28	41	12	4	5	2	0	5	6	0	1	0	0		
July	1013	30	20	32	16	62	50			16	3	2	7	52	31	6	0	0	0	2	4	2	26	46	14	3	3	2	0	5	7	0	0	0	0		
August	1014	30	20	32	16	65	49			0	0	0	9	50	32	7	1	1	0	0	2	2	22	46	17	5	3	2	1	5	7	0	0	0	0		
September	1014	31	20	33	16	64	45			1	1	5	16	48	18	8	2	2	1	0	3	0	16	35	16	14	12	4	0	5	7	0	0	0	0		
October	1013	32	22	34	19	66	56			12	1	16	29	25	8	6	5	5	5	1	5	1	5	14	13	27	26	9	0	5	8	0	0	0	0		
November	1011	33	25	34	22	69	62			57	7	28	23	11	4	3	6	13	12	0	7	1	3	3	6	23	38	18	1	5	8	0	1	0	0		
December	1009	33	25	35	23	74	70			160	12	18	16	11	5	6	8	19	15	2	14	2	2	3	5	19	36	18	1	5	7	0	2	0	0		
Means	1008	32	26	34	23	76	73			433	17	12	11	6	4	6	11	33	13	4	10	4	3	3	5	17	40	17	1	7	8	0	3	0	0		
Totals	1011	32	23	35*	16§	71	62			—	—	10	14	27	14	6	6	14	7	2	8	3	11	19	11	14	23	10	1	6	7	—	—	—	—		
Extreme values	—	—	—	—	—	—	—	—	—	1909	115	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	15	0	—		
No. of years observations	20	20				20		20		20	20	20										20										20		20	20	20	

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.173

WMO No 94120

DARWIN AIRPORT (12° 25' S, 130° 53' E) Height above MSL – 35 m

Climatic Table compiled from observations 1985 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																										
February	1007	32	25	34	22	78	71	6	6	392	21	10	6	11	10	11	14	31	6	1	13	3	5	0	5	6	44	24	0	7	10	0	0	17		
March	1007	31	25	34	22	82	76	6	7	370	20	14	2	7	5	7	11	35	17	2	9	1	2	1	4	10	47	26	0	8	11	0	0	13		
April	1008	32	25	34	22	78	68	5	6	270	17	11	11	20	20	13	5	10	7	3	31	9	9	1	2	1	17	30	0	6	9	0	0	14		
May	1010	33	24	35	21	68	52	4	4	96	9	2	12	44	28	5	2	3	1	3	22	15	33	5	1	2	1	20	1	7	9	0	0	6		
June	1012	32	22	34	18	59	43	2	3	36	3	2	4	46	37	8	1	1	0	1	19	14	37	9	5	1	3	12	0	10	9	0	0	1		
July	1013	31	20	33	16	49	35	2	3	6	1	0	3	39	54	1	0	1	0	2	13	8	39	15	6	1	2	16	0	11	9	0	0	0		
August	1013	31	19	33	16	54	36	2	2	2	1	0	11	50	33	5	0	0	0	1	28	17	22	7	4	1	2	19	0	10	10	0	1	0		
September	1013	32	20	34	16	57	39	2	2	4	0	7	26	34	19	8	2	1	2	1	45	4	6	8	2	1	7	27	0	7	11	0	1	0		
October	1012	33	23	36	20	63	47	2	3	8	2	21	27	22	9	7	5	3	6	0	67	0	1	1	1	0	4	26	0	6	12	0	0	1		
November	1010	34	25	36	21	65	50	3	4	61	6	23	13	12	5	9	8	13	16	1	42	3	1	2	1	1	17	32	1	6	11	0	0	6		
December	1009	34	26	35	22	68	58	4	5	146	12	14	12	17	12	10	5	17	13	0	26	3	1	1	5	4	16	43	1	6	11	0	0	15		
December	1007	33	25	35	22	73	66	5	6	254	15	11	12	13	7	8	10	31	7	1	17	4	5	0	6	3	37	28	0	7	11	0	0	16		
Means	1010	32	23	36*	15§	66	53	4	4	–	–	10	12	26	20	8	5	12	6	1	28	7	13	4	4	3	16	25	0	8	10	–	–	–		
Totals	–	–	–	–	–	–	–	–	–	1645	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	2	89		
Extreme values	–	–	–	38†	11‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		
No. of years observations	20	20				20		30		20		20										20										20		20	20	20

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.174

WMO No 95111

PORT KEATS AIRPORT (14° 15' S 129° 32' E) Height above MSL – 29 m

Climatic Table compiled from observations 2001 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa 1007	°C 33	°C 25	°C 36	°C 22	% 81	% 70	Oktas		mm 343	19	8	13	10	6	12	15	17	13	6	13	2	1	4	14	8	23	33	2	Knots		5	7	0	7	0
February	1006	32	25	34	21	82	75			708	21	14	4	11	11	5	8	25	17	5	11	2	1	4	8	7	34	33	0	6	8	0	12	0		
March	1008	33	24	36	21	78	65			365	17	12	12	13	16	11	11	11	7	7	11	6	7	12	3	6	29	24	2	5	7	0	8	0		
April	1010	35	23	36	18	57	44			53	6	5	20	29	28	4	2	3	2	7	5	3	30	15	3	2	27	15	0	6	7	0	1	0		
May	1012	33	20	36	14	49	37			30	3	2	5	46	30	8	2	2	2	3	4	9	22	30	7	3	15	10	0	7	7	0	2	0		
June	1014	31	17	34	10	40	30			8	1	0	2	35	52	5	2	0	1	3	6	1	16	41	13	3	13	7	0	9	8	0	1	0		
July	1014	31	17	34	11	41	30			0	0	1	12	37	41	6	0	0	0	3	8	1	23	23	11	0	14	20	0	8	8	0	0	0		
August	1013	32	16	35	11	44	33			0	1	5	12	48	25	2	2	5	1	0	4	1	8	10	7	1	30	39	0	7	8	0	0	0		
September	1012	33	22	37	15	65	47			7	2	36	7	9	4	7	4	14	18	1	6	1	0	7	0	0	32	54	0	5	9	0	0	0		
October	1010	35	24	39	18	60	48			14	2	38	1	7	5	3	2	13	29	2	15	0	0	2	4	2	14	63	0	7	9	0	0	0		
November	1009	34	25	37	22	69	60			183	11	26	7	11	9	6	6	11	18	6	15	2	3	2	3	7	17	51	0	6	8	0	4	0		
December	1008	34	26	37	22	75	66			357	15	15	10	10	1	5	9	25	20	5	9	3	1	4	6	6	26	45	0	5	8	0	6	0		
Means	1010	33	22	38*	9§	61	50			–	–	13	9	22	19	6	5	11	11	4	9	3	9	13	6	4	23	33	0	6	8	–	–	–		
Totals	–	–	–	–	–	–	–	–	–	2068	98	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	41	0			
Extreme values	–	–	–	40†	9‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
No. of years observations	4	4				4				4	4	4										4										4		4	4	4

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.175

WMO No 94102

TROUGHTON ISLAND (13° 45' S 126° 9' E) Height above MSL – 8 m

Climatic Table compiled from observations 1992 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with			
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder	
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm								
	hPa	°C	°C	°C	°C	%	%	Oktas		mm																											
January	1007	32	27	34	23	79	73			276	12	8	4	7	7	6	28	32	8	0	11	4	2	1	2	5	60	15	0	10	12	0	2	0			
February	1006	31	26	33	23	82	77			244	16	6	5	4	7	5	21	37	14	1	7	6	1	1	1	6	57	21	0	11	13	0	5	0			
March	1009	32	26	34	23	78	73			214	13	4	4	15	15	16	19	19	8	0	11	17	7	1	1	3	43	17	0	9	10	0	4	0			
April	1011	33	27	35	24	66	60			55	5	2	8	19	34	26	8	3	0	0	11	38	24	1	0	2	17	7	0	9	9	0	1	0			
May	1013	32	26	34	23	56	51			4	0	0	0	33	41	18	4	4	0	0	2	21	59	1	0	1	10	6	0	13	11	0	0	0			
June	1014	29	23	31	21	51	48			0	0	0	0	37	46	12	3	1	0	1	4	27	54	5	0	2	7	1	0	14	12	0	0	0			
July	1014	29	22	30	20	58	54			0	2	0	1	33	46	15	4	1	0	0	5	33	43	1	0	2	11	5	0	11	11	0	0	0			
August	1014	29	23	31	21	64	56			0	1	1	1	21	28	25	12	10	1	1	13	32	18	0	0	3	21	13	0	9	10	0	0	0			
September	1013	31	25	32	22	73	65			0	1	2	2	12	8	12	33	27	4	0	20	9	3	0	0	2	33	33	0	7	9	0	0	0			
October	1011	32	26	33	23	71	66			2	1	1	3	9	4	7	32	39	5	0	12	8	2	1	0	2	44	31	0	8	11	0	0	0			
November	1009	33	28	35	25	70	66			13	3	3	4	10	6	5	38	29	4	1	14	6	3	1	0	2	47	26	1	8	11	0	0	0			
December	1008	33	27	35	24	74	69			103	7	6	6	9	9	5	31	28	6	0	12	9	4	1	0	3	55	16	0	11	12	0	2	0			
Means	1011	31	25	35*	19§	69	63			–	–	3	3	17	21	13	20	19	4	0	10	18	18	1	0	3	34	16	0	10	11	–	–	–			
Totals	–	–	–	–	–	–	–	–	–	911	61	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	14	0			
Extreme values	–	–	–	36†	11‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
No. of years observations	13	13				13				20	20	13										13											13	13	13		

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.176

WMO No 95205

DERBY AIRPORT (17° 22' S 123° 40' E) Height above MSL – 7 m

Climatic Table compiled from observations 1985 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																		Mean wind speed		Number of days with				
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900									1500									0900	1500	Gale or above	Fog	Thunder		
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa 1006	°C 36	°C 26	°C 40	°C 23	% 74	% 50	Oktas		mm 179		7	10	6	6	24	14	21	11	1	17	4	2	4	13	8	7	45	0	Knots		7	10	0	5	0
February	1005	33	25	37	22	81	62			153		7	12	8	4	20	15	21	12	1	23	4	3	2	10	9	14	35	0	8	10	0	9	0		
March	1008	34	25	38	22	76	53			110		9	11	14	15	20	11	11	6	3	15	7	13	12	8	8	10	27	0	7	9	0	7	0		
April	1010	35	23	37	19	64	38			33		6	8	26	23	19	4	6	4	4	4	4	27	12	8	4	12	29	0	6	8	0	2	0		
May	1013	33	19	36	13	48	29			24		1	10	21	49	13	3	0	1	2	5	4	24	29	9	2	8	19	0	8	9	0	4	0		
June	1015	31	15	34	10	44	24			11		1	6	27	46	16	1	0	0	3	3	3	29	34	7	1	5	18	0	8	8	0	0	0		
July	1015	31	14	34	8	45	23			7		1	7	23	42	23	2	0	0	2	4	1	13	23	11	1	14	33	0	7	9	0	2	0		
August	1014	32	15	36	10	43	18			2		9	7	16	22	31	4	4	4	3	4	1	10	13	10	3	11	48	0	7	10	0	0	0		
September	1012	35	19	41	13	55	29			0		9	2	6	15	26	12	14	13	3	14	1	1	10	10	5	12	47	0	7	10	0	0	0		
October	1010	37	22	41	18	56	33			2		4	3	7	7	25	25	11	18	0	13	0	2	6	3	3	9	64	0	8	11	0	2	0		
November	1008	38	25	42	23	58	37			17		5	2	3	7	16	27	23	17	0	15	1	0	1	4	4	6	69	0	8	12	0	1	0		
December	1006	36	26	41	23	66	46			88		9	4	6	4	8	19	27	23	0	16	2	5	2	2	7	7	59	0	9	12	0	4	0		
Means	1010	34	21	43*	9§	59	37			–	–	6	7	14	20	20	11	11	9	2	11	3	11	12	8	5	9	41	0	8	10	–	–	–		
Totals	–	–	–	–	–	–	–	–	–	626	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	36	0			
Extreme values	–	–	–	45†	6‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		
No. of years observations	20	20				20				60		20									20									20		20	20			

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.177

WMO No 94203

BROOME AIRPORT (17° 57' S 122° 14' E) Height above MSL – 9 m

Climatic Table compiled from observations 1986 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																		Mean wind speed		Number of days with			
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900									1500									0900	1500	Gale or above	Fog	Thunder	
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm						
January	hPa 1006	°C 33	°C 26	°C 37	°C 23	% 73	% 63	Oktas 4 4		mm 108	9	9	9	7	9	7	11	12	33	12	0	5	3	4	2	4	3	64	15	0	Knots 8 11		0	0	13
February	1006	32	26	35	22	78	68	4	4	225	13	9	6	12	6	9	10	35	12	1	7	2	4	3	7	3	56	18	0	8	11	0	1	10	
March	1008	33	25	37	22	74	59	3	3	107	7	10	9	19	19	16	7	12	3	5	7	3	11	11	9	3	44	12	0	8	10	0	1	10	
April	1011	34	22	37	17	65	45	2	2	26	3	3	6	35	27	12	2	3	0	12	1	3	20	18	12	3	37	6	0	6	9	0	2	3	
May	1013	32	18	35	12	54	34	2	2	17	2	1	5	47	33	5	1	0	0	8	1	3	28	24	14	7	20	3	0	7	9	0	3	0	
June	1015	30	15	33	9	50	27	1	1	13	2	0	3	56	34	1	0	0	0	6	1	5	29	34	16	3	10	2	0	7	9	0	2	0	
July	1015	29	14	33	8	52	28	1	1	9	2	1	4	59	24	1	0	1	0	10	0	6	21	26	21	5	18	3	0	6	9	0	4	0	
August	1014	31	14	35	10	54	28	1	1	7	3	1	6	26	36	9	4	3	1	14	0	2	5	13	27	3	46	4	0	7	10	0	6	0	
September	1013	31	19	38	13	59	44	1	1	2	3	3	3	21	22	16	6	16	8	5	0	0	2	4	17	5	59	13	0	7	11	0	4	0	
October	1011	33	22	40	18	59	49	1	2	12	1	3	1	8	10	31	12	27	7	1	0	0	1	3	7	7	70	12	0	8	12	0	1	1	
November	1009	33	25	40	22	63	56	2	3	9	1	2	1	6	12	12	15	40	11	1	0	0	1	0	5	3	72	19	0	9	13	0	0	3	
December	1007	33	26	38	23	68	61	3	2	57	5	3	5	7	8	7	15	44	10	1	1	1	1	1	1	1	75	19	0	10	13	0	0	7	
Means	1011	32	21	41*	7§	63	47	2	2	—	—	4	5	25	20	11	7	18	5	5	2	2	11	12	11	4	48	10	0	8	11	—	—	—	
Totals	—	—	—	—	—	—	—	—	—	592	51	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	24	47	
Extreme values	—	—	—	43†	6‡	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years observations	19	19				19		50		19		19									19									19		19	19		

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.178

WMO No 94312

PORT HEDLAND AIRPORT (20° 22' S, 118° 38' E) Height above MSL – 9 m

Climatic Table compiled from observations 1984 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa 1006	°C 36	°C 26	°C 44	°C 22	% 65	% 53	Oktas		mm 53	0	14	7	13	9	9	15	17	15	1	34	4	3	1	0	1	1	56	0	Knots		9	14	0	0	9
February	1005	36	26	41	22	66	53			53	0	4	3	9	22	18	11	25	8	0	26	4	5	10	4	2	8	41	0	10	14	0	1	9		
March	1009	37	25	41	21	58	42			42	0	3	3	23	32	20	8	7	3	1	40	6	13	9	8	0	2	22	0	10	13	0	0	6		
April	1012	35	22	39	17	51	33			33	0	1	1	26	40	24	5	2	0	1	44	10	15	9	1	1	1	19	0	9	12	0	1	1		
May	1014	31	18	36	12	46	31			31	0	1	0	40	35	14	6	1	0	3	33	5	29	12	1	1	1	18	0	10	12	0	1	1		
June	1016	28	15	33	9	44	27			27	0	0	1	40	49	7	2	0	0	1	30	9	36	14	1	1	1	8	0	10	12	0	1	0		
July	1017	28	13	31	7	48	27			27	0	0	2	32	51	12	1	1	0	1	50	4	24	12	1	0	0	9	0	8	11	0	2	0		
August	1016	30	14	34	9	48	23			23	0	1	1	21	35	17	13	5	2	5	37	5	17	11	2	3	2	23	0	9	12	0	2	0		
September	1014	32	16	39	12	45	30			30	0	0	5	22	25	12	14	16	2	4	37	3	7	5	1	1	5	41	0	9	13	0	2	0		
October	1011	35	19	42	14	43	36			36	0	4	5	17	14	12	13	26	7	2	40	1	3	2	1	1	6	46	0	10	15	0	1	0		
November	1008	36	22	43	18	47	41			41	0	7	9	11	8	7	15	26	17	0	33	0	0	1	1	0	3	62	0	10	16	0	0	1		
December	1006	36	25	44	21	57	49			49	0	7	8	7	8	10	17	26	17	0	31	1	0	1	1	0	5	61	0	9	16	0	0	3		
Means	1011	33	20	45*	8§	52	37			–	–	3	4	22	27	13	10	13	6	2	36	4	13	7	2	1	3	34	0	10	13	–	–	–		
Totals	–	–	–	–	–	–	–	–	–	290	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	11	30			
Extreme values	–	–	–	46†	6‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
No. of years observations	21	21				21				20	20	21										21										21		21	21	21

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.179

WMO No 94302

LEARMONTH AIRPORT (22° 14' S 114° 5' E) Height above MSL – 5 m

Climatic Table compiled from observations 1984 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																		Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900								1500								0900	1500	Gale or above	Fog	Thunder		
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W						NW	Calm
January	hPa 1007	°C 38	°C 23	°C 45	°C 19	% 60	% 37	Oktas		mm 20	3	3	5	4	2	58	16	10	1	1	20	21	10	6	11	18	13	1	0	11	11	0	0	3
February	1006	37	24	43	20	61	38			56	4	3	4	6	11	55	16	4	1	0	25	24	17	7	6	11	9	1	0	10	11	0	0	5
March	1010	36	23	41	19	65	37			43	3	0	5	14	5	59	14	1	1	1	22	25	23	12	5	8	2	3	0	10	10	0	0	4
April	1013	33	20	37	17	62	35			16	3	2	4	5	4	48	28	1	0	8	19	30	26	8	9	3	3	2	0	7	9	0	0	2
May	1016	28	17	34	11	65	37			50	5	1	7	7	5	29	41	5	1	4	18	37	23	10	3	3	4	2	0	6	9	0	1	1
June	1017	25	12	29	8	71	37			57	7	2	5	6	4	19	49	8	1	6	20	35	27	12	3	1	1	1	0	5	9	0	0	0
July	1018	24	12	27	7	74	42			22	5	2	6	5	5	22	51	4	1	4	17	26	24	20	10	3	0	0	0	6	10	0	1	0
August	1018	26	12	31	8	64	32			13	3	1	0	3	4	41	38	5	1	7	20	25	19	16	9	6	5	0	0	5	10	0	1	0
September	1016	29	14	34	10	59	29			3	1	1	2	1	9	71	11	1	2	2	16	20	13	16	12	11	12	0	0	9	11	0	1	0
October	1013	33	16	39	13	50	24			0	0	0	1	3	6	71	11	5	3	0	13	13	18	7	13	19	16	1	0	12	12	0	0	0
November	1011	35	18	40	15	53	28			1	1	3	2	5	3	60	20	6	1	0	14	14	8	3	8	24	27	2	0	12	13	0	0	0
December	1008	37	21	43	17	52	32			10	1	1	2	1	2	55	28	10	1	0	17	21	5	3	5	24	24	1	0	12	12	0	0	0
Means	1013	32	18	46*	6§	61	34			–	–	2	3	5	5	49	27	5	1	3	18	24	18	10	8	11	10	1	0	9	11	–	–	–
Totals	–	–	–	–	–	–	–	–		291	36	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	4	15	
Extreme values	–	–	–	48†	4‡	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
No. of years observations	21	21				21				21	21	21								21								21		21	21	21		

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.180

WMO No 94300

CARNARVON AIRPORT (24° 53' S 113° 40' E) Height above MSL – 8 m

Climatic Table compiled from observations 1986 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0800	1400	0800	1400	Average fall	No. of days with 1 mm or more	0900								1500								0900	1500	Gale or above	Fog	Thunder				
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W						NW	Calm		
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																										
February	1009	31	22	39	20	63	55			12	1	1	2	5	13	64	6	6	3	0	0	0	0	33	57	9	1	0	13	16	0	0	1			
March	1007	33	24	40	21	60	54			16	2	2	2	19	21	45	4	4	3	0	1	1	4	2	31	55	6	0	13	16	0	0	3			
April	1012	32	22	39	18	61	53			16	2	3	3	21	31	33	7	1	1	0	1	1	5	3	38	45	7	0	12	15	0	0	2			
May	1014	30	19	37	15	67	53			17	3	3	4	23	41	22	4	2	1	0	1	1	4	2	45	34	10	3	9	13	0	1	1			
June	1016	27	15	33	11	69	45			25	5	7	16	34	28	7	1	1	3	3	5	4	12	6	29	25	14	5	7	11	0	1	0			
July	1018	24	11	28	8	69	41			43	7	11	18	28	31	6	1	3	1	1	9	5	10	8	30	18	14	6	7	11	0	1	0			
August	1019	23	10	27	7	75	45			48	7	11	11	36	31	5	1	4	0	1	9	2	12	11	35	15	10	6	7	12	0	1	0			
September	1019	24	11	29	8	70	45			19	5	8	5	18	49	9	2	0	4	5	0	2	8	8	41	20	14	7	8	13	0	1	0			
October	1017	24	14	30	10	59	48			9	3	4	4	13	43	21	6	5	3	1	1	1	2	0	48	32	13	3	11	15	0	1	0			
November	1015	26	16	33	13	54	49			2	1	2	1	8	40	40	6	1	2	0	0	0	0	0	45	44	8	3	14	17	0	0	0			
December	1012	28	19	37	15	56	52			4	1	1	2	9	20	49	12	4	3	0	0	0	0	1	28	54	15	2	14	16	0	0	1			
Means	1010	30	21	39	18	59	53			5	1	2	1	7	12	59	12	4	3	0	0	0	0	1	27	57	12	3	14	17	0	0	1			
Totals	1014	28	17	42*	8§	63	49			–	–	5	6	18	30	30	5	3	2	1	2	1	5	4	36	38	11	3	0	11	14	–	–	–		
Extreme values	–	–	–	–	–	–	–	–	–	216	38	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	6	9			
No. of years observations	19	19				19		19		19		19								19								19		19	19	19				

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.181

WMO No 94403

GERALDTON AIRPORT (28° 48' S 114° 42' E) Height above MSL – 35 m

Climatic Table compiled from observations 1984 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with			
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder	
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm								
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																				Knots							
February	1011	31	18	42	13	56	43	2	2	6	2	4	10	11	27	33	7	5	2	1	0	1	1	3	52	29	11	3	0	12	17	0	0	1	0		
March	1010	33	19	42	14	54	40	2	2	13	2	5	17	16	34	21	4	2	1	0	0	4	7	7	55	18	7	2	0	13	16	0	0	1			
April	1014	31	18	39	13	56	39	2	2	15	3	5	27	22	30	13	1	1	1	0	1	2	11	9	50	17	8	2	0	11	16	0	1	2			
May	1017	28	16	36	10	65	41	2	3	25	6	9	34	17	25	6	3	1	3	2	2	3	12	7	37	17	14	8	0	8	13	0	2	2			
June	1018	25	13	31	8	68	43	3	3	72	10	11	58	11	8	4	1	5	0	2	8	9	15	9	18	11	14	16	0	8	11	0	1	1			
July	1020	21	11	26	6	74	47	3	3	113	14	15	57	12	5	1	1	5	3	1	11	13	12	14	11	12	13	13	1	9	11	0	1	1			
August	1020	20	9	23	5	81	55	3	3	95	15	18	49	12	3	3	5	5	4	1	8	12	14	14	12	9	17	14	0	9	10	0	1	0			
September	1020	20	9	25	5	81	53	3	3	67	13	11	49	11	11	3	7	4	3	1	6	5	7	18	21	16	8	19	0	8	10	0	1	0			
October	1018	22	9	29	6	76	51	2	2	30	9	4	39	15	17	3	10	7	4	1	1	2	3	5	35	30	16	8	0	9	12	0	3	0			
November	1017	25	11	35	6	62	44	2	2	19	7	4	16	16	41	11	7	3	2	0	1	3	1	2	58	23	9	3	0	10	15	0	2	1			
December	1014	27	14	39	10	51	42	2	2	9	4	3	12	15	30	24	8	4	4	0	0	2	5	2	52	27	7	5	0	12	16	0	1	1			
December	1012	30	17	41	12	51	44	2	2	5	2	1	7	16	29	33	5	3	5	1	0	1	1	3	59	27	6	3	0	13	17	0	0	1			
Means	1016	26	14	43*	5§	64	45	2	2	–	–	7	31	14	22	13	5	4	3	1	3	5	7	8	38	20	11	8	0	10	14	–	–	–			
Totals	–	–	–	–	–	–	–	–	–	469	87	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	13	11			
Extreme values	–	–	–	47†	1‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
No. of years observations	21	21				21		21		21	21	21										21										21		21	21	21	

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.182

WMO No 94610

PERTH AIRPORT (31° 56' S 115° 58' E) Height above MSL – 20 m

Climatic Table compiled from observations 1974 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																										
February	1012	32	18	41	11	55	34	3	2	7	2	8	9	43	8	21	5	4	2	0	3	5	16	14	5	20	36	1	0	10	12	0	0	1		
March	1016	30	16	39	9	60	33	3	3	18	4	8	14	43	5	23	3	1	2	1	3	9	22	10	9	21	24	2	0	10	11	0	1	1		
April	1018	26	14	34	7	69	42	3	4	33	6	11	31	36	4	7	1	2	4	4	4	10	18	8	11	14	29	6	0	8	10	0	2	1		
May	1019	22	11	29	5	75	46	4	5	90	11	21	42	24	1	4	0	3	2	3	14	20	15	4	14	13	15	5	0	7	9	0	3	1		
June	1019	19	9	23	3	82	53	5	5	147	16	18	42	19	1	5	2	7	3	3	21	15	9	3	9	11	21	10	1	7	9	0	3	1		
July	1020	18	8	23	3	84	55	4	5	163	18	25	37	13	2	7	3	5	4	4	15	15	8	4	12	11	19	16	0	6	10	0	3	1		
August	1020	19	8	24	3	85	52	4	5	116	15	21	36	12	3	6	8	4	5	5	14	6	7	4	14	19	20	14	2	6	9	0	3	1		
September	1018	20	9	26	3	78	50	4	4	76	13	21	24	15	4	10	4	14	3	5	9	3	6	1	10	25	35	11	0	7	11	0	3	1		
October	1017	23	11	32	5	64	42	4	4	40	9	15	14	27	7	18	10	5	2	2	3	3	14	5	3	30	37	5	0	9	11	0	3	1		
November	1015	27	13	37	7	53	35	3	3	32	6	6	16	38	8	16	6	5	5	0	1	4	17	8	7	24	35	4	0	10	11	0	1	1		
December	1013	30	16	40	9	52	33	3	2	7	3	5	10	41	9	25	5	3	2	0	1	2	18	9	8	27	34	1	0	11	12	0	0	1		
Means	1017	25	13	42*	2§	68	42	4	4	—	—	14	24	30	5	13	4	5	3	2	7	8	15	7	9	19	29	6	0	8	11	—	—	—		
Totals	—	—	—	—	—	—	—	—	—	747	106	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	22	12		
Extreme values	—	—	—	47†	0‡	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
No. of years observations	31	31				31		30		20	20	31										31						31	31	31						

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.183

WMO No 94601

CAPE LEEUWIN (34° 22' S 115° 8' E) Height above MSL – 14 m

Climatic Table compiled from observations 1986 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																		Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500								0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm					
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																				Knots				
February	1015	23	17	27	14	69	62	5	4	12	5	0	5	35	27	15	7	8	3	0	0	0	0	51	26	10	11	2	0	17	17	1	1	0
March	1018	23	17	29	14	69	62	5	4	21	7	5	19	30	15	12	8	6	4	1	1	0	1	38	30	13	11	6	0	15	15	1	1	1
April	1019	22	16	29	12	70	62	5	5	42	12	10	25	16	6	6	13	14	8	2	4	1	3	28	13	10	26	15	0	15	14	1	1	0
May	1018	20	14	25	10	68	59	6	6	119	17	18	26	7	5	5	13	17	9	0	15	5	10	13	7	13	23	14	0	16	14	3	2	1
June	1018	18	13	21	10	70	63	6	6	164	21	21	20	1	1	3	15	29	9	1	17	8	6	1	4	15	34	15	0	18	18	5	3	1
July	1018	17	12	20	8	69	62	6	6	161	22	10	20	2	0	7	11	38	11	1	11	3	7	3	8	9	38	21	0	19	18	6	2	1
August	1019	17	11	21	8	72	64	6	6	120	21	19	13	3	1	9	19	27	9	0	9	1	3	4	12	19	31	21	0	16	17	5	2	1
September	1017	17	12	21	10	69	64	5	5	89	18	8	9	8	1	4	17	36	16	1	4	1	3	6	11	14	43	18	0	18	18	3	3	1
October	1018	18	13	25	10	69	62	5	5	54	16	5	15	13	10	15	17	13	12	0	1	0	0	24	19	22	18	16	0	15	16	2	1	0
November	1016	20	15	27	10	67	63	5	5	33	9	4	11	35	17	11	8	10	4	0	0	0	0	38	27	10	19	6	0	16	16	1	1	0
December	1016	22	16	27	13	68	64	5	5	13	6	0	5	36	24	11	10	11	3	0	1	1	3	46	20	12	11	6	0	16	17	0	0	0
Means	1017	20	14	32*	9§	69	63	5	5	–	–	9	15	18	11	9	12	18	8	0	5	2	3	25	17	13	23	12	0	16	16	–	–	–
Totals	–	–	–	–	–	–	–	–	–	847	159	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	29	18	6
Extreme values	–	–	–	38†	6‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
No. of years observations	19	19				19		30		19		19										19								19		19	19	

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.184

WMO No 94802

ALBANY AIRPORT (34° 56' S 117° 48' E) Height above MSL – 69 m

Climatic Table compiled from observations 1986 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																		Mean wind speed		Number of days with					
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900									1500									0900	1500	Gale or above	Fog	Thunder			
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm								
	hPa	°C	°C	°C	°C	%	%	Oktas		mm																											
January	1015	24	14	35	9	69	56	5	4	27	3	3	13	35	10	13	8	11	6	1	0	1	22	32	24	18	3	0	0	10	14	0	2	1			
February	1016	24	15	38	10	72	54	5	4	23	3	6	15	26	13	17	4	9	9	1	3	0	25	30	19	16	6	1	0	9	13	0	1	1			
March	1019	23	13	35	8	75	54	5	5	39	5	8	17	16	7	13	11	15	12	1	3	1	20	29	21	20	5	1	0	8	12	0	2	1			
April	1019	22	12	31	7	83	55	5	5	52	7	15	16	14	3	3	3	10	26	10	10	8	12	17	13	17	17	6	0	6	10	0	3	1			
May	1018	19	10	26	5	85	56	5	5	100	10	24	7	3	1	5	4	11	35	10	20	7	5	6	9	17	19	17	0	6	9	0	3	1			
June	1018	17	8	21	4	85	63	6	5	113	12	25	3	1	0	3	4	12	46	6	18	4	1	2	3	8	38	26	0	7	10	0	3	1			
July	1017	16	7	20	3	85	64	5	6	114	13	25	4	1	3	4	5	7	48	3	14	7	1	4	6	9	33	26	0	8	10	0	2	2			
August	1018	16	7	21	4	85	63	5	5	101	13	22	3	2	0	3	6	15	45	4	14	1	5	6	7	22	24	21	0	7	10	0	2	1			
September	1016	17	8	23	5	80	62	5	5	90	12	17	7	3	2	3	8	13	46	1	12	4	4	6	8	20	32	14	0	8	10	0	3	1			
October	1017	18	9	26	5	74	61	5	4	69	10	9	17	5	3	13	13	17	22	1	6	1	12	15	22	23	16	5	0	8	10	0	2	1			
November	1016	21	11	30	8	68	60	5	4	46	6	5	16	23	15	12	8	8	12	1	2	1	18	35	19	18	4	3	0	10	13	0	1	1			
December	1016	22	13	33	7	68	57	5	4	29	4	3	15	28	14	12	11	14	3	0	1	0	24	33	23	15	3	1	0	10	14	0	1	1			
Means	1017	20	11	38*	2§	77	59	5	5	—	—	14	11	13	6	8	7	12	26	3	9	3	12	18	14	17	17	10	0	8	11	—	—	—			
Totals	—	—	—	—	—	—	—	—	—	803	98	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	25	13			
Extreme values	—	—	—	42†	1‡	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
No. of years observations	19	19				19		40		19		19									19									19		19	19				

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.185

WMO No 94638

ESPERANCE (33° 50' S 121° 53' E) Height above MSL – 27 m

Climatic Table compiled from observations 1984 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																		Mean wind speed		Number of days with			
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500								0900	1500	Gale or above	Fog	Thunder	
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm						
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																									
February	1015	26	15	40	11	64	57	3	3	21	6	16	16	19	20	11	7	8	2	1	4	1	3	53	28	10	1	0	0	11	16	0	1	2	
March	1016	26	16	39	11	67	57	4	4	23	5	17	19	21	14	14	8	0	6	1	4	3	7	53	25	5	2	1	0	10	15	0	1	1	
April	1019	25	15	38	10	69	53	4	3	28	8	30	12	13	11	12	7	7	7	1	8	6	3	51	19	11	1	1	0	9	13	0	1	2	
May	1020	23	14	32	8	76	54	4	4	37	10	35	17	6	3	10	1	13	12	3	16	3	4	31	22	11	10	3	0	9	12	0	2	2	
June	1019	21	11	29	7	78	53	4	4	76	13	39	9	2	1	3	7	11	27	1	21	5	1	18	13	12	18	12	0	9	10	0	2	1	
July	1019	18	9	23	6	76	54	5	4	83	16	32	2	0	0	6	5	10	44	1	21	4	3	4	9	9	26	24	0	11	12	0	1	1	
August	1019	17	8	23	4	79	58	4	4	101	17	28	3	1	1	6	3	13	45	0	15	6	2	5	12	8	23	28	1	11	12	0	2	1	
September	1019	18	9	26	5	78	55	4	4	73	15	29	2	3	1	9	4	17	34	1	13	2	3	7	12	14	34	15	0	10	12	0	1	1	
October	1017	19	10	28	6	73	53	4	3	62	14	25	4	2	4	7	6	22	29	1	9	3	2	16	23	19	17	11	0	12	13	0	2	1	
November	1017	21	11	32	7	66	52	4	4	42	12	19	9	7	4	20	7	15	19	0	3	6	2	27	36	16	6	4	0	11	13	0	1	1	
December	1016	23	13	37	8	63	57	3	3	29	8	18	19	12	15	18	6	5	7	0	3	2	4	53	27	8	2	1	0	11	16	0	1	2	
Means	1018	22	12	39*	4§	71	55	4	4	—	—	25	10	9	8	11	6	11	19	1	10	3	3	31	22	11	12	8	0	10	13	—	—	—	
Totals	—	—	—	—	—	—	—	—	—	590	130	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	15	17	
Extreme values	—	—	—	44†	1‡	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years observations	21	21				21		30		19	19	21										21								21	21	21			

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.186

WMO No 94647

EUCLA (31° 41' S 128° 53' E) Height above MSL – 102 m

Climatic Table compiled from observations 1990 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																			Knots							
February	1014	25	17	41	11	62	60	4	3	11	4	12	7	31	27	16	3	1	3	0	1	1	31	42	22	3	0	0	0	10	13	0	1	1		
March	1018	25	16	38	11	64	59	4	4	28	7	20	16	26	19	13	3	2	1	0	3	1	33	38	22	1	1	1	0	9	11	0	2	0		
April	1020	23	14	34	9	64	56	4	4	32	7	36	14	16	10	5	6	6	7	0	6	3	34	34	15	3	2	3	0	9	10	0	1	0		
May	1021	22	11	31	5	68	53	4	3	29	11	44	7	2	3	6	7	15	15	1	13	3	13	27	24	5	10	5	0	8	9	0	2	0		
June	1021	19	8	25	3	71	50	4	4	32	10	48	2	1	3	3	5	15	22	1	22	2	4	16	20	9	13	14	0	9	9	0	1	0		
July	1020	18	7	25	4	69	48	3	3	24	9	37	4	1	2	3	3	24	25	1	18	1	7	19	18	9	13	15	0	9	10	0	1	0		
August	1020	20	8	30	4	67	49	3	4	23	9	42	5	2	3	3	7	23	15	0	12	1	11	19	26	10	9	12	0	9	11	0	2	0		
September	1017	22	10	35	4	60	52	4	4	21	7	31	6	7	9	9	14	15	9	0	8	0	19	21	29	11	4	8	0	11	11	0	2	1		
October	1017	23	11	38	4	51	51	3	3	18	7	23	11	9	12	21	13	7	3	1	8	1	20	34	30	4	1	2	0	11	12	0	1	0		
November	1015	24	14	40	6	59	58	4	4	18	5	17	8	26	23	16	8	1	1	0	1	1	28	44	21	3	1	1	0	10	13	0	0	1		
December	1014	25	16	40	9	62	60	4	4	38	6	9	6	29	29	17	9	1	0	0	1	3	28	38	28	1	1	0	0	10	13	0	1	1		
Means	1018	23	12	44*	3§	64	55	4	4	–	–	27	8	15	15	11	7	9	8	0	8	1	21	33	22	5	5	5	0	10	11	–	–	–		
Totals	–	–	–	–	–	–	–	–	–	286	87	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	15	4		
Extreme values	–	–	–	47†	2‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		
No. of years observations	15	15				15		40		15	15	15										15										15		15	15	15

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.187

WMO No 94653

CEDUNA AMO (32° 8' S 133° 42' E) Height above MSL – 16 m

Climatic Table compiled from observations 1985 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																			Knots							
February	1014	28	16	43	9	44	45	3	4	14	4	16	9	14	24	28	6	2	1	0	3	2	1	1	84	6	1	2	0	12	17	0	0	2		
March	1018	27	13	40	8	50	45	2	4	7	3	16	10	19	28	20	3	2	1	1	5	1	1	2	80	7	2	2	0	12	16	0	1	1		
April	1021	25	10	34	5	53	46	3	4	16	6	22	20	21	12	8	5	6	5	1	5	2	2	3	65	19	3	1	0	10	14	0	2	0		
May	1021	21	9	30	3	63	47	3	4	24	9	31	20	8	5	5	6	3	17	5	16	7	3	1	39	22	9	3	0	10	12	0	2	1		
June	1022	19	7	26	2	72	52	3	4	35	12	43	9	4	0	1	7	5	26	5	20	5	2	2	20	26	15	10	0	10	12	0	2	1		
July	1021	18	6	24	1	68	50	3	4	38	12	44	13	6	1	2	3	3	25	3	19	4	2	2	20	26	17	10	0	10	12	0	2	0		
August	1020	19	6	28	1	64	48	3	4	34	13	32	16	8	3	3	12	6	19	1	16	5	2	3	21	29	17	6	1	11	14	0	2	0		
September	1018	21	9	33	3	56	49	3	4	25	8	27	12	9	9	6	13	12	11	1	13	3	1	1	35	31	13	3	0	13	15	0	1	1		
October	1017	23	10	37	5	48	45	3	4	32	7	17	16	9	8	13	18	17	2	0	10	4	1	0	53	23	8	1	0	13	15	0	1	1		
November	1015	26	13	40	5	45	47	4	4	15	5	20	5	16	16	26	10	5	2	0	4	2	1	5	73	12	2	1	0	12	17	0	0	2		
December	1014	27	15	40	10	45	47	4	5	28	6	12	12	15	20	22	15	2	2	0	2	3	0	5	71	16	2	1	0	12	17	0	0	2		
Means	1018	24	11	44*	2§	55	48	3	4	—	—	25	12	12	13	13	9	6	9	1	10	3	1	3	54	19	7	3	0	11	15	—	—	—		
Totals	—	—	—	—	—	—	—	—	—	279	88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	14	12		
Extreme values	—	—	—	47†	−5‡	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
No. of years observations	18	18				18		21		18		18										18										18		18	18	18

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.188

WMO No 94804

NEPTUNE ISLAND (35° 20' S 136° 7' E) Height above MSL – 32 m

Climatic Table compiled from observations 1984 to 2004

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with			
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder	
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm								
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																											
February	1014	22	16	30	14	73	70			70	0	4	8	22	23	21	12	8	2	0	2	3	11	15	48	12	8	1	0	15	16	1	1	1	0		
March	1015	22	17	29	15	76	73			73	0	2	9	29	27	21	6	5	1	0	4	4	11	13	54	7	6	0	1	14	15	0	1	0			
April	1019	21	16	27	13	74	69			69	0	3	15	23	23	19	8	4	5	0	3	6	12	17	46	8	7	1	0	14	13	1	1	1			
May	1021	19	15	23	13	75	72			72	0	12	11	31	12	11	9	10	4	0	5	10	22	16	20	10	12	4	1	14	13	1	1	0			
June	1020	18	14	21	11	75	71			71	0	19	14	17	5	11	13	11	9	1	12	18	13	5	14	14	13	11	0	14	14	2	2	0			
July	1020	16	13	19	11	77	75			75	0	30	5	2	2	10	17	20	14	0	15	7	3	3	8	17	26	21	0	18	18	3	2	0			
August	1018	16	12	18	9	77	76			76	0	32	9	4	3	10	12	22	8	0	23	7	1	0	16	9	28	16	0	18	18	4	2	1			
September	1018	16	12	20	9	73	71			71	0	19	10	3	0	12	12	26	16	2	15	16	3	1	10	22	17	16	0	17	18	4	1	1			
October	1016	17	12	22	9	76	73			73	0	18	9	7	4	7	14	27	14	0	7	17	6	2	10	15	27	16	0	20	18	3	1	1			
November	1016	17	13	21	10	74	72			72	0	15	16	7	3	14	21	16	7	1	6	15	6	5	21	19	21	7	0	16	16	2	1	0			
December	1016	20	14	25	12	74	70			70	0	4	10	27	19	15	17	6	2	0	1	3	16	10	43	15	11	1	0	15	16	1	1	1			
December	1014	20	15	26	14	75	72			72	0	2	9	19	23	18	13	13	3	0	4	5	11	6	50	12	11	1	0	15	16	1	1	1			
Means	1017	19	14	31*	9§	75	72			–	–	13	11	16	12	14	13	14	7	0	8	9	10	8	28	13	16	8	0	16	16	–	–	–			
Totals	–	–	–	–	–	–	–	–	–	387	0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	23	15	7			
Extreme values	–	–	–	33†	7‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
No. of years observations	21	21				21				20	20	21										21										21		21	21	21	

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.189

WMO No 94672

ADELAIDE AIRPORT (34° 57' S 138° 32' E) Height above MSL – 8 m

Climatic Table compiled from observations 1984 to 2005

Month	Average pressure at MSL	Temperatures				Average humidity		Average cloud cover		Precipitation		Wind distribution – Percentage of observations from																				Mean wind speed		Number of days with		
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month	0900	1500	0900	1500	Average fall	No. of days with 1 mm or more	0900										1500										0900	1500	Gale or above	Fog	Thunder
												N	NE	E	SE	S	SW	W	NW	Calm	N	NE	E	SE	S	SW	W	NW	Calm							
January	hPa	°C	°C	°C	°C	%	%	Oktas		mm																			Knots							
February	1014	28	16	40	11	46	39	3	4	17	5	11	11	3	13	12	28	20	2	0	1	1	3	10	13	59	11	2	0	9	13	0	0	1		
March	1018	25	14	36	8	50	45	4	4	12	4	17	13	7	13	19	11	15	3	2	1	0	1	9	22	56	7	3	1	7	12	0	0	1		
April	1021	22	12	31	6	53	47	6	5	28	7	25	17	9	8	12	8	11	6	4	4	4	6	11	13	43	13	6	0	7	9	0	1	0		
May	1021	19	10	25	4	65	56	7	5	52	11	32	34	5	5	5	5	7	0	7	12	4	2	4	11	40	14	12	1	7	9	0	2	0		
June	1021	16	8	21	3	75	66	7	5	70	15	38	24	1	1	5	8	10	8	7	28	5	1	1	4	20	21	20	0	8	10	0	4	0		
July	1020	15	7	19	2	74	63	8	5	59	15	38	19	4	4	5	6	9	9	6	35	3	1	1	5	23	18	14	0	8	10	0	4	0		
August	1019	16	8	21	2	67	59	6	5	53	16	42	18	3	1	4	11	8	10	3	15	6	2	2	4	24	27	20	0	9	10	0	3	0		
September	1017	18	9	27	3	61	56	6	5	49	12	34	11	1	2	9	14	17	11	1	13	6	1	3	1	37	22	17	0	10	11	0	1	1		
October	1017	21	11	32	4	56	52	6	5	41	10	24	10	3	6	7	22	21	7	0	5	6	0	2	11	49	21	6	0	11	12	0	1	1		
November	1015	24	13	35	7	48	44	5	5	19	7	15	11	3	13	4	29	16	9	0	3	5	0	9	18	54	5	6	0	9	12	0	0	2		
December	1014	26	15	36	10	48	42	4	4	28	7	14	4	3	13	10	26	25	5	0	2	2	2	6	20	57	9	2	0	10	13	0	0	1		
Means	1018	22	12	41*	−2§	57	51			–	–	26	15	4	8	8	16	15	6	10	4	2	6	11	43	15	9	0	9	11	–	–	–			
Totals	–	–	–	–	–	–	–	65	56	448	113	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	16	7		
Extreme values	–	–	–	44†	−1‡	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		
No. of years observations	20	20				20		45	62	20		22										22										22		22	22	22

* Mean of highest each year

§ Mean of lowest each year

† Highest recorded temperature

‡ Lowest recorded temperature

⊕ Rare

⊖ All observations

1.190

METEOROLOGICAL CONVERSION TABLE AND SCALES

Fahrenheit to Celsius

°Fahrenheit

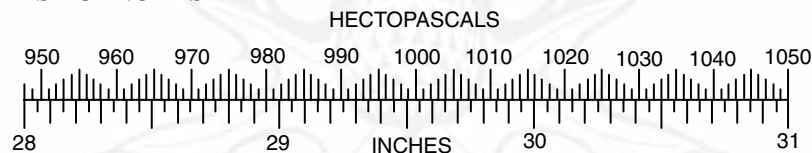
	0	1	2	3	4	5	6	7	8	9
°F	Degrees Celsius									
-100	-73.3	-73.9	-74.4	-75.0	-75.6	-76.1	-76.7	-77.2	-77.8	-78.3
-90	-67.8	-68.3	-68.9	-69.4	-70.0	-70.6	-71.1	-71.7	-72.2	-72.8
-80	-62.2	-62.8	-63.3	-63.9	-64.4	-65.0	-65.6	-66.1	-66.7	-67.2
-70	-56.7	-57.2	-57.8	-58.3	-58.9	-59.4	-60.0	-60.6	-61.1	-61.7
-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

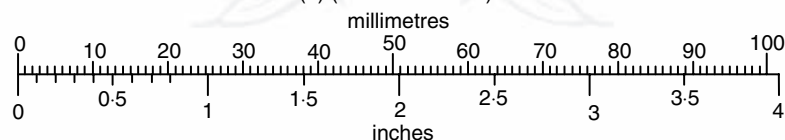
	0	1	2	3	4	5	6	7	8	9
°C	Degrees Fahrenheit									
-70	-94.0	-95.8	-97.6	-99.4	-101.2	-103.0	-104.8	-106.6	-108.4	-110.2
-60	-76.0	-77.8	-79.6	-81.4	-83.2	-85.0	-86.8	-88.6	-90.4	-92.2
-50	-58.0	-59.8	-61.6	-63.4	-65.2	-67.0	-68.8	-70.6	-72.4	-74.2
-40	-40.0	-41.8	-43.6	-45.4	-47.2	-49.0	-50.8	-52.6	-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

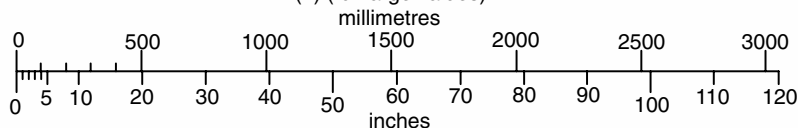


MILLIMETRES TO INCHES

(1) (for small values)



(2) (for large values)



CHAPTER 2

ENDEAVOUR STRAIT TO CAPE WESSEL INCLUDING GULF OF CARPENTARIA

GENERAL INFORMATION

Chart Aus 4720

Scope of chapter**2.1**

- 1 This chapter covers the N coast of Australia from the SW limit of Endeavour Strait (10°50'S 142°10'E) to Cape Wessel, about 300 miles W, including Gulf of Carpentaria, a deep indentation on the N coast of Australia, which is entered between Slade Point (10°59'S 142°08'E) close E of Crab Island, and Cape Arnhem, about 320 miles WSW. It also includes the seas lying SE of Wessel Islands between Cape Wessel (11°00'S 136°45'E) and Cape Arnhem, including Buckingham, Arnhem and Melville Bays.

Ports**2.2**

- 1 The ports of Weipa (2.27), Karumba (2.74), Gove Harbour (2.213) and Milner Bay (2.316) are covered by this chapter.

Seasonal routes**2.3**

- 1 Vessels of low power proceeding into Gulf of Carpentaria from the E should follow the E shore fairly closely, consistent with safe navigation, at all times of year except when the NW Monsoon is blowing strongly. The NW Monsoon blows from December to March and brings cloud and rain.
- 2 The season of SE winds extends from March until the middle of September. On the E side of Gulf of Carpentaria it tends to vary and develop into land and sea breezes, whilst in the middle of the gulf it is constant and accompanied by a considerable NW set. This can raise a considerable sea in the W part of the gulf. At this time of year it is advisable to follow the E shore around.
- 3 After the middle of September vessels bound into the gulf or back to the E coast of Australia via Torres Strait should still keep from 20 to 40 miles from the E shore of the gulf when S of Pera Head (12°57'S 141°36'E).

Topography**2.4**

- 1 The E shore of Gulf of Carpentaria is low and regular in contour, but the W side, which rises in parts to wooded hills, is indented with bays and creeks and is fronted by numerous islands.

Large tidal flats, which cover on most HWs, extend nearly across the entire head of the gulf and change the contour of the land between HW and LW.

- 2 The shore at the head of the gulf is mostly covered with mangroves up to 9 m in height. Casuarina trees are prevalent along the shores of the gulf and are a noticeable feature owing to their tall broomlike shapes.

2.5

- 1 **Caution.** Information regarding the shores of Gulf of Carpentaria is imperfect and in some cases is taken from very early records. The same applies to the coastlines of many of the islands. Great care is necessary therefore when navigating in these waters.

Depths**2.6**

- 1 The depths throughout Gulf of Carpentaria do not exceed 70 m with from 55 to 70 m in the centre. In general there is deeper water closer to the W shore than the E. The shores are difficult to approach as they are mostly fronted by shoal depths, the 10 m depth contour is generally up to 10 miles offshore, though at the head of the gulf this distance increases.

Pilotage**2.7**

- 1 Torres Straits Pilotage Service is extended into Gulf of Carpentaria. The pilot can board at any port, or place, and is ordered by arrangement with the Sydney office. For details, see *Admiralty List of Radio Signals Volume 6 (4)*.

Aboriginal trust areas**2.8**

- 1 Many parts of the coastline of Queensland, Northern Territories and islands within Gulf of Carpentaria, are Aboriginal trust areas and reserves. Permission to enter such areas must be obtained from the Local Government Council (See 1.41).

Caution**2.9**

- 1 The charts of the S part of Gulf of Carpentaria are not based on adequate hydrographic surveys in all areas and mariners are warned to proceed with caution because uncharted dangers may exist.

THROUGH ROUTES FROM TORRES STRAIT ACROSS GULF OF CARPENTARIA

GENERAL INFORMATION

Chart Aus 4720

Deep-draught vessels**2.10**

- 1 The only route through Torres Strait for deep draught vessels is via Prince of Wales Channel.
- See *Australian Pilot Vol III* for details of Torres Strait, Prince of Wales Channel and Carpentaria Shoal Light-buoy and associated shoals.

THROUGH ROUTES

General information

Chart Aus 4720

Routes**2.11**

- 1 From W of Carpentaria Shoal Light-buoy (isolated danger) (10°44'5S 141°03'4E) the recommended route across Gulf of Carpentaria leads W, about 250 miles, to NNE of Cape Wessel (11°00'S 136°45'E).

From WSW of Carpentaria Shoal Light-buoy, the route through Gulf of Carpentaria to Melville Bay leads WSW, about 260 miles, to a position SSE of Truant Island (11°40'S 136°50'E).

Major lights:

2.12

- 1 Cape Wessel Light (11°00'S 136°45'E) (white hut on black metal framework tower, 34 m in height)
- Truant Island Light (11°40'S 136°50'E) (2.207).

Other aids to navigation

2.13

- 1 **Racons:**
Cape Wessel Light – as above.
Carpentaria Shoal Light-buoy (10°44'·5S 141°03'·4E).

Directions

(continued from *Australia Pilot Vol III*)

Charts Aus 306, Aus 4720

Carpentaria Shoal to Cape Wessel

2.14

- 1 From a position 30 miles W of Carpentaria Shoal Light-buoy (10°44'·5S 141°03'·4E) the recommended route, as shown on the chart, leads 269° direct to a position about 12 miles NNE of Cape Wessel (11°00'S 136°45'E).

There are no known dangers on this route and the chart is the best guide.

(Directions continue for passage along the N coast of Australia at 3.13 and for Melville Bay at 2.209)

Charts Aus 715, Aus 306, Aus 4720

Carpentaria Shoal to Melville Bay

2.15

- 1 From a position about 28 miles WSW of Carpentaria Shoal Light-buoy (10°44'·4S 141°03'·4E) the preferred route leads WSW. Approaching Melville Bay the route, shown on the chart, passes (with positions given from Truant Island (11°40'S 136°50'E)):
- 2 SSE of Barbette Shoal (5½ miles ENE) the E-most head on Truant Bank noting Pugh Shoal and Buccaneer Rock (2.210) (4 and 3 miles NE); thence:
SSE of Truant Island, distant about 16 miles, noting Barricade Shoal which lies 2½ miles S of the island and closer to the recommended track; thence:
- 3 NNW of Bremer Rock (21 miles S), drying 1·7 m, thence:
NNW of Sykes Shoal (20 miles S), thence:
To position 11°57'·1S 136°46'·0E, about 5 miles NNW of Veronica Island Light (22 miles S) (2.233).
(Directions continue for Melville Bay at 2.233)

ENDEAVOUR STRAIT TO NORMAN RIVER

GENERAL INFORMATION

Chart Aus 4720

Scope of section

2.16

- 1 The area covered by this section comprises:
Endeavour Strait to Albatross Bay (2.18)
Albatross Bay and Port of Weipa (2.27)
Albatross Bay to Norman River (2.63)
Norman River and Port of Karumba (2.74)

Approaches from Torres Strait

2.17

- 1 The recommended route through Torres Strait is via Prince of Wales Channel.
Endeavour Strait (10°50'S 142°10'E) may be used by light draught vessels bound W, but is not recommended as a route proceeding E.
Full details of both of these channels are to be found in *Australia Pilot Volume III*.
Caution. See 2.9.

ENDEAVOUR STRAIT TO ALBATROSS BAY

General information

Chart Aus 301

Route

2.18

- 1 The recommended route, shown on the chart, leads from position 10°54'S 141°32'E, about 35 miles W of Slade Point (2.24) the E entrance point of the Gulf of Carpentaria, to a position 4½ miles W of Duyfken Point (12°34'S 141°36'E), about 100 miles S.

Topography

2.19

- 1 Vrilya Point (11°14'S 142°07'E), 14 miles S of Slade Point, is fringed with cliffs, 15 to 20 m high, with a steep bare hill, 30 m high, close E.
- 2 Cotterell River (11°22'S 142°07'E), Doughboy River (11°28'S 142°05'E), together with Macdonald, Jackson and Skardon Rivers flow into the sea between Vrilya Point and Cullen Point, 45 miles SSW. Skardon River entrance (11°46'S 142°00'E), is a well defined opening distinguishable by a large clump of casuarina trees close S of the entrance.
- 3 The coast between Cullen Point (11°57'S 141°54'E) and Duyfken Point, 41 miles SSW, consists of low sand dunes backed by swampy ground. Pennefather River, which drains these swamps, breaks through the sand dunes to the sea about 20 miles SSW of Cullen Point. A prominent clump of casuarina trees stands on the S entrance point of Pennefather River but the entrance cannot be distinguished until abreast of it. The river is only suitable for boats as the entrance is shallow.

Inadequate surveys

2.20

- 1 Certain areas of the reference chart have not been adequately surveyed and mariners should exercise caution when proceeding off the recommended tracks. See information on the reference chart.

Tidal streams

2.21

- 1 When crossing the entrance to Endeavour Strait due allowance should be made for the tidal streams which set across the track. South of Latitude 11°S the tidal streams run parallel to the coastline and are comparatively weak.

Major light**2.22**

- 1 Duyfken Point Light (stainless steel framework tower, 30 m in height) (12°34'S 141°36'E).

Other aid to navigation**2.23**

- 1 **Racon:**
Duyfken Point Light (12°34'S 141°36'E).

Directions

(continued from *Australia Pilot Vol III*)

Charts Aus 4, Aus 301

2.24

- 1 From position 10°54'S 141°32'E, about 35 miles W of Slade Point, the recommended track shown on the chart leads 181½° passing:
W of Slade Point (10°59'S 142°08'E) noting the coastal bank with depths of less than 10 m which extends up to 17 miles W from the point; thence:
W of Vrilya Point (11°14'S 142°07'E) (2.19); thence:
- 2 W of Kerr Reef (11°49'S 141°51'E). A spit, with depths of less than 5 m over it, extends 6 miles from the coast a short distance S of the reef. Thence:
W of a 7.4 m shoal (12°08'S 141°42'E), the shoalest of a group lying 7 miles NNW of Pennefather River entrance (2.19); thence:
- 3 To position 12°20'S 141°30'E, about 16 miles NNW of Duyfken Point Light (2.22).
The track then leads 175° passing:
W of Janssen Shoal (12°35'S 141°34'E), the W-most danger off Duyfken Point.
(*Directions continue at 2.68 and for Albatross Bay at 2.51*)

Anchorage

Chart Aus 301 (see 1.16)

Port Musgrave**2.25**

- 1 Port Musgrave (12°00'S 141°55'E) entered between Cullen Point and the coast, 2 miles E, forms a good natural harbour of refuge for vessels seeking shelter and able to enter.

Local knowledge is necessary.

2.26

- 1 **General information.** The entrance channel is narrow and intricate with a reported (1987) least depth of 3.3 m. A sand bar with a least depth of 0.3 m over it extends nearly 3 miles NNW from Cullen Point. Caution is required.
- 2 The estuary is about 3 miles in width with Ducie River entering it from the E and Wenlock River from the S. Several shoals and drying flats lie within the entrance but good anchorage is reported about 1 mile S of Cullen Point in a depth of 11 m, sand.
The township of New Mappoon, an Aboriginal settlement, stands about 8 cables S of Cullen Point.
There is an airport at Cullen Point.

ALBATROSS BAY AND PORT OF WEIPA**General information**

Charts Aus 4, Aus 301

Position**2.27**

- 1 Albatross Bay, entered between Duyfken Point (12°34'S 141°36'E) and Boyd Point, 21 miles S, is the estuary for the Pine, Mission and Embley Rivers. These rivers are always discoloured.
Weipa stands on the peninsula between the Mission and Embley Rivers at the head of the bay.

Function**2.28**

- 1 The port of Weipa has been developed for the export of bauxite.

Topography**2.29**

- 1 Duyfken Point (12°34'S 141°36'E), consists of four low sandy tree covered points separated by shallow bays. On the SE side of Landfall Point, 2¼ miles E of the point, are some low red cliffs and hillocks which are the only noticeable natural features of this part of the coast. Duyfken Point Light (2.22) is exhibited close to the SW extremity of the point. A monument stands close S of the light.
- 2 On the N side of Albatross Bay from Duyfken Point to the entrance to Pine River, 6 miles ENE, the coast is low, sandy and covered with scrub. From Pine River to Andoomajettie Point, 7 miles ESE, the coast is low and covered with mangroves. Kerr Point (12°39'S 141°49'E), the W extremity of Weipa peninsula is fringed with mangroves. The ore storage area inland of Lorim Point (12°40'S 141°52'E) is easily identified.
- 3 The coast on the S side of the bay from Boyd Point to Wooldrum Point, 17 miles NE, is low generally, sandy and tree covered, with some red bauxite cliffs about 5 miles NE of Boyd Point. Within Boyd Bay, situated E of Boyd Point, red bauxite cliffs, 15 to 20 m high, rise from the beach.
- 4 Cora Bank (12°40'·5S 141°51'·0E) is an extensive mid-channel shoal. Navigable channels between 1 and 2 cables in width, marked on each side by numbered light-beacons, lie N and S of Cora Bank, re-uniting in mid-stream about 2¼ miles SE of Gonbung Point. The deeper channel lies to the N.

Port Limits**2.30**

- 1 The port of Weipa comprises the waters of Albatross Bay E of a line, as shown on the chart, from Jantz Point, the W extremity of Duyfken Point, to Boyd Point.

Approach and entry**2.31**

- 1 Weipa is approached through Albatross Bay and entered by South Channel and Embley River.

Traffic**2.32**

- 1 In 2002 the port was used by 96 vessels totalling 15 305 996 dwt.

Port Authority**2.33**

- 1 Ports Corporation Queensland, GPO Box 409, Brisbane, Queensland 4001. Website: www.pcq.com.au

Limiting conditions

Controlling depth

2.34

- 1 South Channel and Embley River bar, (12°40'·4S 141°50'·0E) have a maintained depth of 10·8 m. The channel S of Cora Bank (2.29) has a maintained depth of 7·3 m.

Underkeel clearance

2.35

- 1 An under keel clearance of 0·6 m for light ship arrival and 0·9 m for loaded departure is required.

Deepest and longest berth

2.36

- 1 Lorim Point Export Wharf (2.57).
Caution. Depths in the port vary depending upon regularly occurring siltation and subsequent dredging. The latest values should be confirmed with the Port Authority.

Tidal levels

2.37

- 1 Mean maximum range about 2·2 m; mean minimum range about 0·8 m. See *Admiralty Tide Tables Volume 4*.

Density of water

2.38

- 1 Density: dry season 1·024 g/cm³; wet season 1·012 g/cm³. These figures can vary considerably.

Maximum size of vessel handled

2.39

- 1 **Official limit:** length 256 m; beam 35·5 m.
Vessels up to 76 293 dwt and 255 m in length have used the port.

Arrival information

Outer anchorages

2.40

- 1 **Anchorage** is permitted anywhere in Albatross Bay except for the prohibited area (2.42) shown on the chart. The holding ground is good, mud and shells, in depths of about 11 m.
Shallow draught vessels. A good holding anchorage, for vessels of shallow draught, sheltered from NW winds exists E of Hutchman Point (12°35'S 141°37'E), the S-most of the four points on Duyfken Point (2.29).

Pilotage and tugs

2.41

- 1 **Pilotage** is available 24 hours and is compulsory for all foreign vessels over 35 m LOA. Australian vessels less than 50 m in length and those with a valid Pilotage Exemption Certificate are exempt.
The pilotage area comprises the waters of Albatross Bay E of a line, as shown on the chart, from Jantz Point to Boyd Point.
- 2 **Boarding place:** 1 mile W of Fairway Light-beacon (12°42'·0S 141°41'·3E). See *Admiralty List of Radio Signals Volume 6 (4)*.
Pilot vessel: white and orange launch.
Tugs. Three are available.

Traffic Regulations

2.42

- 1 **Vessel Traffic Service** is in operation for the control of shipping. See *Admiralty List of Radio Signals Volume 6 (4)*.

Speed restriction. A speed limit of 10 kn W of Gonbung Point (12°40'S 141°50'E) and 8 kn E of the point is in force.

- 2 **Anchorage is prohibited** in an area shown on the chart extending for 3 miles to seaward of Fairway Light-beacon (12°42'·0S 141°41'·3E). Anchoring is also prohibited in South Channel and Embley River fairway between Urquhart Point (12°40'S 141°49'E) and Evans Landing, 1½ miles ENE.

Regulations concerning entry

2.43

- 1 Vessels over 30 000 dwt enter the dredged South Channel on the in-going tidal stream up to 2½ hours before HW; they berth starboard side-to.

Quarantine

2.44

- 1 Weipa is a first port of entry, radio pratique may be available. See *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

General layout

2.45

- 1 The port of Weipa lies on the N bank of Embley River estuary on the S side of Weipa Peninsula. The deep-water berths are situated E of Gonbung Point and N of Cora Bank (2.29).
Mission River (2.59), for small vessels, lies on the N side of Weipa Peninsula.
- 2 **Approach channels.** South Channel (2.51), channels N (2.52) and S (2.54) of Cora Bank.
Swinging basins (2.53) for the deep-water berths lie about 1½ miles E and 2 miles ESE of Gonbung Point.

Fishing

2.46

- 1 In winter months, when prawn trawling is permitted, up to 150 trawlers operate in the area adjacent to Weipa.

Natural conditions

2.47

- 1 **Tidal streams** in Albatross Bay set NE on the in-going stream and SW on the out-going stream; the streams attain a rate of about 1½ kn at springs.
Tidal streams flow generally in the direction of the channels except in the outer portion of South Channel where the in-going stream sets in a NE direction diagonally across the channel. At the inner end of South Channel, off Urquhart Point, the streams set strongly across the entrance to the channel and the out-going stream reaches 4 kn.

2.48

- 1 **Local weather.** Albatross Bay is generally calm for the major portion of the year. South-east winds may at times raise a short steep sea up to 1·2 m in height.
From May to August an occasional swell from the SW enters the bay caused by strong S winds at the head of the gulf.
- 2 From November to March, during the monsoon period, a W swell is experienced which occasionally rises to a height of 3 m and breaks heavily on the shallow banks in the NE part of the bay. During this period visibility is sometimes reduced by heavy rain squalls.
Cyclones are rare, occurring about once every 3 years, generally in January or February.

Principal marks**2.49****1 Landmark:**

Conspicuous tanks (12°40'S 141°51'E) close N of Evans Landing Wharf.

Major light:

Duyfken Point Light (12°34'S 141°36'E) (2.22).

Other aid to navigation**2.50****1 Racon:** Duyfken Point Light (12°34'S 141°36'E).**Directions for entering harbour**

(continued from 2.24)

North approach and South Channel**2.51****1** From position 12°35'S 141°32'E, about 4½ miles W of Duyfken Point, the approach leads SE then E across Albatross Bay passing:

SW of Duyfken Point at a distance of at least 4 miles.

Gonbung Point Leading Lights:**2** Front light (white metal tower) (12°40'·1S 141°50'·4E).

Rear light (as above) (1¾ miles ENE of the front light).

The alignment (078°) of Gonbung Point Leading Lights then leads through the centre of South Channel into the deep water channel of Embley River passing (with positions given from Gonbung Point):

3 SSE of Fairway Light-beacon (red and white metal tripod) (9 miles WSW) marking the N side of the entrance to South Channel. The channel has a bottom width of 106 m. Thence:

Between No 1 (starboard hand) and No 2 (port hand) Light-beacons (8 miles WSW); thence:

Between numbered pairs of light-beacons marking the S and N sides of the dredged channel; thence:

4 Between No 17 (starboard hand) and No 18 (special) Light-beacons (1¼ miles WSW) at the inner end of South Channel. No 18 Light-beacon marks the E end of a drying sandbank at the junction of South Channel, Embley River and Jackson Channel (2.60). Thence:

NNW of Urquhart Point (1 mile W) the S entrance point of Embley River.

5 The track then leads E passing:

S of No 20 Light-beacon (port hand) (6½ cables W).

This light-beacon stands on the alignment of Gonbung Point Leading Lights and marks the N side of the deep water channel of Embley River.

6 Caution. At the inner end of South Channel, off Urquhart Point, the streams set strongly across the entrance to the channel and the out-going stream reaches 4 kn. See note on plan.**Channel north of Cora Bank****2.52****1** From S of No 20 Light-beacon (port hand) (12°40'·2S 141°49'·7E) the fairway leads E then NE passing (with positions given from Gonbung Point):

N of Cora Bank W Light-beacon (W cardinal) (3½ cables SW) marking the W end of Cora Bank; thence:

2 Between Gonbung Point and the N side of Cora Bank (2.29) passing between numbered light-beacons, marking the N and S sides of the fairway, to the wharves.**3 Caution.** At the dolphin berth at Evans Landing both the in-going and out-going streams set across the line of the berth towards the shore. The out-going stream begins ½ hour before the time of HW and the in-going stream ½ hour after the time of LW. Off Lorim Point both streams set parallel to the berth. The out-going stream attains a rate of 4½ kn and the in-going stream 2 to 3 kn.**2.53****1 Swinging basins.** Lorim Point swinging basin, situated SE of the berth, has a width of 487 m and is dredged to a least depth of 9·4 m (1992).

Evans Landing swinging basin lies about 2½ cables SE of the wharf and has a width of 335 m, with a least depth of 9·4 m (1992).

Channel south of Cora Bank.**2.54****1** From S of No 20 Light-beacon (port hand) (12°40'·2S 141°49'·7E) the alternative channel S of Cora Bank leads SE, ESE then NW passing (with positions given from Gonbung Point):

SW of Cora Bank W Light-beacon (W cardinal) (3½ cables SW); thence:

2 Between Leithen Point (1½ miles SE) and the S side of Cora Bank passing between the numbered light-beacons marking the N and S sides of the channel; thence :**3** S, E and N of Cora Bank E Light-beacon (E cardinal) (2 miles ESE) marking the E edge of Cora Bank; thence:

NW through the channel N of Cora Bank to the wharves.

The turn on passing SE of Cora Bank E Light-beacon is sharp, speed should be reduced before making it.

Berths**Anchorage****2.55****1 Emergency anchorage area,** the position of which can be seen on the chart, lies S of Jessica Point (12°41'S 141°53'E), good holding ground in depths from 7 to 15 m. The NE and SW limits are marked by special light-buoys.

Permission to use this anchorage should be obtained from the Harbour Master.

2.56**1 Jackson Channel anchorage.** North of Urquhart Point (12°40'S 141°49'E), at the E end of Jackson Channel (2.60) clear of Gonbung Point Leading Lights, in depths of about 20 m, suitable only for small vessels.**Alongside Berths****2.57****1 Evans Landing Wharf** (12°40'·0S 141°50'·8E) single berth, 195 m long, depth 9·29 m (1999), used for petroleum products and also by fishing vessels.

Humbug Point Wharf (12°40'·2S 141°51'·7E) single berth, 114 m long, depth 9·5 m (1999), used for general cargo.

2 Lorim Point Export Wharf (12°40'·4S 141°52'·0E) double berth 549 m long, maximum depth 12·3 m, is equipped for bulk loading of bauxite and kaolin. The kaolin conveyor lies close NW of the bauxite conveyor and bridge structure

Port services

2.58

- 1 **Facilities:** hospital at Weipa. Mobile cranes up to 150 tonnes capacity. Oily waste disposal by road tanker from Humbug wharf only.

Supplies. Diesel oil is only available at Evans Landing Wharf.

Fresh water: available at all berths, limited quantities, rate of supply slow.

- 2 **Provisions:** only by air, at least 24 hours notice required.

Communications. Weipa is not connected to the Queensland railway system. There is an airport 10 km from the port with a daily air service to Cairns. Weekly shipping service between Weipa and Karumba.

Anchorage and minor channels

Mission River

2.59

- 1 Mission River (12°37'S 141°50'E), suitable for small coasting vessels, flows into Albatross Bay N of Weipa Peninsula between Andoomajettie Point and Kerr Point. The estuary is bounded by low mangrove covered shores. There are depths of from 2.1 to 3.7 m in the approach.

Local knowledge is required.

- 2 **Anchorage.** There is reported to be good sheltered anchorage in 5 to 7 m in mid-channel about 2½ miles E of Andoomajettie Point. This anchorage should be approached with caution, sounding constantly.

Jackson Channel

2.60

- 1 Jackson Channel (12°39'S 141°46'E), flanked by drying sandbanks, is the natural outlet for Embley River. The channel has a charted depth over the bar of 1.5 m and is suitable only for small craft.

Local knowledge is required.

Bagley Channel

2.61

- 1 Bagley Channel (12°35'S 141°42'E) about 4 cables wide with a least charted depth of 2.1 m in the entrance gives access to Pine River, a shallow winding stream which drains the swamps at the N end of Albatross Bay.

Local knowledge is required.

Chart Aus 301

Boyd Bay

2.62

- 1 Boyd Bay (12°55'S 141°39'E) provides good anchorage for small craft and is sheltered from the SW. A detached shoal, with a depth of 1.5 m over it, lies 1¼ miles NE of Boyd Point in the approaches to the bay.

ALBATROSS BAY TO NORMAN RIVER

General information

Charts Aus 301, Aus 4720 (see 1.16)

Route

2.63

- 1 From W of Duyfken Point (12°34'S 141°36'E), the N entrance point of Albatross Bay, the route along the E coast of Gulf of Carpentaria leads SSW, then S, to the vicinity of the 10 m depth contour in a position about 13 miles WNW of Norman River entrance, 300 miles S.

Topography

2.64

- 1 From Boyd Point (12°55'S 141°38'E), the S entrance point of Albatross Bay, to False Pera Head, 11 miles S, the coast consists mainly of red bauxite cliffs up to 21 m high. Pera Head (2.68), 3½ miles SSW of the point, is a prominent rocky point with red bauxite cliffs on either side.
- 2 From False Pera Head to Worbody Point the N entrance point to Archer River, 15 miles S, the coast is generally low, sandy, and covered with scrub. From 2 miles SE of Ina Creek (13°11'S 141°39'E) for 2 miles SSE it is interspersed with red bauxite cliffs, 10 to 15 m high.

South of Archer River the coast continues to be low, fringed with mangroves whilst a few casuarina trees grow near the sandy parts.

Caution

2.65

- 1 The coast S of Wallaby Island (13°22'S 141°39'E) to the head of Gulf of Carpentaria has not been fully surveyed. Mariners are advised not to approach within 20 miles of the shore without local knowledge.

See general caution at 2.9.

Major light

2.66

- 1 Duyfken Point Light (12°34'S 141°36'E) (2.22).

Other aid to navigation

2.67

- 1 **Racon:** Duyfken Point Light (12°34'S 141°36'E).

Directions

(continued from 2.24)

2.68

- 1 From the vicinity of 12°35'S 141°32'E, about 4½ miles W of Duyfken Point Light, the offshore route leads SSW across Albatross Bay passing:

WNW of Pera Head (12°57'S 141°36'E) noting the detached reef, with a depth of 0.4 m over it, which sometimes breaks and is steep-to on its W side, which lies 1½ miles WSW of the head. Mariners are advised not to approach within 2 miles of the coast in this vicinity. Thence:

- 2 The route continues SSW, then S, between 20 to 40 miles from the shore to the vicinity of a position 13 miles WNW of Norman River entrance.

Dangers to be avoided on route:

Dangerous wreck (12°59'7S 141°31'8E), 3 miles offshore.

Shoal 10.3 m (13°16'S 141°16'E), 22 miles offshore.

Shoal 16.7 m (13°40'S 141°12'E), 17 miles offshore.

Shoal 17 m (16°00'S 140°54'E), 28 miles offshore.

- 3 Shoal 12.0m (16°26'S 140°51'E), 24 miles offshore.

Shoal 10 m (16°13'S 141°05'E), 16 miles offshore.

- 4 Dangerous wreck (16°44'2S 141°01'9E), 6 miles offshore.

Dangerous wreck (16°49'S 140°52'E), 12 miles offshore.

(Directions continue, for Karumba at 2.85, for Albert River at 2.95, and for Mornington Island at 2.120)

Minor rivers

Chart Aus 301 (see 1.16)

Archer River

2.69

- 1 Archer River entrance (13°21'S 141°39'E), about 2½ cables wide, is fronted by a flat and obstructed by a bar

with a depth of less than 2 m over it. The entrance is marked by plastic floats and the channel by beacons as far as Aurukun, about 5 miles within the estuary.

Several shoal patches, as indicated on the chart, lie in the approach to Archer River.

2.70

- 1 **Anchorage** has been obtained in Archer Bay under the lee of Wallaby Island, which lies close within the entrance to Archer River, in a depth of 7 m, good holding ground. Mariners should note the bay is unsurveyed.

Chart Aus 4720 (see 1.16)

Mitchell River

2.71

- 1 Mitchell River entrance (15°12'S 141°35'E) is about 1 mile wide. A spit extends N from the S entrance point and the river probably has no access except by boat. Numerous tributaries discharge N and S of the main branch and the coast in this vicinity is lower than that to the N. There is an Aboriginal settlement on the shore of Magnificent Creek, a tributary of Mitchell River.

Nassau River

2.72

- 1 Nassau River (15°55'S 141°23'E) is a small river open to the sea. The entrance to the river, sometimes marked by fishermen's floats, is hard to define due to a large sandbank, which dries 0.5 m, fronting the entrance in a N to S direction about 5 cables offshore. The entrance to the river is approached from S of the sandbank and has a least depth of 0.7 m (2.3 ft) across the bar. Inside the river entrance, which is about 250 m wide, the depths increase to about 5 m (16 ft) in the centre until the junction of Nassau River and Rocky Creek, which leads generally S just within the entrance.

Van Diemen Inlet

2.73

- 1 Van Diemen Inlet, entered close N of Point Burrowes (16°58'S 140°58'E) low and sandy, is fronted by a bar with a charted depth of 0.5 m. Within the entrance the depths increase to about 3 m (10 ft) but the river soon becomes narrow and tortuous and suitable only for boats.
- 2 Numerous patches of 5.5 m and less lie within a radius of 7 miles from the entrance to Van Diemen Inlet.

NORMAN RIVER AND PORT OF KARUMBA

General information

Chart Aus 4720 (see 1.16)

Position and function

2.74

- 1 Karumba stands on the NE side of Norman River about 1½ miles within the entrance. It is a small river port which is used for the export of live cattle and is also used by fishing vessels. In 1999 zinc concentrate was transported to vessels anchored up to 30 miles offshore.

Topography

2.75

- 1 The entrance to Norman River has few landmarks from which a mariner, unaccustomed to the area, can obtain his position, the coast being low and covered with mangroves. The SW side of the river entrance is covered with high thick trees, the NE side is low and sandy with several buildings on it.

Approach and entry

2.76

- 1 Karumba is approached through a buoyed channel and entered via the Norman River.

Port Authority

2.77

- 1 Ports Corporation Queensland, GPO Box 409, Brisbane, Queensland 4001. Website: www.pcq.com.au

Limiting conditions

Controlling depth

2.78

- 1 The marked channel ESE from the Fairway Light-buoy (2.81) has a maintained depth of 3.4 m.

Tidal levels

2.79

- 1 The tide is usually diurnal with a mean range 2.2 m. For details see *Admiralty Tide Tables Volume 4*.
Abnormal levels. During the months May to August, with strong SE winds and high pressure over the gulf, the height of tide can be up to 0.6 m less than predicted.

Arrival information

Notice of ETA

2.80

- 1 To avoid delay advance notice of arrival at the Fairway Light-buoy (safe water) (17°26'S 140°43'E) should be sent to the Port Authority.

Outer anchorage

2.81

- 1 Karumba roadstead, 14 miles NW of Fairway Light-buoy (safewater) (17°26'S 140°43'E) in depths of 9 to 11 m. A quarantine anchorage is centred in position 17°24'3S 140°42'7E as shown on the natioanl large scale chart.

Pilotage

2.82

- 1 Pilotage is compulsory for Australian vessels of 50 m LOA and over, and foreign vessels 35 m LOA and over. Pilotage is provided by Cairns giving 72 hours notice of arrival and is available 24 hours. For further details see *Admiralty List of Radio Signals Volume 6 (4)*.

Local knowledge

2.83

- 1 Local knowledge or a pilot is required.

Harbour

2.84

- 1 **Tidal streams** may attain a rate of up to 4 kn at springs.

Directions

(continued from 2.68)

2.85

- 1 From the vicinity of 17°22'S 140°37'E, about 13 miles WNW of Alligator Point, the track leads ESE towards the Fairway Light-buoy (safewater) marking the start of the maintained channel. This channel is marked both sides by light-beacons (with positions from Alligator Point (17°28'S 140°49'E):
- 2 **Karumba Leading Lights;**
Front light-beacon (white triangle on metal pile with platform) (17°26'8S 140°45'5E).
Rear light-beacon (white triangle with metal pile) (7 cables ESE of the front light)

The alignment (119°) of the above lights leads from the Fairway Light-buoy along the maintained channel to the Outer Banks (3½ miles WNW).

3 Elbow Bank Reach Leading Lights;

Front light-beacon (white triangle on black metal pile with platform) (17°26'7S 140°45'2E).

Rear light-beacon (same structure) (17°26'7S 140°44'8E).

The alignment (264°) astern, of the above lights leads E for 1¼ miles.

4 The track then continues generally ESE through the buoyed channel, marked by various light-beacons (port and starboard hand) the positions of which can best be seen from the chart, passing:

Between Alligator Point, the S entrance point of Norman River and an un-named point (1 mile E) forming the N entrance point of Norman River, known locally as Karumba Point, from which a light (white tripod beacon) (17°28'S 140°50'E) is exhibited; thence:

5 Between the river banks to the berth.

Useful mark:

Karumba Light (water tower) (17°30'S 140°50'E).

Berths

2.86

- 1 **Moorings.** Mooring buoys, occasionally lighted, are moored on the W side of the river abreast the wharves (17°29'S 140°50'E) and are used by fishing vessels during the closed season.

Berths. There are several wharves, at which fishing vessels and other vessels berth, on the SE side of the river.

Norman River

General information

2.87

- 1 Norman River above Karumba is suitable only for small craft. The river is blocked by sand banks at the Baffle Group of islands, 4 miles above Double Island (17°38'S 140°57'E). The town of Normanton is situated about 15 miles above Double Island and can be reached only by small craft, and then only at, or near, HW spring tides.

GULF OF CARPENTARIA – SOUTH PART

GENERAL INFORMATION

Charts, Aus 305, Aus 4720 (see 1.16)

Scope of section

2.88

- 1 The area covered by this section comprises;
 - Norman River to Albert River (2.93)
 - Albert River to Appel Channel (2.97)
 - Norman River to Mornington Island (2.115)
 - Mornington Island to Sir Edward Pellew Group (2.127)

Caution. See 2.9.

Principal islands

Wellesley Islands

2.89

- 1 Wellesley Islands, centred about 16°45'S 139°30'E, lie off the W side of the head of Gulf of Carpentaria and include Mornington Island, the largest of the group, the Bountiful Islands, the Forsyth Islands, and many other islets and rocks. The area between this group and the adjacent coast between Tarrant and Bayley Points has not been thoroughly examined, but the depths are mostly under 5.5 m and there appear to be many dangers.

- 2 South Wellesley Islands (17°03'S 139°26'E) (2.99) include, amongst others, Sweers and Bentinck Islands and Allen and Horseshoe Islands.

2.90

- 1 Mornington Island and Denham Island close SW provide good grazing for cattle and horses; wallabies abound providing a popular diet for the islanders. Bird life, including wild fowl is abundant; excellent fish can be obtained and turtles are plentiful on the reefs E of the island.

- 2 The Aboriginal settlement of Gununa (2.107), an ex-mission station, stands on Dubbar Point at the SW end of Mornington Island and practically all the inhabitants live in the vicinity of the settlement.

Crocodiles and sharks infest the waters around Mornington Island and bathing anywhere is very dangerous.

2.91

- 1 **Forsyth Islands.** During summer the Forsyth Islands (16°50'S 139°07'E) (2.100) are hot and humid with hordes of virile poisonous sandflies which cause considerable discomfort to unprotected personnel.

Sir Edward Pellew Group

2.92

- 1 Sir Edward Pellew Group (2.135) consists of five principal islands lying off the approach to McArthur River (15°49'S 136°40'E).

Vanderlin Island (15°45'S 137°01'E), the largest of the group, lies farthest E and is separated from the W islands by Addison Channel.

- 2 The main islands on the W side are arranged as to the compass points and include, amongst others, North Island, Centre Island, South West Island and West Island.

On Observation Island (15°37'S 136°54'E) an obelisk was erected by HMAS *Geranium* in 1923 in memory of Commander Matthew Flinders, RN, of HMS *Investigator*, December 1802.

NORMAN RIVER TO ALBERT RIVER

General information

Chart Aus 4720 (see 1.16)

Route

2.93

- 1 From Norman River (17°28'S 140°50'E) the route to Albert River (17°34'S 139°45'E) leads W then SW.

Topography

2.94

- 1 The coast from Alligator Point, at the mouth of Norman River, to Gore Point, 51 miles W, is low and covered with mangroves. At Spring Creek, midway between Alligator Point and Gore Point, there is a sandy beach, an unusual feature along this stretch of coast, extending E from the creek for about 5 miles. Two clumps of tall mangrove trees mark the W entrance to Spring Creek.

ALBERT RIVER TO APPEL CHANNEL

General information

Chart Aus 4720 (see 1.16)

Route

2.97

- 1 From Albert River (17°34'S 139°45'E) a route to Appel Channel, at the SW end (16°44'S 139°14'E) of Mornington Island, leads NW then NNW, passing between Bentinck Island (17°04'S 139°30'E) and Allen Island, 8 miles W.

Topography

2.98

- 1 **Mainland coast.** The coast between Stokes Point and Tarrant Point (17°22'S 139°25'E), 23 miles WNW, is low and covered with mangroves. Tarrant Point can be identified by a slight rise in the land behind it forming low mounds or hillocks. Several rivers and creeks flow into the gulf along this stretch of the coast.

- 2 There is a wide but shoal bight on the coast between Tarrant Point and Point Parker, about 25 miles NW, over its S part the shore is low and covered with mangroves but rises slightly farther inland when closer to Point Parker. Point Parker is wooded and rises to a hillock 9 m high; there is a sandy beach, clear of mangroves, on its S side.

From Point Parker to Bayley Point, 10 miles NW, the coast continues low and mangrove covered intersected with several creeks.

2.99

- 1 **South Wellesley Islands.** Sweers Island (17°06'S 139°37'E), the SE-most of South Wellesley Islands, is separated from the larger Bentinck Island to the W by Investigator Road (2.108). Inspection Hill (2.105), on the S extremity of Sweers Island, is the highest land in the area. The N extremity of the island is rocky and wooded and the NE end is faced by low dark cliffs.

- 2 Bentinck Island is slightly elevated and well covered with grass and trees. The S side of the island is considerably indented and the projecting points are lined with mangroves, fronted with coral heads.

Fowler Island, between Bentinck and Sweers Islands, is not easily distinguished from a distance, there is a clump of trees near its S extremity.

- 3 Allen Island (17°02'S 139°14'E) lies between Point Parker and the W extremity of Bentinck Island. Ironstone cliffs face the SE end of the island which is low and fertile, being covered with grass, small trees and shrubs.

Horseshoe Island (17°00'S 139°16'E) with several outlying islets and above-water rocks lies off the NE side of Allen Island.

2.100

- 1 **Forsyth Islands** comprising Forsyth Island (16°50'S 139°07'E), the largest of the group, Bayley Island, 5 m high, Pains Island, 4 m high, and several other islets, reefs and above-water rocks lie between the mainland at Bayley Point and the SW extremity of Mornington Island, 15 miles NE. The islands are generally low lying and covered with scrub and trees.

Depths

2.101

- 1 This route is suitable only for vessels of shallow draught.

Caution. Owing to the imperfect nature of the survey in this area navigation is dangerous except in conditions of good light. Constant attention to soundings should be given and a sharp look-out maintained, whilst speed should be

- 2 From Gore Point (17°38'S 139°56'E) to Kangaroo Point, (17°35'S 139°45'E) the E entrance point of Albert River, the coast is sandy for the first 6 miles and forms a conspicuous mark when viewed from offshore because of the break in the mangrove trees. Disaster Inlet, entered immediately S of Gore Point has a remarkable quoin-shaped clump of mangroves on its S entrance point.

- 3 Albert River entrance can be identified by a peculiar clump of trees on Kangaroo Point. The coast E of the entrance as far as the mouth of Leichhardt River, 2 miles E, is sandy and backed by straggling trees, whilst that W is covered with mangroves. The land is low and has few noticeable features.

- 4 During the dry season the out-going streams from most of the creeks and inlets between Flinders River (17°36'S 140°36'E) and Gore Point are insufficient to force a channel through the banks across their mouths.

Directions

(continued from 2.68)

2.95

- 1 From a position about 13 miles WNW of Alligator Point (17°28'S 140°49'E) the route leads W passing:

Clear of a dangerous wreck (position approximate) (17°18'S 140°21'E); thence:

N of Gore Point (17°38'S 139°56'E) distinguishable by a particularly bare sand hill, 12 m high, standing on it; there is no similar hillock on this coast.

(Directions continue for Albert River at 2.96 and for Appel Channel at 2.106)

Burketown

General information

2.96

- 1 **Position.** Albert River (17°34'S 139°45'E) is entered between Kangaroo Point and Stokes Point. Burketown stands on the W bank of the river about 35 miles above the entrance.

Controlling depths:

Albert River bar: 0.9 to 1.5 m.

Albert River to Truganini Landing: 1.4 m.

Truganini Landing to Burketown: 0.6 m.

- 2 **Pilotage.** Pilots are not available.

Local knowledge. Albert River is suitable only for small coasting vessels. Local knowledge and daylight entry are required.

Harbour. There is a wharf and shed at Truganini Landing.

- 3 **Local weather.** The wind affects the depth of water over the bar; the least depth with SE and greatest with N winds.

- 4 **Directions.** *(continued from 2.95)* The bar off the entrance to Albert River lies about 4 miles NNE of Kangaroo Point (17°35'S 139°45'E), its position and the depths over it are subject to change as it consists of shifting sand. The channel is usually visible owing to breakers on the banks, some of which dry, or by discolouration of the water over the shoals.

During every wet season heavy freshets cause the banks in the river to shift.

- 5 Above Truganini Landing to Burketown the river is suitable only for small craft.

Caution. An obstruction lies 5 miles NE of Kangaroo Point.

Useful mark

Kangaroo Point Light (lattice tower, 9 m in height) (17°35'S 139°45'E).

reduced, as many uncharted dangers may exist. See also general caution at 2.9.

Local knowledge

2.102

- 1 Local knowledge is required for Appel Channel, at the end of the route. A local Aboriginal seaman can normally be employed as a pilot for Appel Channel (2.107).

Natural conditions

2.103

- 1 **Tidal streams.** Observations taken in 1960 indicate the nature of the tide to be mainly diurnal with a maximum range of about 3.7 m but during strong SE weather this was reduced by about 0.9 m. In the same period the maximum recorded rate of tidal streams was about 1¼ kn.

2.104

- 1 **Local weather.** In the S approach to Appel Channel, between Mornington Island and Denham Island, there is seldom any sea or swell even during the SE winds but dense haze often reduces the visibility to as little as 5 miles in this vicinity during the season of SE winds.

Landmark

2.105

- 1 Inspection Hill (17°08'S 139°37'E) on the S extremity of Sweers Island.

Directions

(continued from 2.95)

2.106

- 1 From a position 7 miles N of Albert River entrance (17°34'S 139°45'E) the track leads NNW for about 14 miles before continuing NW for about 22 miles and remaining clear of unsurveyed waters, passing (with positions given from Point Parker (17°02'S 139°09'E)):
 - Between Tarrant Point (25 miles SE) and Locust Rock (28 miles ESE) (2.109) the S-most danger off Sweers Island; thence:
- 2 SW of the small rocky islet (16 miles ESE), distant 1½ miles, lying 1½ miles S of Kirk Point; and: Clear of a dangerous rock over which the depth is unknown lying 3 miles SW of Kirk Point; thence: SW of an uncharted drying reef reported to lie 1 mile S of Albinia Island (13 miles ESE).
- 3 The track then continues NNW passing:
 - Between Creffild Point (2.112), distant 3 miles, and Margaret Island (13 miles E); thence:
 - Between Horseshoe Island (7 miles ENE), enclosed by reefs, and Bessie Island (12½ miles E); thence: WSW of a ledge of rock, at the N end of which lies Douglas Island (12½ miles ENE). Thence:
- 4 Between the reef NE of Forsyth Island (13 miles N) (2.100) and Oyster Reef extending 3 miles SSE from Timber Point (18 miles NNE) to the Appel Channel approach (2.107).

Useful mark

A light-beacon (rectangular top mark) (17°06'8S 139°35'7E).

Caution. Tidal streams are reported to set strongly E and W across the track on the route between Mornington Island and Horseshoe Island.

Appel Channel

General information

2.107

- 1 **Description.** Appel Channel, known locally as Mission Channel, separates Mornington Island from Denham Island. The channel is marked by beacons and is suitable for vessels up to 3.7 m draught.

Gununa Aboriginal settlement stands at the SW end of Mornington Island at the W entrance to Appel Channel. A small jetty with a depth of 1.8 m alongside is situated abreast the settlement, greater depths exist a short distance off the jetty.

- 2 **Local knowledge** is required.

Sheltered anchorage can be found in depths of 7 to 9 m, ½ cable S of the jetty.

Facilities: hospital; airstrip.

Investigator Road anchorage

Chart Aus 4720 (see 1.16)

General information

2.108

- 1 **Description.** Investigator Road (17°07'S 139°35'E), between the S part of Sweers Island and the E side of Fowler Island, is the only secure anchorage at the head of Gulf of Carpentaria for vessels throughout the year. It is sheltered from prevailing winds, E by Sweers Island and W and N by Fowler and Bentinck Islands.

The roadstead is spacious and easy of access from S, having a broad and clear passage leading to it.

- 2 **Depths.** Investigator Road has depths of from 7.3 to 11.1 m (24–36 ft) throughout its S part.

Tidal streams in Investigator Road set S with the rising tide and N with the falling tide, the stream changing to a N direction from 2 to 3 hours before HW.

The maximum rate is about 2 kn but the rate and also the duration of the set are considerably influenced by the strength of the prevailing wind.

Directions

2.109

- 1 **Initial position.** Investigator Road must be entered from the S entrance as reefs and shoals extend across the N of the roadstead from Raft Point (17°06'S 139°35'E) to the N part of Sweers Island.

From a position 5 miles ESE of Locust Rock (17°09'5S 139°37'5E), the track leads W passing (with positions given from Inspection Hill (17°08'S 139°37'E) (2.105)):

- 2 S of Locust Rock (1¼ miles S) at a distance of 2 miles and:

Clear of a gravel bank extending about 1 mile S of the rock, with a depth of 1.5 m over it.

When about 3½ miles SW of Locust Rock, the track alters N for about 4 miles remaining clear of the mooring buoy (2.110).

- 3 With the alignment (030°) of the NW extremity of Sweers Island (4¼ miles N) over Inscription Point (1¼ miles NW), a low white sandy spit, a NNE track then leads towards the anchorage passing:

W of Macdonald Point (1 mile W) fringed with rocky ledges and foul ground.

Small craft may enter Investigator Road from the N, noting that a drying rock lies in mid-channel, 1 mile ENE of Raft Point.

Useful mark

Light-beacon (17°06'8S 139°35'7E) (2.106).

Anchorage**2.110**

- 1 Anchorage, for vessels of moderate draught, can be made in sand and coral about 1 mile SW of Inscription Point, as indicated on the chart, with the red cliffs on the W side of Sweers Island just open NW of Inscription Point in about 9 m.

Smaller vessels may anchor closer in to Sweers Island with the red cliffs in line with Inscription Point.

Mooring buoy. There is a mooring buoy situated 1 mile WSW of Macdonald Point (2.109).

Point Parker Anchorage

Chart Aus 4720 (see 1.16)

General information**2.111**

- 1 **Description.** Point Parker anchorage, suitable for small coasting vessels, lies between Point Parker (17°02'S 139°09'E) and the W side of Allen Island.

The approach channel to the anchorage has depths of not more than 3·7 m. There is also a channel close S of Creffild Point.

Tidal streams set SE with the rising tide and NW with the falling tide.

Directions**2.112**

- 1 **Initial position.** From a position 3 miles S of Creffild Point, the SE extremity of Allen Island, the approach leads NW passing (with positions given from Point Parker):

SW of an un-named islet (4 miles ESE).

The approach then leads NNW passing:

Between the reefs off the W side of Allen Island and those off Point Parker.

Anchorage**2.113**

- 1 Anchorage can be made in depths of from 5 to 7 m with Point Parker bearing 259°, distant between 1 and 2 miles.

Boat passage**2.114**

- 1 During the season of SE winds the route from the mainland to Gununa Aboriginal settlement, on the SW end of Mornington Island, and the open sea E of the islands and islets is most uncomfortable for small craft on account of a short sharp sea. It is possible, with local knowledge, for mariners in small craft to navigate along the shores W of the islets. There is a channel between Forsyth Island and Pains Island with a least depth of 5·5 m. Numerous shoals lie close to the edge of the channel and local knowledge is required.

- 2 The shallow water W of the island chain does not provide good sheltered anchorage even for small craft during SE weather and small craft will drag in the lee of these islands when the wind reaches its peak.

During the NW Monsoon such a passage should be made E of the islet chain. With NW winds, the lee side of the islands provides quite good anchorage.

NORMAN RIVER TO MORNINGTON ISLAND**General information**

Chart Aus 4720 (see 1.16)

Route**2.115**

- 1 The route from Norman River (17°28'S 140°50'E) to Mornington Island leads initially NW, then W, along the N coast of Mornington Island (16°30'S 139°25'E). The route continues S down the W side of Mornington Island to the NW entrance to Appel Channel (2.107)

An alternative route leads generally WNW from Norman River to Appel Channel (2.107) at the SW end (16°44'S 139°14'E) of Mornington Island, passing between Mornington and Bentinck Islands.

Topography**2.116**

- 1 Bountiful Islands (16°42'S 139°51'E), so named by Captain Flinders in 1802 on account of the great supply of turtle found there, form the E group of Wellesley Islands and are divided into two groups each being surrounded by coral reefs on which there are some islets and rocks.

- 2 The NE and largest of the islands is low with cliffs of ironstone formation on its SE side, the crest of the island consists of red sandstone. A stranded wreck lies on the NW side of the island.

The SW island is small and surrounded by coral reefs.

2.117

- 1 Mornington Island, the main island of the Wellesley group, is in general surrounded by shoal water and reefs.

Cape Van Diemen (16°32'S 139°43'E) the E extremity of Mornington Island is foul. Lingnoonganee Island lies close offshore about 2 miles N of the point and foul ground extends ENE from it.

- 2 Nyuldora, a headland at the N extremity of Mornington Island, is faced by low white cliffs. A sandy beach is reported to extend about 15 miles W from this headland to Hall Point, low and wooded.

Depths**2.118**

- 1 See cautions at 2.9 and 2.101.

Tidal streams**2.119**

- 1 Tidal streams in the vicinity of Mornington Island set SE with the rising tide and NW with the falling tide.

In the vicinity of Bountiful Islands the tidal stream sets S with the rising tide.

Directions

(continued from 2.68)

Norman River to NW of Mornington Island**2.120**

- 1 From a position about 13 miles WNW of Alligator Point (17°28'S 140°49'E) the route N of Mornington Island leads initially NW passing (with positions given from Cape Van Diemen (16°32'S 139°43'E)):

Clear of a dangerous wreck (position approximate) (16°57'S 140°17'E); thence:

NE of Bountiful Islands (12 miles SE); thence:

- 2 NE of a dangerous rock (9 miles ENE) the E-most danger off Pisonia Island (6 miles ENE); a reef lies close N of the island; thence:

NE of the foul ground extending 3½ miles E from Moondalbee Island (6½ miles NE); thence:

NE, then N of Watson Patch (existence doubtful) (9 miles N).

2.121

- 1 The route then leads W passing (with positions given from Hall Point (16°28'S 139°19'E)):
 - N of Nyuldora, the N extremity of Mornington Island (15 miles ENE); thence:
 - Clear of a 5.3 m patch (16 miles NE); thence:
 - Clear of an 8.0 m patch (12 miles NNE); thence:
- 2 Between Hall Point, fringed by a reef, and Rocky Island (11½ miles N) covered with guano; a reef which dries lies off its N part. Manowar Island, the N-most island of the Wellesley group with a stranded wreck on its S tip, lies about 3 miles NNW of Rocky Island.

Caution. Numerous coral patches and depths of less than 11 m lie off the N coast of Mornington Island, for which the chart is the best guide.

(Directions continue at 2.131)

Norman River to Appel Channel south-east entrance 2.122

- 1 From a position about 13 miles WNW of Alligator Point (17°28'S 140°49'E) the route to Appel Channel leads generally WNW passing (with positions given from Oaktree Point (16°59'S 139°30'E)):
 - Clear of a dangerous wreck (position approximate) (17°18'S 140°21'E); thence:
- 2 NNE of Sweers Island (9 miles ESE). The N part of this island should not be approached closer than 10 miles except under very favourable conditions of light owing to the foul ground extending NE from it. Thence:
 - NNE of a shoal 4.6 m (5.5 miles ESE); thence
 - NNE of an unnamed shoal patch of undetermined depth (4.5 miles E); thence
- 3 NNE of the reefs and rocks lying up to 3 miles NNW from Oaktree Point; thence:
 - SSW of Sydney Island (16½ miles N) fringed with dangers; and:
 - NNE of Douglas Island (8 miles W) (2.106) the N-most of the South Wellesley Islands; thence:
- 4 SSW of Tulburrerr Island (18 miles NW) lying 1½ miles SW of Gerrigroo Point; thence:
 - Between the reef NE of Forsyth Island (23 miles WNW) (2.100) and Oyster Reef extending 3 miles SSE from Timber Point (21 miles NW) to the Appel Channel approach.

North-west of Mornington Island to Appel Channel north-west entrance

2.123

- 1 **Description.** The approach to the W entrance of Appel Channel (2.107) is through a tidal channel, between sandbanks which extend almost the full width of the channel at its NW end, and limit the use of this approach to vessels of 2.4 m draught or less. The sandbanks can usually be distinguished by their light brown colour but this should not be relied upon at HW.

Local knowledge is required. See general caution at 2.9.
2.124

- 1 **Route.** From W of Hall Point (16°28'S 139°19'E) the line of bearing 170° of the W side of Denham Island (16°43'S 139°10'E) was reported (1969) to provide clear passage to the W approach to Appel Channel passing (with positions given from Hall Point):

2

Between Gee Wee Point (14 miles SW) and a line of dangers extending about 11 miles NNW from Midbagar Point (20 miles SSW) the S extremity of Denham Island.

The line of bearing 090° on the centre of Mission Bay (15 miles SW) then leads to the anchorage off the W entrance to Appel Channel.

Anchorage

Mission Bay

2.125

- 1 In 1969 HMAS *Bombard* (100 tons) found safe and comfortable anchorage in Mission Bay, 197°, distant 2.4 miles, from Gee Wee Point (16°38'S 139°09'E) with good holding ground, mud.

Bountiful and Rocky Islands

2.126

- 1 Anchorage can be found, clear of the reef, in 6 m about 5 cables NNE of the N point of South Bountiful Island (16°43'S 139°50'E). Landing, only at HW, is available close SW of this point.
 - During the season of SE winds good anchorage can be obtained in a depth of 7 m about 3½ cables off the W shore of Rocky Island (16°16'S 139°16'E).

MORNINGTON ISLAND TO SIR EDWARD PELLEW GROUP

General information

Charts Aus 4720, Aus 305 (see 1.16)

Route

2.127

- 1 From N of Mornington Island (16°30'S 139°25'E) the route to Sir Edward Pellew Group leads WNW.

Topography

2.128

- 1 From Bayley Point (16°55'S 139°02'E) to Tully Inlet, 53 miles WNW, the beach is broken up by patches of mangroves and mud flats. Calvert River, 34 miles NW of Tully Inlet, is more than 5 cables wide at its entrance. The E entrance is marked by a projecting point with a hillock on it.
- 2 The coast between Calvert River and Robinson River, 32 miles WNW, consists of tidal flats. Approximately midway between these two rivers there are numerous small openings behind which are small rivers and lagoons with mangroves along their banks.
 - From Pelican Spit (15°53'S 137°00'E) to McArthur River entrance, 19 miles W, the coast is fringed with mangroves and has no distinctive features.

Depths

2.129

- 1 Numerous shoal patches indicated on the chart, with depths of less than 15 m, lie well offshore along this stretch of the coast. In general, between Bayley Point and Robinson River the 20 m contour lies 20 miles offshore.
 - See general caution 2.9.

Landmark

2.130

- 1 Vanderlin Island (15°45'S 137°01'E) (2.140).

Directions*(continued from 2.121)***2.131**

- 1 From N of Hall Point (16°28'S 139°19'E), on the N coast of Mornington Island, the route leads WNW to a position in about 36 m) about 35 miles N of Vanderlin Island (15°45'S 137°01'E). There are numerous dangers along this coast which must be avoided and for which the chart is the best guide.

(Directions continue at 2.169, for Addison Channel at 2.141 and for Maria Island at 2.180)

Rivers**Calvert River****2.132**

- 1 Calvert River (16°16'S 137°45'E) is more than 5 cables wide at its entrance and has a drying sand bar which may extend right across the approaches. Within the bar there are depths of about 1·8 m; the river is wide but generally shallow.

Robinson River**2.133**

- 1 Robinson River (16°02'S 137°16'E) in 1884 had a depth of 1·2 m over the bar. Immediately inside the entrance the river divides into three parts, joining up again about 2 or 3 miles farther up. There are depths of from 6·1 to 9·1 m about 2 miles above the entrance and the river is probably navigable at HW for vessels with draughts of not more than 1·8 m.

SIR EDWARD PELLEW GROUP**General information**

Chart Aus 305 (see 1.16)

Route**2.134**

- 1 Addison Channel (15°35'S 136°55'E) (2.141) leads between Observation Island (15°37'S 136°54'E) on the W and Stevens Rocks, Turtle Islet, Middle Shoal and David Islet on the E and is the main approach to the anchorages available in the Sir Edward Pellew Group and to McArthur River. The recommended track leads through the centre of Addison Channel.

Topography**2.135**

- 1 Sir Edward Pellew Group consists of five principal islands with numerous islets and rocks lying off the approach to McArthur River. The islands are moderately high and composed mostly of hard sandstone with a small mixture of quartz and iron.

2.136

- 1 Vanderlin Island (15°45'S 137°01'E) (2.140) lies about 16 miles ENE of the entrance to McArthur River. Little Vanderlin Island lies close S of Goat Point, the S extremity of the island.
- 2 North Island (15°34'S 136°52'E) is separated from Vanderlin Island by Bruce (2.145), Addison (2.141) and Hyde Channels (2.147). Bald Hill (38 m high) and devoid of vegetation, with low ground to the W and SW, stands 1¼ miles S of Cape Pellew the NE extremity of the island. North Hill (75 m high), 2 miles farther S, is thickly wooded. The E coast between Cape Pellew and Red Bluff (2.140), 5 miles SSE, is mostly rocky. North Rock close NE of Cape Pellew is a good mark from the NW and SE.

Between Red Bluff and Walker Point, 3 miles SSW, the coast is almost entirely fronted by sandstone boulders. Skull Island and Watson Island lie off the W coast.

- 3 Centre Island (15°40'S 136°47'E) is separated from North Island by Centre Channel (2.149). An extensive but shoal bay occupies much of the E side of the island, the S side of the entrance to this bay is formed by a small irregular peninsula. The S side of the island is foul up to Labu Islet which lies close off the SW extremity. The N coast of the island is rocky.

- 4 South West Island (15°44'S 136°40'E) lies close W of Centre Island and is practically connected to the mainland SW by mangrove swamp.

West Island (15°35'S 136°33'E) the W-most of the Sir Edward Pellew Group is connected both to the mainland and South West Island by mud flats.

Surveys**2.137**

- 1 The islands in Sir Edward Pellew Group have not been thoroughly examined, in particular:

The E coast of Vanderlin Island S of Three Hummocks Point (15°38'S 137°04'E); the S and SW coasts.

The W coast of North Island between the S entrance point of Paradise Bay and Long Point (15°37'S 136°50'E).

South West Island and West Island.

2.138

- 1 **Caution.** As certain areas of the reference chart have not been completely surveyed mariners should exercise caution. See also general caution at 2.9.

Tidal streams**2.139**

- 1 In Bruce, Addison and Hyde Channels the tidal streams appear to be steady in direction but are variable N and S of these channels, they are affected by the force and direction of the wind. The duration of slack water is very brief.

The rate of tidal streams in the vicinity of Charles Point (15°41'S 136°55'E) is at least 2 kn at springs.

Landmarks**2.140**

- 1 Vanderlin Island (15°45'S 137°01'E), attains a height of approximately 83 m. It is prominent, especially from the E in the morning.
Red Bluff (15°35'S 136°54'E) a conspicuous headland composed of massive red sandstone boulders.

Directions*(continued from 2.131)***Addison Channel to McArthur River****2.141**

- 1 **Channel.** Addison Channel is the recommended channel between Vanderlin and North Islands and has a least charted depth of 6·1 m (20 ft) 7½ cables SE of Observation Island (15°37'S 136°54'E). The water between these two islands is never clear and as the bottom over the shoals cannot be seen, caution is required when entering.

2.142

- 1 **Route.** From a position 15°02'S 137°03'E the line of bearing 183° of the centre of Vanderlin Island leads towards the entrance of Addison Channel. As the island is closed Vanderlin Rocks (15°33'S 137°01'E) should be seen ahead on the same bearing passing (with positions given from Red Bluff (15°35'S 136°54'E));

- 2 E of Urquhart Islet (6 miles NNE); foul ground extends E and an isolated 8.2 m patch lies 3 miles E of the same islet, close W of the track.

The line of bearing 227½° of the obelisk (5 m in height) on Observation Island (21 m high) (1½ miles S) then leads in mid-channel passing:

- 3 NW of Vanderlin Rocks (7 miles ENE) which dry, are steep-to and nearly always marked by breakers; thence:
NW of Stevens Rocks (3½ miles ENE) sandstone boulders 2.4 m high; thence:
NW of Turtle Islet (3½ miles E) at the N end of Middle Shoal; thence:
4 NW of Middle Shoal (2½ miles E) which forms the SE side of the fairway.

When the N edge of Red Bluff bears 270° the track leads generally SSW passing:

- ESE of Observation Island (1½ miles S) composed of sandstone boulders. Rocky spits, usually marked by tide rips, extend 2½ cables N and SE respectively from the island; a 4 m patch lies 5 cables to the NE. Thence:
5 WNW of Turton Rock and Marsden Shoal lying within 5 cables W of David Islet (2¾ miles SE) on the S extremity of Middle Shoal. Turton Rock and Marsden Shoal are just covered at HW and are then marked by heavy tide rips. Thence:
6 ESE of Walker Point (3 miles SSW) fronted by sandstone boulders. Clover Shoal with a least depth of 7.3 m lies 1¾ miles SSE of this point close W of the track. Thence:
WNW of Charles Point (5¾ miles S) the W extremity of Vanderlin Island. Beattie Shoal, with a depth of 3.7 m over it lies close W of Charles Point and is marked by heavy overfalls and tide rips.
7 When Brown Islet (7¾ miles S) is 201°, 2½ miles distant, the track leads 219½°, passing:
NW of Brown Islet, on the SW end of a reef about 1¼ miles long. Shoals with a depth of 3.6 m lie about 6 cables N and 1½ miles NNE of this islet close SE of the track. Thence:
SE of Ataluma Point (10½ miles SSW), distant 1 mile. The 5m depth contour lies about 3½ cables off this point which is steep-to.

2.143

- 1 **McArthur River** (15°49'S 136°40'E) is shoal in its approach and the entrance changes after every freshet. The entrance is reported to be navigable only by vessels of 2.4 m draught or less and the channel to be marked by buoys and beacons. The town of Borrooloola, where there is an airport, lies on the W bank of the river about 35 miles above the entrance. Local knowledge is required.

Useful mark

2.144

- 1 North Rock (15°30'S 136°53'E) (2.136).

Side Channels

Bruce Channel

2.145

- 1 **Route.** Bruce Channel, leads between Pearce Islet (15°29'S 136°55'E) and Urquhart Islet, 2 miles ESE. It is recommended only for small vessels.

Local knowledge is desirable.

2.146

- 1 **Directions.** From NE the line of bearing 230° of the S extremity of Pearce Islet leads in the fairway towards the entrance of Bruce Channel.

When the W extremity of Urquhart Islet bears 158° the track then leads S passing (with positions given from Pearce Islet):

- E of Heriot Reef (5 cables N); thence:
2 Between Pearce Islet and Urquhart Islet keeping clear of the spit extending SW from this latter islet; thence:
E of Hervey Rocks (1½ miles S), distant 1 mile; thence:
E of Craufurd Islet (4 m high) (3¼ miles SW); thence:
E of Red Bluff (5¾ miles S) (2.140); thence:
The route then joins Addison Channel (2.141).

Hyde Channel

2.147

- 1 **Route.** Hyde Channel, leads between Middle Shoal (15°36'S 136°56'E) and the NW side of Vanderlin Island.

The channel is about 5 cables wide at its narrowest part between the sandy spit extending S from Turtle Islet and Disaster Reef (15°37'S 136°58'E). Vanderlin Rocks lie in the N approach to Hyde Channel. The Gutter is an extension SW of Hyde Channel.

Local knowledge is desirable.

2.148

- 1 **Directions.** From the vicinity of 15°31'S 137°01'E the track leads SW passing (with positions given from Cape Vanderlin):

- SE of the isolated 8.2 m patch (4½ miles N), distant 1 mile; thence:
NW of Vanderlin Rocks (2½ miles NE) (2.142).
The line of bearing 182° of Cape Vanderlin, steep-to on its W side and composed of hard sandstone boulders, then leads S passing:
2 W of Vanderlin Rocks, distant 1½ miles.
When Maxwell Point (1¼ miles E) bears 135° the line of bearing 224° of the E extremity of David Islet (4½ miles SW) (2.142) then leads in mid-channel until the N extremity of Turtle Islet (2 miles W) (2.142) bears 276°. The track then leads generally SW passing:
3 WNW of Wheatley Islet (25 m high) (1¼ miles SW) composed of sandstone boulders with a few trees and prickly grass on it. A submerged rock lies close S of Wheatley Islet. Thence:
4 WNW of Disaster Reef (2¼ miles SW). The reef has two dangerous rocks which, lie on the W edge of a bank extending W from the head of Base Bay. No sign of this reef shows even with a strong tidal stream. Thence:
ESE of David Islet (4½ miles SW) (2.142); thence:
The route continues SW through The Gutter to join Addison Channel (2.141)

Centre Channel

2.149

- 1 **Route.** Centre Channel, between the S coasts of North and Skull Islands and the N coast of Centre Island.

Local knowledge is required.

2.150

- 1 **Directions.** After passing through Addison Channel the line of bearing 250° of Rocky Island (15°40'S 136°50'E) leads in the fairway passing (with positions given from Phil Point (15°39'S 136°51'E)):

- 2 SSE of Walker Point (2 miles ENE) (2.142). Kirby Shoal, with a least depth of 5.8 m lies 1 mile SSE of this point close S of the fairway. A shoal patch with a least depth of 4.3 m lies 8 cables E of Rocky Island and a dangerous wreck with mast showing, lies 5 cables farther S.
- 3 When Long Point (2 miles NNW) bears 340° and well open of Phil Point the line of bearing 308° of Skull Point (4½ miles WNW) leads through the channel passing: Between Phil Point, off which a reef with a small islet on it extends 3 cables SW, and Rocky Point (1½ miles SW) with Rocky Island close E; thence: SW of Conder Point (1½ miles NNW) the S entrance point of Mud Bay; thence:
- 4 SW of Long Point (2 miles NNW). Gulch Reef, with an above-water rock on it, lies close NE of the track and is the outer-most danger extending SW from Long Point, the N entrance point of Mud Bay.

Local knowledge is essential for proceeding farther W.

Anchorage

2.151

- 1 **Off Vanderlin Island.** There is good anchorage available between the E side of North Island and the W side of Vanderlin Island. Depths generally are from 8 to 11 m, mud.

2.152

- 1 **Small vessels.** There is good anchorage for small vessels between Cape Vanderlin and the spit extending N from Wheatley Islet (15°36'S 136°59'E).

Paradise Bay

2.153

- 1 **Description.** Paradise Bay (15°31'S 136°51'E) at the N end of the W side of North Island affords good anchorage for small vessels during the season of SE winds. The bay affords excellent landing facilities as in most places the beach is wide and flat; sandhills at its head give some shelter from the wind.
- 2 From NW the line of bearing 145° of the centre of the bay gives depths ranging steadily from 14.6 m at 5 miles to 8.9 m at 1 mile.

From N, passing 5 cables off the N entrance point the depths decrease evenly from 20 m at 6 miles to 8.9 m at 1 mile. The line of bearing 180° of the S entrance point of the bay gives similar depths.

Anchorage: 3 cables offshore in a depth of 5 m, good holding ground, mud.

Cabbage Tree Anchorage

2.154

- 1 **Description.** Cabbage Tree Anchorage, W of Observation Island (15°37'S 136°54'E) affords good shelter

for small vessels from E winds. Cabbage Tree Cove itself, midway between Red Bluff and Walker Point is so shoal that its outer part is available only for boats.

Anchorage. From N steer for the E extremity of Walker Point bearing 213° until past the spit extending N from Observation Island.

- 2 From S steer for Red Bluff bearing 010° until in the position for anchoring.

From either direction careful attention must be paid to the current which may set across the course. The tidal streams are strong.

Geranium Bay Anchorage

2.155

- 1 Geranium Bay (15°41'S 136°56'E) affords excellent shelter for small vessels from winds between NNE, through E, to SSE in about 3 m. The holding ground is good consisting of thick mud. Geranium Bay itself is shoal.

Local knowledge is recommended.

Good anchorage can also be obtained off Charles Point, the S entrance point of Geranium Bay, in a depth of 15 m.

Buchanan Bay

2.156

- 1 **Description.** Buchanan Bay (15°39'S 136°42'E) lies between the NE side of South West Island and the W side of Centre Island with depths between 3.7 to 5.5 m. The head of the bay is shoal but leads to Georges Channel, separating the two islands, which is a boat channel only; it is narrow and dries in places.

Anchorage is available in a depth of 5 to 6 m with the N extremity of Red Islet bearing 100°, distant 1 mile.

Minor bays

Refuge Cove

2.157

- 1 Refuge Cove (15°35'S 137°00'E) at the N end of Vanderlin Island, entered between Cape Vanderlin and Maxwell Point, 1¼ miles E, affords good shelter for boats.

Barbara Cove

2.158

- 1 Barbara Cove (15°39'S 136°58'E) on the NW side of Vanderlin Island, entered between Kedge Point and Symonds Bluff, 1¼ miles WSW, is shoal and boats can only enter it at HW.

North Island

2.159

- 1 The bay at the N end of North Island between Ross Point and Cape Pellew (15°30'S 136°53'E) affords good anchorage for small craft; the route between North Rock and Cape Pellew appears to be clear.

SIR EDWARD PELLEW GROUP TO BLUE MUD BAY

GENERAL INFORMATION

Chart Aus 305

Scope of section

2.160

- 1 The area covered by this section comprises;
Sir Edward Pellew Group to North East Inlet (2.164)
North East Inlet to Blue Mud Bay (2.184)

Route

2.161

- 1 The route from Sir Edward Pellew Group (15°30'S 137°00'E) to Blue Mud Bay, NW of Groote Eylandt, leads initially N along the E coast, then W along the N coast of Groote Eylandt.

For a route for small vessels W of Groote Eylandt via Lowrie Channel, see 2.182.

Topography

2.162

- 1 Groote Eylandt, the largest and outermost of the islands extending E from Cape Barrow (13°40'S 136°04'E), is the largest island in Gulf of Carpentaria. Central Hill (13°58'S 136°39'E) (2.168) near the middle of the island is the highest land bordering the whole of Gulf of Carpentaria. Some of the ridges descending from Central Hill are wooded but the island is mostly barren rock with densely wooded flats in the low areas.

Caution

2.163

- 1 See general caution at 2.9, and caution on reference chart.

SIR EDWARD PELLEW GROUP TO NORTH EAST ISLET

General information

Chart Aus 305 (see 1.16)

Route

2.164

- 1 The route from Sir Edward Pellew Group (15°30'S 137°00'E) to North East Islet leads direct N about 90 miles.

Topography

2.165

- 1 **Mainland coast.** From McArthur River (15°49'S 136°40'E) to Rosie Creek, about 36 miles NW, the coast is featureless and fronted by mud flats.

Limmen Bight is entered between the entrance to Rosie Creek and Rantyrirry Point, about 75 miles NNW. The shores of the bight are generally low and sandy, backed by low level country. Limmen Bight River enters Limmen Bight about 12 miles S of Maria Island (14°53'S 135°44'E) but the entrance is blocked by nearly drying mud flats. Mount Young, an isolated rock hump, lies close S of the entrance. Beatrice Islet lies on the edge of the mudbanks NE of the river entrance.

- 2 The N part of the shores of Limmen Bight from Edward Island (14°30'S 135°37'E) to Rantyrirry Point, 24 miles NE, is wooded and fronted by shoal flats. Low Rock, two above-water rocks on a rocky shoal, and Sandy Island, standing in the middle of a large area of drying sandbanks with a smaller islet lying about 3 miles farther E, lie 12 miles SE, and 16 miles ENE, respectively, of Edward Island.

- 3 Other, smaller islands lie closer to the shores of the bight, on the drying sand flats or in deeper water off the various small headlands. The bight is, for the most part, unsurveyed and mariners should proceed with caution.

Nungkanangka Island (14°17'S 135°44'E) lies in the entrance to Rose River. Numbulwar Aboriginal settlement stands on the N entrance point and a water tower stands on the coast close NE of the settlement.

- 4 From Rantyrirry Point to Cape Barrow, 33 miles NNE, the coast consists of sandy hummocks and sandhills with low level country inland, it has not been thoroughly examined.

2.166

- 1 **Groote Eylandt south coast.** From Cape Beatrice (14°18'S 136°57'E), the SE extremity of Groote Eylandt, to South Point, 37 miles W, the coast is fronted by numerous islets and rocks. The coast W of Inamalmandja Point, midway between Cape Beatrice and South Point, has not

been thoroughly examined and should not be approached. South Point is the S extremity of a narrow peninsula which forms the SW end of Groote Eylandt.

2.167

- 1 **Groote Eylandt east coast.** The coast between Cape Beatrice and Ungwariba Point, 10 miles NNW, is rocky. From Ungwariba Point to Mamalimandja Point, about 14 miles NNW, the coast is deeply indented by two bays with a small peninsula terminating in Ilyungmadja Point between. The S bay entered between Ungwariba Point and Ilyungmadja Point, about 9 miles NW, has not been completely examined, the head of the bay is named Dalumbu Bay. The N bay has not been examined. Alexander Hill stands 2 miles N of Mamalimandja Point, the N entrance point of the N bay, it is at the S end of a range of prominent white sandhills. The NE extremity of Groote Eylandt, 7 miles NNE of Alexander Hill, has some conspicuous pink sandhills on it.

- 2 North East Islet (13°38'S 136°57'E), 45 m high, (2.169) is the largest and the outer islet of a group of islets lying up to 10 miles NE of Scott Point at the NE end of Groote Eylandt.

Principal marks

2.168

- 1 **Landmark:**

Central Hill (13°58'S 136°39'E), 220 m high, the charted height is approximate.

Major lights:

North East Islet Light (white GRP hut, 2 m in height) (13°38'S 136°57'E).

Bing Bong Light (15°38'S 136°23'E).

Directions

(continued from 2.131)

2.169

- 1 From the vicinity of 15°02'S 137°03'E the track leads N to a position ENE of North East Islet passing with positions given from North East Islet (13°38'S 136°57'E):

E of Cumberlege Reef (14°28'S 136°54'E) a drying reef which breaks, a 7.1 m patch lies about 1 mile NW; thence:

- 2 E of Cape Beatrice (40 miles S). A group of rocky islets and reefs lie up to 3½ miles S of this cape, there are tide rips off the W extremity of the largest of these islets. Thence:

E of Groote Reef (32 miles S), with a 5.5 m patch at its E extremity, the E-most known danger off the E coast of Groote Eylandt; thence:

E of Bombard Shoal (25 miles S); thence:

- 3 E of Mamalimandja Point (17 miles SSW). Reefs front this point, the NE reef is named Rocky Islet. A depth of 3.9 m is charted 5½ miles NE of the point; the area has not been completely examined and less depths may exist. Thence:

E of the un-named point (10 miles S), fronted by reefs, on the NE extremity of Groote Eylandt; thence:

- 4 To a position ENE of North East Islet. A ridge of shoal water terminating in a 4.8 m patch extends about 3½ miles S and a rocky ledge lies 2½ cables NE of North East Islet; a light is exhibited on the summit (2.168).

2.170

- 1 **Useful mark:**

Conspicuous pink sandhills (13°47'S 136°55'E).

(Directions continue at 2.187)

Bing Bong anchorages

Chart Aus 305 (see 1.16)

General information

2.171

- 1 **Position and function.** Bing Bong Anchorages (15°25'S 136°31'E) provide a bulk loading facility for deep-draught vessels. Zinc/lead concentrate is transported to the anchorages by a 3000 dwt barge, via a buoyed channel with a maintained depth of 3.5 m, from an initial loading point about 4 miles SE of Bing Bong Creek (15°36'S 136°19'E).

- 2 **Approach.** The anchorages are approached from the NE through the open waters of Gulf of Carpentaria. In 1995 the bulk carrier *M V Frangiskos C.K.*, approaching from the NE reported Cape Beatrice (2.169) showing on radar at 30 miles and the islands of Sir Edward Pellew Group (2.134) at 60 miles.

Limiting conditions

2.172

- 1 **Maximum size of vessel handled.** Part laden 46 000 dwt, and full laden 28 000 dwt vessels have been handled.

Vessels should maintain a distance of 9.5 m or less between the waterline and the top of either bulwark or hatch coaming, whichever is higher. This must be maintained from time of anchoring until completion of loading.

- 2 **Local conditions.** Very low tides can cause delays of up to 4 hours for the barge leaving the loading berth.

It is reported (August 2000) that frequent dense rolling fog banks at the anchorage, mainly in the morning, can reduce visibility to less than 100 m (see 1.164). This usually occurs between June and September and can cause delays of up to 5 hours.

Arrival information

2.173

- 1 **Port radio** is operated from the loading facility.
Pilotage. Pilots are not compulsory, but recommended, and are available as shown in *Admiralty List of Radio Signals Volume 6 (4)*

Directions

2.174

- 1 From position 15°20'S 136°32'E the recommended track, as shown on the chart, leads 180°, passing (with positions given from Bing Bong Light (15°38'S 136°23'E)):

Through BB2 Anchorage (16½ miles NNE), thence:
W of a 9.4 m shoal (16 miles NE), thence:

To a position E of a 9.8 m patch (15 miles NNE).

The track then leads 216° for 2 miles to BB1 Anchorage (13¼ miles NE).

Anchorages

2.175

- 1 **BB2** (15°23'3S 136°32'0E), the outer anchorage, in a depth of about 12 m.

BB1 (15°26'5S 136°30'8E), the preferred inner anchorage, in a depth of about 12 m.

Vessels should use their starboard anchor; the holding ground is reported to be good.

Port services

2.176

- 1 **Facilities.** Customs and quarantine formalities are handled by the Master or the Chief Officer of the barge.

There are no routine medical facilities at Bing Bong; emergency cases would be airlifted to Darwin, about 1000 km distant.

Supplies are only available from Darwin or Mount Isa, also about 1000 km distant.

Maria Island anchorages

General information

2.177

- 1 **Route.** The route from Sir Edward Pellew Group to the anchorages at Maria Island (14°53'S 135°44'E) leads W about 80 miles.

2.178

- 1 **Topography.** Maria Island is covered with brushwood; the E and S sides are relatively steep-to. The W side is shoal and indented by Eagle Bay.

For topography of mainland coast, see 2.165.

2.179

Caution is required in the approach to Maria Island because of the unsurveyed area. The island can be approached apparently with safety from the E and S.

Directions

(continued from 2.131)

2.180

- 1 **Initial position.** From a position 15°02'S 137°03'E the track leads W passing (with positions given from Maria Island):

N of Labyrinthian Shoals (position approximate) (27 miles SE), in depths of not less than 12.8 m.

The shoals are a group of sandbanks and rocky heads, the two largest sandbanks are above water and have a few bushes on them, thence:

- 2 Clear of the dangerous reef (charted dangerous rock, position doubtful) (11 miles E); thence:

N of the small islet lying 1½ miles ENE of Beatrice Islet (11 miles S); thence:

Between the S side of Maria Island and the mudflats extending N from the mainland.

Caution. Meikleham Reef lies 8 miles ENE of Cape Maria, the NE extremity of Maria Island.

Anchorages

2.181

- 1 Anchorage can be obtained during the season of SE winds with the SW extremity of Maria Island bearing 118° and during the NW Monsoon with the same point bearing 320°. Small craft may anchor in about 3 to 4 m with the N entrance point of Eagle Bay bearing NE, distant 1¼ miles.

Lowrie Channel

General information

2.182

- 1 **Description.** Lowrie Channel separating Bickerton island (13°45'S 136°11'E) from the mainland is the S approach to Blue Mud Bay anchorages (2.300) and is reported to be safe for small vessels.

There are depths of 5.5 to 12.1 m between Woody Islet and the mainland but only 3.9 m at the N end of the channel.

- 2 **Local knowledge** is required.

Topography. For details of mainland coast see 2.165.

Tidal streams meet off Tasman Point (14°13'S 136°19'E) and heavy tide rips are encountered in this vicinity.

Roper River

General information

2.183

- 1 Roper River (14°45'S 135°25'E) entered about 20 miles WNW of Maria Island may be identified by Gulnare a remarkable bluff, 41 m high, terminating a range of hills N of the river.
- 2 The depth over the bar is charted at 0.5 m but this depth changes with the seasons and the channel is known to shift. Inside the bar the depths increase gradually to 9.1 m, this depth being maintained for several miles, the river being from 2½ to 4 cables wide and navigable by small craft for about 100 miles.
- 3 **Local knowledge** is required.
There is a small town 10 miles above the entrance and Ngukurr Aboriginal settlement, a community government centre, 30 miles farther up river.

NORTH EAST ISLET TO BLUE MUD BAY

General information

Charts Aus 305, Aus 14

Route

2.184

- 1 From ENE of North East Islet (13°38'S 136°57'E) the route leads W along the N coast of Groote Eylandt, for a distance of about 35 miles, to Chasm Island near the entrance to Blue Mud Bay.

Topography

2.185

- 1 For topography of Groote Eylandt, see 2.162.

Principle marks

2.186

- 1 **Landmark:**
Central Hill (13°58'S 136°39'E) (2.168).
Major light:
North East Islet Light (13°38'S 136°57'E) (2.168).

Directions

(continued from 2.170)

2.187

- 1 From a position about 11 miles ENE of North East Islet (13°38'S 136°57'E) the route leads W passing (with positions given from North East Islet):
N of Moresby Rock (2 miles N). Heavy tide rips are formed between this rock and the islet, mariners are advised not to approach the shore within 4 miles when rounding this danger. Thence:
2 S of a dangerous wreck (19 miles NW); thence:
N of North Point Island (15 miles W); thence:
N of Chasm Shoal (20 miles W); thence:
The track then leads SW to a position 4¼ miles NNW of Chasm Island (20 miles W).

2.188

- 1 **Useful mark:**
Jagged Head (13°42'S 136°45'E) (2.191).
*(Directions continue for
Milner Bay approaches at 2.308)*

Port Langdon

Chart Aus 305 (see 1.16)

General information

2.189

- 1 Port Langdon entered between Scott Point (13°45'S 136°51'E) and Jagged Head, about 6 miles NW, has general depths of from 11 to 16.5 m over the greater part of the port and provides good anchorage especially in SE winds.
- 2.190
Topography. Scott Point is low, sandy and fringed with rocks. Spit End, 6 miles SSW of Scott Point, is the end of a narrow shelving spit which encloses Little Lagoon to the E.
The shores of Port Langdon are covered with thick scrub except for Jagged Head which is barren. On the E and S sides are sandhills but the W side is mostly rocky. McComb Point (13°46'S 136°44'E), 4 miles NNW of Baird Cliff (2.191), separates Thompson Bay from Hempel Bay; the latter has not been examined.

Principal marks

2.191

- 1 **Landmarks:**
Central Hill (13°58'S 136°39'E) (2.168).
Jagged Head (13°42'S 136°45'E), about 35 m high, a conspicuous clifly headland which is actually an island the seaward side of which is formed of broken rock rising nearly to the summit.
- 2 Baird Cliff (13°50'S 136°45'E) a conspicuous red cliff at the head of the port.
Conspicuous pink sandhill (13°46'S 136°51'E) close S of Scott Point.
- Major light:**
North East Islet Light (13°38'S 136°57'E) (2.168).

Directions

2.192

- 1 From N of Cody Bank (13°42'S 136°49'E) the line of bearing 207° of Central Hill (13°58'S 136°39'E) just open E of McComb Point (13°46'S 136°44'E) leads towards the entrance in a least depth of 14.3 m passing (with positions given from Jagged Head):
ESE of Pinnacle Rock (3½ miles NNE); thence:
2 ESE of Woodhouse Rocks (1¼ miles NNE) the outer rock is awash; thence:
Between an islet (19 m) lying on a shoal 5 cables ENE of Jagged Head and Cody Bank (3 miles E) which shows light in colour during daylight hours.
When Baird Cliff (8½ miles S) bears about 185° the track leads 180° until McComb Point (5 miles S) bears 270°. The track then leads 090° towards the anchorage.
- 3 Central Hill is very distinctive in exceptionally clear weather but in normal visibility it is doubtful whether it can be easily identified. At such times a mariner should steer in on McComb Point instead.

2.193

- 1 **Useful mark:**
Laycock Hill (13°48'S 136°51'E) close within the NE corner of Little Lagoon.

Anchorage

2.194

- 1 Good anchorage can be obtained in the E side of Port Langdon, SW of Scott Point, in a depth of 11 m, mud and sand.

There is also sheltered anchorage with good holding ground in the SE corner of Port Langdon, NW of Spit End, in a depth of 9 m, mud.

Caution. A dangerous rock lies 4 cables offshore about 1½ miles N of Spit End close to the latter anchorage.

Little Lagoon

2.195

- 1 Little Lagoon, with depths up to 9.1 m in its central

part, is entered S of Spit End and is suitable only for small craft. An iron pipe, 5 cables E of Spit End, marks the N side of the inner end of the entrance channel to Little Lagoon. The channel almost dries.

Local knowledge is desirable.

- 2 **Landing.** There is a jetty at Umbakumba, 1¼ miles SSE of Spit End, on the S shore of Little Lagoon.

CAPE WESSEL TO CAPE ARNHEN

GENERAL INFORMATION

Chart Aus 306

Scope of section

2.196

- 1 The area covered by this section comprises;
 - Cape Wessel to Melville Bay (2.202)
 - Melville bay and Gove Harbour (2.213)
 - Truant Island to Arnhem Bay (2.243)
 - Arnhem Bay (2.273)
 - Melville Bay to Cape Arnhem (2.281)

Topography

2.197

- 1 **Wessel Islands** consist of a chain of islands extending from the mainland at Point Napier (11°58'S 135°55'E) and terminating in Cape Wessel, about 76 miles NE. The E and SE coasts of these islands consist mostly of rocky cliffs rising abruptly from the sea whilst the opposite sides are generally low and sandy.

Caution. The waters around these islands are only partially surveyed and undue reliance should not be placed on charted detail.

2.198

- 1 **The English Companys Islands** form a chain nearly parallel to the coast and extend from Truant Island (11°40'S 136°50'E), the NE-most of the group, to Garalja Island (12°05'S 136°06'E) 23 m high, approximately 50 miles SW.

Caution. A number of shoal patches lie within a 12 mile radius of Truant Island, these shoals rise abruptly from general depths of 40 to 55 m (22 to 30 fm). Provided due allowance is made for tidal streams near these shoals navigation in the area is not difficult.

2.199

- 1 **Bromby Islets** See 2.205.

Natural conditions

2.200

- 1 **Discoloured water.** In 1963 long patches of yellow and light brown discoloured water were observed at various states of the tide in the approaches to and in the N and W parts of Melville Bay (12°02'S 136°40'E). They were considered to be small patches of an unknown nature floating on, and suspended just below, the surface. From a distance these patches resembled shoals or sandbanks, although, in fact, no such dangers existed in these positions.

Prohibited and restricted areas

2.201

- 1 The mainland and island chains forming Malay Road (11°50'S 136°32'E) are all designated Aboriginal lands and landing is only permitted with the appropriate authority.

The NW extremity of Cape Wilberforce peninsula is held sacred by the land owners and landing is strictly prohibited.

CAPE WESSEL TO MELVILLE BAY

General information

Charts Aus 306, Aus 715

Route

2.202

- 1 From a position 12 miles NNE of Cape Wessel (11°00'S 136°45'E) the recommended route to Melville Bay, indicated on the chart, leads S, about 70 miles, to a position about 3½ miles NNW of Veronica Light (12°03'S 136°47'E).

Topography

2.203

- 1 **Wessel Islands.** Rimbija Island, the N-most of the Wessel Islands, is fairly level. Cape Wessel, a perpendicular cliff 12 to 15 m high, is the NE extremity of the island and can be readily identified on radar.
- 2 Marchinbar Island (11°19'S 136°36'E), the largest of the Wessel Islands, is separated from Rimbija Island by Wessel Strait, a narrow foul channel, Emu Islet lies at the W end of this strait. The entire E coast is cliffy and high. Sphinx Head (2.207) lies about 10 miles S of Low Point, the NE extremity of the island. South of Sphinx Head the land rises to two flat-topped hills with a maximum height of 68 m. Cumberland Strait (2.261) at the S of the island separates Marchinbar Island from Guluwuru Island.

See 2.244 for the topography of the other islands in the group.

2.204

- 1 **The English Companys Islands.** Truant Island (11°40'S 136°50'E) is the NE-most of the group. See 2.245 for the topography of the other islands in the group.

2.205

- 1 **Bromby Islets** are a chain of islets and rocks extending about 10 miles ENE from the N entrance point (11°53'S 136°34'E) of Elizabeth Bay and terminating in North East Bromby about 10 miles NE from Cape Wilberforce (11°55'S 136°35'E). Bromby Islet (11°50'S 136°40'E) is the largest of Bromby Islets. The inner islets are surrounded by reef.

Marine farm

2.206

- 1 A marine farm which may be a fixed or moving structure is located off the NE coast of Truant Island (2.204).

Principal marks

2.207

- 1 **Landmark:** Sphinx Head (conspicuous cliffs) (11°11'S 136°43'E).

Major light:

Truant Island Light (round metal tower, 15 m in height) (11°40'S 136°50'E).

Cape Wessel Light (11°00'S 136°45'E) (2.12).

Other aid to navigation**2.208**

- 1 **Racon.** Cape Wessel Light (11°00'S 136°45'E).

Directions

(continued from 2.14)

Cape Wessel to Truant Island**2.209**

- 1 From position 10°50'S 136°52'E, about 12 miles NNE of Cape Wessel Light, the recommended track shown on the chart leads 189° along the E coast of Marchinbar Island (2.203) passing (with positions given from Sphinx Head): E of Cape Wessel (11½ miles N) (2.203) discoloured water and tide rips occur off the N side. Cape Wessel Light (2.12) is exhibited on the cape. Thence:
- 2 E of Sphinx Head; thence:
E of a reef which breaks extending 1 mile S from an un-named point (4 miles SSW); thence:
E of two rocks awash (9 miles SSW); thence:
To a position about 10 miles NNW of Truant Island.
(Directions for Arnhem Bay are given at 2.248)

Truant Island to Melville Bay**2.210**

- 1 From position 11°31'S 136°45'E, about 10 miles NNW of Truant Island, the recommended track leads 180° passing (with positions given from Truant Island (11°40'S 136°50'E)):
W of Buccaneer Rock (3 miles NE) the shoalest part of Truant Bank, Pugh Shoal lies 1 mile farther ENE; thence:
- 2 W of a 16-1 m patch lying 2 miles WSW of Truant Island. A light is exhibited on the island (2.207). Thence:
Between Barricade Shoal (2½ miles S) (2.15) and Attack Shoal (6½ miles WSW) steep-to on its S and E sides. Miller Islets, small, low and steep-to lie 2½ miles farther WSW. Thence:
- 3 E of North East Bromby (10 miles SW) (2.205) a rocky islet with a reef extending N from its N side; thence:
E of Cape Wilberforce (19½ miles SW) (2.232); thence:
To a position 3½ miles NNW of Veronica Island Light (2.233).
(Directions continue for Melville Bay at 2.233 and for Cape Arnhem at 2.284)

Side channel**Bromby Islets****2.211**

- 1 There is a very narrow passage, with depths of 9 m, between the two NE Bromby Islets (11°49'S 136°43'E) (2.205). The areas between all the other islets are foul.
Local knowledge is required and the passage should be made at LW when the coral shoals are visible.

Anchorage**2.212**

- 1 **Caution.** Marchinbar and Truant Island anchorages lie in unsurveyed waters. See charted note.

Marchinbar Island. An anchorage, sheltered from all but strong E winds, can be found in Burston Bay 3 miles SW of Sphinx Head (11°11'S 136°43'E) (2.207). Two islets lie in the middle of the bay.

The anchorage berth, in 20 m, lies W of the Norruum Islet and can be approached on a NW track passing midway between the two islets in a least depth of 9 m.

- 2 **Truant Island.** Anchorage protected from NE, E, SE and S winds can be found off the NW part of Truant Island (11°40'S 136°50'E) with Truant Island Light bearing 122°, distant 9 cables, in 6 to 10 m.

Landing is possible on the beach at the SW end of Truant Island.

MELVILLE BAY AND GOVE HARBOUR**General information**

Chart Aus 715 (see 1.16)

Position and function**2.213**

- 1 Melville Bay is entered between Cape Wirawawoi (12°10'S 136°47'E) and Cape Wilberforce, 19 miles NW.
The port of Gove Harbour is situated in the inner part of Melville Bay and has been developed for the export of bauxite and alumina. A number of fishing vessels and small craft also use the port.

Topography**2.214**

- 1 The shore of Melville Bay between Cape Wirawawoi its E entrance point and Wargarpunda Point, 6 miles WSW, is low, sandy and heavily wooded. Mount Saunders, a flat topped hill covered with dark green trees with a peak at its S end, rises about 1½ miles S of Cape Wirawawoi but the low land surrounding it is sandy and barren. Nhulunbuy, an Aboriginal local regional centre, is situated under the mount.
- 2 The inner part of Melville Bay is entered between Dundas Point (12°13'S 136°40'E) and Parfitt Point, 2½ miles SW, the latter point is conspicuous when viewed from N. The large bay thus formed is divided into two smaller bays by Drimmie Peninsula, high and rocky, which extends 2 miles S from the shore about 2 miles ENE of Dundas Point. The peninsula is joined to the mainland by a causeway which covers at HW. The E shore of this inner bay consists of low points with shallow bays between, the S shore is formed of low cliffs and the W shore is sandy.
- 3 The W coast of Melville Bay from Parfitt Point continues low and sandy for 10 miles NNW to a rocky point, with a conspicuous islet lying off it, 2 miles NE of Mount Bonner. About 7½ miles NNW of Mount Bonner there is another rocky point forming the E entrance point of a shallow opening. A ridge of hills rising to Mount Bonner extends SSE from this point. Cape Wilberforce (11°55'S 136°35'E) (2.232) is the E extremity of a narrow peninsula extending about 7 miles ENE from the mainland on the N side of the same shallow opening. The small peninsula extending 2 miles NW from Cape Wilberforce is cliffy.
- 2.215**
1 The coast between Cape Arnhem (12°21'S 136°59'E) and Cape Wirawawoi, 16 miles NW, is considerably indented by several rocky points. Rocky Bay, a foul inlet



Gove from SSW (2.213)

(Original dated prior to 2003)

(Photograph – Alcan Gove Shipping)

with Miles Island lying N of it, is situated about 6 miles NW of Cape Arnhem. Yirrkala, an Aboriginal population centre, stands about 1 mile W of the N entrance point of Rocky Bay. A tower (57 m high) stands 3 cables E of the centre. Mount Dundas (2.232) lies close to the coast about 10 miles NW of Cape Arnhem.

Port Limits

2.216

- 1 Gove Harbour port limit is a line joining Wargarpunda Point (12°11'S 136°41'E) and Shepherd Bluff, as shown on the chart.

Approach and entry

2.217

- 1 Gove Harbour is approached WNW of Bremer Island (12°06'S 136°49'E) through Melville Bay, and entered W of Wargarpunda Point.

An route leads WNW from NE of Cape Arnhem (12°21'S 136°59'E), S of Bremer Island, to Gove Harbour.

Traffic

2.218

- 1 In 2002 the port was used by 116 vessels totalling 6 261 566 dwt.

Port authority

2.219

- 1 Alcan Gove Pty. Ltd., P.O Box 21, Nhulunbuy, Northern Territory 0881.
website: www.alcangove.com.au

Limiting conditions

Controlling depths

2.220

- 1 Approach channel to Bulk Cargo Wharf: 13.8 m.
Approach channel to General Cargo Wharf: 7.3 m.
Least depth in the S approach to Gove Harbour is 9 m in the fairway between the S side of Bremer Island (12°06'S 136°49'E) and the mainland.

Deepest and longest berth

2.221

- 1 Bulk Cargo Wharf (2.240) on the W side of Dundas Point, for bulk cargoes and liquids.

Tidal information

2.222

- 1 **Tidal levels:** for details, see reference chart and *Admiralty Tide Tables Volume 4*.

Tidal conditions. Berthing before the in-going tide has reached mid level is recommended as the tidal stream is reported to set off Bulk Cargo Wharf after that time.

Density of water

2.223

- 1 Density: 1.025 g/cm³.

Maximum size of vessel handled

2.224

- 1 Bulk carriers up to 88 000 dwt and 267 m in length, and tankers up to 140 803 dwt and 270 m in length have used the port.

Arrival information

Notice of ETA

2.225

- 1 Requirement for a pilot should be sent, 10 days before arrival, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages

2.226

- 1 **G1 Anchorage:** 2 miles WNW of West Woody Islet (12°11'S 136°40'E) in a depth of 15 m, mud and shingle.
G2 Anchorage: 2¼ miles NW of West Woody Islet in a depth of about 18 m. This anchorage is particularly appropriate for loaded tankers awaiting a berth.
 Anchorage for small craft, sheltered from the E, can be found 8 cables W of the head of the bay on the W side of Bremer Island (12°06'S 136°49'E) in depths of 11 m. Anchorage is available in Middle Bay (12°13'S 136°42'E).

Pilotage and tugs

2.227

- 1 **Pilotage** is compulsory for vessels using the Bulk Cargo and General Cargo wharves.
Boarding place: ½ mile N of Fairway Buoy.
Tugs are available.

Regulations concerning entry

2.228

- 1 **Minimum under-keel clearance** of 10% of draught is required for Bulk Cargo Wharf.

Quarantine

2.229

- 1 Gove Harbour is a first port of entry, radio pratique may be available. See *Admiralty List of Radio Signals Volume 1 (2)* and 1.54.

Harbour

General layout

2.230

- 1 Gove Harbour lies between Dundas Point and Drimmie Peninsula, 1½ miles SE, and includes both sides of the former point.

Alongside berths. Bulk Cargo Wharf (2.240) on the W side of Dundas Point, has a T-head, the N branch of the wharf head constitutes the bulk bauxite and alumina berth and the S branch the bulk liquids berth.

- 2 General Cargo Wharf (2.240) lies on the E side of the point.

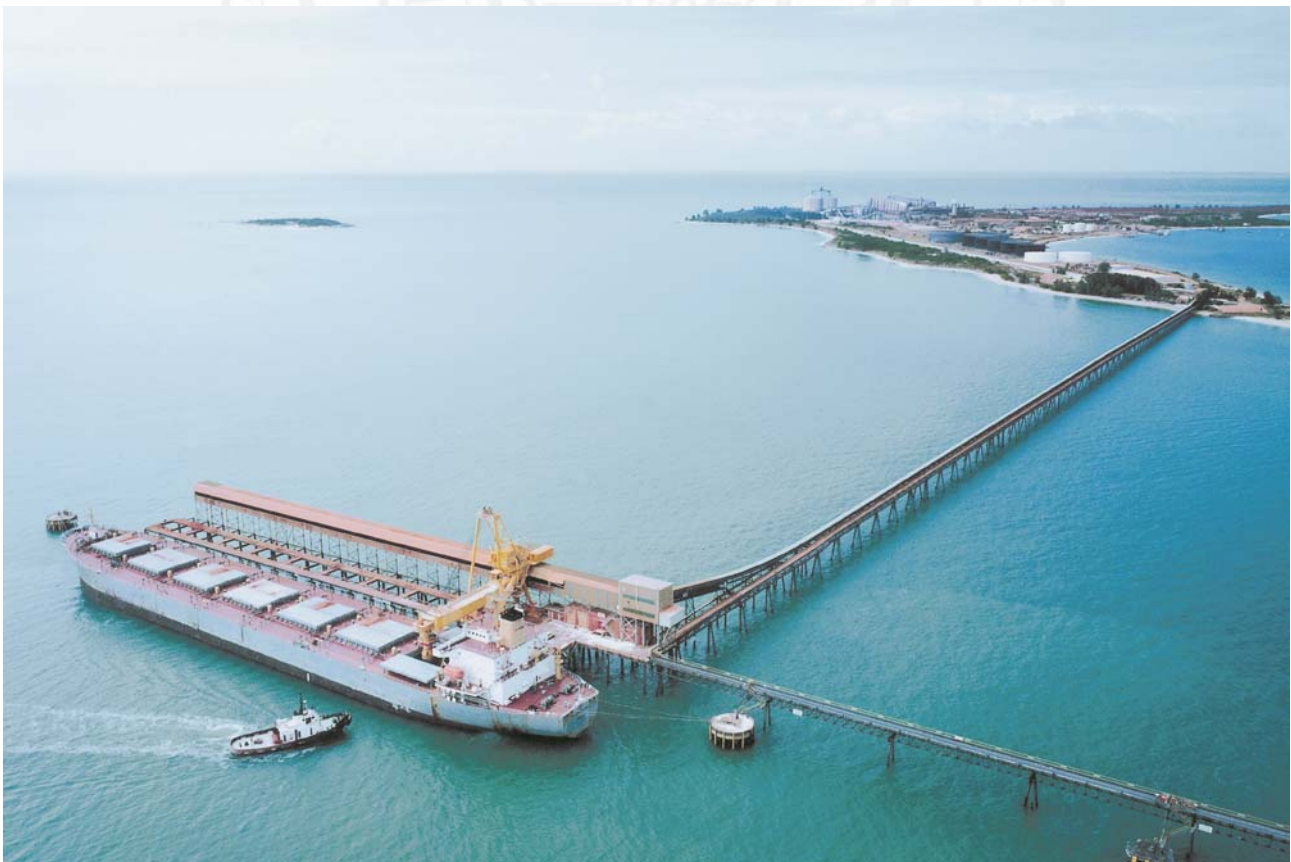
Wharf (2.240), for small vessels, lies at the head of the harbour. Two mooring buoys (lighted), 180 m apart, lie on an approximate N/S heading, 3½ cables ENE of the general Cargo Wharf, in a depth of 7.5 m.

Anchorage is available for vessels seeking shelter (2.241).

Natural conditions

2.231

- 1 **Tidal streams** in the harbour may attain a rate of 3 kn but are generally less.
 The in-going stream sets SSE through the entrance and the out-going stream sets NNW.
- 2 **Climatic table.** See 1.170 and 1.171.



Gove Harbour – Bulk Cargo Wharf from SW (2.230)

(Original dated prior to 2003)

(Photograph – Alcan Gove Shipping)

Landmarks**2.232**

- 1 Cape Wilberforce (11°55'S 136°35'E) a conspicuous sheer cliff face, up to 70 m high, visible from a considerable distance.
Group of conspicuous silos on Wargarpunda Point (12°11'S 136°41'E).
Chimney (94 m) (12°11'3S 136°41'2E).
- 2 Radio masts exhibiting red obstruction lights on Mount Saunders (12°11'S 136°46'E).
Mount Dundas (12°13'S 136°52'E) flat-topped and covered with trees and steep on its N side. The low barren land along the coast in this vicinity accentuates the mount and in clear weather it can be seen from a considerable distance offshore.

Directions for entering harbour*(continued from 2.210 and 2.15)***North approach****2.233**

- 1 From position 11°57'S 136°46'E about 5 miles NNW of Veronica Island Light, the recommended track shown on the chart leads 209° direct to the entrance to Gove Harbour passing (with positions given from West Woody Islet (12°11'S 136°40'E)):
- 2 WNW of Veronica Island (10½ miles NE). A light (white GRP hut, 2 m in height) is exhibited from the islet. A smaller islet (1 m high) lies 7 cables SSE of the light; thence:
WNW of Bremer Island (8 miles ENE) (2.282); thence:
- 3 ESE of Bonner Rocks (7½ miles NW), the N of which is conspicuous, lying off the rocky point extending NE from Mount Bonner. An extensive above-water rock (1 m high) lies NE of these two islets, 2 miles from the point. Thence:
WNW of a 9.8 m patch (5 cables NNW) the outer-most danger off West Woody Islet; thence:
- 4 WNW of Snapper Shoal (8 cables W). A light-buoy (port hand) is moored off its W side; thence:
Clear of Fairway Light-buoy (safe water) (1½ miles W).

South approach**2.234**

- 1 From position 12°17'S 137°06'E, about 8 miles ENE of Cape Arnhem, the recommended track shown on the chart leads initially 295° passing (with positions given from Mount Dundas):
NNE of Arnhem Shoal (9 miles SE) (2.284) the N-most danger off Cape Arnhem; thence:
- 2 NNE of Lone Rock (1 mile N) awash, steep-to on its N side; thence:
NNE of the drying rock (2.1 m) (3¼ miles NW); thence:
SSW of the shoal bank extending 1 mile SSE from the S end of Bremer Island (5½ miles NNW); thence:
- 3 NNE of the drying sandbanks extending 1½ miles ESE from Cape Wirawawoi (6 miles NW) a rocky ledge extends 3 cables N from the cape.

The line of bearing 083° of the S end of Bremer Island, astern, then leads 263° in the fairway passing:

N of the 6.1 m depth (6½ miles NW); thence:

S of the 4.6 m shoal (7½ miles NW); thence:

- 4 N of East Woody Islet (7½ miles WNW) small, rocky and connected to the mainland by a sand spit; thence:

N of a 9.8 m patch lying 5 cables NNW of West Woody Islet (11½ miles W) to a position 1½ miles NW of the same islet.

The track then leads SSW to Gove Harbour Fairway Light-buoy (safe water) (13 miles W).

2.235**Useful marks:**

Conspicuous cliff (red and white) (12°12'8S 136°49'8E).

Radio tower (12°12'8S 136°47'4E).

Radio mast on the shore (12°11'2S 136°47'5E).

Entrance channel**2.236**

- 1 From Fairway Light-buoy (safe water) (12°10'9S 136°38'6E) the fairway leads SE passing (with positions given from West Woody Islet):
SW of Snapper Shoal (8 cables W). A light-buoy (port hand) is moored off its W side; thence:
- 2 SW of West Woody shoal (8 cables SW). A light-buoy (port hand) is moored off its W side, the buoy should be given a clearance of 3 cables. If bound to Bulk Cargo Wharf proceed direct for the berths as convenient.

Caution. A depth of 10.6 m lies 7½ cables W of Bulk Cargo Wharf close W of the direct approach to the berth.

2.237

- 1 If bound to General Cargo Wharf continue on the SE track passing:
SW of Bulk Cargo Wharf; thence:
SW of Five Fathom Light-beacon (port hand) (1¼ miles S) marking the limit of clear water S of Dundas Point.
- 2 The line of bearing 075° of Half Tide Rock Light-beacon (isolated danger) (2 miles SSE) then leads in the fairway passing:
NNW of Granite Islands (3 miles S), small above-water rocks, the outer-most danger on the S shore; thence:
- 3 SSE of Patch Shoal (1½ miles SSE) marked by a light-buoy (isolated danger) noting the 6.7 m shoal marked by a port hand light-buoy which lies 2 cables SSW of Patch Shoal, and closer to the track.

The track then leads generally N passing:

W of Half Tide Rock Light-beacon; thence:

To the berth as convenient.

2.238

- 1 If bound for the wharf at the head of the bay the track continues generally N passing:
W of Harbour Islet lying 2 cables SW of Rocky Point (1¼ miles ESE) foul ground extends 2 cables SW and 3 cables W from this point. A buoy (lateral, white) marks the edge of a reef extending NNW from the island close S of the wharf.

2.239

1 **Useful marks:**

White beacon marking rocks close off McIntyre Point (12°13'5S 136°41'7E), a light-buoy (special) is moored close SW of the beacon.

General Cargo Wharf Light (dolphin) (12°12'3S 136°40'7E).

Berths**Alongside berths**

2.240

- 1 **Bulk Cargo Wharf** (12°12'4S 136°40'1E), consists of two in-line berths connected to the shore by a light traffic access bridge, 982 m in length. The two berths form the head of the **T**, lying in a NW/SE alignment (330°/150°). Maximum parameters for vessels at the berths are:

- 2 **Berth No 1:** (NW) (Bauxite/Alumina loading berth):
Length 275 m, minimum beam 20 m, maximum 33.2 m.
Draught (at LAT): 13.5 m
Vertical Clearance (at MHWS, height of tide 3.1 m): 13.9 m.
Maximum sailing draught (MHWN, height of tide 2.6 m): 14.6 m.
- 3 **Berth No 2:** (SE) (Tanker Wharf)
Length 275 m, beam unrestricted.
Maximum displacement: 90 000 dwt.
Draught (at LAT): 13.6 m.
Maximum arrival draught: 12.8 m.

Note: Sailing draughts are dependent on tides and based on a minimum under keel clearance of 10%.

- 4 **General Cargo Wharf** (12°12'3S 136°40'7E), two berths 94 m in length, the N berth with a depth of 11.6 m and the S berth with a depth of 10 m at LAT. The facility is designed for vessels up to 25 000 dwt and a maximum LOA 160 m.

Perkins Wharf (12°11'63S 136°41'22E), mainly used for fuelling fishing vessels, is situated 2.5 cables N of Harbour Islet. There are depths of 4 m alongside the wharf which has a berthing face of 73 m. There is a concrete ramp on the E side of this wharf, used mainly by the Ro-Ro barge that operates a weekly service from Darwin. A water intake for the power house is situated 2 cables E of Perkins Wharf

Anchorage berth

2.241

- 1 Anchorage, for vessels seeking shelter, is available SW of Half Tide Rock (12°13'S 136°41'E) in depths of 6 to 9 m, sand and mud.

Port Services

2.242

- 1 **Repairs.** Light repair facilities are available.
Other Facilities. There are no official reception facilities available for oily waste, but a road tanker can be obtained in an emergency for small quantities. Hospital at Nhulunbuy.
Supplies. Fresh water is available at all berths. Provisions are available.
Communications. Local airport, situated 16 km S of the harbour, with regular flights to international connecting flights at Cairns and Darwin.

TRUANT ISLAND TO ARNHAM BAY**General information**

Charts Aus 715, Aus 306

Route

2.243

- 1 From NNW of Truant Island (11°40'S 136°50'E) the route to Arnhem Bay leads SW, through Donington Sound, between the Wessel Islands to the N and The English Companys Islands to the S.

Topography

2.244

- 1 **Wessel Islands.** Guluwuru Island (11°32'S 136°25'E) separated from Marchinbar Island (2.203) by Cumberland Strait (2.261) to the N rises to a height of 47 m at its S end, it is high and cliffy.
Raragala Island (11°37'S 136°16'E) lies separated from Guluwuru Island to the N by a narrow passage known as Gugari Rip or Hole in the Wall (2.266). The headland (11°40'S 136°15'E) faced by high cliffs on the SE side of Raragala Island is conspicuous.
- 2 **Cunningham Islands,** consisting of Jirrgari Island (33 m (107 ft) high) (11°43'S 136°08'E), Bumaga and Warnawi Islands, lie immediately SW of Raragala Island. There is no safe passage between Jirrgari and Bumaga Islands. The channel between Bumaga and Warnawi Islands is navigable, although hampered by a dangerous rock and coral shoals, but the wider passage between Warnawi and Alger Islands is recommended.
- 3 **Alger Island** (11°53'S 135°57'E), known locally as Balangara, is the innermost of the Wessel Islands and is separated from the mainland at Point Napier by a passage nearly 3 miles wide. There is a sand cay mid-channel. The passage between the cay and Alger Island is foul. The passage between the cay and Point Napier is navigable but is only recommended for small craft with local knowledge.
- 4 **Channel.** Firefly Strait (11°50'S 136°00'E) (3.18), is a recommended channel between Alger Island and Warnawi Island to the N, with a navigable width of about 2 miles, leading to Brown Strait.
- Local knowledge** is required. For details see 3.14.
- 2.245**
- 1 **The English Companys Islands.** Truant Island (11°40'S 136°50'E) (2.204) is the NE-most of the group. Miller Islets (2.210) lie about 9 miles farther WSW.
Wigram Island (11°47'S 136°35'E) is low at its E end and a small islet lies close offshore. The SE extremity is formed of a high cliff, which is conspicuous, rising inland to a height of 63 m (208 ft); the W end of the island is nearly as high.
- 2 **Cotton Island** (11°51'S 136°28'E), SW of Wigram Island, is rocky with high cliffs and sea caves at its SE end. There is a small islet, 33 m high, off its W side.
Pobassoo Island (11°55'S 136°27'E) a rounded island fringed by shallow coral reefs to its N and NE lies close off the SW end of Cotton Island. The waters between the two islands are foul. Herald Islet lies about 8 cables to the W.
- 3 **Astell Island** (11°54'S 136°24'E) lies W of the S end of Cotton Island. The waters between Astell Island and the W sides of Cotton and Pobassoo Islands are sheltered but generally shoal.
- 4 **Inglis Island** (12°02'S 136°15'E), the largest of the group, lies about 5 miles SW of Astell Island. Bosanquet Island is separated from the NE extremity of Inglis Island by a narrow passage which is partially restricted by a smaller islet. The N side of Inglis Island is indented by

three bays. The bay E of a prominent high headland is wide and shallow and bordered to the N by a line of islets and rocks lying in a NE to SW line extending for 5 miles from Flat Rock, a rocky islet, 24 m high, lying about 3 miles NNW of the N point of Inglis Island, SW to a rounded rocky islet lying 1 mile E of the high prominent headland. Two narrow bays lie W of the same headland. An islet lies close off the NW point of Inglis Island and is connected to it by a reef.

- 5 Garalja Island (12°05'S 136°06'E) also known locally as Karalami is the SW island of The English Companys Islands and lies about 1½ miles WSW of Maiyayigur Point the W extremity of Inglis Island. A small islet lies 2½ miles N of Garalja Island.

Natural conditions

2.246

- 1 **Sand waves.** Shoal spits extend S from Bumaga, Warnawi and Alger Islands, and from Point Napier, and are constantly on the move. Extreme caution should be used navigating in these areas as shoals can move as well as form over relatively short periods of time.

Tidal streams in excess of 5 kn have been reported passing between Cunningham Islands, Alger Island and Point Napier.

Major light

2.247

- 1 Truant Island Light (11°40'S 136°50'E) (2.207).

Directions

(continued from 2.209)

Truant Island to Arnhem Bay

2.248

- 1 From the vicinity of 11°31'S 136°45'E, about 10 miles NNW of Truant Island, the route leads SW passing (with positions given from Truant Island (11°40'S 136°50'E)): NW of Truant Island; thence:
Between the S part of Marchinbar Island (21½ miles NW) and Attack Shoal (6½ miles WSW) (2.210); thence:
- 2 Between a 5.8 m shoal (21 miles WNW) lying off the entrance to Cumberland Strait and Miller Islets (9 miles WSW); thence:
Between Guluwuru Island (23 miles WNW) and Wigram Island (12 miles WSW). An extensive above-water outcrop and a shoal lies between Wigram Island and Miller Islets and a small islet lies about 8 cables W of the N end of Wigram Island. Thence:
SE of Raragala Island (27 miles W); and:
- 3 NW of a 7.2 m patch which lies 1 mile NW of the N point of Cotton Island (20 miles WSW); thence:
NW of Astell Island (26½ miles WSW) noting the dangers, which can best be seen from the chart, which lie between the N points of Cotton and Astell islands.

2.249

- 1 The route continues SW passing (with positions given from Flinders Point (12°04'S 136°03'E) (2.274)):

NW of Flat Rock (16 miles NE) (2.245). Thence:
SE of a 7.9 m shoal (14½ miles NNE) the outer-most shoal (2.246) on a bank with depths of less than 18 m over it which fronts the SE side of Cunningham Islands; and:

- 2 NW of an islet, 36 m high (14 miles ENE) the largest in a chain of islets and rocks which lie off the NW coast of Inglis Island (2.245). Numerous dangers and depths of less than 15 m, the positions of which can best be seen from the chart, front Inglis Island to seaward of this chain. Thence:
SE of Warnawi Island (15 miles N) from where a light is exhibited (3.16); and:
- 3 NW of a drying reef (5½ miles NE) which extends 3 cables NW from an un-named islet, noting the bank with a least depth of 0.2 m (1 ft) which lies 1½ miles farther NE; thence:
To a position 2½ miles N of an islet (6 m high) (4 miles NE).

2.250

- 1 **Useful marks:**

Everett Island (12°15'S 136°04'E) (2.275).

Garalja Island (12°05'S 136°06'E) (2.245).

(Directions continue at 2.279)

Malay Road and Nalwarung Strait

General information

2.251

- 1 **Description.** Malay Road (11°50'S 136°32'E), and Nalwarung Strait its continuation SW, are bordered to the S by Bromby Islets and the mainland, and to the N by The English Companys Islands. Narrow sections exist between Pobassoo Island (11°55'S 136°27'E) and the mainland and also between Inglis Island (12°02'S 136°15'E) and the mainland. South of Pobassoo Island coral shoals extend N from the mainland reducing the navigable width.

- 2 The Nalwarung Strait narrows to 1¼ miles from halfway along its length with reefs fringing the shore N and S reducing the navigable channel to 8 cables.

2.252

- 1 **Topography.** The NW extremity of Cape Wilberforce peninsula extends about 2 miles NW from the cape (11°55'S 136°35'E) (2.232) to Point William (11°53'S 136°34'E); it is cliffy with many conspicuous geometrical rock formations. A small rocky islet lies within 1 mile of the extremity of the peninsula. The coast between this peninsula and Cape Newbald, about 30 miles SW, consists of low rocky points and small bayhead beaches fringed by reefs with the hinterland rising to a coastal range of hills to the S.

All The English Companys Islands are sufficiently steep on their S side to afford reliable radar ranging.

2.253

- 1 **Tidal streams.** Due allowance should be made for tidal streams which set SW with the rising tide and NE with the falling tide in Malay Road.

2.254

- 1 **Depths.** A ridge with general depths of less than 10 m extends NE across Malay Road from a position 7½ cables ESE of the S point of Cotton Island to 1½ miles W of Point William.

Caution. See 2.9

*Chart Aus 715***Directions****2.255**

- 1 **Malay Road.** From a position 1¾ miles NW of Point William the track leads SW passing (with positions given from Herald Islet (11°55'S 136°25'E)):
 - NW of a 1.1 m shoal patch (7 miles ENE); thence:
 - Over the ridge (above) passing between a 6.3 m shoal (6 miles ENE) and a 7.9 m shoal (5 miles ENE)
 - Overfalls have been observed during falling spring tides along the ridge. Thence:
 - NW of a drying reef (5½ miles E); thence:
- 2 SE of a 2.8 m shoal (3 miles E); and:
 - NW of a 5.3 m shoal (3 miles ESE).
 The route then leads W passing:
 - Between Pobassoo Island (8 cables E), distant 4 cables, and the coral reef fronting the mainland; thence:
 - S of Herald Islet; thence:
 - S of a 0.4 m shoal patch (2 miles W).
- 3 Passage may then be made towards Warnawi Island and Firefly Strait (11°50'S 136°00'E) (3.16) passing NE of Bosanquet Island (6 miles WSW) leaving the 8.4 m shoal, lying 8 cables ENE of the N point of the island, clear to port, or through Nalwarung Strait passing midway between Inglis Island (7½ miles WSW) and the mainland. There are numerous dangers at the W end of Nalwarung Strait (chart Aus 306) which is unsurveyed. Local knowledge is required.

Side channels**2.256**

- 1 Along the NE to SW axis of Malay Road (11°50'S 136°32'E) channels lead N and S out of Malay Road, one through a passage between The English Companys Islands and the other off the NE side of Cape Wilberforce, respectively. The passages may be made in depths of from 17 to 31 m at any state of the tide.

Local knowledge is required.

2.257

- 1 **Channel through The English Companys Islands.** From Malay Road the route leads N passing (with positions given from Cape Wilberforce (11°55'S 136°35'E)):
 - Clear of a 15.2 m patch (6¼ miles NW); thence:
- 2 Between Cotton Island (7½ miles NW) and Wigram Island (7½ miles NW), on a generally N heading, avoiding an 8.2 m patch, 4 cables SW of the SW extremity of Wigram Island and a 5.1 m patch 4 cables E of the NE extremity of Cotton Island; thence:
 - E of a 9. m patch (9 miles NW).

Caution. Strong currents, tide rips and overfalls are reported in this passage.

2.258

- 1 **Channel north-east of Cape Wilberforce.** From Malay Road the route leads SE passing (with positions given from Cape Wilberforce (11°55'S 136°35'E)):
 - Between the un-named small rocky islet (3 miles NW) and the 11.8 m shoal (¾ miles NNW); thence:
- 2 Midway between the NW extremity of Cape Wilberforce peninsula (2½ miles NW) and the SW Bromby Islet (2¾ miles N); thence:
 - SW of a 15.3 m patch (2 miles N); thence:
 - NE of a 12.6 m patch (5 cables N); thence:
 - NE of Cape Wilberforce, distant 1 mile.

Anchorage**2.259**

- 1 Anchorages, which provide shelter from the NW Monsoon, may be found:
 - In an indentation on the SE side of Wigram Island (11°47'S 136°35'E) (2.245), NE of the 63 m cliffs, 4 cables from the shore in 20 m, mud.
 - On the E side of Cotton Island (11°51'S 136°28'E) (2.245) midway along the coast 6 cables from the shore E of the charted 73 m hill in 12 m, mud.

2.260

- 1 Anchorage sheltered from E to SW winds is available in Elizabeth Bay (11°54'S 136°33'E) in depths of 10 m. The SW side of the bay is fringed by extensive coral shelves up to 7 cables of the shore.
- 2 There is reported good sheltered anchorage, unaffected by tidal streams, in an un-named bay on the mainland about 4 miles from the SE point of Astell Island (11°54'S 136°24'E), about 7 cables offshore, in a depth of 15 m, mud. The bay appears clear of obstructions with a steadily shelving beach of soft sand.
- 3 Anchorage exists between the cove on the NE side of Inglis Island and Bosanquet Island (11°58'S 136°20'E) in depths of from 9 to 14 m. A drying reef drying lies close S of this anchorage.

Cumberland Strait

Chart Aus 715 (see 1.16)

General information**2.261**

- 1 **Description.** Cumberland Strait (11°28'S 136°29'E) separating Marchinbar Island (2.203) to the N and Guluwuru Island (2.244) to the S offers a route through the Wessel Islands for mariners in vessels with draughts up to 4 m.

Local knowledge is essential; the strait should only be used in case of necessity and with the utmost caution.

2.262

- 1 **Dangers.** Rocks obstruct the W entrance and extend up to 3 cables ESE from Southwest Point, the SW extremity of Marchinbar Island, and 1 mile NW from the NE extremity of Guluwuru Island. A rock bar extends across the strait SW from Southwest Point.

2.263

- 1 **Tidal streams** exceeding 12 kn at springs were observed in 1987 and very strong tide rips run in the strait.

Heavy overfalls up to 3 m high occur at the bar when tidal streams run counter to moderate winds. The worst conditions are usually seen during the NW Monsoon when the NW setting out-going stream is running.

Slack water at springs lasts approximately 20 minutes.

Directions**2.264**

- 1 The strait should be approached with extreme caution and the mariner must be particularly aware of the close proximity of dangers and the fierce tidal streams with eddies and overfalls. The roughest seas at all states of the tide and weather is found in the deep water immediately adjacent to the shoal areas in the centre and on the N side of the strait.
- 2 Passage of the strait offering the deepest water and the greatest distance from shoals is reported to be possible on a track of 116½°/296½° between positions 11°26'4S 136°25'8E and 11°28'5S 136°30'2E. Passage should be attempted as close as possible to slack water which nearly coincides with the times of HW and LW at Gove.

2.265

- 1 Small craft should avoid the strait and use Gugari Rip (2.266). If necessary mariners in small craft are advised to commence passage at the end of the ebb stream when approaching from W, and at the end of the flood stream when approaching from E. They should keep to the N side of the strait leaving the shoals off Southwest Point close N.

Gugari Rip**Description****2.266**

- 1 Gugari Rip or Hole in the Wall (11°33'S 136°22'E), a narrow passage about 120 m wide, runs between Guluwuru Island (2.244) to the N and Raragala Island to the S, it has a depth of about 9 m in the centre.

2.267

- 1 **Tidal streams** attain a maximum rate of 12 kn at springs and occurs an hour after slack water. Slack water occurs 15 minutes after HW and LW at Gove.

Strong eddies occur in Gugari Rip but overfalls, which are a feature of Cumberland Strait (2.261), are not found in Gugari Rip.

2.268

- 1 **Passage** through Gugari Rip should be attempted just before or at slack water.

The passage track is 151° at the NW end of Gugari Rip altering gradually to 155° at the SE end.

Caution. A shoal patch (7.6 m) lies 3 cables off the NW entrance to Gugari Rip.

Anchorage**2.269**

- 1 Anchorages in the vicinity of Gugari Rip:
 - In a small bay close W of the N entrance to Gugari Rip (3.21).
 - In Guruliya Bay entered 5 miles WSW of the N entrance to Gugari Rip (3.21).
 - Within 1 mile of the S entrance of Gugari Rip.
- 2 On the E side of Guluwuru Island in a cove 2½ miles NE of the S entrance of Gugari Rip, adjacent to the 4 m hill. The cove has depths of from 9 to 15 m, mud.

Anchorage*Chart 306***Inglis Island****2.270**

- 1 The E bay (12°00'S 136°14'E) on the N side of Inglis Island affords safe anchorage sheltered from E to WSW winds in depths of from 8 to 18 m, mud. The line of rocks and islets (2.245) to seaward affords protection from the tidal stream, however, the anchorage will be influenced by the NE falling spring tide.
- 2 Depths shoal steadily from seaward to the shore, which is fringed by coral reefs extending up to 1 mile to seaward on the SW side of the bay.

Buckingham Bay**General information****2.271**

- 1 Buckingham Bay entered between Point Napier (11°58'S 135°55'E), the cliffy E extremity of Napier Peninsula, and Flinders Point (2.274), 10 miles SE, is rocky in character with numerous cliffy points along both shores.

- 2 The SE side and the shore at the head of the bay are covered with mangroves. Buckingham River, also known as Boonangmguro River, discharges into the SE corner of the bay. Several small islets lie off the SE shore close NW of Flinders Peninsula and two small islets lie 1 and 3 miles, respectively, off the SE shore about 14 miles within the entrance to the bay.

- 3 **Depths** within the entrance to the bay range from 20 m near the N shore to 6.0 m near Flinders Point. The bay shoals to the SW to drying mudflats which extend several miles from the SW shore.

Local weather conditions are strongly influenced by an afternoon NE sea breeze.

Anchorage**2.272**

- 1 There are no well sheltered anchorages in the bay although the mud bottom provides good holding ground. When entering Buckingham Bay, Flinders Point (2.274) should be given a clearance of at least 3½ miles. A shoal spit extends 1.5 m S from Point Napier, see 2.246.

ARNHEM BAY**General information***Chart Aus 306***Description****2.273**

- 1 Pera Channel, the main approach to Arnhem Bay, lies at the SW extremity of The English Companys Islands and leads between Maiyayigur Point (12°03'S 136°07'E), the W extremity of Inglis Island, and Flinders Point, about 4½ miles farther W.

Arnhem Bay is entered between the SW extremity of Mallison Island (12°11'S 136°07'E) and the NE end of Everett Island, 4 miles SW. The bay affords anchorage for a large number of vessels.

Topography**2.274**

- 1 **Approaches.** Flinders Point (12°04'S 136°03'E) is the NE extremity of a long narrow peninsula separating Buckingham Bay and Arnhem Bay. The point is low but rises to a distinctive knoll, 51 m (152 ft) high, about 1½ miles within.

Probable Island, known locally as Urokona, lies 2 miles S of Flinders Point. The E side of the island is indented by numerous small sandy bays separated by prominent bluffs.

- 2 Gwakura Island, immediately S of Probable Island, is formed of a narrow ridge, 40 m high. The passage between these two islands has not been examined but appears foul with strong tide rips.

Rekala Island (12°13'S 136°01'E), about 8 cables S of Gwakura Island, is small and low. The passage between these two islands has not been examined.

2.275

- 1 **Arnhem Bay.** Everett Island (12°15'S 136°04'E), actually the NE extremity of a broad peninsula extending NE from the mainland, has distinctive red cliffs, 20 m high, on its N and E sides and forms the SW entrance point to Arnhem Bay. The cliffs are a useful mark from the entrance of Pera Channel.

The passage between Rekala Island and the peninsula is foul.

- 2 Hardy Island, known locally as Longoidya, lies on the W side of Arnhem Bay about 2½ miles S of Everett Island. It is low rocky and covered with bushes and small trees.

The passage between Everett Island and Hardy Island is foul.

Mallison Island (12°11'S 136°07'E), known locally as Gawa, forms the NE entrance point of Arnhem Bay, it is separated from Cape Newbald to the E by a narrow foul passage.

- 3 The NE side of Arnhem Bay from Cape Newbald is generally low sandy and foul with Rhodes Point, low with red banks about 2 m high, 4 miles farther ESE, forming a small bay with mangrove covered shores. Clifty Point, on the E side of Arnhem Bay about 14½ miles SE of Cape Newbald, composed of red cliffs 9 m high is conspicuous in the afternoon. A low wooded islet lies close off this point.

- 4 Low Islet, known locally as Puralku, lies in the S central part of Arnhem Bay about 12 miles S of Cape Newbald. It is covered with bushes and small trees the tops of which are 12 m high.

Controlling depths

2.276

- 1 Pera Channel requires careful navigation and has a least depth of 20 m in the fairway to Arnhem Bay. Large sections of Arnhem Bay remain unsurveyed.

Tidal streams

2.277

- 1 Tidal streams in Pera Channel off Garalja Island (12°05'S 136°06'E) attain a rate of 4 kn at springs. North of Garalja Island near the islet, 2½ miles N, the N-going stream sometimes attains a rate of about 6 kn.

The S-going streams running through Pera Channel and Nalwarung Strait unite NW of Mallison Island; the N-going stream separates here.

- 2 West of Mallison Island at the entrance to Arnhem Bay the maximum rate of tidal streams at springs is from 3 to 5 kn being strongest close to the island.

In Arnhem Bay the maximum rate is 2 kn at springs being strongest close S of Mallison Island but it seldom exceeds 1½ kn in other parts of the bay.

Landmark

2.278

- 1 Garalja Island (12°05'S 136°06'E) (2.245) conspicuous from the N and the S.

Directions

(continued from 2.250)

2.279

- 1 From a position about 2½ miles N of the islet (12°02'S 136°05'E) (2.245) the fairway leads SSW to a position 1¼ miles W of the same islet.

The fairway then leads S passing (with positions given from Flinders Point (12°04'S 136°03'E)(2.274)):

W of a 9.5 m patch (2½ miles NE); thence:

- 2 Between Maiyayigur Point (4¼ miles E) the W extremity of Inglis Island and Flinders Point. A shoal with a least depth of 6m extends up to 3 miles NNW from Flinders Point causing heavy tide rips. Thence:

W of a drying rock (2½ miles E) the outer-most danger off Garalja Island (3 miles E); thence:

- 3 E of the 9.7 m patch (4½ miles SSE); and:
W of an isolated patch which breaks (6½ miles SE) noting the 3.6 m patch close N and the shoal with a least depth of 1.5 m, 2 miles NNE of the patch; thence:

W of a drying rock drying, (7 miles SE); thence:

Between Mallison Island (9 miles SSE) and Gwakura Island (6½ miles S).

- 4 When W of the SW side of Mallison Island (9 miles SSE) the fairway then leads SE to the anchorages (2.280).

Caution. The area fronting the E coast of Probable Island out to a distance of about 1 mile has not been examined but surveys of Pera Channel indicate a shoal shelf with a depth of 10.3 m, on which overfalls and tide rips were observed, extending up to 1½ miles off the coast midway between its E and S extremities.

Anchorage

Arnhem Bay

2.280

- 1 **Anchorage.** The best berth is on the E side of the bay where a mariner, proceeding in as far as his draught will allow, can obtain shelter from strong SE winds.

There is also good anchorage S of Cape Newbald (12°11'S 136°10'E) in depths of from 13 to 22 m, mud or sand.

- 2 **Caution.** A spit with depths of 4.2 m and 2.4 m near its N and E ends extends up to 5 miles N and 2¾ miles NE from Low Islet (12°23'S 136°10'E).

Rippling Shoal, which is narrow and sandy, extends about 6 miles SSE from a position 2 miles ENE of Hardy Island. It is steep-to on the E side and generally marked by tide rips, discoloured water can sometimes be seen on its shoalest part.

- 3 Both of these dangers lie SW of the anchorages.

The waters W of Rippling Shoal and S of Low Islet have not been examined.

MELVILLE BAY TO CAPE ARNHEN

General information

Chart Aus 715

Route

2.281

- 1 The route from Melville Bay to Cape Arnhem, north of the Bremer Islets (12°04'S 136°50'E), leads E, then SE.

Topography

2.282

- 1 Bremer Island (12°06'S 136°49'E), low and sandy, is the largest of a group of islets and rocks known as Bremer Islets. Higginson Islet (12°02'S 136°53'E) (2.283) is the NE-most islet of the group.

Cape Arnhem (12°21'S 136°59'E), the W entrance point of Gulf of Carpentaria, is a grassy projection rising gradually from the waters edge to a height of 46 m, with low cliffs on the S side.

Landmark

2.283

- 1 Higginson Islet (conspicuous) (12°02'S 136°53'E).

Directions

(continued from 2.210)

2.284

- 1 From the vicinity of 12°00'S 136°45'E, about 3½ miles NNW of Veronica Island, the route to Cape Arnhem leads initially E passing (with positions given from Higginson Islet):

N of Veronica Island (5½ miles W) from where a light is exhibited (2.233); thence:

- 2 N of Sykes Shoal (4½ miles WNW) (2.15) the N-most danger off Bremer Island (4¼ miles SW); thence:

N of Bremer Rock (1½ miles WNW) noting North East Bremer Islet 1½ miles farther S; thence:
N of Higginson Islet noting the depth of 8.2 m which lies 5 cables NW.

The route then leads SE passing:

- 3 NE of Forlsche Rock (2 miles S); thence:
NE of East Bremer Islet (¾ miles S) a line of above-water rocks extends 1½ miles S from this

islet; thence:

NE of Arnhem Shoal (unexamined) lying 1½ miles N of Cape Arnhem (19½ miles SSE). There are strong tide rips for some distance off the cape.

Useful mark:

Mount Dundas (12°13'S 136°52'E) (2.232).
(*Directions continue at 2.290*)

CAPE ARNHEN TO MILNER BAY

GENERAL INFORMATION

Charts Aus 4720

Scope of section 2.285

- 1 The area covered by this section comprises:
Cape Arnhem to Blue Mud Bay (2.287).
Approaches to Milner Bay (2.302).
Milner Bay (2.316).

Caution 2.286

- 1 Owing to the incomplete nature of the surveys mariners should exercise caution when proceeding away from the recommended tracks.

CAPE ARNHEN TO BLUE MUD BAY

General information

Charts Aus 305, Aus 306, Aus 14

Route 2.287

- 1 The route from Cape Arnhem (12°21'S 136°59'E) to Cape Shield, the N entrance point of Blue Mud Bay, leads SSW about 85 miles.

Topography 2.288

- 1 Between Cape Arnhem and the entrance to Port Bradshaw, about 18 miles SW, the coast is sandy with low white sandhills behind.
The coast between the entrance to Port Bradshaw and Mount Alexander, about 10 miles SSW, has many dangers fronting the shore. Mount Alexander (2.289) stands close to the coast at the root of a small peninsula known as Wyanmerra Point.
- 2 Caledon Bay (2.292) is entered between Point Alexander (12°50'S 136°37'E) and Cape Grey, 11 miles SSE.
Between Cape Grey and Bald Point, 7 miles WSW the coast is indented by Wonga, Trial and Saint Davids Bays, which are of little importance.
- 3 From Bald Point to Bagbiringula Point, 6 miles SSW, the coast is strait, from Bagbiringula Point to Cape Shield, 15 miles SW, the coast is indented by two shallow unexamined bays separated by Point Arrowsmith. The N bay is known as Wardarlea Bay; both bays afford little shelter. Cape Shield (13°20'S 136°21'E) has sandy shores, Gooninnah Island lies 2 miles E of the cape.

Landmark 2.289

- 1 Mount Alexander (12°42'S 136°41'E), 99 m (325 ft) high, visible for over 20 miles in clear weather.

Directions

(*continued from 2.284*)

2.290

- 1 From a position about 8 miles ENE of Cape Arnhem (12°21'S 136°59'E) the route to Blue Mud Bay leads SSW passing (with positions given from Cape Grey (13°00'S 136°40'E)):
ESE of Cape Arnhem (43 miles NNE) (2.282); thence:
ESE of Arnhem Rock (42½ miles NNE) noting the 9.7 m (32 ft) shoal (unexamined) lying 1½ miles SW of the rock; thence:
- 2 ESE of Sir Rodericks Rocks (32 miles NNE) an extensive group of above and below-water rocks; thence:
ESE of the islets and rocks extending 1 mile SE from Binanangoi Point (26 miles NNE); thence:
ESE of Southern Cross Rocks (17 miles N); thence:
- 3 ESE of Three Hummocks (14 miles N) a group of three islets; thence:
ESE of Dudley Shoal (10½ miles NE); thence:
ESE of the shoal water extending up to 1 mile E from Cape Grey, the rocky E extremity of a narrow peninsula extending SE from the mainland. A dangerous wreck lies 1½ miles SSE and Doyle Rock lies 2 miles SSW of the cape. Thence:
- 4 Clear of Burns Shoal (18 miles S) and a dangerous wreck 9 miles farther SE; thence:
ESE of Gooninnah Island lying near the S end of a reef which extends up to 3½ miles E from Cape Shield (27 miles SW); thence:
To a position 4¼ miles NNW of Chasm Island (39 miles S).

(*Directions continue for Milner Bay approaches at 2.308*)

Port Bradshaw

General information 2.291

- 1 Port Bradshaw entered between Gwapiilina Point (12°34'S 136°46'E) and Binanangoi Point, the N and S entrance points, affords good anchorage for small vessels and shelter from SE winds.

Local knowledge is required.

- 2 **Topography.** The W side of Port Bradshaw is backed by a range of hills from 122 to 150 m high consisting mostly of granite. An islet lies in the entrance nearly midway between the N and S entrance points. The entrance and approach are somewhat obstructed by islets and rocks.

Anchorage can be obtained in depths of from 6 to 9 m (19 to 30 ft).

Caledon Bay

General information

2.292

- 1 Caledon Bay entered between Point Alexander (12°50'S 136°37'E) and Cape Grey (2.290), 11 miles SSE, extends in a NW direction to Middle Point, about 5 miles WNW of Point Alexander, where it divides into two smaller bays; the N bay is known as Grays Bay.

- 2 Within a line joining Point Alexander and the spur extending from Mount Caledon (2.293), Caledon Bay has not been closely examined but the inner bay W of Middle Point is shoal and not well sheltered. Grays Bay on the W side of Point Alexander affords good anchorage.

2.293

- 1 **Topography.** Mount Caledon, 11 miles WNW of Cape Grey, is composed of granite and has a spur extending NE to the coast terminating in a point. The SW side of the bay from the above point to Cape Grey is fringed by rocks and shoals.

- 2 From about 1½ miles S of Point Alexander, on which there is a sandy hillock, a line of dangers extends approximately 11½ miles ESE terminating in Dudley Shoal. Three islands, McNamara, Bridgland and Dudley, together with several rocks, above and below water, lie in this area.

Directions

2.294

- 1 **Route.** The only safe entrance into Caledon Bay is between the chain of rocks, islets and reefs extending SE and ESE from Point Alexander and the dangers on the SW side of the bay between Cape Grey and Mount Caledon spur.

2.295

- 1 **Initial position.** From E of Cape Grey the track leads WNW passing (with positions given from Cape Grey (13°00'S 136°40'E)):

SSW of Dudley Shoal (10½ miles NE); thence:

SSW of Regan Shoal (5½ miles NE); thence:

Between Cape Grey (2.290) and the rock drying 1.4 m (4 ft) lying ¼ miles SSW of Dudley Island (8 miles NNE); thence:

- 2 Between the dangers on the S side and a rock awash (7 miles NNW) keeping the point extending from Mount Caledon slightly SW of the projected axis of the track. This point should not be confused with a red sandy point in the W part of the bay.

- 3 The line of bearing 330° of the E side of Middle Point (14 miles NNW) then leads in the fairway between an above-water rock (8½ miles NW) and McNamara Island (9 miles NNW) until the same point is 330°, distant about 1¾ miles, with Grays Bay fully open, when the track then leads 360° to pass the same point at a distance of about 8 cables E.

Anchorage

2.296

- 1 Anchorage can be obtained in Grays Bay in a position 7 cables E of an islet situated N of Middle Point in a depth of 7 m (24 ft), mud.

Blue Mud Bay

Charts Aus 14, Aus 305

General information

2.297

- 1 **Description.** Blue Mud Bay is entered between Cape Shield (13°20'S 136°21'E) and North Point Island, about 27 miles SE; the N side is formed by the mainland W of Cape Shield and the S side by the N side of Groote Eylandt and Bickerton Island.

The bay has not been thoroughly surveyed. The N and W shores are difficult of access owing to the extensive shoals which occupy a large portion of the bay.

2.298

- 1 **Topography.** Between Cape Shield and Point Blane, 10 miles WNW, there is an extensive bay; the inner part is known as Myaoola Bay. Point Blane a narrow tongue of land forms the E entrance point to Grindall Bay. Grindall Point, situated in the NW part of Blue Mud Bay 8 miles WSW of Point Blane, is a narrow peninsula forming Jalma Bay to its W and Grindall Bay to its E. Mount Grindall lies on the E side of the peninsula.

- 2 Bennet Bay, W of Cape Barrow (13°40'S 136°04'E), at the S end of Blue Mud Bay has not been examined. Low wooded country rises very gradually to the interior from the W part of the bay and Walker River flows through it. Mount Ranken rises above its N bank, about 16 miles inland, and is a useful mark in clear weather.

- 3 Isle Woodah (13°27'S 136°09'E), the largest of the islands in Blue Mud Bay, is low compared with the adjacent islands. The S half is low and sandy terminating in a rocky point, its E extremity is of similar appearance. Round Hill Island lies on the shoal ridge extending from the E side of Grindall Point to Isle Woodah, a large above-water rock lies about 2 miles SW of Round Hill Island. Nicol Island stands on the outer edge of a shoal ridge E of Isle Woodah. Morgan Island, partially covered with trees and grass, lies approximately 1½ miles off the middle of the W side of Isle Woodah with no passage between. Meringa and Marinnan Islands are two small islands on the N edge of the shoal on which Morgan Island stands.

- 4 Burney Island (13°35'S 136°14'E) is surrounded by foul ground, a cove indents its W side. Amagbirra Islet, low and sandy, lies about 1½ miles E of Burney Island and Wedge Rock lies about 3 miles farther E.

Directions

2.299

- 1 The NE approach to the anchorages W of Isle Woodah is between Nicol and Burney Islands. The S approach is through Lowrie Channel (2.182).

Caution. Mariners navigating in the above waters should bear in mind that other dangers may exist besides those shown on the charts, see also 2.286.

Anchorages

2.300

- 1 Moderately sheltered anchorage can be found between Cape Shield (13°20'S 136°21'E) and Point Blane, 10 miles WNW, in depths of 5 to 7 m. The head of the bay is shallow.

2.301

- 1 Sheltered anchorage can be obtained in depths of 13 to 24 m, mud, from 1 to 2 miles SW to W of the S extremity of Isle Woodah (13°27'S 136°09'E).

Anchorage for small vessels, sheltered from all winds, can be obtained in a depth of 7 m mud, from 1 to 2 miles S of Morgan Island.

Caution. An above-water rock lies about 8 cables S of the S extremity of Morgan Island.

APPROACHES TO MILNER BAY**General information**

Chart Aus 14

Route**2.302**

- 1 The recommended track, as shown on the chart, from NNW of Chasm Island (13°40'S 136°35'E) to Milner Bay leads from position 13°35'5S 136°33'0E, through Warwick Channel, to Milner Bay.

Topography**2.303**

- 1 Bickerton Island (13°45'S 136°11'E) is the largest of the islands between Cape Barrow (13°40'S 136°04'E) and Groote Eylandt. It is separated from Connexion Island, 4 miles ESE, by Warwick Channel.

The N and S sides of the W coast of Bickerton Island are deeply penetrated towards its hilly interior by North Bay and South Bay. Neither of these two bays have been closely examined.

A bay on the E side of the island is shoal. Hand Islet lies close off the E coast.

Controlling depth**2.304**

- 1 The least depth in the approach is 14.1 m, 3½ miles SSE of Connexion Island Light (13°50'S 136°20'E) (2.310).

Pilotage**2.305**

- 1 For details, see 2.323.

Tidal information**2.306**

- 1 **Tidal streams** run strongly in both Warwick and Connexion Channels with strong eddies and tide rips.

Tidal levels: for details see 2.322.

Landmark**2.307**

- 1 Tower, 115 m in height (13°50'S 136°26'E).

Directions

(continued from 2.290 and 2.188)

2.308

- 1 **Route.** The recommended approach route to Milner Bay leads through Warwick Channel, between Bickerton Island and Connexion Island, which has been surveyed over a width of 2 miles and has a least depth of 28.8 m in the fairway.

2.309

- 1 **Initial position:** From position 13°35'5S 136°33'0E the recommended track, shown on the chart, leads initially 221° passing (with positions given from Brady Rock (13°41'S 136°27'E)):

NW of Chasm Island (7½ miles E); thence:

SE of Hawknest Island (3½ miles NW). Because of its low height Hawknest Island will probably not be sighted from the NE before Bustard Island. Thence:

- 2 SE of Brady Rock. A light (white hut, 2 m in height) is exhibited from the summit of the rock. Thence: NW of Winchilsea Rock (2¾ miles SSE), the NW extremity of Winchilsea Island, mostly barren and rocky noting the 7.7 m patch which lies 5 cables WSW of Winchilsea Rock, 1¼ miles SE of the recommended track; thence: SE of Bustard Island (3½ miles WSW).

2.310

- 1 The line of bearing 250° of Bickerton Island Light (white GRP hut, 2 m in height) (13°47'S 136°17'E) in line with Hand Islet (13°47'0S 136°17'5E) then leads in the fairway passing (with positions given from Hand Islet): SSE of Arruwa Island (6 miles NE) a reef and foul ground lie S and SW of this island about 1 mile N of the track; thence:

NNW of the N side of Connexion Island (4 miles ESE).

- 2 When Hand Islet is 250°, distant 2¼ miles, the track leads 195° through Warwick Channel passing:

ESE of Hand Islet; thence:

Between Connexion Island Light (white fibreglass tower, aluminium handrails, 11 m in height) (4 miles SE), distant 1½ miles, and the un-named islet and reefs (3½ miles SSW) lying off the SE side of Bickerton Island.

- 3 When Milner Bay jetty (13°52'S 136°25'E) bears 085° the track leads, as indicated on the chart, to Milner Bay passing SW, S then SE of Connexion Island. Burley Shoal, 1½ miles S of Connexion Island, is the S-most known danger off this island and is marked by a light-buoy (S cardinal).

Caution. Depths of less than 12 m lie close N and S of the recommended track S of Connexion Island.

2.311

- 1 **Useful mark:**

Conspicuous tanks (13°51'6S 136°25'2E) (2.324).
(Directions continue at 2.325)

Side channel**Connexion Channel****2.312**

- 1 Connexion Channel separates the NW side of Groote Eylandt from Connexion Island and has a least charted depth of 10.8 m in the fairway 8 cables NW of North West Bluff (13°50'S 136°24'E) (2.315).

The N approach is encumbered by a rocky shoal with a least depth of 7.3 m, 2½ miles N of North West Bluff.

Local knowledge is recommended.

Anchorage and minor bays**Brady Rock anchorage****2.313**

- 1 An anchorage, for mariners awaiting the pilot (2.323), is available about 1 mile E of Brady Rock (13°41'S 136°27'E) clear of the recommended track, in a depth of 36 m.

North West Bay**2.314**

- 1 **Description.** North West Bay, entered between a point 1½ miles S of Chasm Island (13°40'S 136°35'E) and the

NE extremity of Winchilsea Island, 2½ miles WSW, has not been surveyed. The S part of North West Bay appears to be shallow.

Bartalumba Bay

2.315

- 1 **Description.** Bartalumba Bay (13°48'S 136°28'E) lies between Winchilsea Island and North West Bluff, which rises to a height of 87 m, and is clifty on its N side. There is a conspicuous yellow patch on the cliffs close within the SW entrance point of the bay. An inlet lies 8 cables ESE of the yellow patch.

- 2 **Anchorage** can be obtained 4 cables NE of the yellow patch in depths of about 7 m.

Facilities. A jetty used by prawn boats is situated on the NE entrance point to the inlet. The boats are supported by facilities ashore.

Dangers. A below-water rock lies close off the jetty and a dangerous wreck, with mast showing, lies about 4 cables NE of the jetty head.

MILNER BAY

General information

Chart Aus 14

Position and function

2.316

- 1 An ore loading facility is situated in Milner Bay (13°52'S 136°25'E) on the W side of Groote Eylandt, just S of North West Bluff the island's NW extremity. The port has been developed for the export of manganese ore.

Topography

2.317

- 1 Milner Bay lies at the N end of a shallow bay into which several creeks discharge. Angurugu Creek, 7 miles S, is the largest of the creeks which discharge along the W coast of Groote Eylandt.

At Milner Bay there are a number of conspicuous tanks grouped around the root of a pier and conveyor which connects the loading berth to the shore.

The township of Alyangula stands close N of the pier.

Port limits

2.318

- 1 The port limits are as shown on the chart.

Approach and entry

2.319

- 1 Milner Bay is approached from the NE and through Warwick Channel, and entered S of Connexion Island.

Traffic

2.320

- 1 In 2002, 54 vessels totalling 2 115 573 dwt used the port.

Port authority

2.321

- 1 Groote Eylandt Mining Co., Alyangula, Groote Eylandt, NT 0885.

Limiting conditions

2.322

- 1 **Controlling depth:** 12.5 m (1986).
Deepest and longest berth. Milner Bay T-Head Jetty (2.326).

Tidal levels. Mean spring range about 1.3 m, mean neap range about 1.1 m. The times of HW and LW can vary considerably from day to day. See *Australian National Tide Tables* and *Admiralty Tide Tables Volume 4*.

- 2 **Maximum size of vessel handled.** Official limit: Handymax beam 32.6 m. Largest vessel: 64 173 dwt; 224 m length; 32.26 m beam.

Local weather. Morning fog may occur in June and July and persist until 1100 hours.

Arrival information

2.323

Notice of ETA. Requirement for a pilot should be sent 7 days before arrival, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Quarantine anchorage is available 1 miles W of Milner Bay jetty (13°52'S 136°25'E) in a depth between 15–20 m, sand, good holding ground.

- 1 **Pilotage** is compulsory for vessel using the ore berth.
Boarding place: 1½ miles W of jetty. Arrangements can be made for the pilot to board 1 mile SE of Brady Rock (13°41'S 136°27'E).

Tugs are available.

Regulations concerning entry. Ore vessels are berthed/unberthed only during daylight hours.

- 2 **Quarantine.** Milner Bay is a first port of entry, radio pratique may be available, see *Admiralty List of Radio Signals Volume 1 (2)*. and 1.54.

Quarantine may be granted at the anchorage if a vessel cannot berth on arrival.

Harbour

2.324

- 1 **General layout.** An ore loading berth (2.326) in the form of a T-head jetty is attached to the shore by a pier and conveyor, tankers use this jetty.

Rock Fill Jetty at the N side of the root of the pier is a general cargo berth used by coasting vessels.

Tidal streams at the anchorage can attain a rate of up to 3 kn.

- 2 In the vicinity of the loading berth the tidal streams run parallel to the berth, and seldom exceed a rate of 2 kn.

Landmarks:

Conspicuous tanks (13°51'6S 136°25'2E).

Tower, 115 m in height, (13°50'S 136°26'E).

Directions for entering harbour

(continued from 2.311)

2.325

- 1 From the anchorage proceed to the berth as convenient. Due to the predominantly N flow of the tide vessels usually berth port side-to.

Caution. Alayangula Ridge marked by a light-buoy (lateral) lies about 4 cables SW of the ore loading berth, and shallow water lies close NNW of the seaward end of Rock Fill Jetty.

Berths

Alongside berths

2.326

- / **Milner Bay Jetty** (13°51'7S 136°24'9E), single berth, 99 m in length, 12.0 m depth. Four mooring dolphins extend the length of the berth, the distance between the outer dolphins is 339 m.

Rock Fill Jetty (13°51'6S 136°25'0E), single berth, 5 m depth. Ramp suitable for vessels with bow ramps and Ro-Ro vessels.

Port services

2.327

- / **Repairs:** not available.

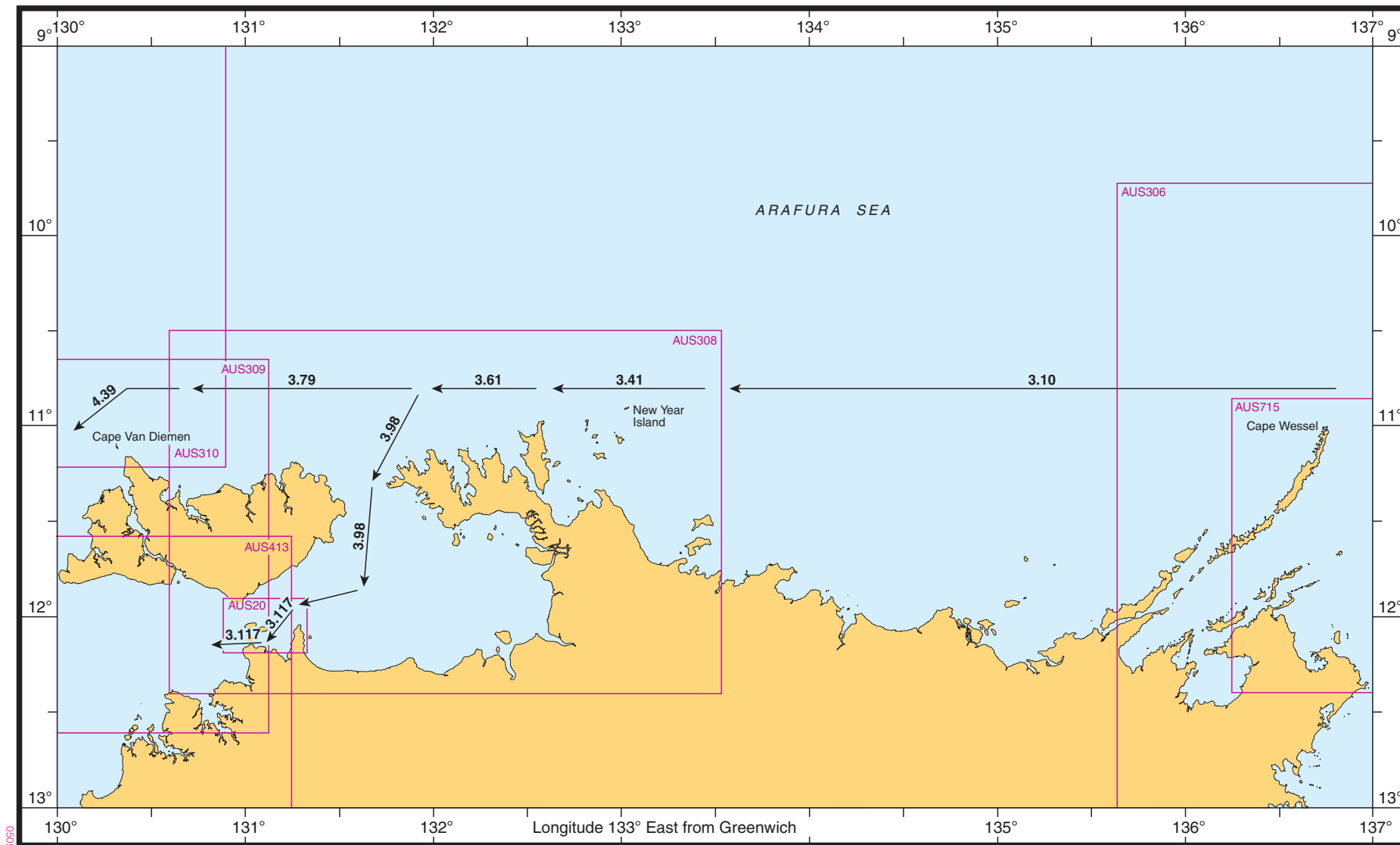
Supplies: fresh water available; fuel and stores not available.

Communications: local airport, 10 km from the port, with flights to international connecting flights at Cairns and Darwin.



Chapter 3 - Cape Wessel to Cape Van Diemen including Van Diemen Gulf

122



0505

CHAPTER 3

CAPE WESSEL TO CAPE VAN DIEMEN INCLUDING VAN DIEMEN GULF

GENERAL INFORMATION

*Chart Aus 411***Scope of chapter****3.1**

- 1 This chapter covers the through route and coastal waters from Cape Wessel (11°00'S 136°45'E) to Dundas Strait, about 300 miles W, and thence to Cape Van Diemen (11°10'S 130°23'E), also the coastal route and waters through Van Diemen Gulf (11°50'S 132°00'E).

Harbours**3.2**

- 1 There are no significant harbours within the area covered by this chapter.

Routes**3.3**

- 1 The preferred through route, shown on the chart, leads W from Cape Wessel to make a landfall on New Year Island (10°55'S 133°02'E) and then passes N of Croker Island and Cobourg (Coburg) Peninsula, across the N entrance to Dundas Strait and N of Melville Island to a position about 25 miles NNW of Cape Van Diemen.

3.4

- 1 Dundas Strait leads between Cobourg Peninsula and Melville Island into Van Diemen Gulf and thence to Port Darwin (12°28'S 130°51'E) (4.100) through Clarence Strait (12°05'S 131°05'E).

*Charts Aus 308, Aus 309***Caution****3.5**

- 1 Van Diemen Gulf and the waters adjacent to the N coast of Melville Island and the coast E of Vashon Head (11°07'S 132°00'E) have not been properly surveyed. In these areas less water than charted may exist. See caution on reference charts.

THROUGH ROUTES

Passage Directions*Charts Aus 411, 306,***Cape Wessel to Arafura Sea****3.6**

- 1 The preferred route shown on the charts leads 270½° from position 10°50'S 136°52'E, for a distance of 10 miles, to a position 11 miles NNW of Cape Wessel (11°00'S 136°45'E). Thence a route clear of known dangers leads WNW to position 9°00'S 133°05'E in Arafura Sea whence passage can be made to join the main route between Pulau-pulau Tanimbar and Pulau-pulau Kai. See *Ocean Passages for the World* and *Indonesia Pilot Volume III*.

3.7

- 1 **Alternative route.** An alternative track, which has not been surveyed and which is not shown on the charts, leads WNW from a position 12 miles NNE of Cape Wessel to a position 10 miles SSW of Meatij Miarang Light (8°20'S 128°30'E). See *Indonesia Pilot Volume III*.

This track has been used by deep-draught vessels.

CAPE WESSEL TO CAPE VAN DIEMEN

GENERAL INFORMATION

*Chart Aus 411***Scope of section****3.8**

- 1 The area covered by this section comprises;
Cape Wessel to New Year Island (3.10)
New Year Island to Smith Point (3.41)
Smith Point to Dundas Strait (3.61)
Dundas Strait to Cape Van Diemen (3.79)

Route**3.9**

- 1 The preferred route (3.13) lies between 10 and 65 miles off the N coast of Australia. There are a number of bays and anchorages situated along the coast.

Caution. Large sections of the waters adjacent to the coast are either unsurveyed or inadequately surveyed. See cautions on reference and national charts.

CAPE WESSEL TO NEW YEAR ISLAND

General information*Chart Aus 411***Route****3.10**

- 1 The preferred route along the N coast of Australia leads W from Cape Wessel (11°00'S 136°45'E), about 220 miles, to New Year Island.

Major lights**3.11**

- 1 Cape Wessel Light (11°00'S 136°45'E) (2.12).
New Year Island Light (white metal framework tower, 31 m in height) (10°55'S 133°02'E).

Other aid to navigation**3.12**

- 1 **Racon:**
Cape Wessel Light – as above.

Directions

(continued from 2.14)

Charts Aus 411, Aus 306, Aus 308

3.13

- 1 From position 10°50'S 136°52'E, 12 miles NNE of Cape Wessel, the preferred track shown on the chart leads 270½° passing (with positions given from New Year Island (10°55'S 133°02'E)):
N of Cape Wessel (11°00'S, 136°45'E) (2.203); thence:
2 N of a 9.1 m (30 ft) shoal (reported 1941, position approximate) (95 miles E), the bottom is irregular in this vicinity; thence:
N of Hogmanay Shoal (8 miles SE); thence:
N of New Year Island, low, wooded and fringed by a reef.

(Directions continue at 3.47)

Brown Strait

Chart Aus 306 (see 1.16)

General information

3.14

- 1 **Description.** Brown Strait (11°40'S 136°05'E) from 4 to 6 miles wide and with depths of from 10.5 to 33 m in the fairway separates the inner islands of the Wessel group (2.197) from the chain of islands extending 46 miles NE from the coast immediately W of Napier Peninsula and leads SW to Firefly Strait (11°50'S 136°00'E) (3.18), between Alger and Warnawi Islands or, for small craft, to Cadell Strait (3.22).

Local knowledge is required.

3.15

- 1 **Topography.** Stevens Island (11°33'S 136°07'E), the outer island of a chain of islands and rocks extending 46 miles NE from the coast immediately W of Napier Peninsula (12°00'S 135°50'E), lies 27 miles NNE of Napier Point. It is 26 m high, with rocks and foul ground extending 2 miles from its NE extremity and up to 1 mile from its W and S sides.
- 2 The island is covered with thick vegetation, undergrowth and trees approximately 10 m high. Some conspicuous red coloured cliffs which are approximately 6 to 7 m high and 300 m in length are situated on the SW end of the island. The island has expanses of white sand beaches and is fringed by foul ground that dries at LW.
- 3 Burgunngura Island (11°36'S 136°05'E), 11 m high and surrounded by foul ground, lies 2½ miles SW of Stevens Island. This island is low lying with thick vegetation and expanses of white sand beaches. The channel between Burgunngura Island and Stevens Island is subject to heavy tidal overfalls, particularly at springs. A low rocky islet is situated in this channel and appears as two separate islets at HW. The highest parts of this islet are at the N and S extremities and are joined by a drying reef at LW.
- 4 Drysdale Island, 20 m high, lies 6 miles SW of Stevens Island. A drying reef which has several islets and rocks on it joins Stevens, Burgunngura and Drysdale Islands. Yargara Island, 30 m high, lies on this reef close off Dale Point the NE extremity of Drysdale Island.
- 5 Neukarmeringora Island, 7 m high, lies in the middle of Stretton Strait which separates Drysdale Island from Elcho Island, 5 miles SW of Drysdale Island. Neukarmeringora Island is thickly wooded with an expanse of red coloured cliffs approximately 5 m high on its W side. Rock ledges extend from the island's N and S extremities into Stretton

Strait. The passage through Stretton Strait S of Neukarmeringora Island has depths ranging from 0.1 m to 2 m and is only considered passable by shallow draught vessels with local knowledge. The passage does not have a dedicated boat channel and, like most passages in the area, is subject to tidal overfalls and eddies particularly during spring tides. A small islet also lies in this passage which has extensive rock shelving which uncovers at LW and joins up with Elcho Island. A narrow and torturous passage exists N of Neukarmeringora Island but is not recommended.

3.16

- 1 The W coasts of Wessel Islands are mostly low and sandy. Gedge Point, on the W coast of Marchinbar Island (11°19'S 136°36'E) near the middle of the island, has a prominent clump of casuarina trees on it. Shark Point, about 2 miles NE, is high, cliffy and prominent, and forms the E side of Temple Bay. Red Point, about 5 miles SSW, is formed of red cliffs 12 m high. Djeegaree Island (11°37'S 136°12'E) lies close of the NW side of Raragala Island, about 5 miles NE of its SW extremity. Warnawi Island, the SW-most of Cunningham Islands, has on its SW point two tall trees, situated close E of Warnawi Island Light (white GRP hut, 4 m in height) (11°49'S 136°02'E); they are the only sizeable vegetation on the surrounding islands and are prominent.

3.17

- 1 **Tidal streams** in Brown Strait set S with the rising tide and may attain a rate of 4 kn.

Directions

3.18

- 1 The entrance to Brown Strait is approached between the E Wessel Islands group and Pelly Shoals, the outermost of the line of shoals and rocks extending up to 13 miles NE from Stevens Island. A SW track should be made through the centre of Brown Strait passing (with positions given from Stevens Island Light (11°33'S 136°07'E)):
2 SE of Compton Shoal (5 miles NE) with a least depth of 2 m; thence:
SE of Strath Shoal (2½ miles SSE) with a least depth of 7.6 m; thence:
NW of a shoal (9 miles S) with a least depth over it of 0.6 m; thence:
NW of a shoal (15 miles SSW), with a least depth of 6 m over it, lying about 2½ miles NW of Warnawi Island Light (3.16).
- 3 Thence the track leads SSE through Firefly Strait, between Warnawi and Alger Islands passing between the dangers 5 cables SW from Warnawi Island and the NE point of Alger Island (11°53'S 135°57'E).

Caution. A shoal spit with a least charted depth of 4.8 m extends 2 miles S from the NE point of Alger Island. See also 2.246.

3.19

- 1 **Useful marks:**

Stevens Island Light (white GRP tower, 6 m in height) (11°33'S 136°07'E).
Warnawi Island Light (11°49'S 136°02'E) (3.16).

Anchorage

3.20

- 1 Anchorage can be found SW of Djeegaree Island (11°37'S 136°12'E) (3.16) in 9 m (29 ft), mud and sand.

ANCHORAGES, BAYS AND SETTLEMENTS

Chart Aus 715

3.21

- 1 **Trafalgar Bay** (11°07'S 136°42'E), on the W coast of Marchinbar Island, entered between Auster Point and Thumb Point, affords sheltered anchorage about 5 cables WNW of the W of the two small islets in the centre of the bay, in 13 m. The shores of the bay are reported to be foul. A detached 4-6 m shoal lies in the entrance to the bay, 5 cables NW of Thumb Point.

- 2 **Gedge Point.** Landing can be effected on the W side of Marchinbar Island on a sandy beach N of a prominent clump of casuarina trees on Gedge Point (11°12'S 136°37'E).

Gugari Rip. A bay (11°33'S 136°21'E), close to the W of the N entrance to Gugari Rip (2.266), affords anchorage in 9 m, mud and sand.

- 3 **Guruliya Bay** (11°36'S 136°17'E) on the W coast of Raragala Island (2.244) affords sheltered anchorage in depths of about 8 m in the outer part of the bay and of about 5 m, coral and sand, in the inner part. Foul ground extends 1 mile NE of Osborn Point, the W entrance point of the bay; approach should be made on a S track passing midway between both entrance points.

Charts Aus 306, Aus 411, (see 1.16)

Galiwinku anchorage and Cadell Strait

3.22

- 1 **Description.** Galiwinku anchorage is approached from the N and lies about 5 cables offshore of the township at the SW end of Elcho Island. Cadell Strait (12°00'S 135°45'E) separates the NW side of Napier Peninsula from the SE side of Elcho Island and is less than 1 mile wide near its centre. The strait, available only to small craft, is marked by a beacon and buoys and has a bar at the NE entrance.

- 2 **Topography.** Elcho Island, also known locally as Galiwinku, is the largest island in the chain extending NE to Stevens Island. It has the township of Galiwinku at its SW end about 1½ miles NNE of Point Bristow the SW extremity of the island. Galiwinku is the principal settlement in Wessel Islands, with a population in 2001 of 1458; a further 2000 live throughout Wessel Islands. A small settlement lies on the N part of the island adjacent to Stretton Strait.

Dalmana Islet (12°02'S 135°30'E), 3½ miles NW of Point Bristow, lies on the W side of the W approach to Cadell Strait and is a good landmark.

- 3 Howard Island lies SW of Elcho Island and is separated from the mainland by Hutchinson Strait (3.25). The island is 21 miles long and 6 miles wide at its widest point. It has three hills on its E part, the NE-most of which is a useful mark in the approach to Cadell Strait or the anchorage off Galiwinku. The W coast consists of a series of sandy beaches, separated by rocky headlands and fronted in many places by fringing rock reefs. Large sand dunes predominate behind the beaches. Parts of the island are heavily wooded, particularly at the SW end. A prominent stand of trees lies on the headland 5 miles SW of Jigaimara Point.

- 4 **Controlling depth – Cadell Strait:**

Bar 0.5 m (1½ ft) (11°55'2S 135°51'5E) at the NE entrance point.

Local knowledge is required. It is reported that small craft can navigate Cadell Strait in either direction by timing the passage to arrive at the NE entrance at HW.

Landmark:

Conspicuous tank (11°59'6S 135°34'5E) about 2 miles N of Galiwinkut.

3.23

- 1 **Directions.** The line of bearing 212° of Dalmana Islet (12°02'S 135°30'E) a rocky islet, having a moderate covering of trees 4 to 8 m high, lying on a sandbank which covers at HW leads in the approach to the anchorage. Several shoal patches and rocks lie in the vicinity of Dalmana Islet, their positions may best be seen from the large scale national chart.

- 2 When N of Ganbalgawiri Point (12°04'S 135°32'E), the track leads S towards the bay abreast of the settlement.

Caution. A 1.3 m patch lies 9 cables NNW of Point Bristow.

- 3 **Anchorages.** Anchorage may be found between Dalmana Islet and Galiwinku in depths of 7 to 12 m with Elcho Island 1.5 miles distant.

Anchorage for vessels of light draught is available during the period of SE winds in the bay off Galiwinku (12°02'S 135°34'E) on Elcho Island. The berth is W of the settlement, about 5 cables offshore, in a depth of 6 m (18 ft). The anchorage is not recommended during the NW Monsoon.

- 4 Anchorage is available at the SW end of Cadell Strait for a large number of small craft.

Landing is possible on a sand bar at the S end of Dalmana Islet (12°02'S 135°30'E). A barge landing is situated at Wapuruwa Point, 2¼ miles E of Point Bristow.

Facilities: hospital with limited facilities; airstrip.

Supplies: diesel fuel, water, basic supplies.

Refuge Bay

3.24

- 1 Refuge Bay (11°49'S 135°51'E) is crescent shaped and lies on the NW side of Elcho Island, (3.22) affording reasonable protection for shallow draught vessels from prevailing E to SE trade winds. A white fibreglass water tank 15 m high and mounted on a metal framework tower is situated 4½ miles S of Naningbura Point. This tank can be used as a headmark for vessels wishing to anchor, approaching the bay running on a course of 130° to the anchorage. The settlement of Banthula lies on the shore of Refuge Bay in close proximity to the water tank, and comprises a number of houses, a shed and a telecommunications radio mast approximately 33 m high. A windmill is located approximately 500 m to the NW of the tank while the radio mast lies within the settlement itself. A white cross and a set of steps are situated at its N end.

- 2 Refuge Bay is lined by expanses of beach backed by trees and scrub. A creek lies in the NE part of the bay, its entrance lined by mangrove trees. The S part of the bay is thickly wooded inland. Red clay cliffs 10 m high can be seen on the bay's S shore which end in patches of extensive rock ledges extending 200 m offshore from the most SW point of the bay, which is known locally as Murumura Point. These ledges uncover at LW and dry to about 0.5 m.

Chart Aus 411 (see 1.16)

Castlereagh Bay

3.25

- 1 **Description.** Castlereagh Bay is entered between the NW extremity (12°06'S 135°22'E) of Howard Island and Mjrunnga Island, about 17 miles WNW. It has not been thoroughly examined but there are depths of from 9.1 to 18 m (30 to 60 ft) in the middle between the dangers which

extend from its shores. The shores of the bay are wooded with low hills within.

- 2 **Offshore danger.** Loosli Shoal, with a minimum depth of 2.1 m (7ft) (12°03'S 135°16'E) lies nearly in the middle of the entrance to Castlereagh Bay.

Local knowledge is required.

Closed area. An area of the waters in Castlereagh Bay between Howard Island and Glyde River, 11 miles WSW, is closed under the Aboriginal Land Act, except to those vessels exempt by law.

- 3 **Hutchinson Strait** is entered immediately W of Point Guy (12°11'S 135°14'E), the W extremity of Howard Island, and separates that island from the mainland. The strait connects with Cadell Strait (3.22) but is only suitable for boats.
- 4 **Woolen River** (12°13'S 135°10'E) discharges into the head of Castlereagh Bay 4½ miles WSW of Point Guy and has depths of from 2.7 to 11 m (9 to 36 ft) in its lower reaches. The river trends SE, the channel lying principally along its NE bank. It is reported to be navigable by small coasting vessels up to 14 miles above the entrance. The river is blocked by falls 25 miles above the entrance.
- 5 **Glyde River** (12°14'S 135°03'E) discharges into the bay about 11 miles WSW of Point Guy, but its approach is barred by a flat. The river trends S for a distance of about 65 miles and is very tortuous. White Star Landing stands on the W bank about 9 miles above the entrance.

Crocodile Islands

3.26

- 1 **Description.** Crocodile Islands consist of the islands of Mjrunnga (11°57'S 135°05'E), Yabooma (12°02'S 134°57'E) and Milingimbi (12°06'S 134°54'E) together with several smaller islands, islets and reefs. They extend nearly 40 miles from the coast between the W side of Castlereagh Bay (3.25) and Cape Stewart (11°56'S 134°45'E). The islands are of low coral formation and covered with vegetation.

The passage between Mjrunnga and Yabooma Islands is inadequately surveyed with several areas of foul ground.

- 2 **Dangers.** North Crocodile Reef (11°36'S 135°10'E), with a shoal patch of 6.4 m (21 ft) 3 miles N, are the outermost known dangers and lie about 32 miles NE of Cape Stewart. No attempt should be made to pass between this shoal patch and North Crocodile Reef as the bottom is foul.
- 3 North West Crocodile Island, the N-most of the group, lies about 6 miles SSW of North Crocodile Reef. Foul ground extends fully 10 miles E from North West Crocodile Island and North East Crocodile Island, a small island, lies towards the E side of this foul ground.

Several shoals, rocks awash and reported shoals and discoloured water, whose position can best be seen from the chart, lie W and NW of Crocodile Islands.

- 4 **Local knowledge** is required.
- Caution.** In 1993 North West Crocodile Island, North East Crocodile Island and Mjrunnga Island were reported to lie 2 miles NE of their charted positions.

3.27

- 1 **Milingimbi Inlet** the narrow channel between Yabooma and Milingimbi Islands, the two inner islands of the group, is approached from N of Yabooma Island. The track leads generally SW, via a narrow tortuous route obstructed by shoals and reefs and over a bar which dries in places, to a position about 5 cables NW of Hellier Point, the W extremity of Yabooma Island. The track then leads generally S for about 1 mile before turning ESE to pass between Boojiragi Island (12°04'S 134°55'E) and the SW

coast of Yabooma Island. The track then leads generally S as far as Milingimbi, an Aboriginal settlement, with an airstrip, on the E side of Milingimbi Island.

- 2 Between North Point, the N extremity of Yabooma Island and Hellier Point, the coast consists of sand dunes 10–20 m high, scrub and casuarina trees. Two conspicuous oil tanks, painted silver, are situated a short distance NE of the settlement on Milingimbi Island close within the coastline. About 2 cables S of the tanks the ruins of a wooden jetty extend in a NE direction from the shore.

Caution. Survey of this inlet is incomplete therefore the utmost caution is necessary when navigating it.

Boucat Bay

3.28

- 1 Cape Stewart (11°56'S 134°45'E), low and wooded, separates Castlereagh Bay and Crocodile Islands from Boucaut Bay to the W.

Boucaut Bay is entered between False Point, 4 miles W of Cape Stewart, and Skirmish Point about 24 miles farther W. Sand Islet small and low, lying 3 miles NNW of False Point, is connected to the shore by a submerged ledge.

- 2 There are general depths in the bay of from 5.5 to 11 m (18 to 36 ft) but 3 m (10 ft) and 4.6 m (15 ft) patches lie nearly in the middle of the bay about 13 miles W of False Point.

The shore of the bay is low and sandy with patches of mangroves scattered in the W part.

Blyth River flows into the bay 8½ miles SW of False Point.

- 3 **Outlying dangers.** Dangerous wrecks, the positions of which are approximate, lie 20 and 44 miles NNE of Skirmish Point (11°59'S 134°17'E).

Liverpool River anchorage

3.29

- 1 **Description.** Liverpool River, the estuary of which lies between Skirmish Point (11°59'S 134°17'E) (3.28) to the E and Hawkesbury Point, 11 miles WNW, provides good anchorage, sheltered from SE winds, for small vessels. Maningrida, an Aboriginal population centre and service station for the out stations, is situated on the E bank 2 miles NE of Mangrove Bluff (12°05'S 134°12'E).

- 2 Little information regarding Liverpool River entrance has been received since the survey in 1866 and the utmost caution is necessary when entering.

It was reported in 1960 that depths in the main channel as far as Entrance Island (11°57'S 134°13'E) were in agreement with the chart. In 1963 it was reported that the chart was accurate for fixing the ship's position when S of Entrance Island and depths were generally as charted. The river upstream of Bat Island, 1 cable SSW of Mangrove Bluff, is suitable for small craft only.

- 3 **Topography.** Haul Round Island (11°53'.5S 134°13'.7E), the outer island of the estuary, is 4m high, situated on the SW end of a coral reef. A light (3.30) is exhibited from the island.

Entrance Island, about 4 miles S of Haul Round Island, is conical in shape.

- 4 On the E side of the estuary between Skirmish Point and North East Point, 2¼ miles W, and for 3½ miles up the river the land is low and wooded. Thence until the N extremity of Bat Island (12°05'S 134°10'E) the land is moderately elevated, grassy and wooded. Mangrove Bluff, 1 mile NNE of Bat Island, is fringed with mangroves.

- 5 Hawkesbury Point on the W side of the estuary, is thickly wooded. West Point (11°57'S 134°10'E) is low and

sandy, at South West Point, $4\frac{1}{2}$ miles SSE, the land rises to a height of 37 m, 8 cables W of the point.

- 6 Bat Island, lies in the middle of the river with its NE extremity about $3\frac{1}{2}$ miles S of South West Point. A wooded ridge, about 46 m high, approaches close to the mangroves on the W bank abreast Bat Island. The banks of the river for the first 10 miles above South West Point are so thickly lined with mangroves that landing is impracticable. Higher up the river the banks are clearer with open grassy plains.

- 7 **Outlying dangers.** Paxie Shoal ($11^{\circ}26'S$ $134^{\circ}09'E$) of coral, lies 28 miles N of Hawkesbury Point. There are two wrecks, one lying 17 miles NNE of the point with a least depth of 18.6 m ($10\frac{1}{4}$ fm) over it, the other 30 miles NE with a least depth of 12.2 m ($6\frac{3}{4}$ fm) over it.

Local knowledge is required.

- 8 **Tidal streams** may attain a rate of 1 kn near Haul Round Island and 2 kn near Entrance Island, off South West Point $1\frac{1}{2}$ kn during the ingoing and $2\frac{1}{2}$ kn during the outgoing streams.

Landmark:

Conspicuous tower ($12^{\circ}04'S$ $134^{\circ}14'E$).

3.30

- 1 **Directions.** The main channel lies between Haul Round Island and the extensive shoal, with a least depth of 2.2 m (7 ft), $2\frac{1}{2}$ miles W, leading generally S, to about 5 cables W of the W extremity of Entrance Island and E of an islet, about 9 cables ENE of West Point.

- 2 **Caution.** A depth of 2.7 m (9 ft) (reported 1985) lies 2 miles SSW of Haul Round Island close E of the fairway.

Useful mark:

Haul Round Island Light (white conical GRP tower, 7 m in height) ($11^{\circ}53'S$ $134^{\circ}13'E$).

Side Channels. A channel leads E of Haul Round Island with a least depth of 5.4 m (18 ft) over a width of $1\frac{1}{4}$ miles.

- 3 A channel leads between Hawkesbury Point and the extensive shoal with a least depth of 2.2 m (7 ft) (3.30) lying $2\frac{1}{2}$ miles W of Haul Round Island in a least depth of 6.8 m (22 ft) in the fairway; it is somewhat tortuous. A rock awash is situated $1\frac{3}{4}$ miles N of West Point at the S end of this channel.

The above two minor channels unite with the main channel N of Entrance Island.

- 4 **Anchorage** is available W of Entrance Island ($11^{\circ}57'S$ $134^{\circ}13'E$) about 5 cables offshore, in depths of from 10 to 12 m (32 to 40 ft), mud.

Anchorage is available in the vicinity of South West Point ($12^{\circ}02'S$ $134^{\circ}11'E$):

NE of South West Point about 5 cables offshore, close S of a 1.3 m (4 ft) shoal, in a depth of 3.2 m ($10\frac{1}{2}$ ft), mud.

SSE of South West Point, about $1\frac{1}{4}$ miles offshore, in a depth of about 6 m (18 ft), mud.

Rolling Bay

3.31

- 1 Rolling Bay ($11^{\circ}54'S$ $134^{\circ}06'E$) entered between Hawkesbury Point (3.29) and a rounded point $3\frac{1}{4}$ miles WNW is shoal. A ledge of rocks and submerged dangers extends out about 3 miles through the centre of the bay from a point on the W side of the inner part of the bay. The outer end of this ledge breaks.

Local knowledge is required for entry.

Junction Bay

3.32

- 1 Junction Bay, entered between Goomadeer Point ($11^{\circ}52'S$ $134^{\circ}02'E$) and Braithwaite Point, 8 miles NW, is situated W of Rolling Bay (3.31) and has general depths of less than 5.5 m (18 ft) over the greater part.

- 2 The SE side of the bay is moderately elevated and wooded with some red cliffs and a sand patch on the coast. There is a projection on the NW side, the land behind rising to a height of 35 m. South-west of this projection the land is low and swampy, Gumadir River flows into this part of the bay.

- 3 Braithwaite Point ($11^{\circ}46'S$ $133^{\circ}56'E$), the W entrance point, is low and wooded and skirted by rocks. Between Hall Point, $2\frac{1}{2}$ miles NW and Cuthbert Point, 5 miles farther W, the land is low and sandy and continues so SW of the latter point.

Local knowledge is required.

- 4 **Offshore dangers.** A line of shoals and reported rocks to which the chart is the best guide, extends up to 14 miles NNE, and 5 miles ENE, respectively, of Braithwaite Point.

- 5 A shoal with a depth of 11.9 m (39 ft) over it lies 7 miles N of Cuthbert Point ($11^{\circ}44'S$ $133^{\circ}50'E$) just outside the shoal area with rocky patches extending N from the same point. In 1991 shoaling was reported between this shoal and the line of shoals extending NNE from Braithwaite Point. A patch (reported 1999) with a depth of 11.9 m (39 ft) lies 13 miles N of Cuthbert Point.

- 6 **Outlying dangers.** Discoloured water, with a depth of 10.4 m (34 ft) and tide rips close SW of it, lies about 25 miles N of Cuthbert Point. An unexamined 11 m (36 ft) patch (position approximate) was reported (1937) two miles S of the patch of discoloured water.

King River

3.33

- 1 **Topography – East approach.** Guion Point ($11^{\circ}46'S$ $133^{\circ}40'E$) about 11 miles WSW of Cuthbert Point (3.32) divides two bays, the E of these is shoal with low sandy shores. The W bay, entered between Guion Point and a point about 4 miles SW, has general depths of from 3.7 to 5.5 m (12 to 18 ft) but a 3.7 m (12 ft) rocky patch lies in the middle of the entrance and a rocky ledge extends about 2 miles N of the W entrance point.

- 2 There is a sandhill on the E side of the bay about 2 miles S of Guion Point and small rocky islets extend 1 mile N from the same point. The land on the W side of the bay is wooded.

Turner Point ($11^{\circ}46'S$ $133^{\circ}32'E$), 8 miles W of Guion Point, forms the NW entrance point to King River. The river trends S and W with heavily wooded shores.

3.34

- 1 **West approach.** The coast between Turner Point and Ross Point ($11^{\circ}42'S$ $133^{\circ}21'E$), 12 miles WNW, is low and wooded but the rocky Wellington Range, attaining an elevation of 174 m (570 ft), commences about 8 miles SW of Turner Point and extends about 20 miles W giving the land a distinctive rocky appearance in comparison with the low land E of King River. Tor (221 m (725 ft) high) ($11^{\circ}56'S$ $133^{\circ}08'E$), situated about 19 miles SW of Ross Point, is an isolated perpendicular rock and forms a useful mark in clear weather. Ross Point, which forms the SW side of Macquarie Strait (3.38), is the NE extremity of a range of hills about 30 m high.

- 2 Barclay Point ($11^{\circ}45'S$ $133^{\circ}25'E$), 7 miles WNW of Turner Point, is the extremity of a low peninsula which

extends from the coast midway between Turner Point and Ross Point, forming small bays on both sides. Wamirumu Point, encumbered with rocks, divides the E bay into Wangularni (Wangulari) and Waminari Bays, they have not been fully examined.

- 3 Anuru Bay, the W bay, has depths of from 1·8 to 3 m (6 to 10 ft) over its greater part. The coastal bank dries for about 5 cables off the W shore and there is a cliff at the head of the bay.

3.35

- 1 **King River.** The E bank of the river for the first 2 or 3 miles from seaward is fringed with rocks and the 5·5 m (18 ft) depth contour is some distance off shore.

The W bank for about 4 miles S of Turner Point is also fringed with rocks and about 3 miles S of the point there is a rocky ledge which extends about 1 mile from the shore to the 5·5 m (18 ft) depth contour.

- 2 The river has depths of from 5·8 to 7·3 m (19 to 24 ft) at its mouth. The channel, which is from 1 to 3 cables wide, has depths of 5·5 m (18 ft) for about 3 miles within.

From a position about 7 miles from the mouth the river is suitable only for boats for a farther 30 miles.

Local knowledge is required.

Outlying dangers. A 10·7 m (35 ft) patch lies 21 miles NNE of Turner Point (11°47'S 133°32'E) and a dangerous wreck (position approximate) lies 5 miles S of the patch.

Charts Aus 411, 308

Goulburn Islands

3.36

- 1 **North Goulburn Island** (11°30'S 133°26'E) lies with its SW point 9 miles N of Ross Point (3.34) and is the outer island of a group of three. It is generally low with a ridge along its N and W sides.

- 2 **Offshore dangers.** An area of shoals and discoloured water extends up to 9 miles NE from Wudbud Point, the N extremity of the island, with a least charted depth of 2·7 m (9 ft) (reported 1953) 6 miles NNE of the point. A shoal with a least depth of 4·3 m (14 ft) (reported 1980) is charted 2½ miles E of the same point.

3.37

- 1 **South Goulburn Island**, about 2½ miles S of North Goulburn Island, is generally low and sandy with Waruwi Aboriginal settlement and airstrip (3.39) at its SE end. South West Bay, on the W side of the island, has a sandy beach backed by cliffs about 12 m high stratified by red and white clay. Bottle Rocks, awash, are separated from the N entrance point of the bay by a narrow passage with depths of 3·7 m (12 ft).

- 2 The strait between North and South Goulburn Islands has not been thoroughly examined but has shoals with depths of 9·1 m (30 ft) in the fairway. A least known depth of 7·3 m (24 ft) is charted 3 miles SW of Sand Point, the SW extremity of North Goulburn Island.

Sims Island, lying 3 miles WNW of the S extremity of South Goulburn Island, is formed of coarse grained sandstone, large rounded masses cover the N part of the island on which stands Sansom Head.

3.38

- 1 Macquarie Strait, between South Goulburn Island and Ross Point on the mainland, has not been thoroughly surveyed. A depth of 3·7 m (12 ft) is charted in the middle of the strait.

Local knowledge is required.

Tidal streams in the strait between North and South Goulburn Islands set E during the rising tide. Off the E

side of North Goulburn Island the streams are reported to be strong and irregular.

- 2 In Macquarie Strait, between Sims Island and South Goulburn Island the tidal stream attains a rate of 2 kn setting SSE on the rising tide.

3.39

- 1 **Anchorage.**

Mullet Bay (11°31'S 133°23'E) on the W side of North Goulburn Island, entered between Cone Point and Sand Point, affords good anchorage, during the season of SE winds, about 1 mile offshore in depths of between 11 to 13 m (36 to 42 ft), mud.

- 2 **Caution.** A detached rock with less than 1·8 m (6 ft) over it and a shoal with a depth of 1·8 m (6 ft) lie in the S part of the bay.

South West Bay (11°39'S 133°21'E) on the W side of South Goulburn Island also affords anchorage, about 1 mile offshore, in depths of from 9 to 11 m (30 to 36 ft). Small craft can anchor about 3 cables off the beach in a depth of 6 m (18 ft), mud.

- 3 **Caution.** A 5·5 m (18 ft) patch lies in the approaches to the bay 1¼ miles WSW of Bottle Rocks, at the N entrance point of the bay.

Anchorage for small craft can be obtained in the bay E of Waruwi Aboriginal settlement (11°39'S 133°24'E) on South Goulburn Island, 1 mile ESE of the settlement. Local knowledge is required to proceed through the reef which fringes the approaches off the E side of the island.

Chart Aus 308

Aurari Bay

3.40

- 1 **Topography.** White Point (11°42'S 133°18'E) lies 3 miles W of Ross Point (3.34). Between White Point and Brogden Point, 17 miles NW, lies Aurari Bay which has not been thoroughly examined. For about 2 miles SW of White Point the shore of the bay is backed by a range of hills extending SW from Ross Point, thence for about 8 miles W it is low and sandy with White Rocks, a group of rocks, extending about 1 mile offshore. A rock awash lies outside White Rocks about 5 miles W of White Point. Brogden Point, with cliffs on its S side, can be easily identified as it is higher than the adjacent coast.

- 2 The coast between Brogden Point and De Courcy Head, a cliffy projection 14½ miles NW, is rocky. Cape Cockburn, 3 miles W of De Courcy Head, is low, rocky and wooded to within a short distance from the sea, it is not as distinctive as De Courcy Head.

Offshore dangers. A rock which dries 1·8 m (6 ft) lies 1¼ miles NNE of Cape Cockburn, and a shoal 12·5 m (41 ft) lies 8 miles E of the same cape.

NEW YEAR ISLAND TO SMITH POINT

General information

Chart Aus 308, 411

Route

3.41

- 1 From New Year Island (10°55'S 133°02'E) the preferred route along the N coast of Australia continues W, about 56 miles, to a position about 20 miles N of Smith Point (11°07'S 132°08'E).

Topography**3.42**

- 1 Croker Island (11°10'S 132°34'E) is separated from the mainland by Bowen Strait (3.57). Cape Croker, the N extremity of the island, is a wooded point with a distinctive rock hummock, 24 m high, 7 cables inland. The E shore of the island is generally rocky and backed by hills reaching a height of up to 39 m (128 ft), the W side is mostly low and in places sandy. The S end attains the greatest height and is heavily wooded. Several other islands, described at 3.49, lie E of Croker Island, the NE of which is New Year Island (3.13).

Military exercise area**3.43**

- 1 The waters of this sub section lie within designated military firing practice and exercise areas. See 1.9 for general information, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details.

Marine protected area**3.44**

- 1 Part of the Cobourg peninsula is a national park and the surrounding waters are designated a marine protected area. See (1.61), *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details.

Natural conditions**3.45**

- 1 **Current.** During October to December a strong set towards the land may be expected in the vicinity of Cape Croker. See also 3.64.

Major light**3.46**

- 1 New Year Island Light (10°55'S 133°02'E) (3.11).

Directions*(continued from 3.13)***3.47**

- 1 From position 10°48'S 133°02'E, 6½ miles N of New Year Island, the preferred track shown on the chart continues 270½° to a position about 20 miles N of Smith Point passing (with positions given from Cape Croker (10°59'S 132°36'E)):
- 2 N of Bramble Rocks (11½ miles ENE) at the N end of a shoal spit extending NNW from Oxley Islands (13 miles E), reported to lie 5 cables E of charted position (2004). The N and larger of the two islands is connected to the S island, which is low and wooded, by a spit which uncovers at LW; And:
- 3 S of Money Shoal (10°21'S 132°46'E) which lies about 27 miles N of the track, formed of coral and reported to break during the season of SE winds; thence:
N of Britomart Shoal (5 miles NNW) the N extremity of a spit which extends NNW from Cape Croker. Cape Croker Light (white GRP hut, 4 m in height) (10°59'S 132°35'E) is exhibited from the cape. Thence:
- 4 N of Jones Shoal (21 miles W); thence:
To a position about 20 miles NNW of Smith Point (28 miles WSW).

(Directions continue at 3.65 and for Dundas Strait via the coastal route at 3.67)

Side channel*Chart Aus 308***General information****3.48**

- 1 **Route.** A passage is reported between Cape Cockburn (11°20'S 132°52'E) and Grant Island, 10 miles N, thence between Croker Island (11°10'S 132°34'E) and Oxley Islands, 12 miles E, with a navigable width of about 5 miles between the shoals on either side.

3.49

- 1 **Topography – East side.** Grant Island, surrounded by reef except on its SW side, lies about 10 miles N of Cape Cockburn (3.40). The island rises to a peak, 32 m high, at its NW end but is low and wooded on its E side.
- 2 McCluer Island is the highest of the islands N of Cape Cockburn and lies about 16 miles NNE of that cape. Its N side is fringed by reef with a wooded islet situated on a spur extending from its NW extremity, the E side is also fringed by reef with several islets of dead coral close offshore.
- 3 Lawson Islands lie about 6 miles W of McCluer Island. The N island is surrounded by a reef which extends 1½ miles E and 5 cables N and W, there is a small islet near the E end of the reef. The S island smaller, low and wooded, lies about 1½ miles SSE.
- 4 New Year Island (10°55'S 133°02'E) (3.13) is the N-most of the islands extending N from Cape Cockburn and lies about 27 miles NNE from the cape. A light (3.11) is exhibited from the island. Oxley Islands (3.47) lie on a bank about 12 miles WSW of New Year Island.
- 5 **West side.** Darch Island (11°12'S 132°40'E) is thickly wooded and surrounded by reef, on the N side of which there is a rock which covers and uncovers. There is a narrow channel between Darch Island and Croker Island but it has not been closely examined.

Cape Croker, the N extremity of Croker Island, lies 11 miles N of Mission Bay (11°09'S 132°36'E) (3.52). A light (3.47) is exhibited from the cape. For topography of Croker Island, see 3.42.

3.50

- 1 **Caution.** Between Oxley Islands and New Year Island surveys are not complete but irregular depths of from 7.6 to 16.5 m (25 to 54 ft), coral, with overfalls in places have been reported in the area.

The area between Lawson Islands and Grant Island, and SW of them, has not been fully surveyed and such soundings as are shown on the chart indicate that there may be shoaler depths and undiscovered dangers in the vicinity.

See also information on the chart.

Directions**3.51**

- 1 The route leads WNW between Grant Island and Cape Cockburn, thence NNW between the shoals extending NE from One Tree Point, the NE extremity of Darch Island (11°12'S 132°40'E), and the 10 m (33 ft) shoal (reported 1988) lying 6½ miles ENE of the same island
- 2 **Caution.** A shoal 6.1 m (20 ft) (reported 1984), the outer-most charted danger in the approaches to Mountnorris Bay (3.54) lies on the SSW side of the channel, 3½ miles NE of Templer Island (11°18'S 132°44'E), and is the NE-most known danger off that island. A 10.3 m (34 ft) shoal patch lies midway between Templer Island and Grant Island.

ANCHORAGES AND BAYS

Mission Bay anchorage

3.52

- 1 **General information.** Mission Bay (11°09'S 132°36'E), situated approximately in the middle of the E coast of Croker Island, is entered between a point, backed by a 28 m high red sand hill, on the N and a point 3 miles SSE, both these points are fringed by reefs. Minjilang Aboriginal centre is situated at the head of the bay.

- 2 **Anchorage** can be obtained in Mission Bay during the NW Monsoon, in depths of from 5 to 13 m (16 to 42 ft), sand.

Care is necessary during the season of SE winds as the sea is driven across the entrance.

Caution. A rock which dries 0.9 m (3 ft) lies 7½ cables NNE of the S entrance point.

New Year Island anchorage

3.53

- 1 **General information.** Anchorage, which is exposed, can be obtained WNW of the W extremity of New Year Island (10°55'S 133°02'E), N of the sandbank which extends from the SW extremity of the island, in a depth of 18 m (59 ft).

Landing can be found on the beach at the root of the sandbank.

Mountnorris Bay

3.54

- 1 **Description.** Mountnorris Bay is entered between Cape Cockburn (11°20'S 132°52'E) (3.40) and Point David (3.57), the S extremity of Croker Island 16½ miles W, it has not been fully surveyed. Rocks and shoal water extend up to 4 miles offshore from Guialung Point on the W side of the bay, only small vessels and mariners with local knowledge should proceed in this far.

3.55

- 1 **Topography.** Templer Island, surrounded by reef, lies in the middle of the entrance to Mountnorris Bay about 8½ miles WNW of Cape Cockburn. Cowlard Island, small and situated on a reef, lies midway between Templer Island and Cape Cockburn. Valentia Island, thickly wooded, lies 2½ miles W of Annesley Point, there is no safe passage between. Copeland Island, surrounded by a coral reef, lies near the head of Mountnorris Bay and has a distinctive perpendicular yellow cliff on its N side. There is no safe passage between it and the mainland except for boats.

- 2 The land rises to thickly wooded hills from 46 to 73 m (150 to 239 ft) high on the SE side of the bay, there are similar hills along the W side. Bay Hill stands at the head of the bay and is prominent.

3.56

- 1 **Offshore dangers.** A detached 6.4 m (21 ft) patch lies 2 miles NW of Templer Island (11°18'S 132°44'E). Depths of 4.9 m (16 ft) and 6.1 m (20 ft) were reported in 1984 to lie 2½ miles NNE, and 3½ miles NE, respectively, of Templer Island, and depths of 5.5 m (18 ft) are charted between Templer and Cowlard Islands, in the approaches to Mountnorris Bay.

- 2 **Anchorage.** Malay Bay (11°23'S 132°52'E), on the E side of Mountnorris Bay, affords good anchorage for small vessels, about 2 miles within its entrance, in depths of from 6 to 7 m (18 to 24 ft).

Caution. A reef extends nearly 1 mile N from Annesley Point the S entrance point of Malay Bay.

Bowen Strait

3.57

- 1 **Description.** Bowen Strait between the SW side of Croker Island and the mainland is obstructed with shoals and has been only partially examined, other dangers than those charted may exist. It is reported to be suitable for small vessels having a draught up to 4.6 m (15 ft).

Local knowledge is required.

- 2 **Topography.** The S part of Croker Island attains a height of 41 m (135 ft) about 2¾ miles N of Point David (12°21'S 132°35'E), the low narrow and stony S extremity of the island.

The coastline on both sides of the strait from Point David to Adjamarrugu Point, 14 miles NNW, on the N side and from Guialung Point (11°26'S 132°38'E) to High Point, 18 miles NW, on the S side has not been thoroughly examined.

- 3 **Depths.** There is stated to be a least depth of 8.2 m (27 ft) in the fairway E of the shoals lying in the middle of the strait off Giles Point (11°16'S 132°30'E) and a least depth of 5.8 m (19 ft) is charted in the fairway of the SE entrance close E of the shoal spit extending ESE from Point David, greater depths are charted in the NW entrance.

- 4 **Offshore dangers.** A shoal with a depth of 7.9 m (26 ft) over it (reported 1965) lies 3 miles NNE of Danger Point (11°07'S 132°20'E) and Campbell Reef lies 4½ miles SE of the same point in the NW approaches to the strait.

Palm Bay anchorage

3.58

- 1 Palm Bay on the W side of Croker Island, at the NW entrance to Bowen Strait, is entered between a point 3¾ miles SSE of Peacock Island (11°02'S 132°27'E) and Adjamarrugu Point, 4½ miles S. The bay affords good anchorage during the season of SE winds.

Local knowledge is required.

- 2 **Anchorage** can be obtained in depths of from 7 to 9 m (24 to 30 ft). There is a sandy beach in the SE part of the bay which is reported to provide good landing.

Caution. The NE part of the bay and an area extending 2¼ miles NW from Adjamarrugu Point are foul.

Raffles Bay anchorage

3.59

- 1 Raffles Bay (11°13'S 132°24'E) on the N side of Cobourge Peninsula, at the NW entrance to Bowen Strait, is entered between High Point and Danger Point, a low point, 8 miles NW. The inner part of the bay entered between High Point and D'Urville Point, 3 miles W, affords shelter from all but N winds for small vessels.

- 2 Both entrance points as well as the shores on either side of the bay are fronted by ledges and rocks which restrict the navigable width of the channel to about 1 mile. The shores of the bay are low and covered with mangroves, there is a cliff on the E side about 2 miles S of High Point.

- 3 **Pearling station.** The bay S of a line joining D'Urville Point and High Point is a private pearling lease and is totally obstructed by pearling float lines. Entry into Raffles Bay should not be attempted during hours of darkness and contact should be made with the pearling station if mariners require anchorage in the inner bay. See 1.8.

Local knowledge is required.

- 4 **Anchorage** can be obtained in depths of from 6 to 7 m (18 to 24 ft).

Offshore danger. Campbell Reef (11°10'S 132°24'E) lies in the approach to Raffles Bay.

Chart Aus 308 (see 1.16)

Port Bremner

3.60

- 1 Port Bremer situated between Danger Point (11°07'S 132°20'E) and Smith Point, about 11½ miles W, is entered between Sandy Island No 1 and Sandy Island No 2. Both of these islets are low and reef fringed and lie 8½ miles W, and 2¾ miles WNW, respectively, from Danger Point.
 - 2 The inner part of Port Bremer is entered between Edwards Point (11°11'S 132°16'E) and Kuper Point, 2 miles W, but rocky ledges fringe the shore on both sides of the entrance reducing the navigable width to 5 cables. The waters S of a line from Edwards Point to Stewart Point, as indicated on the chart, are used for the culture of pearls. See 1.8.
 - 3 **Offshore dangers.** A shoal with a least charted depth of 9.5 m, lies 1¼ miles NNE of Sandy Islet No 1 and should be given a wide berth as there may be less depth over it. In 1963 an isolated 4.2 m patch was reported to lie 3½ miles N of Edwards Point (11°11'S 132°16'E) on the E side of the entrance. In 1996 an isolated 2.4 m shoal was reported to lie in the approaches to the inner part of Port Bremner 3½ miles NW of Edwards Point.
- Currents** in the approaches, for details see 3.64.

SMITH POINT TO DUNDAS STRAIT

General information

Chart Aus 308 (see 1.16)

Routes

3.61

- 1 **Offshore route.** From a position 20 miles N of Smith Point (11°07'S 132°08'E) the recommended offshore route along the N coast of Australia leads W, about 30 miles, to a position about 25 miles N of the entrance to Dundas Strait.
- Coastal route.** From position 10°48'S 132°05'E the coastal route to Dundas Strait leads SW, about 33 miles, to the entrance of the strait NNW of Cape Don (11°18'S 131°46'E), the W extremity of Cobourg Peninsula.

Military exercise area

3.62

- 1 The waters of this sub section lie within designated military firing practice and exercise areas. See 1.9 for general information, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details

Marine protected area

3.63

- 1 Part of Cobourg Peninsula is a national park and the surrounding waters are designated a marine protected area. See (1.61), *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details.

Natural conditions

3.64

- 1 **Tidal streams** see 3.97.
- Current** off Vashon Head (11°07'S 132°00'E) sets W between March and October increasing in strength nearer to Danger Point (11°07'S 132°20'E) the average rate being about 1 kn. The direction changes with the monsoon.

Offshore route

Directions

(continued from 3.47)

3.65

- 1 From position 10°48'S 132°05'E, about 20 miles NNW of Smith Point, the recommended offshore route along the N coast of Australia leads 270° to a position about 33 miles NNW of Cape Don, passing about 25 miles N of the entrance to Dundas Strait.
- There are no known dangers on this stretch of the route.
(Directions continue at 3.83)

Coastal route

Major light

3.66

- 1 Cape Don Light (grey concrete tower white lantern, 36 m in height) (11°19'S 131°46'E).

Directions

(continued from 3.47)

3.67

- 1 From position 10°48'S 132°05'E, about 20 miles NNW of Smith Point, the recommended coastal route to Dundas Strait, as shown on the chart, leads 223° to a position 8 miles NNW of Cape Don passing (with positions given from Cape Don):
- 2 NW of Orontes Reef (24 miles NE) (3.72); thence: NW of a dangerous wreck, 1½ miles NW of Vashon Head (17½ miles NE), thence: NW of a 9.3 m (31 ft) shoal (15 miles NE) the outer-most danger off Wanaraij Point (Wanaray Point); thence:
- 3 NW of Allaru Island, small and sandy lying close outside the reef extending from Araru Point (10 miles NE), low sandy and covered with mangroves; thence: NW of Lingi Point (6½ miles NNE) well wooded and surrounded by reef; thence: To a position 8 miles NNW of Cape Don (3.103).
(Directions continue at 3.103)

Port Essington

General information

3.68

- 1 **Description.** Port Essington, an inlet on the N coast of Cobourg Peninsula, was originally used as a naval base in the nineteenth century. The port, entered between Smith Point (11°07'S 132°08'E) and Vashon Head 8 miles W, provides good anchorage and is divided into an outer and inner harbour by a spit of land on the E side about two-thirds of the way S from the entrance.
- 2 Knocker Bay, S of a line from Oyster Point (11°18'S 132°08'E) to Kangaroo Point (11°17'S 132°07'E) as shown on the large scale national chart, is used for the culture of pearls. See 1.8.

3.69

- 1 **Topography.** Port Essington is not easy to identify as the land around is generally low and thickly wooded. The highest hill, Saddle Hill (11°18'S 132°14'E), does not exceed 72 m. Turtle Point (11°13'S 132°07'E), which forms a useful mark for clearing Orontes Reef (3.72), can usually be identified before either Smith Point (3.72) or Vashon Head, low and wooded, rising to a 27 m hill about 2 miles within.
- 2 The inner harbour of Port Essington between Record Point and Spear Point, about 1 mile W, is spacious and

nearly landlocked and provides good shelter in all winds. It is divided into three bays by Middle Head and Mangrove Point.

- 3 Barrow Bay, entered between Record Point and the spit extending from Middle Head has generally low shores covered with mangroves. The shores of the bay are fringed by mud flats which extend up to 5 cables offshore. Middle Head is a wide cliffy projection rising to a height of 63 m about 5 cables inland, a narrow spit with a dangerous rock on its extremity extends 1 mile NW from Middle Head.

- 4 Depths generally in the entrance are about 11 m whilst the greater part of Barrow Bay has depths of less than 5 m.

East Bay and West Bay, two shoal inlets at the head of Port Essington, are separated from each other by Mangrove Point. The shores of both bays are fringed by mud flats and bordered by mangroves.

3.70

- 1 **Tidal streams.** In the entrance to Port Essington during the rising tide the tidal stream sets strongly W past Smith Point and Vashon Head.

Within the entrance the rising tide sets SE then S past Turtle Point, with a strong set into Curlew and Knocker Bays, thence SE again into the inner harbour.

- 2 The out-going stream follows the direction of the fairway between Spear Point (11°20'S 132°09'E) and Turtle Point and sets strongly past Black Point.

Currents in the approaches see 3.64.

3.71

- 1 **Landmarks:**

Monument (11°07'S 132°08'E), 8 m in height, on Smith Point (3.72).

Conspicuous radio tower 6 cables NNE of Black Point (11°09'S 132°09'E).

Directions

3.72

- 1 **Caution.** Port Essington has been neither closely nor recently examined and the chart should be used with caution, see information on the large scale national chart.

Outer harbour. From N of Vashon Head the track leads SSE towards Turtle Point (11°13'S 132°07'E) passing (with positions given from Turtle Point):

- 2 WSW of Orontes Reef (9 miles N); the sea seldom breaks on this reef and it cannot be seen even when close-to as the discolouration of the water is not confined to its immediate vicinity. And:

ENE of the shoal water and foul ground surrounding and extending 3 miles NNE from Vashon Head (8 miles NW); thence:

WSW of Smith Point (5½ miles NNE), low and rocky with a monument (3.71).

- 3 The fairway then leads SE passing:
NE of Walford Point (3 miles NW); thence:
NE of Low Point (2 miles WNW); thence:
Between Black Point (4 miles NNE), cliffy and covered with trees on its S side, and a 4.7 m (15½ ft) patch (1 mile NNW) lying in the entrance to Kennedy Bay.

- 4 The fairway then reverts SSE passing:
Between Reef Point (3½ miles ENE) and Turtle Point, both fringed by rocks; thence:
ENE of rocks awash extending 5 cables E of False Turtle Point (1½ miles S); thence:
Between the drying reef extending W from Table Head (4½ miles ESE), a low rocky projection distinctive from the S, and Curlew Point (3½ miles S); thence:

- 5 Between dangerous rocks lying about 1 mile WNW of Observation Cliff (6½ miles SE), which is a useful mark, and a 2.9 m (9½ ft) patch lying 1 mile NNE of Oyster Point (5½ miles SSE) a bluff headland; thence:

ENE of a 3.4 m shoal (6½ miles SSE); thence:

WSW of a 2.9 m (9½ ft) shoal (6½ miles SSE); thence:

- 6 Between Record Point (8 miles SSE), distant 2½ cables, the extremity of a long narrow tongue of sand partially wooded and steep-to, and the mud flats extending E and SE from Spear Point (7½ miles SSE) a rocky headland on the W side of the narrow entrance leading to the inner harbour. The contraction of the passage here causes a considerable increase in the strength of the tidal streams. Thence:

To the anchorage in the inner harbour as convenient.

Anchorges

3.73

- 1 **Outer harbour.** Good anchorage can be obtained during the season of SE winds, about 5 cables NW of Black Point, in a depth of about 11 m.

Caution. Foul ground with rocks awash, extends nearly 1 mile S from Smith Point in the N part of this bight.

Inner harbour. The best berth in the inner harbour lies just within the entrance to Barrow Bay, about 7½ cables SSE of Record Point, in a depth of 11 m.

Local knowledge is required.

3.74

- 1 Anchorage can be obtained by small craft in Port Essington as follows:

Outer harbour, Coral Bay, sheltered from E winds by Walford Point, in depths of from 6 to 7 m. Coral Reef (11°10'S 132°03'E) forms the NW side of this bay.

- 2 Anchorage is also available in the S part of Berkeley Bay (11°14'S 132°10'E).

Inner harbour, 5 cables E of Minto Head, in a depth of about 4.7 m.

Anchorges and bays

Trepang Bay

3.75

- 1 **Description.** Trepang Bay entered between Wanarai Point (11°08'S 131°58'E) and Araru Point, 6 miles SW, affords good anchorage during the season of SE winds. Both the E and W sides of the bay are fringed with reefs which extend up to 1 mile offshore. Allaru Island lies close outside the reef extending from the W entrance point.

- 2 **Depths** in the bay are from 11 to 12.5 m (36 to 41 ft) in its entrance and shoal gradually towards its head which consists of mud flats and mangroves. A drying reef extends 1½ miles NW from the head of the bay and divides the inner part of the bay.

- 3 **Anchorage.** A berth with good holding ground can be found with Araru Point (11°11'S 130°53'E) bearing 270° in a depth of 10 m (33 ft), blue mud.

Local knowledge is required.

Popham Bay

3.76

- 1 **Description.** Popham Bay, entered between Lingi Point (11°12'S 131°49'E) and Ardighiyi Point, 4 miles SSW, has depths of from 11 to 16.5 m (36 to 54 ft) in its entrance and shoals gradually towards its head. The shores of the

bay are fringed with reef and rocks except at its head where it merges into a mangrove swamp.

A 27 m hill stands on the E side of the inner bay and affords a good observation spot.

- 2 **Local knowledge** is required.

Offshore dangers. Bird Islet, low and flat and surrounded by reef, lies 7 cables NNE of Ardigbiyi Point; a 7.2 m patch lies about 1 mile NW of the same point.

Tidal streams are not strong in Popham Bay but may attain rates of 2½ to 3 kn in the offing.

Blue Mud Bay

3.77

- 1 **Description.** Blue Mud Bay situated between Araru Point (11°11'S 131°53'E) and Lingi Point, about 4 miles WSW, is almost entirely encumbered with reefs leaving only two narrow arms between them leading towards the SE and SW parts of the bay.

The bay affords secure anchorage for boats and small craft but caution is necessary when entering as tidal streams sweep past the reef off Lingi Point with a rate of up to 2½ kn.

Alcaro and Christies Bays

3.78

- 1 **Description.** Alcaro Bay and Christies Bay, both fringed by reef, lie between Ardigbiyi Point and Cape Don (11°18'S 131°46'E), about 2¾ miles SW.

Alcaro Bay is open NW. Anchorage with good holding ground can be found with Cape Don Light bearing 227°, distant 2 miles, in 7 m, mud and sand. There is a landing for boats in the S point of the bay. There are crocodiles in the area.

- 2 Christies Bay most of which dries is entered close NE of Cape Don. A boat channel leads from the entrance to a pier in ruins at the head of the bay. The channel dries for about 100 m outside the head of the pier. At HW there is a depth of about 0.9 m at the pier.

DUNDAS STRAIT TO CAPE VAN DIEMEN

General information

Charts Aus 411, Aus 308, Aus 309

Route

3.79

- 1 The recommended offshore route along the N coast of Australia from N of the entrance to Dundas Strait continues W, about 80 miles, passing off the N coast of Melville Island to a position about 25 miles NNW of Cape Van Diemen (11°10'S 130°23'E) the NW extremity of the island.

Topography

3.80

- 1 The N coast of Melville Island between Point Jahleel (11°11'S 131°17'E) and Cape Van Diemen, 53 miles W, is mostly wooded to the edges of the cliffs with sandy beaches that form the N side of the island. Numerous bays indent the shore, some leading to mangrove fringed rivers which extend up to 15 miles into the interior.
- 2 From the NE extremity of Cape Van Diemen a line of low white cliffs extends intermittently 9 miles SE terminating in a coastal hill about 42 m (138 ft) high. East of the coastal hill there is a bay with some prominent red cliffs on its SE side.

Outlying danger

3.81

- 1 Lynedoch Bank (10°01'6S 130°48'5E) (chart Aus 310) lies about 72 miles NNE of Cape Van Diemen. Formed of coral and sand it is about 7 cables in extent and has relatively deep water close around it.

Exercise area

3.82

- 1 The waters E of Radford Point (11°18'S 130°54'E) (3.85) lie within designated military firing practice and exercise areas. See 1.9 for general information, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details

Directions

(continued from 3.65)

3.83

- 1 From about position 10°47'S 131°34'E, N of the entrance to Dundas Strait, the track continues 270° to about 25 miles NNW of Cape Van Diemen (11°10'S 130°23'E) passing (with positions given from Point Jahleel (11°11'S 131°17'E)):
 - N of an 8.5 m (28 ft) shoal (reported 1971) (10 miles WNW) the N-most danger charted off Smoky Point, reef fringed and shoal; thence: About 22 miles N of Cape Van Diemen a low sandy point from which a spit of sand and rock, with numerous drying sand cays on it, extends 6 miles NNW; and:
 - 3 S of Goodrich Bank (10°42'S 130°19'E) noting the 16.3 m bank which lies 5 miles farther W, 4 miles N of the recommended track; thence: To a position 25 miles NNW of Cape Van Diemen. (*Directions continue for Calder Shoal at 4.41, for Gale Bank and for Holothuria Banks and at 4.43 and for Beagle Gulf at 4.70*)

Anchorage and bays

Chart Aus 308 (see 1.16)

Brenton Bay

3.84

- 1 Brenton Bay, entered between Point Byng, 6 miles SW of Point Jahleel (11°11'S 131°17'E) and Smoky Point, 3 miles farther W, is shoal and unsurveyed and does not afford good anchorage. Johnston River discharges into the head of the bay.

Chart Aus 309 (see 1.16)

Lethridge Bay

3.85

- 1 Lethridge Bay, entered between Harold Point (11°19'S 131°03'E) and Radford Point, about 8½ miles W, is open NW but provides moderately sheltered anchorage for small vessels during the season of SE winds. Depths generally within the entrance are from 4 to 5 m. Jessie River discharges into the head of the bay.
- 2 **Local knowledge** is required as the bay is largely unsurveyed.

Offshore dangers. Madford Shoals, two drying patches on which the sea breaks, lie 3 miles NE and 3½ miles ENE of Radford Point (11°18'S 130°54'E) and are the outermost dangers on the W side of the bay.

Snake Bay**3.86**

- 1 Cape Lavery (11°20'S 130°39'E) the N end of a peninsula on the W side of Snake Bay is low, and foul ground extends 2 miles N, on which Karslake Island is situated. Snake Bay is entered between Cape Lavery and Brown Point, 4 miles SE, with Burraburra Head 4 miles farther ENE, from which conspicuous red cliffs extend 1½ miles SW. The E shore of the outer part of Snake Bay between Brown Point and Johnson Point, 2½ miles S, is fronted by Strath Sands the outer edge of which is clearly marked by breakers at LW.

- 2 Milikapiti, an Aboriginal population centre at the former Gribble settlement at Snake Bay, is situated on the W bank of the channel about 2 miles SSE of Don Point (11°24'S 130°40'E) but it can be reached only by small coasting vessels.

Local knowledge is required.

Depths. There are general depths of from 6 to 8 m in the outer part of the bay.

- 3 **Bar** with depths of less than 4 m fronts the entrance channel 1¼ miles SSE of Cape Lavery.

Offshore dangers. Saunders Patch (11°19'S 130°45'E) lying 3 miles NNW of Burraburra Head (11°22'S 130°46'E) is the outermost danger off the head. Laxton Reef lies 2 miles SSE of Saunders Patch, a shoal with a least depth of 0.7 m lies 1½ miles WSW of the reef.

3.87

- 1 **Directions.** A channel, barely 2 cables wide at its narrowest part, lies between Strath Sands and the dangers off the W shore of the bay and is entered close E of the peninsula S of Cape Lavery and leads into Curtis Haven, which is unsurveyed.

- 2 A 1 m shoal and Paddy Patch, least depth 1.3 m, lie on the W side of the channel 1¼ miles NNE and 1 mile SSE, respectively, of Don Point.

Tjipripu River flows into the SE corner of Curtis Haven.

Anchorage, with good holding, can be found WNW of Brown Point (11°23'S 130°42'E) in a depth of 6 m.

Shark Bay**3.88**

- 1 Shark Bay, unsurveyed, is entered between Karslake Island (3.86) and Purumpenelli Point, 3½ miles WNW. The coast WNW from this point is fronted by a drying reef. Cook Reef, a detached drying reef, lies 2½ miles NNW of the point.

- 2 The bay is narrowed to a width of about 1 mile in its outer part by dangerous foul ground extending from both sides. Within the entrance the bay widens somewhat and has depths of from 3 to 5 m but it shoals rapidly towards its head. Mirikauyunga Creek lies at the head of the bay.

DUNDAS STRAIT TO CLARENCE STRAIT**GENERAL INFORMATION**

Chart Aus 308

Scope of section**3.89**

- 1 The area covered by this section comprises;
Dundas Strait to Clarence Strait and Van Diemen Gulf (3.98).
Clarence Strait (3.117).

Description**3.90**

- 1 Van Diemen Gulf (11°50'S 132°00'E) is bordered N by Cobourg Peninsula, E and S by the mainland and W by Melville Island. It is entered from the N by Dundas Strait and from the SW by Clarence Strait.

Topography**3.91**

- 1 The shores of the gulf are generally low, marshy and reef fringed and are difficult to identify apart from Cape Don, the hills on the S side of Cobourg Peninsula and the hills at the E end of Melville Island.

The E side of the gulf is intersected by numerous rivers.

Controlling depth**3.92**

- 1 See 3.121 for the least depth on the recommended track between Dundas and Clarence Straits through Van Diemen Gulf.

Charted depths**3.93**

- 1 The depths throughout Van Diemen Gulf are very irregular with depths of over 37 m (20 fm) in the broad fairway of Dundas Strait.

Outlying dangers**3.94**

- 1 The E part of Van Diemen Gulf has not been fully surveyed but is known to contain numerous dangers, the positions of which are best seen from the chart. Many uncharted shoals and reefs and also less water than charted may exist. See information on the reference chart.

Mariners without extensive local knowledge are recommended to keep clear of this part of the gulf.

Exercise area**3.95**

- 1 Military exercises are conducted in the majority of Van Diemen Gulf and Clarence Strait. See 1.9 for general information, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details.

Marine protected area**3.96**

- 1 Part of Cobourg Peninsula is a national park and the surrounding waters are designated a marine protected area. See (1.61), charts Aus 720 and Aus 721, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details.

Tidal streams**3.97**

- 1 During the rising tide the stream flows SSE through Dundas Strait and E through Clarence Strait turning at about half tide at Darwin. For details see information on charts and 3.101 and 3.122.

DUNDAS STRAIT TO CLARENCE STRAIT AND VAN DIEMEN GULF

General information

Chart Aus 308 (see 1.16)

Route

3.98

- 1 The recommended route for Dundas Strait and through Van Diemen Gulf to Clarence Strait is shown on the chart.

Topography

3.99

- 1 The SW side of Cobourg Peninsula between Cape Don, the E entrance point to Dundas Strait, and Warigili Point (11°33'S 132°07'E), 25 miles SE, is indented by several bays which have not been examined. Shark and Shamrock Bays, the two NW of these, are separated from each other by a broad mangrove covered point. Black Rock stands on a detached reef close off its extremity. High Black Rock lies off the entrance to Shamrock Bay.

- 2 Burford Island, 15 miles SE of Cape Don, covered with mangroves lies off the entrance to Aiton Bay, which mostly dries.

Mount Bedwell and Mount Roe, two conical hills, lie about 4 miles NW of Warigili Point and form useful marks in clear weather.

3.100

- 1 Point Jahleel (11°11'S 131°17'E) the NE extremity of Melville Island and W entrance point to Dundas Strait is low, covered with mangroves and fringed by reef. The coast between Point Jahleel and Soldier Point (3.102), 22 miles SE, is low, thickly wooded and indented by several bays; it has not been fully examined.
- 2 Napier Bay is entered between Soldier Point and Cape Keith, 9 miles SSW. The coast of Cobham Bay entered between Camp Point, 2½ miles W of Cape Keith, and Conder Point (3.102), 11½ miles SW, is low and bordered with mangroves. The coast continues low and featureless to Ant Cliff, a small stretch of cliff, 17 m high, light red in colour and prominent, 6½ miles farther SW.

Tidal streams

3.101

- 1 Tidal streams in Dundas Strait run with considerable strength during spring tides and cause strong tide-rips, they cause a dangerous race sometimes attaining a rate of 5 kn off Cape Don. For further details see information on charts.
- 2 During the rising tide the streams setting S through Dundas Strait and E through Clarence Strait meet about 30 miles ENE of Cape Hotham (12°03'S 131°18'E), the uncertainty of this position however makes navigation in this part of the strait somewhat difficult.
- 3 In a position 1¼ miles S of Cape Keith, 28 miles NNE of Cape Hotham, the tidal stream during the rising tide sets SSW, and NNE during the falling tide, both streams having a maximum rate of about 1 kn.
- 4 Close inshore, about 2½ miles WSW of Cape Keith, the tidal stream sets SW to W during the rising tide and E to NE during the falling tide. Both streams have a maximum rate of about 1 kn but are irregular in duration the W-going stream having been observed to run nearly continuously for about 22 hours.
From 1½ to 3 miles SE of Ant Cliff, 20 miles SW of Cape Keith, the tidal stream sets NE with the rising tide with a maximum rate of 1 kn. During the falling tide the stream sets SW with the same maximum rate.

Principal marks

3.102

Landmarks:

Soldier Point (conspicuous red cliff) (11°28'S 131°32'E) fringed by mangroves N and W.

Conder Point (11°44'S 131°17'E) conspicuous red sandy cliffs about 5 m high, 6 cables W of the point, which is awash at HW and has a distinctive clump of mangroves at its S end.

Major light:

Cape Don Light (11°19'S 131°46'E) (3.66).

Directions

(continued from 3.67)

Cape Don to Clarence Strait

3.103

- 1 From position 11°11'S 131°42'E, 8 miles NNW of Cape Don, the recommended track shown on the chart leads initially 188½° passing (with positions given from Soldier Point):
E of Elphinstone Reef (17 miles NNW) lying 9 miles E of Point Jahleel; thence:
- 2 W of Cape Don (17 miles NE) a low rounded point fronted by a reef and rising to a rounded hill 51 m (168 ft) high about 1 mile within. Shoal water lies up to 2 miles N and 1¼ miles NW of the cape with foul ground within. The cape should be given a wide berth as tidal streams are strong. Thence:
- 3 W of Fitzpatrick Shoal (18 miles ENE) reported to be extending farther SE with tide-rips over the extension; thence:
E of Soldier Point (3.102); thence:
E of Hinkler Patches (2¼ miles SSE) sand and shell; thence:
- 4 E of Ommaney Shoals (5 miles S) marked by tide rips and breakers at LW during strong SE winds; and:
W of Mataram Shoal (partially unexamined) (22 miles ESE) marked by heavy overfalls and tide-rips even in the calmest weather. It appears to extend SSE as far as Christine Reef, 11 miles farther SSE. Thence:
- 5 The track then leads 200° passing:
WNW of an 18.2 m patch (unexamined) (16 miles SE); thence:
ESE of Renard Shoals (10 miles S) clearly marked by discolouration, breakers or tide-rips; and:
WNW of Giles Shoal (18 miles SE) a gravel bank.
- 6 WNW of a 13.9 m shoal (17 miles SSE) lying about 3 miles WNW of the N extremity of Wells Shoal, a bank of coarse sand; thence:
ESE of Abbott Shoal (21 miles S) marked at its E edge by No 1 Light-buoy (port hand).
- 7 The track then leads 254° passing:
SSE of Taiyuan Shoal (21 miles SSW) a long narrow ridge of coral and sand the NE part of which is marked by eddies; and:
NNW of Bill Shoal (26 miles S) also marked by eddies; thence:
- 8 SSE of Conder Point (21½ miles SW) (3.102); and:
NNW of Taylor Patches (30 miles SSW).
The track then leads 222½° passing:
SE of Ant Cliff (28 miles SW) (3.100); thence:
SE of the coastal bank extending 10 miles ESE from Muranapi Point (37½ miles SW) (3.118); and:
NW of Howard Knoll (35 miles SSW); thence:

- 9 To a position NW of Cape Hotham (37 miles SSW) a low wooded promontory fringed by reefs, the SE entrance point to Clarence Strait. Cape Hotham Light (white metal framework tower, 16 m in height) is exhibited 6 cables WSW of the cape. (*Directions continue at 3.125*)

Inshore route

Inshore channel

3.104

- 1 There is an inshore channel from Soldier Point (11°28'S 131°32'E) along the SE side of Melville Island inshore of the shoals.

Local knowledge is required.

Directions

3.105

- 1 From Dundas Strait, E of Soldier Point (3.102), the track leads 260° passing (with positions given from Soldier Point):

Between Soldier Point, distant about 7½ cables, and Hinkler Patches (2¼ miles SSE) (3.103).

The line of bearing 020° of the S extremity of Soldier Point, astern, then leads in the fairway for a distance of about 3 miles passing:

- 2 Between Hinkler Patches and the 10m depth contour of Napier Bay (2 miles SSW).

The track then leads S passing:

Between Ommaney Shoals (5 miles S) (3.103) and the 10 m depth contour extending 1 mile E from Baxendell Reef (6¼ miles SSW); thence:

- 3 Between Cape Keith (8¾ miles SSW) fringed with mangroves, distant 2¼ miles, and an 11 m patch (reported 1969) (8 miles S).

The track then leads SW passing:

NW of a 7.9 m shoal (9 miles S); thence:

NW of Renard Shoals (10 miles S) (3.103); thence:

- 4 SE of a detached 8.9 m (29 ft) patch (16½ miles SW); thence:

NW of Beagle Shoals (21½ miles SSW) always marked by discolouration and, except at slack water, by tide-rips, and in bad weather by breakers; thence:

- 5 SE of Nihill Patch, with a least depth of 1.5 m over it, lying 1¾ miles S of Conder Point (21½ miles SW) (3.102); and:

NW of Hunt Patch (24 miles SSW) with a depth of 4.6 m.

When Ant Cliff (28 miles SW) (3.100) bears 293°, distant 5½ miles, a S track can then be taken for Howard Channel (3.125) and a SSW track for North Channel (3.128).

3.106

- 1 The inshore channel can also be reached by passing between Ommaney and Renard Shoals, on the line of bearing 280° of Cape Keith, having regard to the 7.9 m (26 ft) patch S, and the 11 m (36 ft) patch (reported 1969) N of the channel, until Soldier Point bears 010°, when the SW track can be followed as directed above.

- 2 **Caution.** Dangerous steep seas are raised when the tide sets against the wind in the vicinity of Soldier Point, and between Ommaney and Renard Shoals.

Anchorage, rivers and bays

Anchorage in the inshore channel

3.107

- 1 The holding ground is good throughout the inshore channel (3.104), but, during the season of SE winds, all anchorages are uncomfortable as vessels swing to the tide and the wind raises a heavy sea, especially when the wind and tide are in opposition.

- 2 **Small vessels** can obtain excellent anchorage during the NW Monsoon in Napier Bay (11°30'S 131°30'E) and Cobham Bay (11°38'S 131°25'E).

Local knowledge is required.

Sir George Hope Islands

3.108

- 1 **Description.** Sir George Hope Islands lie off the S side of Cobourg Peninsula. Greenhill Island, the W and largest of the group, lies 1½ miles SSE of Warigili Point (11°33'S 132°07'E). Bluff Point, the NW extremity of the island is a prominent cliff. Warla Island, surrounded by rocks with a shoal patch close E, lies 2 miles NE of the N extremity of Greenhill Island.

- 2 Wangoindjung Island and Warlagawaji Island lie off the NE side of Greenhill Island, the passage between appears foul.

Morse Island and Wunmiyi Island, the remainder of the group, lie within 12 miles E of Greenhill Island.

Local knowledge is required.

3.109

- 1 **Routes.** There appears to be a route with depths of 9.1 m, but possibly less, between the shoal water extending E from Warlagawaji Island and that extending W from Morse Island, which leads into a deep S of Wunmiyi Island.

- 2 The route between the N extremity of Greenhill Island and Warigili Point is restricted by reefs extending from both sides but a narrow channel leads to a well protected anchorage N of Sir George Hope Islands in a depth of about 11 m. An underwater rock over which the depth is unknown (position doubtful) lies nearly 2 miles W of the N extremity of Greenhill Island in the W approach to this route.

Van Diemen Gulf – east side

3.110

- 1 The E side of Van Diemen Gulf is very low and swampy. It has not been closely examined and is difficult to approach owing to shoal depths.

Endyalgout Island (11°41'S 132°34'E) lies off this shore separated from it by Iwalg and Minimini Creeks, a rocky drying spit extends from the SW extremity of the island. Mogogout Island lies about 3 miles WNW.

Aralaij Beach, 14 miles S of Endyalgout Island, provides an open stretch available to boats.

Van Diemen Gulf – south side

3.111

- 1 **East Alligator River**, entered between Point Farwell (12°05'S 132°33'E) to the W and the coast 3½ miles E, has depths of about 2.7 m in the entrance decreasing to 1.2 m 7 miles within. The river was examined in 1818 for a distance of about 17 miles above the entrance and at the farthest point was 1 cable wide.

3.112

- 1 **South Alligator River.** Field Island (12°05'S 132°23'E), about 8 miles WSW of Point Farewell, is low and mangrove covered. Reef and foul ground surround the

island and extend 2 miles SW to Barron Island which is also low and surrounded by reef.

- 2 South Alligator River is entered through Cunningham Channel between Field Island and Midnight Point, about 1¼ miles SE. The E side of the entrance is low but the W side rises to Mount Hooper a wooded range with three peaks rising to about 85 m. The river has been explored for a distance of 36 miles and has soft mud banks thickly lined with mangroves which makes landing impracticable except at HW. The country around is a low level plain except for a few wooded hills. Munmarlary, a settlement, lies on the E side about 15 miles from the entrance, a road bridge crosses the river 12 miles S of Munmarlary.

- 3 Small craft can, with caution, use the river for a distance of 17 miles above its mouth. The least charted depth in the fairway through Cunningham Channel is 2.8 m.

3.113

- 1 **West Alligator River**, entered about 8 miles SW of Field Island (12°05'S 132°23'E), has not been examined but appears shoal. There are some wooded ranges on its W entrance point and some rocks (3.115) lie 4 miles WNW of this point.

- 2 Two drying patches, the W with some rocks on it, lie between the entrance and Field Island but there appears to be a channel to the S from which the river could be approached.

3.114

- 1 **Crocodiles**, rather than alligators as the names would suggest, are numerous in the vicinity of the three Alligator rivers; a mistake made by the early explorers to the area.

Finke Bay

3.115

- 1 Finke Bay entered between the W entrance point of West Alligator River and Point Stuart (12°13'S 131°53'E), about 21 miles W, is mostly shoal. Drying mudflats extend E from Point Stuart, the land behind this point being low and thickly wooded.

Offshore danger. A group of rocks over which the depth is unknown lie 4 miles WNW of the E entrance point.

Chambers Bay

3.116

- 1 Chambers Bay, entered between Point Stuart and Cape Hotham (12°03'S 131°18'E) (3.103), 36 miles WNW, is a broad open bay shoal at its head. Ruby Island, surrounded by reef, lies about 4½ miles SSE of Cape Hotham.

Offshore dangers. Elizabeth Reef and Draytons Reef, which dry from 2.8 to 3.7 m, lie 3½ and 4½ miles E, respectively, of Cape Hotham, foul ground and shoal water extends up to 8 miles ENE of the cape. The area S of the reefs is inadequately surveyed.

CLARENCE STRAIT

General information

Charts Aus 20, Aus 308

Description

3.117

- 1 **Clarence Strait**, the W approach to Van Diemen Gulf, lies between Cape Hotham (12°03'S 131°18'E) and Ant Cliff, 16½ miles NNW, on the E, and Lee Point (12°20'S 130°54'E) and the SW extremity of Melville Island, near Buchanan Island (11°49'S 130°39'E), on the W. The strait is divided into three channels by Vernon Islands.

- 2 **Howard Channel**, (3.125) the middle channel approximately 7 cables wide in the narrowest and shoalest part S of East Vernon Island (12°04'S 131°05'E), is marked by lights and light-buoys and is the recommended route through Clarence Strait. Because of strong tidal streams in the area reliance should not be placed on the light-buoys being in position.

- 3 **North Channel**, (3.128) the N and widest channel between Cape Gambier (11°56'S 130°58'E) and North West Vernon Island, is considerably reduced in width by reefs extending S from Cape Gambier on the N side and by detached reefs in the fairway.

- 4 **South Channel**, (3.130) between South West Vernon Island and the mainland, is narrow and considerably obstructed by shoals in its E part and is used only by small coasting vessels.

Topography

3.118

- 1 The N coast of Clarence Strait from Ant Cliff (11°47'S 131°11'E) to Cape Gambier, 15½ miles SW, has few prominent features. Muranapi Point with red cliffs, 5 m high, lies 9½ miles SW of Ant Cliff. The coast between Cape Gambier and Cockle Point, 21 miles WNW, is backed by a hilly ridge terminating on its E side by Notch Peak. Between the hills and the coast the land is low and wooded. Maclear Creek (11°53'S 130°54'E) marked by tall casuarinas, is entered 5½ miles NW of Cape Gambier, close NW of this creek there are cliffs of yellow clay 7 m high. The area W of these cliffs has not been surveyed.

3.119

- 1 Vernon Islands are three wooded coral islands lying on the S side of Clarence Strait, the tops of trees being from 18 to 21 m high. North West and East Vernon Islands are completely covered with mangroves. South West Vernon Island has trees near the centre and is fringed with mangroves. Each island is surrounded by reef which is entirely covered at HW but the edges of these reefs dry in places and are generally steep-to.

3.120

- 1 On the S side of the strait the land behind Gunn Point (12°10'S 131°00'E) is about 30 m high and the tops of trees, about 1 mile S of the point, reach a height of 55 m. Gunn Reef extends up to 2 miles NW from Gunn Point.

- 2 Shoal Bay lies between Gunn Point and Lee Point, 12 miles SSW, the SW entrance point to Clarence Strait. Hope Inlet is a shoal creek in the SE corner of the bay and forms the outlet from Howard River. Tree Point, the N entrance point of this inlet, can be identified by a clump of high casuarinas rising well above the low mangroves. The land behind Lee Point is about 30 m high but around Shoal Bay it is low and wooded in places.

Controlling depth

3.121

- 1 The recommended track through Howard Channel (3.125) has a least depth of 11.1 m, as shown on the chart, 1 mile SE of East Vernon Island Light (12°05'S 131°06'E).

Natural conditions

3.122

- 1 **Tidal streams.** The rate of tidal streams at spring tides in the centre of Howard Channel is from 3 to 4 kn and rates up to 6½ kn for the E-going stream have been reported. For further details on rates and directions see information on the chart.

Low powered vessels. Mariners in low powered vessels are cautioned on the strength of the tidal stream.

3.123

- 1 **Local weather.** During the season of SE winds smoke from bush fires combined with haze frequently hangs over low ground making it difficult to identify the land during the night. With reasonable care the mariner should be able to pass through Howard Channel with the aid of radar, lights and light-buoys, but it cannot be assumed that the latter are always in position.

Major lights**3.124**

- 1 Charles Point Light (12°23'5S 130°37'8E) (4.83).
Aero Light (12°25'3S 130°52'0E) (4.120).

Directions

(continued from 3.103)

Howard Channel**3.125**

- 1 From position 12°00'0S 131°15'7E, at the entrance to Clarence Strait, the recommended track through Howard Channel continues 222½° passing (with positions given from Escape Cliff (12°08'2S 131°15'0E):
NW of the coastal bank extending 2 miles W from Cape Hotham (6¼ miles NNE). A light is exhibited from the cape (3.103). Thence:
NW of a 9.7 m patch (4½ miles N); thence:
2 SE of an 11 m patch (6½ miles NNW); thence:
SE of the wreck with a depth of 13.1 m over it, lying 4 cables SE of Rooper Rock (6 miles NW) marked on its SSE side by No 2 Light-buoy (port hand), with a strong tidal stream there is a heavy race over this rock; and:
NW of Escape Cliff, a reddish colour with a level top, forming a useful mark from the NW.

3.126

- 1 The track then leads 253° passing (with positions given from East Vernon Island Light (red GRP hut on metal framework tower on concrete piles 11 m in height) (12°04'7S 131°05'6E));
NNW of Stephens Bank (5¾ miles ESE) lying 4 miles NNE of Point Stephens. The bank is covered by the red sector of Cape Hotham Light (3.103) between the bearings 025° and 070°. Thence:
2 SSE of a 6.4 m depth (3 miles E) at the E end of the shoal bank extending E from East Vernon Island; thence:
SSE of the E end of East Vernon Island (2 miles ENE).
The track then leads 279° passing:
3 Through the narrowest and shallowest part of the channel between the coastal bank extending S from East Vernon Island Light and the shoal with a least depth of 7.4 m (1½ miles S); thence:
Between the detached rock (2½ miles W) close to the reef edge on the W side of East Vernon Island and the detached 8 m patch (3 miles WSW); thence:
4 Between North West Vernon Island (4 miles WNW) and South West Vernon Island Light (white GRP hut on concrete column, 5 m in height) (4 miles WSW) exhibited from the N extremity of the island. Thence:
N of Van Waerwyck Reef (4¼ miles W).
5 The track then leads 271° passing:
N of Henry Ellis Reef (5 miles W); thence:
S of Ward Point (5¾ miles WNW) the W extremity of North West Vernon Island. North West Vernon

Island Light (white GRP hut on steel pile structure, 9 m in height) is exhibited 4 cables NW of the point. Thence:

- 6 Between Wood Rock (8 miles W) and Marsh Shoal (9 miles W) an extensive shoal steep-to on its N side and marked on its NW side by a light-buoy (starboard hand). A depth of 10.2 m lies 2½ miles NW of Marsh Shoal, 1 mile NW of the recommended track.

Caution. Mariners without local knowledge should not pass between Lyne Reef and Marsh Shoal owing to the strong tidal streams which set across the reefs.

Charts Aus 308, Aus 309 (see 1.16)

3.127

- 1 The track then leads 223½° passing (with positions given from North West Vernon Island Light (3.126));
Between the W side of Marsh Shoal, marked by a light-buoy (starboard hand) (4 miles SW), and the shoal with a least depth of 9.6 m (7 miles W); thence:
2 Close NW of an 11.4 m depth (8 miles WSW) noting Lowry Shoal (12°03'S 130°47'E) lying 2½ miles SSW of Moresby Shoals; thence:
NW of the W edge of the shoal water extending SW from Foelsche Bank (6¼ miles SSW) noting Skottowe Shoal (12°05'S 130°44'E); thence:
To a position about 10 miles NNW of Lee Point (12°20'S 130°54'E).

(Directions continue at 4.86)

Side channels

Chart Aus 20

North Channel**3.128**

- 1 **General information.** North Channel lies between the reefs extending from Cape Gambier (11°56'S 130°58'E) and the adjacent coast on the N side, and Knight Reef (12°01'S 131°07'E) and North West Vernon Island on the S side.
2 **Topography.** Knight Reef lies about 5 cables NE of the reef surrounding North West Vernon Island. A sandbank on the E end of Knight Reef dries 3.3 m and can give a deceptive view of the extent of this danger when starting to dry. A light (3.126) is exhibited from North West Vernon Island and a prominent tree stands on the reef NE of the island. Harris Reef, which dries 2 to 3 m, lies on the N side of North Channel, 3½ miles SSE of Cape Gambier.

Tidal streams are strong and set across the fairway in places.

3.129

- 1 **Directions.** The most suitable time for navigating North Channel is in daylight, towards LW, when most of the reefs are uncovered, and, if practicable, with the sun behind or at high altitude.

The route through North Channel leads WSW passing (with positions given from North West Vernon Island Light (3.126));

- 2 NNW of Knight Reef (12°01'S 131°07'E); and:
SSE of Tregenna Reef (6½ miles NE).
The route continues WSW along the N side of North West Vernon Island passing:
SSE of Price Knoll (3 miles NE) which may not be visible at LW; thence:
SSE of Smith Reef (2½ miles NNE); thence:
3 Between Oliver Reef (1 miles NNW) and a 5.5 m patch (position approximate, reported 1980) (4 cables NW); thence:

Between Wood Rock (2¼ miles WSW) and Hancox Shoal (2½ miles WNW).

South Channel

3.130

- 1 **General information.** South Channel, between South West Vernon Island (12°07'S 131°02'E) and the coastal reef extending from the mainland between Glyde Point (12°09'S 131°07'E) and Gunn Point (3.120), 7 miles W, has no marks for clearing the reefs when they are covered.

Lyne Reef lies on the N side of the W entrance to South Channel, 2½ miles WSW of South West Vernon Island Light (3.126).

- 2 **Depths.** A shoal spit, with a depth of less than 5 m over it, extends E from the E end of the reef off South West Vernon Island. A bar with a least depth of 7.3 m lies S of this spit at the E entrance to South Channel, 1½ miles NNW of Glyde Point.

Local knowledge is required.

Anchorage and bays

Charts Aus 20, Aus 308 (see 1.16)

Adam Bay

3.131

- 1 **Description.** Adam Bay entered between Cape Hotham (12°03'S 131°18'E) and Glyde Point, 13 miles SW, forms the estuary of Adelaide River. Port Daly an area of water off the entrance to Adelaide River between Ayers, Hart and Andrews Points provides shelter and anchorage for coasting vessels.

Local knowledge is essential.

3.132

- 1 **Topography.** The E shore of Adam Bay from Cape Hotham to Ayers Point (12°13'S 131°14'E), 11 miles SSW, is fronted by a bank of sand and mud which dries. Escape Cliff (3.125) is a useful mark. South of this cliff the coast consists mostly of mangroves. Ayers Point, the E entrance point of Adelaide River, is a low muddy point with mangroves N and SE of it, the land behind being covered at HW spring tides.
- 2 The W shore of Adam Bay between Point Stephens (12°10'S 131°09'E) (3.126) and Hart Point, 5 miles SE, is

fringed by mangroves and fronted by a bank of mud and sand. Andrews Point (12°14'S 131°15'E), a low green point with mangroves on it, lies approximately 1 mile SE of Ayers Point. Salt Water Arm of Adelaide River trends SW immediately W of Andrews Point and separates that point from Hart Point, about 1 mile W, on the W side of Port Daly.

3.133

- 1 **Approach** to Port Daly through Adam Bay is obstructed with sand and mud flats which partly dry. A passage from 1 to 3 cables wide leads through these flats.

Depths. There is a depth of 3.6 m on the bar at the entrance to the route into Port Daly situated approximately 2 miles ENE of Point Stephens. Close E of the bar at the entrance there is a shoal with a depth of 0.9 m over it.

- 2 **Tidal streams** off Ayers Point attain a rate of from 2 to 3 kn increasing to 5 or 6 kn in The Narrows, 2 miles SE. At Castle Point, 12 miles up river, the maximum rate is about 2½ kn.

3.134

- 1 **Directions.** The land is too low to afford any good leading marks, and the water is at times too muddy to sight the shoals, so great caution is required when entering as the channel is not marked.

Low powered vessels should enter the channel at the last stage of the in-going tide and proceed to an anchorage in Port Daly, where allowance must be made for the 3 kn tidal stream, then proceed up river as convenient.

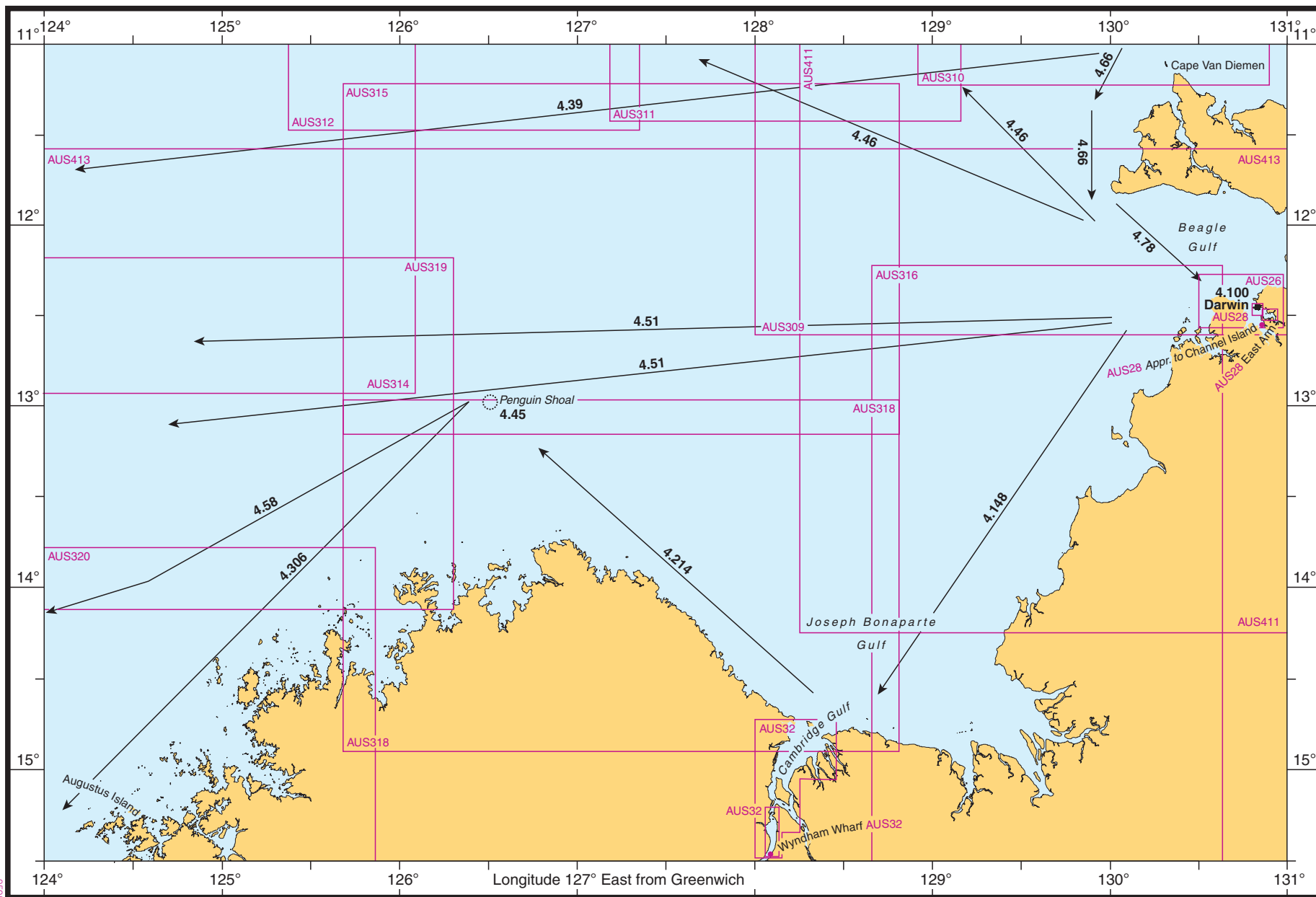
- 2 **Anchorage.** Temporary anchorage can be obtained in Port Daly in depths of from 4 to 9 m the best berth being about 1 cable off the SE extremity of Ayers Point.

3.135

- 1 **Adelaide River** is entered from Port Daly. The river can be navigated by short vessels with a draught up to 3 m for a distance of 40 miles to the bridge carrying the Arnhem Highway.

- 2 Entering the river follow the S bank past Andrews Point and cross to the N bank at The Narrows. A rock which dries 0.9 m lies on the SW side of The Narrows, about 7½ cables SE of Andrews Point. Beatrice Rock, a dangerous rock, lies in mid-river about 1 mile above The Narrows. The better channel is to the N of these dangers.

Chapter 4 - Cape Van Diemen to Augustus Island



CHAPTER 4

CAPE VAN DIEMEN TO AUGUSTUS ISLAND

GENERAL INFORMATION

Chart 4603

Scope of the chapter**4.1**

- 1 This chapter covers the NW coast of Australia between Cape Van Diemen (11°10'S 130°23'E) (3.83), the NW extremity of Melville Island, to Augustus Island (15°20'S 124°35'E) (4.346) about 420 miles SW.

It also includes the outlying dangers, anchorages and oil terminals, together with the offshore routes, from N of Cape Van Diemen in the E, to the vicinity of Augustus Island, Degerando Island (4.310), Browse Island (4.64) and Ashmore Reef (4.10) in the W.

Ports**4.2**

- 1 The ports of Port Darwin (4.100) and Wyndham (4.167) together with the oil terminals of Jabiru and Challis (4.14), Elang (4.20) and Laminaria (4.26) and the gas terminal at Bayu Undan (4.31) are covered by this chapter.

Caution**4.3**

- 1 The coast between Cape Talbot (13°48'S 126°45'E) (4.237) and Augustus Island (4.346), about 160 miles SW, is very indented and, although it possesses good harbours, it should be approached with caution owing to the numerous off-lying islets, rocks and reefs, as well as on account of the strength of the tidal streams.
- 2 In addition only portions of this area have been properly surveyed, other parts have been only cursorily examined, and the remaining parts have not yet been surveyed. The charts and sailing directions being, therefore, incomplete should be used with caution.

OUTLYING DANGERS – ANCHORAGES – OIL AND GAS TERMINALS**General information**

Charts Aus 309, Aus 310, Aus 311, Aus 315

Banks and shoals**4.4**

- 1 From Goodrich Bank (10°42'S 130°19'E) (3.83) a chain of banks with depths of less than 30 m over them extends approximately 130 miles WSW, terminating in The Boxers (11°30'S 128°30'E) (4.44). Depths of from 12 to 19 m lie near the S end of these banks and most of them lie within a few miles of the two routes leading W from Cape Van Diemen.

4.5

- 1 A number of shoals, some named, extend from Evans Shoal (9°53'S 129°32'E) to Sunset Shoal, 63 miles WNW, and they appear to be part of a submerged barrier between the 100 m and 200 m depth contours. North of these shoals the depths increase rapidly to several hundred metres.

4.6

- 1 Parry Shoal (11°12'S 129°42'E) (4.44) formed of coral on which the sea occasionally breaks is the shoalest head

of an extensive bank, with depths of 18.1 m at its N and S ends, and lies 40 miles W of Cape Van Diemen.

Parry Shoal, and associated dangers, lie nearly midway between the routes for mariners proceeding to and from Port Darwin, and those bound for ports W of Cape Van Diemen.

Irregular depths**4.7**

- 1 A large bank with depths of less than 30 m over it lies between 50 and 90 miles WSW of Cape Van Diemen.

A 29 m patch rises abruptly from surrounding depths of over 100 m in position 12°05'S 127°30'E and a depth of 33 m lies 4½ miles WNW of this patch.

- 2 A 25.6 m patch rises abruptly from surrounding depths in position 12°11'S 126°51'E and lies close N of the preferred route shown on the chart.

There are very irregular depths, whose position can best be seen from the chart, between these shoals and the bank, and those which lie off Cape Van Diemen. Every precaution should be taken when navigating in this area.

Marine protected areas**4.8**

- 1 Ashmore Reef (4.10) and Cartier Islet (4.57) are designated marine protected areas. See 1.61, 4.55, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details.

Sahul Banks

Charts Aus 312, Aus 314, Aus 315

General information**4.9**

- 1 Sahul Banks consist of numerous shoals and banks of sand and coral rock extending from Ashmore Reef (12°16'S 123°02'E) to Troubadour Shoals (9°53'S 128°34'E) (4.49) about 360 miles ENE. The shoal area extends farther ENE, to Evans Shoal (9°55'S 129°33'E) (4.5), with least depths ranging from 4 to 8.4 m. The banks rise abruptly from the sea bed in positions generally near to the 200 m depth contour which runs approximately parallel to the S coast of Timor, and at an average distance of about 80 miles from it. The NW-most charted shoal (11°00'S 124°26'E) (existence doubtful) has a depth of 27 m over it.

- 2 Sahul Banks and the area in their vicinity have only been partially surveyed and are reported to be dangerous in places. Mariners navigating in the area should proceed with caution. No breakers have been seen on Sahul Banks.

An isolated shoal with a depth of 5.5 m over it was reported (1999) to lie SE of the Banks in position 11°07'S 126°01'E as shown on the chart.

- 3 **Offshore facilities.** Sahul Banks contain the Joint Petroleum Development Area, as shown on the charts, which includes a number of oil terminal facilities (See 4.14, 4.20 and 4.26) and a gas field.

Gasfield. *Bayu-Undan* Gasfield is centred on 11°04'S 126°39'E and consists of two production platforms and an FSO. See 4.31.

Ashmore Reef

Chart Aus 314 (See 1.16)

General information

4.10

- 1 **Description.** Ashmore Reef (12°16'S 123°02'E) composed of coral and sand with three low islands on it, and also several sandbanks which dry, is a National Nature Reserve and marine protected area, see 1.61 and information on the large scale national chart.

The S side of Ashmore Reef is an unbroken ridge of coral marked by heavy breakers, whilst its N edge is broken with three passages to the lagoons, only the W-most passage has been examined.

- 2 **History.** Great Britain took formal possession of these islands in 1878 and they were placed under the authority of the Commonwealth of Australia in 1931.

Topography. East and Middle Islands are sandy and covered with grass. A prominent tree, reported visible at a distance of 10 miles, stands on Middle Island.

Outlying danger. Hibernia Reef (11°59'S 123°21'E) lies 17 miles NE of Ashmore Reef.

- 3 **Tidal streams** in the vicinity of Ashmore Reef set E on the rising tide and W on the falling tide.

In the vicinity of the entrance to the W lagoon the stream is reported to set SE on the rising tide and NW on the falling tide with rates up to 4 kn at springs, the effect is local.

Anchorage

4.11

- 1 Within the marine protected area, anchorage is permitted only in the western lagoon. Approach is from the NW on a line of bearing between 135° to 140° of the prominent tree on Middle Island (12°16'S 123°02'E) passing between Marlin Bank (12°12'S 122°59'E) and the bank with a least depth of 8.3 m, 1½ miles farther SW.

Harbour

4.12

- 1 A passage to the W lagoon lies 2 miles NE of West Island (12°15'S 122°58'E) and leads into a lagoon where there are numerous detached reefs and coral heads with depths of less than 2 m (charted as dangerous rocks) over them.

Local knowledge is required.

- 2 **Entry** into the lagoon is best on a rising tide with the sun behind at high elevation.

Berths. There are four visitor moorings inside the lagoon which affords good protection from the swell but no protection from the wind.

Wells on West Island and East Island are contaminated with cholera. See note on national large scale chart.

Pascoe Passage

Chart Aus 314

General information

4.13

- 1 Pascoe Passage lies N of Cartier Islet (12°32'S 123°33'E) (4.57) at the S end of the 100 m shelf extending S from Woodbine Bank (12°24'S 123°30'E).

Local knowledge is required as the passage is inadequately surveyed, see information on the chart.

Tide rips mark the 100 m depth contour SW and SE of Woodbine Bank, and a tide rip exists within the passage, 14 miles ENE of Cartier Islet.

- 2 **Currents** attain a rate of 1 kn but the direction is uncertain.

Prohibited area. Entry is prohibited to an area within a radius of 4 miles of Cartier Islet (4.57), a marine protected area. See 4.8 and 4.55.

Jabiru and Challis Oil Terminals

Chart Aus 314

General information

4.14

- 1 **Position and function.** Jabiru and Challis Oil Terminals, two floating production facilities, consisting of the converted 140 000 dwt tanker *Jabiru Venture* (11°56'S 125°00'E) and the purpose built 115 000 dwt barge *Challis Venture* (12°07'S 125°01'E) are situated in Timor Sea, 145 miles N of Cape Voltaire (4.273), and are the outlets for Jabiru and Challis Oilfields.

- 2 **Traffic.** In 2002, 9 vessels totalling 911 157 dwt used the terminals.

Operator. Coogee Resources (Ashmore Cartier) Pty Ltd, Perth WA.

Limiting conditions

- 3 **Maximum size of vessel.** Tankers up to 150 000 dwt can use the facilities.

Tropical storms. During the summer months Timor Sea is subject to occasional tropical storms. In January and February, in particular, weather and sea state may prevent mooring, and, or loading, for periods of a few days.

Arrival information

4.15

- 1 **Port radio.** *Jabiru Venture* and *Challis Venture* are equipped with radio, for details see *Admiralty List of Radio Signals Volume 6(4)*.

Notice of ETA should be sent 5 days in advance to the production manager at Perth and confirmed or varied 72 hours before arrival to the terminal, for details see *Admiralty List of Radio Signals Volume 6(4)*.

- 2 **Outer anchorage.** Restricted and Cautionary Areas surround each terminal. Mariners who cannot berth on arrival must anchor within the permitted anchoring areas. Contact should be made with the Facility Master for information and guidance on this matter.

Permitted anchorage areas, as shown on the chart, lie 3 miles S of each terminal.

- 3 **Caution** an unlit wave rider buoy is located about 3½ miles SE of *Jabiru Venture*.

Pilotage. Pilotage is compulsory. The Facility Master, who acts as pilot and berthing master, boards 3 miles from either terminal.

Tugs are not available.

- 4 **Regulations concerning entry.** Propeller and rudder should be fully submerged and trim should not exceed 10% of the after draught.

Quarantine. A request for radio pratique should be sent to the agents not more than 24 hours before arrival, see *Admiralty List of Radio Signals Volume 1(2)* for details.

Terminal

4.16

- 1 **Aids to navigation.** The terminals are each equipped with a non-directional radiobeacon which transmits continually.

Racon transmits from *Jabiru Venture* if this facility is disconnected for bad weather. For details see *Admiralty List of Radio Signals Volume 2*.

Directions**4.17**

- 1 The Facility Master will advise by radio the bearing on which mariners should approach.

Caution. Jabiru Shoals lie about 10 miles N of *Jabiru Venture*.

Berths**4.18**

- 1 Vessels are moored in tandem astern of either facility by a 50 m long hawser.

Port services**4.19**

- 1 **Facilities:** Boats are available to assist with mooring. No other facilities.

Terminal regulations. When berthed, Masters are required to keep their engines on stand-by and be ready to respond to requests for engine movements immediately. Vessels will be required to move astern to prevent creeping up or jack-knifing as necessary.

Elang Oil Terminal

Chart Aus 312

General information**4.20**

- 1 **Position and function.** A FPSO consisting of the converted 131 600 dwt tanker *Modec Venture* (10°52'5S 126°34'0E) is situated in Timor Sea, 175 miles N of Cape Talbot (4.237), and is the outlet for the Elang oilfield.

Operator. Modec Inc, 25th Floor, Mid Plaza 2, Jln, Jend Sudirman, Kav. 10–11 Jakarta 10220 Indonesia.

Limiting conditions**4.21**

- 1 **Maximum size of vessel handled.** Offtake vessels between 25 000 dwt and 150 000 dwt can use the facilities.
- 2 **Tropical storms.** During the summer months Timor Sea is subject to occasional tropical storms. In January and February, in particular, weather and sea state may prevent mooring, and, or loading, for periods of a few days.

Arrival information**4.22**

- 1 **Ballast.** Deballasting operations are not to commence without the permission of the Facility Operations Supervisor.

Port Radio. *Modec Venture* is equipped with VHF radio manned between 2130 and 0930 GMT.

Notice of ETA should be sent to the operator 72 hours before arrival and confirmed or varied to the facility 24 hours before arrival.

- 2 **Outer anchorage.** Restricted and Cautionary Areas surround the terminal and anchoring is prohibited in these areas. Vessels who cannot berth on arrival should make contact with the facility manager for guidance. A permitted anchorage area is located in position 10°44'S 126°43'E as shown on the chart.

- 3 **Pilotage.** Pilotage is compulsory. Pilots will embark 2 miles from the terminal and will remain with the offtake vessel while moored at the facility.

Tugs are not available

Regulations concerning entry. Propellers should be submerged with trim by the stern of not greater than 0.015 L.

Directions**4.23**

- 1 Instructions for approach and berthing will be passed by VHF radio by the Facility Operations Supervisor.

Berth**4.24**

- 1 Vessels are moored astern of the FPSO by a 50 m hawser

Port services**4.25**

- 1 **Facilities.** There are no facilities at the terminal and offtake vessels may be required to provide accommodation for some or all of the following:

Two Pilots
Independent surveyor
Customs Officers
Shipping Agent
Operator Management Representative

- 2 **Terminal regulations.** When moored, Masters are required to keep their engines on standby and be ready to respond to requests for engine movements immediately. Vessels will be required to move astern to prevent creeping or jack-knifing as necessary.

Laminaria Oil Terminal**General information****4.26**

- 1 **Position and function.** A FPSO consisting of the purpose built vessel *Northern Endeavour* (10°37'S 125°59'E) is situated in Timor Sea 195 miles NNW of Cape Talbot (4.237) and serves Laminaria Oilfield.

Traffic. In 2002 the terminal was used by 17 vessels totalling 2 285 364 dwt.

Operator. Woodside Petroleum Ltd, 1 Adelaide Terrace, Perth WA.

Limiting conditions**4.27**

- 1 **Density of water.** 1.025 g/cm³
Maximum size of vessel handled: 150 000 dwt.
Tropical storms. During the summer months Timor Sea is subject to occasional tropical storms. In January and February, in particular, weather and sea state may prevent mooring, and, or loading, for periods of a few days.

Arrival information**4.28**

- 1 **Port Radio.** *Northern Endeavour* is equipped with radio, for details see *Admiralty List of radio Signals Volume 6 (4)*.

Notice of ETA: 72 hours.

Prohibited anchorage. There are underwater facilities extending 3 miles from the terminal, which is surrounded by a cautionary area as shown on the chart, and in which anchoring is prohibited.

- 2 **Caution.** An obstruction lies 6¼ miles ESE of the terminal.

Pilotage. Pilotage is compulsory and pilots board 3 miles N of the terminal.

Tug. The Offtake Support Vessel *Total Provider* will assist in berthing and remain secured during transfer operations.

- 3 **Regulations concerning entry.** Propellers must be fully submerged and maximum permissible trim of 0.015 x LOA by the stern. Mooring will normally be conducted between the hours of sunrise and sunset.

Berth**4.29**

- 1 Vessels are moored astern of the FPSO by a hawser of about 70 m with the support vessel on a static tow astern.

Port services**4.30**

- 1 **Facilities.** There are no facilities available at the terminal though in an emergency, medical evacuation by helicopter may be arranged through the terminal or vessels agents.

Terminal regulations. When moored, Masters are required to keep their engines on standby and be ready to respond to requests for engine movements immediately. Vessels will be required to move astern to prevent creeping or jack-knifing as necessary.

Bayu Undan Gas Terminal**General information****4.31**

- 1 **Position and function.** A FSO consisting of the purpose built vessel *Liberdade* (11°03'0S 126°37'1E) is situated in the Timor Sea 164 miles N of Cape Talbot (4.237) and serves the Bayu Undan Field.

Operator. ConocoPhillips Ltd, 53 Ord Street, West Perth W.A. Australia 6005.

Limiting conditions**4.32**

- 1 **Tidal streams.** During spring tides and light winds, tidal rate and direction can change dramatically and without warning; rates of up to 5 kn may be experienced.

Weather. May to October is the SE monsoon or dry season with SE to NW winds; November to April is the

NW monsoon or wet season with W to SW winds. Winds of greater than 20 kn can be experienced for several days.

Arrival information**4.33**

- 1 **Port Radio.** *Liberdade* is equipped with Inmarsat and VHF; 24 hour watch is kept.

Notice of ETA: 72 hours with confirmation at 48, 24 and 12 hours before arrival.

Prohibited area/anchorage. Bay Undan Field is surrounded by a 5 mile radius Operational Restricted Zone, charted as a Cautionary Area within which entry without permission and anchoring is prohibited.

- 2 **Pilotage.** Pilotage is compulsory. Pilot will embark 2 miles NW of the FSO.

Tug. An Infield Support Vessel is available to assist in mooring to the FSO.

Regulations concerning entry. The offtake tanker's propeller must be fully submerged and the maximum allowable trim is 0.015 x LOA. Mooring/unmooring is conducted throughout 24 hours subject to the prevailing weather.

- 3 **Other aids to navigation.**

Racons are located on the FSO and E platform. See *Admiralty List of Radio Signals Volume 2* for details.

Berth**4.34**

- 1 Vessels for condensate offtake are moored astern of the FSO by an 70 m hawser with the support vessel in static tow astern. LPG vessels moor alongside the FSO on her starboard side.

- 2 There are 3 mooring buoys situated within the Cautionary Area, as shown on the chart.

OFFSHORE ROUTES**GENERAL INFORMATION**

Charts 942a, Aus 411, Aus 413

Scope of section**4.35**

- 1 The area covered by this section comprises:
Routes W and WSW from Cape Van Diemen (4.39).
Routes NW and WNW from Cape Fourcroy (4.46).
Beagle Gulf to N of Gale Bank and between Gale Bank and Penguin Shoal (4.51).
Gale Bank to Ashmore Reef (4.54).
Penguin Shoal to Browse Island (4.58).

Ocean routes**4.36**

- 1 Several routes listed in *Ocean Passages for the World* pass through the area covered by this chapter they include:
Routes from the S Indian Ocean and those passing E of Timor (9°00'S 125°00'E) to the N coast of Australia passing through North Sahul Passage (10°10'S 127°05'E) (4.50).
- 2 Routes from the S Indian Ocean to the NW coast of Australia passing S of Cartier Islet (12°32'S 123°33'E) and through Osborn Passage (12°40'S 124°00'E) (4.56).

Seasonal routes from South Africa to the NW coast of Australia passing S of Browse Island (14°07'S 123°33'E).

Unsurveyed areas**4.37**

- 1 Many banks in Timor Sea are unsurveyed and caution is necessary when navigating in their vicinity. The routes described have been surveyed to a width of 10 miles on either side. Large scale charts should be consulted for details of the surveys concerned which may not be in accordance with full modern standards. Less depths than charted may be found outside these limits.

Dangers**4.38**

- 1 A number of islands, dangers and banks lie in the track of mariners proceeding N of the coast between Cape Talbot (13°48'S 126°45'E) (4.237) and Augustus Island (15°20'S 124°35'E) (4.346), about 160 miles SW, and SE of Sahul Banks. The tracks to clear the known dangers are described in this section.
- 2 Sahul Banks (4.9) are partially surveyed and depth anomalies may be expected. For details of routes passing through the NE part of Sahul Banks by North Sahul Passage, and the passage W of Troubadour Shoals (9°53'S 128°34'E) see 4.50 and 4.49.

ROUTES WEST AND WEST-SOUTH-WEST FROM CAPE VAN DIEMEN

General information

Charts 942a, Aus 309 Aus 411, Aus 413

Routes

4.39

- 1 From NNW of Cape Van Diemen (11°10'S 130°23'E) the offshore route along the N coast of Australia divides into two:

The N-most route for mariners proceeding to the Philippines.

The S-most route for vessels bound towards Ashmore Reef, or to Australian ports farther W.

4.40

- 1 The S-most of the above routes passes along the S edge of the chain of banks (4.4) extending WSW from Goodrich Bank (10°42'S 130°19'E) (3.83) in general depths of over 30 m but isolated lesser depths lie very close to the track 30 miles WSW of Goodrich Bank, see also 4.6.

Directions

(continued from 3.83)

Cape Van Diemen to Calder Shoal

4.41

- 1 **Route.** From NNW of Cape Van Diemen the N-most route leads generally W about 70 miles to a position S of Calder Shoal where it joins the route NW (4.49) from Beagle Gulf.

4.42

- 1 From position 10°48'S 130°11'E, about 25 miles NNW of Cape Van Diemen, the track leads W passing:
N of Marie Shoal (10°54'S 130°06'E); thence:
Between a 16.1 m patch (10°47'S 130°00'E) and a 16.3 m patch 2 miles WSW; thence:
N of a 16.6 m patch (10°52'S 129°52'E).
- 2 The track then leads WSW passing:
SSE of a 17.5 m patch (10°49'S 129°40'E); thence:
SSE of Cootamundra Shoal (10°51'S 129°13'E); thence:
SSE of Calder Shoal (10°51'S 129°04'E), distant 8 miles.

(Directions continue at 4.49)

Charts Aus 309, Aus 315

Cape Van Diemen to Gale Bank and Bassett Smith Shoal

4.43

- 1 **Route.** From Cape Van Diemen the route leads about 265 miles WSW to Gale Bank. Thence the route divides into two, leading W to Ashmore Reef or SW to Bassett Smith Shoal.

4.44

- 1 From position 10°48'S 130°11'E about 25 miles NW of Cape Van Diemen, the preferred route (067°–247°) shown on the chart leads WSW, passing:
NNW of Marie Shoal (10°54'S 130°06'E), least depth 8.9 m, thence:
Close SSE of a 18.1 m patch (10°55'.5S 129°52'.0S), thence:
- 2 NNW of Parry Shoal (11°12'S 129°42'E), least depth 10.8 m, noting the presence of isolated shoals with depths of 18.1 and 19.3 m which lie closer to the track, thence:
Over The Boxers (11°30'S 128°30'E) least depth 24.6 m, thence:

- 3 NNW of Van Cloon Shoal (12°38'S 126°25'E), least depth 14.2 m, thence:
To a position (12°31'S 126°03'E) about 6 miles NNW of Gale Bank (12°37'S 126°05'E), least depth 21.5 m.

4.45

- 1 From the position 6 miles NNW of Gale Bank, the track divides, leading:
W in continuation of the N-most route (4.59) from Beagle Gulf (4.78), or alternatively leading SW for about 50 miles, passing NW of Penguin Shoal (13°05'S 125°58'E), least depth 9.7 m, thence:
To a position about 12 miles WNW of Bassett Smith Shoal (13°18'S 125°45'E), least depth 4.8 m (see chart Aus 319).
(Directions continue for Ashmore Reef at 4.56 and for routes WSW at 4.63)

ROUTES NORTH-WEST AND WEST-NORTH-WEST FROM CAPE FOURCROY

General information

Charts 942a, Aus 309, Aus 311, Aus 312 Aus 411

Routes

4.46

- 1 At the entrance to Beagle Gulf, SW of Cape Fourcroy (11°48'S 130°01'E) (4.69), two routes lead NW and WNW.
The NW route, for mariners proceeding to the Philippines, passes E of Timor (9°00'S 125°00'E).
The WNW route, for mariners proceeding N into the deep-water trench between Timor and Sahul Banks, passes through North Sahul Passage (10°10'S 127°05'E).

Directions

(continued from 4.70)

Cape Fourcroy to Calder Shoal

4.47

- 1 From position 11°55'S 129°56'E, 8½ miles SW of Cape Fourcroy, the route leads NW passing (with positions given from Cape Fourcroy):
SW of a 16.3 m bank (18 miles WNW); thence:
NE of a 16 m bank (32 miles WNW); thence:
- 2 SW of Parry Shoal and associated dangers (40 miles NNW) (4.44); thence:
To a position 8 miles S of Calder Shoal (10°51'S 129°04'E) where the route is then joined by the offshore route (4.41) along the N coast of Australia.

4.48

- 1 **Useful mark:**
Cape Fourcroy Light (11°48'S 130°01'E) (4.70).

Calder Shoal to Sunrise Bank

4.49

- 1 From position 11°00'S 129°03'E, 8 miles S of Calder Shoal, the route then continues NW passing:
SW of Calder Shoal; thence:
NE of an 18.3 m depth (10°32'S 128°40'E), a depth of 23.8 m lies close E of the track, 4½ miles farther NE; thence:
- 2 Over Margaret Harries Banks passing SW of its shoalest head (16.2 m) (10°06'S 128°37'E); thence:
SW of Troubadour Shoals, distant 14 miles from its shoalest head (10.6 m) (9°53'S 128°34'E).
The route then continues NNW passing:

Between Sunrise Bank (9°44'S 128°11'E) and Sunset Shoal (sounding doubtful) (9°33'S 128°32'E), passing about 3 miles ENE of the former.

Cape Fourcroy to North Sahul Passage

4.50

- 1 From position 11°55'S 129°56'E, 8½ miles SW of Cape Fourcroy, the route leads WNW passing:
NNE of a 21.5 m bank (11°59'S 129°48'E); thence:
SSW of a 15.6 m patch (11°36'S 129°31'E); thence:
- 2 NNE of Newby Shoal (11°52'S 129°10'E) noting the three banks of 21.5, 23.5 m and 23 m, which lie closer to the track, 23 miles ENE, 15½ miles NE and 23 miles NNW, respectively, of the shoal; thence:
SSW of Bellona Bank (10°07'S 127°22'E), distant 12 miles; thence:
Through North Sahul Passage passing NNE of Echo Shoals (10°09'S 126°49'E), distant 7 miles.
(Directions continue in Indonesia Pilot Volume II)

BEAGLE GULF TO NORTH OF GALE BANK AND BETWEEN GALE BANK AND PENGUIN SHOAL

General information

Charts Aus 309, Aus 311, Aus 413

Routes

4.51

- 1 From NNW of Fish Reef (12°26'S 130°27'E) (4.88), at the S part of Beagle Gulf, two routes lead W, about 250 and 260 miles.
The N-most route, for mariners bound for Osborn Passage and the ocean route S of Cartier Islet (12°32'S 123°33'E) (4.57), passes N of Gale Bank (12°37'S 126°05'E) (4.43).
- 2 The S-most track, for mariners bound to Australian ports farther W, passes between Gale Bank and Penguin Shoal (4.45), 30 miles SSW.

Directions

(continued from 4.88)

4.52

- 1 From position 12°15'S 130°20'E, 13 miles NNW of Fish Reef, two routes lead W passing:
N of Lorna Shoal (12°22'S 130°18'E) (4.88); thence:
S of Shepparton Shoal (12°05'S 129°53'E) (4.84) noting the 21.5 m bank, which lies closer to the routes, 7 miles SW of the shoal; thence:
- 2 Over or S of Flat Top Bank with its shoalest part (18.8 m) (12°17'S 129°15'E) close N of the N-most route. A number of smaller banks lie up to 17 miles NE, 13 miles E and 9 miles S respectively, of Flat Top Bank, with a least depth of 15.5 m (12°16'S 129°29'E). Thence
N or S of Van Cloon Shoal (12°38'S 126°25'E) (4.44); thence:
- 3 N of Gale Bank (12°37'S 126°05'E), distant about 6 miles, or S of the shoalest head (15.5 m) (12°51'S 126°10'E) of Baldwin Bank, distant 7 miles, to a position 5 miles N of Penguin Shoal (13°05'S 125°59'E) (4.45).

4.53

Useful mark:

Fish Reef Light (12°26'S 130°27'E) (4.88).
(Directions continue for Ashmore Reef at 4.56 and for Browse Island at 4.63)

GALE BANK TO ASHMORE REEF

General information

Charts Aus 314, Aus 319, Aus 413

Route

4.54

- 1 From N of Gale Bank (12°37'S 126°05'E) the routes (4.43 and 4.52) from Cape Van Diemen and from Beagle Gulf combine and lead W, about 135 miles, passing through Osborn Passage to join the Ocean Route S of Cartier Islet at position 12°40'S 123°45'E, see *Ocean Passages for the World*.

Prohibited area

4.55

- 1 Cartier Islet Marine Reserve, a circular area of 4 miles radius, has been established centred on Cartier Islet (12°31'9S 123°33'0E). Entry to the area is prohibited, except in cases of emergency. No collecting or fishing of any description is permitted.
Mariners are warned that this is a former military exercise area, and that unexploded ordnance may still exist within it.

Directions

(continued from 4.45 and 4.53)

4.56

- 1 From position 12°32'S 126°03'E, about 6 miles N of Gale Bank, the preferred route (086°–266°) shown on the chart leads about 140 miles W passing:
S of Challis Oil Terminal (12°07'S 125°01'E) (4.14) surrounded by a cautionary area; thence:
N of Eugene McDermott Shoal, least depth 11.1 m, (sounding doubtful) (13°05'S 124°35'E); thence:
- 2 N of a group of suspended wells (1.13) centred on position 12°42'S 124°31'E; thence:
S of a group of suspended wells (1.13) centred on position 12°30'S 124°25'E; thence
N of Vulcan Shoal (12°48'E, 124°16'E), least depth 9.5 m, noting Goeree Shoal, 5 miles SE; thence:
- 3 Through Osborn Passage (12°40'S 124°00'E) passing S of Barracouta Shoal (12°33'S 124°02'E) least depth 10.2 m, distant 6 miles, to join the ocean route at position 12°40'S 123°45'E.

4.57

- 1 The ocean route then continues generally W passing (with positions given from Cartier Islet (12°32'S 123°33'E)):
S of Wave Governor Bank (3½ miles SE); thence:
S of Cartier Islet, formed of sand and loose coral, the surrounding reef dries in places and is steep-to. In moderate weather the sea does not break on the surrounding reef from 2 hours before to 2 hours after HW and soundings give no warning of this danger. See also 4.55. Thence:
- 2 S of Johnson Bank an extensive bank least depth 8.7 m, (18 miles WNW); thence:
S of Ashmore Reef (28 miles WNW) (4.10) to the open ocean.

PENGUIN SHOAL TO BROWSE ISLAND

General information

Charts Aus 319, Aus 320, Aus 413

Routes

4.58

- 1 From N of Penguin Shoal (13°05'S 125°59'E) (4.43) the route leads WSW, about 25 miles, along the NW side of Holothuria Banks (4.226) to Bassett-Smith Shoal.

The route then divides into three:

- The N-most track for mariners bound S of Browse Island (14°07'S 123°33'E) (4.64).
- 2 The centre track for mariners bound W of Adèle Island (15°31'S 123°09'E) (5.18).
- The S-most track for mariners on the coastal route passing NW of the Bonaparte Archipelago, for details see 4.310.

4.59

- 1 **Deep-draught vessels** making for the Port of Cockatoo Island (5.92) are advised to use the offshore routes passing W of Adèle Island (15°31'S 123°09'E).

Topography

4.60

- 1 Browse Island is surrounded by coral reef.
Historic wreck lies 1 mile ESE of the island, see 1.60.

Tidal streams

4.61

- 1 Tidal streams cause rips around Browse Island. The streams set S at the commencement of the rising tide and E at its finish. During the falling tide the stream sets NNE at first and ends setting W at a rate of from 1 to 1½ kn.
There is a heavy tide-rip resembling breakers W of the island.

Other aid to navigation

4.62

- 1 **Racon.**
Browse Island Light (14°06'·5S 123°32'·9E) (4.64).
This aid is available only on the N most track.

Directions

(continued from 4.45 and 4.53)

Penguin Shoal to Bassett-Smith Shoal

4.63

- 1 From position 13°00'S 125°58'E, 5 miles N of Penguin Shoal, the route leads WSW passing:
NNW of Bassett-Smith Shoal (13°18'S 125°45'E), least depth 4·8 m, distant 10 miles. It is reported that the sea does not break over this shoal and there is nothing in the appearance of the water to indicate its position. Thence:
To a position WNW, distant 12 miles, from the same shoal.

Bassett-Smith Shoal to Browse Island

4.64

- 1 From a position about 12 miles WNW of Bassett-Smith Shoal (13°18'S 125°45'E) the N and centre tracks lead WSW and SW, about 140 miles passing:
SE of Eugene McDermott Shoal (sounding doubtful) (13°05'S 124°35'E); thence:
SE of Heywood Shoal (sounding doubtful) (13°26'S 124°01'E), least depth 13·7 m; thence:
- 2 SE of Echuca Shoal (13°54'S 123°54'E), least depth 13·7 m; thence:
SE of Browse Island (14°07'S 123°33'E), distant 5 miles for mariners on the N-most WSW track, and distant 34 miles, for those on the centre SW track.
- 3 The N-most track continues to a position SSW of the same island, distant 8 miles.

Useful mark.

Browse Island Light (white hexagonal GRP tower, 11 m in height) (14°06'·5S 123°32'·9E).
This light is only visible on the N track.
(Directions continue for the N track at 5.17 and 5.23, for the centre track at 5.24. Directions are given for the S-most track at 4.310)

CAPE VAN DIEMEN TO FISH REEF

GENERAL INFORMATION

Scope of section

4.65

- 1 The area covered by this section comprises:
Cape Van Diemen to Cape Fourcroy (4.66)
Beagle Gulf (4.78)
Port Darwin (4.100)

CAPE VAN DIEMEN TO CAPE FOURCROY

General information

Chart Aus 309

Route

4.66

- 1 The route from NNW of Cape Van Diemen (11°10'S 130°23'E) to Port Darwin leads generally S off the W side of Bathurst Island to a position about 8½ miles SW of Cape Fourcroy.

Topography

4.67

- 1 The N end of Bathurst Island is mostly low with a few small hills rising above the woodlands. The land backing the coast is generally wooded with mangroves thickly formed within the inlets.

Climatic table

4.68

- 1 See 1.170 and 1.172.

Landmark

4.69

- 1 Cape Fourcroy (11°48'S 130°01'E) faced by conspicuous dark red cliffs from 9 to 12 m high. A prominent sandhill lies on the coast 1 mile N of the cape. From a distance Cape Fourcroy somewhat resembles Cape Helvetius, 8 miles NNE, but the former can be identified by the light (4.70) and other buildings on it.

Directions

(continued from 3.83)

4.70

- 1 From position 10°48'S 130°11'E, about 25 miles NNW of Cape Van Diemen, the route leads initially WSW, about 13 miles, passing (with positions given from Rocky Point (11°29'S 130°09'E)):
 - NNW of Marie Shoal (34 miles N) (4.42); thence: To a position 6 miles W of the same shoal.
- 2 The track then leads SW, about 16 miles, passing:
 - NW of Moss Shoal, least depth 7.4 m, (25 miles NNW) to a position 5 miles WNW of the same shoal.
 The track then leads generally S passing:
 - E of Parry Shoal (30 miles WNW) and associated dangers (4.44); thence:
- 3 E of a 15.4 m depth (24 miles NW) lying at the centre of a narrow bank; and:
 - W of Mesquite Shoal (17½ miles NNW) with a least depth of 5.3 m; thence:
 - W of Rocky Point noting the shoal (8.4 m) which lies 5 miles WSW of the point and closer to the track; thence:
- 4 Between the 17.5 m bank (20 miles WSW) and the shoal patches extending up to 6½ miles NNW of Cape Helvetius (12 miles SSW). An isolated 7.5 m patch lies 3 miles W of the cape, 5 miles E of the track. Thence:
 - W of a shoal (5.1 m) (17 miles SSW) lying 2 miles NNW of Point Fawcett:
- 5 W of Cape Fourcroy (20 miles SSW) (4.69), distant 5 miles. The cape should be given a wide berth as submerged rocks lie close to the cape and the bottom within the 20 m depth contour is irregular. Cape Fourcroy Light (white metal framework tower, 15m in height) is exhibited from the cape. Thence:
 - To a position 8½ miles SW of Cape Fourcroy.
 (Directions continue at 4.84 and for the offshore routes NW and WNW from Cape Fourcroy at 4.47)

Anchorage and bays

Apsley Strait – north part

4.71

- 1 **Description.** Apsley Strait (11°35'S 130°28'E) separates the W side of Melville Island from Bathurst Island. Saint Asaph Bay and Port Cockburn form the N part of this strait and provide good anchorage for small coasting vessels of suitable draught.
 - The S part of the strait (4.89) is used only by small powered boats.
 - 2 **Topography.** The W coast of Melville Island between Cape Van Diemen and Piper Head, 5 miles S, consists of steep red and white cliffs.
 - Brace Point the N extremity of Bathurst Island, 4 miles SSW of Piper Head, as well as a considerable part of the N extremity of Bathurst Island, is nearly isolated at HW by a mangrove swamp.
 - 3 The land within the strait is generally low and thickly wooded on either side. A level range of wooded hills visible from a distance of 20 miles rises close within the coast on the W side of Port Cockburn.
- #### 4.72
- 1 **Depths.** The approach to Saint Asaph Bay has not been closely sounded, and is in parts unsurveyed, but S of Mermaid Shoal (11°11'S 130°16'E) there is a passage with

a depth of 9 m leading to The Narrows, the entrance to Saint Asaph Bay.

Local knowledge is required. The N part of the strait is suitable only for small coasting vessels. Daylight entry is necessary.

- 2 **Tidal streams.** At the W entrance to The Narrows the stream sets E on the in-going tide and W on the out-going tide with a maximum rate of about 2 kn. The rate is about the same in the approach to Port Cockburn but is somewhat less in Saint Asaph Bay.

4.73

- 1 **Directions.** The water in the approach to Saint Asaph Bay is very muddy and, as there are no channel marks, every precaution is necessary.

If proceeding against the out-going tide a good clearance should be given to the sandy spit extending N from Brace Point (11°19'S 130°20'E) (4.71) as the tidal stream then sets over it with considerable strength when it is covered.

- 2 From a position S of Mesquite Shoal (11°13'S 130°01'E) (4.70) the approach to Saint Asaph Bay leads initially E passing between Mermaid Shoal and its associated dangers to the N, and the shoal water extending N from the N end of Bathurst Island to the S.

Caution. A depth of 5.5 m (reported 1983) is charted in the approach, 7 miles WNW of Brace Point and a shoal (2.5 m) lies on the S side of the channel, 3 miles NW of the same point.

Saint Asaph Bay

4.74

- 1 Saint Asaph Bay is the wide N part of Apsley Strait and has general depths of from 10 to 20 m throughout the greater part.
 - Topography.** Luxmore Head, at the SE end of the bay, consists of a series of rocky points with red cliffs to the S. The whole of the E shore is fronted by a rocky reef the land within generally low and well wooded. The W shore of the bay is wooded and fringed by sandy beaches forming small bays where landing can be easily effected.
- 2 **Anchorage.** The recommended berth is off the mangrove flats on the E side of the bay out of the influence of tidal streams.

Port Cockburn

4.75

- 1 **Port Cockburn** immediately S of Saint Asaph Bay extends S as far as Harris Island, 5 miles S of Luxmore Head. Garden Point, 4 miles SSE of Luxmore Head, is fronted by a reef extending nearly 1 mile WNW. Pularumpi, an Aboriginal settlement with an airport, is situated on the point.
- 2 The E side of Port Cockburn is fronted by shoal water with numerous rocky heads but the W side is generally clear.

Anchorage can be obtained in Kings Cove entered between Garden Point and Barlow Point, 5 cables SSE, towards its centre in depths of from 7 to 18 m, mud.

Landing is possible near some fuel tanks on the N side of the cove.

Gordon Bay

4.76

- 1 **General information.** Gordon Bay entered between Clift Island (11°33'S 130°10'E) and Cape Helvetius (4.70), 9 miles SW, affords good shelter for small vessels during the season of SE winds.
 - Local knowledge** is required.
- 2 Port Hurd entered S of Kanunga Point (11°39'S 130°11'E) is an inlet, about 5 cables wide at its entrance,

fronted by a bar with a depth of 2.1 m lying in the middle of the bay. The shores of the inlet are low and thickly covered with mangroves and afford no landing place.

Chart Aus 309 (see 1.16)

Minor inlets

4.77

- 1 **Gullala Creek** is entered immediately N of Marloo Point (11°31'S 130°12'E). The area between Rocky Point and Kanunga Point, 10 miles SSE, and up to 5 miles offshore, is unsurveyed. See information on the chart.

Tunganapu Creek is a wide tidal estuary situated 1¾ miles E of Point Fawcett (11°46'S 130°02'E) (4.70). A small cove, with a landing beach, lies between Point Fawcett and Harlock Point, 5 cables E.

Local knowledge is required.

- 2 **Tidal streams** may attain a rate of about 4 kn at springs. A muddy disturbed condition of the water is characteristic of this part of the coast.

Anchorage may be obtained 3 cables off the beach immediately E of Point Fawcett, in gravel and sand. The beach, which is only about 30 m long, is separated from the larger beaches E, which form the entrance to Tunganapu Creek, by Harlock Point.

Landing can be made on the above beach.

BEAGLE GULF

General information

Chart Aus 309 (see 1.16)

Description

4.78

- 1 Beagle Gulf, entered between Mitchell Point (11°50'S 130°03'E), 2½ miles SE of Cape Fourcroy, on the N and Point Blaze (12°56'S 130°08'E) (chart Aus 316), about 65 miles S, on the S, is the W approach to Clarence Strait (3.117) and Port Darwin (4.100).

Routes

4.79

- 1 From SW of Cape Fourcroy (11°48'S 130°01'E) the route to Port Darwin leads ESE, about 50 miles, across Beagle Gulf to a position NE of Charles Point Light (12°24'S 130°38'E).

From NNW of Lee Point (12°20'S 130°54'E), at the W entrance of Clarence Strait, the coastal route to Port Darwin leads SW, about 12 miles, across Beagle Gulf to about the same position.

- 2 The coastal route W from Port Darwin to Fish Reef (12°26'S 130°27'E), a distance of about 20 miles, passes N of Charles Point to a position NNW of Fish Reef.

Topography

4.80

- 1 The S side of Bathurst Island, which forms the N shore of Beagle Gulf, consists of a line of prominent sandhills and cliffs extending nearly to the SE extremity of the island. Castle Hill (11°48'S 130°11'E), a sandhill about 1¼ miles long in an E to W direction, lies about 8 miles E of Mitchell Point. A radio tower stands 2¾ miles NE of Castle Hill, in position 11°46'S 130°13'E.

- 2 Charles Point (12°23'S 130°37'E) is low and faced by a red cliff on its E side. The S coast of Beagle Gulf from Charles Point to Native Point (12°43'S 130°21'E) (chart Aus 316), about 25 miles SW, is fronted by reefs and shoals for up to 20 miles offshore in places.

Historic Wreck

4.81

- 1 Historic wreck of the Japanese submarine *I.124* (12°07'S 130°07'E) lies in the entrance to the gulf, see 1.60 and *Australian Seafarers Handbook AHP 20*.

Exercise area

- 2 Military exercises are conducted in the SW part of Beagle Gulf in the vicinity of Quail Island (12°31'S 130°26'E). See 1.9 for general information, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners* for details.

Tidal streams

4.82

- 1 For details of tidal streams in Beagle Gulf, see information on the chart.

Principal marks

4.83

- 1 **Landmarks:**

Cape Fourcroy (11°48'S 130°01'E) (4.69).

Charles Point Lighthouse (white framework tower, red bands with central column, 32 m in height) (12°23'S 130°38'E).

Major lights:

Charles Point Light – as above.

Aero Light (12°25'S 130°52'E) (4.120).

Emery Point Light (12°27'S 130°49'E) (4.120).

Directions

(continued from 4.70 and 3.127)

Cape Fourcroy to Port Darwin

4.84

- 1 From a position about 8½ miles SW of Cape Fourcroy, the track leads ESE passing (with positions given from Charles Point Light):

SSW of Mitchell Point (11°50'S 130°03'E) (4.80); and:

NNE of Shepparton Shoal (12°05'S 129°53'E), least depth 11.3 m, a heavy swell may build up over this shoal during the NW Monsoon; thence:

- 2 SSW of Afghan Shoal (11°54'S 130°07'E), least depth 0.8 m. This shoal lies partially outside the arc of visibility of Cape Fourcroy Light (4.70) and the early part of the N-going tidal stream sets onto it from the S. Thence:

NNE of Charles Point (4.80), distant 6 miles; and:

- 3 SSW of Fenton Patches (12 miles NNE) an area of irregular soundings. Five buoys (special) mark a fish haven on the NW side of the patches. Thence: To a position 6 miles NE of Charles Point Light.

4.85

- 1 **Useful marks:**

Radar Hill (11°49'S 130°05'E) a prominent sandhill with a cliff at its base.

Penguin Hill (11°50'S 130°07'E) a prominent conical sandhill.

(Directions for Port Darwin continue at 4.121)

Clarence Strait to Port Darwin

4.86

- 1 From a position about 10 miles NNW of Lee Point (12°20'S 130°54'E) the line of bearing 223½° of Charles Point Light leads in the fairway passing (with positions given from Lee Point):

NW of two artificial reefs (fish haven) (2½ and 3¾ miles NW, respectively), which lie seaward of Angler Reef; thence:

SE of Fenton Patches (12°12'S 130°43'E) (4.84); thence:

- 2 NW of the shoal flats extending 7 miles from the coast NW of Night Cliff (4 miles SW) noting an 9.5 m patch (9¼ miles WNW). Care is necessary in poor visibility with an E-going tidal stream to avoid being set onto these flats.

The track then continues generally SW to a position 6 miles NE of Charles Point Light.

4.87

- 1 **Useful mark:**

Conspicuous water tower (12°23'S 130°51'E) (4.119).

Conspicuous radio tower (12°24'5S 130°53'0E) (4.119)

(Directions for Port Darwin continue at 4.121)

Port Darwin to Fish Reef

4.88

- 1 From a position about 6 miles NE of Charles Point Light (12°24'S 130°38'E) the track from Port Darwin to Fish Reef leads W passing (with positions given from Charles Point Light):

N of Charles Point (1 mile WNW), distant 5 miles. Charles Point Light is exhibited 1 mile ESE of the point. Thence:

- 2 N of a shoal (9.4 m) (6 miles WNW) the NW-most danger off Gilruth Point; thence:

N of Fish Reef (11 miles WSW) a coral reef surrounded by shoal patches. Fish Reef Light (concrete tower) (12°26'S 130°27'E) is exhibited from the W end of the reef. Thence:

- 3 N of Lorna Shoal (19 miles W), distant 7 miles. The W side of Lorna Shoal is fairly steep-to and soundings give little warning of its proximity. No attempt should be made to pass S of this shoal as numerous dangers lie to the SE.

(Directions continue for routes W at 4.52 and for Cambridge Gulf at 4.153)

Anchorage and bays

Apsley Strait – south part

4.89

- 1 **Description.** The S part of Apsley Strait (4.71) from Harris Island (11°26'S 130°24'E) takes a general SSE direction for about 25 miles with depths of more than 10 m over the greater part, although it has not been thoroughly examined. Near the S entrance the depths become very irregular the channel being encumbered with rocks and drying shoals.

- 2 **Local knowledge** is required and the S part of the strait is suitable only for small powered boats.

Tidal streams sometimes attain a rate of 4 kn.

4.90

- 1 **Topography.** The shores are generally low and thickly covered with mangroves with no noticeable features except for the various rivers flowing into the strait.

Nguiu

4.91

- 1 **Description.** Nguiu is an Aboriginal settlement and population centre of about 2,100 persons, standing on the E side of Bathurst Island where Medina Inlet meets Apsley Strait. Medina Inlet, the S entrance to Apsley Strait (4.71), trends in a general NE direction close off the SE extremity

of Bathurst Island. A drying ridge extends between Buchanan Island (11°49'S 130°39'E) and the SW extremity of Melville Island. The ridge continues 4½ miles SW from Bathurst Island and forms the SE side of Medina Inlet Channel which is about 2 cables wide and marked by Light-buoys.

- 2 **Topography.** The coastline of the inlet is generally low, unremarkable and thickly wooded with extensive mangrove growth. The entrances to side creeks and mangrove islets are difficult to identify. Small white sand beaches are apparent on the N and E extremities of Buchanan Island (11°49'S 130°39'E) which is also thickly wooded with mangroves.

- 3 **Controlling depth.** A bar at the seaward entrance to the channel has a least depth of 3.7 m (1996).

Pilotage is not available.

Local knowledge is recommended. The channel in Medina Inlet is suitable for small coasting vessels.

Tidal streams follow the general direction of the channel and attain rates of about 4 kn at springs.

4.92

- 1 **Directions.**

From a position about 6 miles SW of Buchanan Island, the entrance to Medina Inlet Channel should be approached on a N heading; a suitable headmark is the radio tower on Mission Hill (see below). At about 1½ miles distant from Bathurst Island the channel turns NE passing 2 cables SE of Waniunga Beach (2½ miles WSW of Buchanan Island), then 1 cable NW of Buchanan Island. Thereafter the buoyed channel curves NW towards Nguiu settlement and the S entrance to Apsley Strait.

- 2 **Useful mark.** Radio tower on Mission Hill (4 miles NW of the SE extremity of Bathurst Island) is a prominent.

4.93

- 1 **Anchorage** has been obtained 7 cables off Nguiu in a depth of 11 m but holding ground is poor. Sheltered positions can be found in Apsley Strait but poor holding ground and a strong flow make anchoring for extended periods hazardous.

Landing. Barges use the pebble beach at Nguiu or the small sandy beach on the opposite side of the waterway on Melville Island.

- 2 **Berths.** There are no alongside berths. Once a week a barge (length 30 m, draught 2 m) lands cargo directly on the beach (pebble and broken shell) 40 m E of the fuel tanks on the foreshore.

4.94

- 1 **Port services.**

Repairs. Only limited repair facilities are available.

Other facilities: Health clinic; doctors are available on weekdays only. At weekends there are nursing staff.

Supplies are very limited. Prior arrangement for stores is recommended. Fuel, oil and water are not available.

Communications. There is a daily air service to Darwin and a weekly barge service (Thursdays).

Chart Aus 316 (See 1.16)

Bynoe Harbour and Port Patterson

4.95

- 1 **Description.** Bynoe Harbour and Port Patterson two inlets on the W side of Cox Peninsula, separated from each other by Indian Island (12°37'S 130°30'E), are generally only used by fishing vessels and small craft.

Local knowledge is required.

Topography. The shores of Bynoe Harbour and Port Patterson are almost entirely covered with mangroves and are low, featureless and difficult to identify. They are mostly fringed with rocky ledges which dry in many places.

- 2 A chain of reefs and islands extends about 16 miles SSW to the mainland from Fish Reef (12°26'S 130°27'E), from which a light (4.88) is exhibited, and form the W side of Port Patterson and its approach channel. Quail Island, the outermost of these islands, lies 5 miles S of Fish Reef. Bare Sand Island and Grose Islands, the latter covered with mangroves and extending almost to the mainland, stand on the inner part of the reef S of Quail Island.

- 3 Middle Reef, which lies midway between Fish Reef and Margaret Point, 8 miles ESE, has a bright yellow sand patch which dries on its S part. The sand patch forms a useful mark.

Tidal streams, see information on the chart.

Directions

4.96

- 1 The best time to enter West Channel (12°27'S 130°29'E) (4.97) is near LW when Fish Reef and Middle Reef show up well. The water is generally too muddy for them to be seen when covered and the sea seldom breaks on them.

A good deal of discoloured water is seen in the approach probably due to the scour of the tide on Middle Reef.

4.97

- 1 **Channels.** Approach to Bynoe Harbour and Port Patterson is from the N between Gilruth Point (12°25'S 130°35'E) and Fish Reef and is divided into two channels by Middle Reef.

West Channel, between Middle Reef and Fish Reef, has a least depth of 5.3 m in mid-channel over the bar which connects these two reefs, and leads S to Port Patterson.

- 2 A channel to Bynoe Harbour branches off from West Channel abreast of Quail Island and leads E of Indian Island passing S of Moira Reef (12°31'S 130°30'E) and the spit (see below) extending SSE from Middle Reef.

- 3 **Thrings Channel,** E of Middle Reef, has depths of 20 m in its outer part, but a vessel bound for Bynoe Harbour by this channel must pass into depths of less than 7 m SE of Middle Reef. A spit with depths of less than 3 m over it extends 3½ miles SSE from Middle Reef. Bill Shoal (2.6 m) (12°29'S 130°33'E) and Tapp Rock, which dries, 1 mile SW, lie on the W side of the channel, 2 miles WSW and 3¼ miles SW, respectively, of Margaret Point (12°28'S 130°35'E). Gale Shoal, least depth 4.1 m, (12°31'S 130°33'E) and a sounding (doubtful) of 5 m, 2 miles farther S, lie in the S part of the channel to the E of the spit.

4.98

- 1 **Bynoe Harbour** is entered between Unjin Point (12°34'S 130°31'E) the N extremity of Indian Island, and Burge Point, on the mainland 3 miles E.

Within its entrance the harbour continues S for 4 miles and thence SE for a further 4 miles, when it branches into three creeks into the heads of which flow the River Charlotte, River Annie, Leviathan Creek and other streams.

4.99

- 1 **Port Patterson** entered between Unjin Point and Quail Island, lies between Indian Island to the E and the islands SSW of Quail Island to the W. It extends for 4 miles SSW before branching into E and W arms, both unsurveyed. (The name Everingham Channel is sometimes used for the E arm.) Quail Island, sand rising to 9 m in height, and

previously a bombing range, is a closed area due to the presence of unexploded ordnance.

PORT DARWIN

General information

Chart Aus 26, Aus 28

Position and function

4.100

- 1 Darwin, a city of considerable importance, is the administrative centre of the Northern Territory and stands on the tableland ESE of Emery Point (12°27'S 130°49'E). Port Darwin (12°28'S 130°51'E), the principle port of the Northern Territory, is situated in a large estuary on the S shore of Beagle Gulf. The port is multifunctional handling the export of live cattle and minerals, tourism and is the service and supply base for the onshore and offshore oil and gas industry.

Topography

4.101

- 1 The shores on both sides of the approach are fronted by a drying coastal bank. The coast on the W side of the approach between Charles Point (12°23'S 130°37'E) (4.80) and West Point, 9 miles ESE, is low. Lee Point (12°20'S 130°54'E) on the E side of the approach is also low.

- 2 A conspicuous tower, radio tower and water tank are charted between 1¼ miles ENE and ESE of Emery Point (12°27'S 130°49'E), but, the close proximity of all these marks and other prominent towers in the vicinity, all of which exhibit red lights, makes positive identification of any individual mark difficult at night.

Port limits

4.102

- 1 The port limits are formed by a straight line drawn in a NE direction from Charles Point to a position 12°18'2S 130°41'1E, thence in an ESE direction to Lee Point, from whence it continues generally along the HW line of the Port of Darwin to the commencement at Charles Point.

Approach and entry

4.103

- 1 Port Darwin is approached between Charles Point Patches and Middle Ground through Middle Pass (12°21'S 130°43'E) (4.121) and entered between Charles Point and Lee Point.

Middle Pass, a deep-water route through a channel marked by light-buoys, through the isolated patches of less than 10 m which lie across the fairway between Charles Point Patches and the NW end of Middle Ground (4.124), is the main approach for deep draught vessels.

Traffic

4.104

- 1 In 2003 the port was used by 4469 vessels of which 2953 were fishing vessels and a total of 1 059 121 tonnes of cargo was handled.

Port Authority

4.105

- 1 Darwin Port Corporation, Darwin Business Park, GPO Box 390, Darwin, Northern Territory 0801. Website: www.darwinport.nt.gov.au

Limiting conditions

4.106

- 1 **Controlling depth.** Middle Pass (12°21'S 130°43'E) has a reported depth of not less than 12 m.



Darwin – Port from W (4.100)
(Original dated 2002)

(Photograph – Royal Australian Navy)

Deepest and longest berth. East Arm Wharf (4.135).

Tidal levels. See information on chart and *Admiralty Tide Tables Volume 4*.

Density of water: 1.024 g/cm³, may be reduced to 1.021 g/cm³ during the wet season.

- ² **Maximum size of vessel handled.** Vessels of 100 000 gt are accepted at East Arm Wharf. The largest passenger vessel to call at Port of Darwin is the *Queen Elizabeth II*

and the largest cargo vessel the 81 000 dwt tanker *Saiko Maru* with a draft of 12.8 m.

Arrival information

Vessel Traffic Service

4.107

- ¹ VTS is in operation for the control of shipping. Radio reporting is required, inbound, from:

Position (A) (12°18'·27S 130°41'·14E).

Position (B) (12°25'·28S 130°46'·64E).

Outbound, reporting is required from position (B) only.

For further details see *Admiralty List of Radio signals Volume 6 (4)*.

Coast radio

4.108

- 1 A coast radio station operates from Port Darwin. For details see *Admiralty List of Radio Signals Volume 1 (2)*.

Notice of ETA

4.109

- 1 Requirement for a pilot should be sent 24 and 2 hours before arrival at the pilot boarding position, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages

4.110

- 1 Principle outer anchorages:
 - Anchorage A1–A3 centred on 12°19'·5S 130°42'·8E, NW of Middle Ground (4.124), as shown on the chart.
 - Anchorage B1, B2 and B4 centred on position 12°23'·5S 130°45'·7E, between the deep-water route and Middle Ground as shown on the chart.
- 2 Anchorage B5 (Talc Head explosive anchorage) in position 12°27'·6S 130°47'·1E.
- Anchorage C1–C7 centred on position 12°29'S 130°50'E, in the approaches to East Arm (4.135) and Middle Arm (4.137), as shown on the chart. Anchorage C2 and C3 are within Naval Waters (see Appendix I).

4.111

- 1 **Prohibited anchorage area** (12°27'S 130°48'E), due to submarine power cables, exists between lines drawn from West Point (4.124) to Bullocky Point in the N and from Oak Point to Elliott Point (4.124) in the S. Mariners are cautioned against anchoring in the foul area, indicated on the chart, N of the prohibited area due to the remains of boom defence cables.
- 2 Anchorage is also prohibited within 1½ cables of a submarine sewage pipeline which extends 5 cables S from the coast midway between Darwin Naval Base (12°28'S 130°49'E) and Doctors Gully.
- 3 Anchoring is also prohibited, as shown on the charts, between Elliott Point and Darwin Naval Base in an area East of No 9 buoy (Abbott Patches) due to the existence of submarine cable extending SW from the coast.
 - Anchorage is prohibited in an area centred on position 12°28'·7S 130°51'·2E, in the entrance to East Arm.

Pilotage and tugs

4.112

- 1 **Pilotage** is compulsory for all vessels exceeding 25 m LOA, except those exempt by law.

Boarding places:

Outer boarding place, 1 mile N of Charles Point Patches No 5 Light-buoy (12°20'S 130°42'E).

Inner boarding place, 1 mile NW of Channel Rock No 6 Light-buoy (12°25'S 130°47'E).

In bad weather the pilot boat will lead ahead to sheltered waters using VHF radio for communication.

Tugs are available.

Regulations concerning entry

4.113

- 1 There are naval waters in Port Darwin around the Naval Base and in Middle and West Arms as shown on the chart. For details of regulations affecting these waters, see Appendix I.

Tankers are only allowed to berth during daylight hours, but can depart at any time, subject to weather conditions.

Quarantine

4.114

- 1 Port Darwin is a first port of entry, radio pratique may be available on request. For details see *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

General layout

4.115

- 1 **Port Darwin** comprises the following:
 - Darwin Naval Base, protected by two breakwaters, situated close ESE of Elliot Point.
 - Darwin wharves for some commercial operations, open to the S, lie SE of the city.
- 2 East Arm Wharf lies 2·8 miles SE of the city and is the primary location for commercial operations including bulk commodities, livestock, containers and supply vessels for the offshore oil and gas industries.
 - Frances Bay has facilities for fishing vessels and small craft. There are two private marinas and a small private wharf.
- 3 Middle Arm. The Conoco Phillips LNG terminal is being constructed (2004) on land S of Wickham Point (12°30'·5S 130°51'·5E) with a jetty and pipeline connecting to the Bayu Undan gasfield 311 miles NW of Darwin. The pipeline will be constructed on the western side of the fairway out to Charles Point Patches (4.103) and then to the Bayu Undan oilfield.

Unexploded ordnance

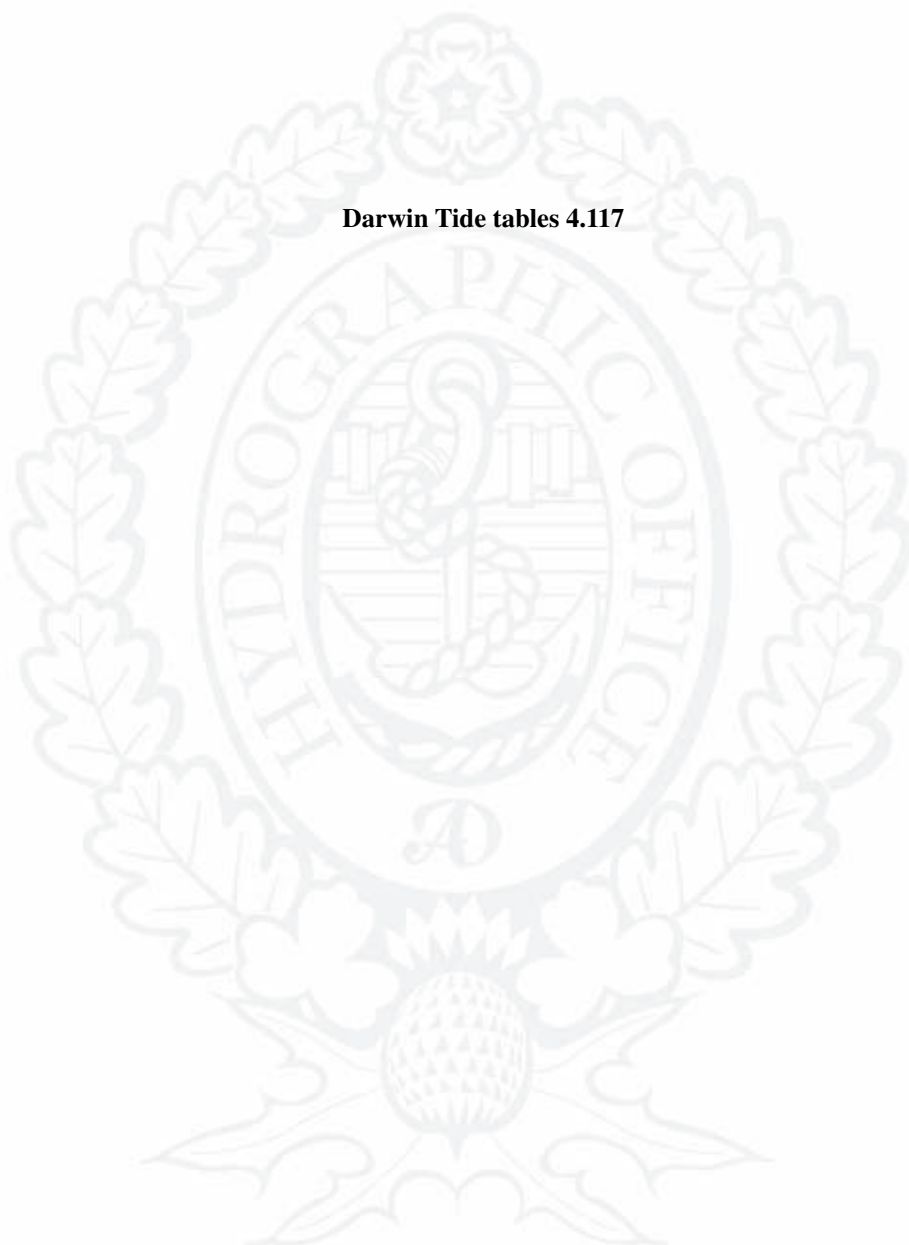
4.116

- 1 An area, radius 5 cables, centred at position 12°22'S 130°46'E, about 3½ miles NNW of East Point, is dangerous due to unexploded depth charges with regard to anchoring, fishing or any form of submarine or seabed activity. See *Annual Australian Notices to Mariners* for details.

Natural conditions

4.117

- 1 **Tidal streams** in the approach channel, 6 miles NW of East Point (12°25'S 130°49'E), may exceed 4 kn at springs. The streams become rotary at both HW and LW, with little slack, see information on the chart.
 - Near the entrance to the harbour the strength of the tidal stream diminishes considerably and the direction within the harbour usually corresponds with the direction of the channel.
- 2 Care must be taken to guard against the fact that the streams do not always run directly along the jetties but may set towards or away from them. The streams in this area are considerably affected by heavy rains and by strong NW or SE winds. Tidal streams may reach 3 kn at the berths.
- 3 Owing to strong tidal streams discolouration is present at all times and during springs a turbid muddy colour is seen in the harbour, the whole of which is disturbed by eddies.

Darwin Tide tables 4.117

4.118

- 1 **Local weather.** Port Darwin is within the S zone of tropical storms. The season extends from November to April each year and the port may be affected at any time during this period.

During the storm season Masters are provided with a copy of the Port Cyclone Procedures which sets out the various stages of alert and preparation to be followed in case of an approaching storm.

- 2 During the wet season severe thunder squalls with heavy rain occur. These squalls are usually brief but gusts may reach 40–60 kn and the wind generally shifts through 360°.

Climatic Table: see 1.170 and 1.173.

Principal marks**4.119**

- 1 **Landmarks:**

Charles Point Lighthouse (12°23'S 130°38') (4.83).
Conspicuous hospital (chimney 66 m in height, with an elevation of 73 m) (12°21'S 130°53'E). Useful mark when making No 5 Light-buoy from the W.
Conspicuous water tower (20 m in height, with an elevation of 39 m) (12°23'S 130°51'E).
Conspicuous building (12°26'4S 130°49'9E) sloping white steel and glass roof, especially obvious during the afternoon.

2 Talc Head (12°28'6S 130°46'6E) a narrow cliffy promontory covered with bushes, appears as an island when viewed from a distance.
Conspicuous silo (elevation 43 m) (12°28'9S 130°53'9E).
Conspicuous radio tower, 69 m in elevation (12°24'5S 130°53'0E).

4.120

- 1 **Major Lights:**

Charles Point Light (12°23'S 130°38') (4.83).
Aero Light (conspicuous water tank) (12°25'3S 130°52'0E) shown on request by aircraft.
Emery Point Light (white metal framework tower, 9 m in height) (12°27'2S 130°48'9E).

Directions for entering harbour

(continued from 4.85 and 4.87)

Outer Approaches – Middle Pass**4.121**

- 1 **Transit** through Middle Pass should be made at moderate speed turning close to the buoys, both inward and outward bound.

4.122

- 1 From position 12°18'S 130°41'E, 6 miles NE of Charles Point Light, the deep-water route through Middle Pass, shown on the chart, leads initially SE passing (with positions given from Emery Point):
NE of No 5 Light-buoy (starboard hand) (10 miles NW) marking the NE extremity of Charles Point Patches; thence:
- 2 NE of Middle Pass A Light-buoy (starboard hand) (8¾ miles NW).
The track then alters SSW through Middle Pass, passing:
WNW of Middle Pass B Light-buoy (port hand) (8½ miles NW).
- 3 The track then reverts to lead SE passing:
SW of Middle Pass B Light-buoy (port hand) (8½ miles NW) noting the depth of 11.5 m which lies 2½ cables SW of the buoy.

Caution. The tidal stream sets directly across Middle Pass at up to 4 kn at springs.

Outer approaches – alternative route**4.123**

- 1 From the vicinity of 12°18'S 130°41'E, about 6 miles NE of Charles Point Light, an alternative approach, for vessels of less than 9 m draught, passes N and E of Charles Point Patches and leads S passing (with positions given from Emery Point):
E of No 5 Light-buoy (starboard hand) (10 miles NW); thence:
- 2 W of Middle Pass (8½ miles NW).
When Emery Point Light bears less than 134° the track then leads SE towards the harbour entrance.
- Caution.** An area of sandwaves exists between No 5 Light-buoy (starboard hand) and Middle Pass.

Harbour Approach**4.124**

- 1 South of Middle Pass (12°21'S 130°43'E) the fairway continues SE passing (with positions given from Emery Point):
SW of Middle Ground (6 miles NW) a spit extending NW from the coastal bank fronting East Point; thence:
NE of No 7 Light-buoy (starboard hand) (4¾ miles NW) marking the NE side of the drying spit extending NW from West Point; thence:
- 2 SW of No 6 Light-buoy (port hand) (3 miles NW) marking Channel Rock, usually indicated by tide rips and overfalls; thence:
NE of West Point (3¼ miles WNW) low and fronted by a reef, and, depending upon draught, clear of the 9.4 m patch 8 cables ENE of the point; thence:
NE of a dangerous wreck (2 miles WNW); and:
- 3 SW of the drying spit (1 mile N) lying along the NE side of the channel; thence:
Between Emery Point and Abbott Patches, marked on its NE side by No 9 Light-buoy (starboard hand) (1¼ miles SW); thence:
SW of Elliott Point (3 cables SSE) a cliffy promontory 10 m high; thence:
SW of Darwin Naval Base (7 cables SE) (4.131) enclosed by two breakwaters. A light is exhibited from the head of each breakwater. Thence:
- 4 The track alters ESE passing:
SW of Bennett Shoal (1 mile SE) a gravel patch marked on its SE side by No 8 Light-buoy (port hand); thence:
SW of No 10 Light-buoy (special) (1¼ miles SE) which separates inward and outward traffic.
- 5 If bound to Port Darwin wharves proceed as convenient passing:
N of No 11 Light-buoy (N cardinal) (2¼ miles SE) which marks the NW end of shoal water extending NW from Wickham Point), noting the dangerous obstruction 3 cables NE, and the dangerous wrecks about 6 cables E, respectively, of the buoy; and:
S of Fort Point (2 miles ESE).

4.125

- 1 **Useful marks:**

Prominent white building (12°27'0S 130°49'7E) unusual shape. This building is obscured by East Point when bearing more than 160°.
Radio masts (red obstruction lights) (12°28'4S 130°44'7E).



Darwin– Fort Point Wharves (4.126)
(Original dated 2002)

(Photograph – Royal Australian Navy)

Berths

Alongside berths – Darwin wharves

4.126

- 1 **Depths** alongside the wharves are liable to change due to silting and shifting sand, the latest values should be checked with Darwin Port Corporation.

4.127

- 1 **Iron Ore Wharf** (12°28'4S 130°50'5E) single berth 142 m long, depth 11.0 m (2003) for petroleum products. Can be used as a Ro-Ro berth for vessels with starboard quarter ramps. Mooring dolphins 69 m E and W of the berth.

4.128

- 1 **Fort Hill Wharf** (12°28'4S 130°50'7E) two berths, total length 300 m, maximum depth 8.0 m east and 10.5 m west (2003), for Ro-Ro operations, livestock and passenger vessels. A linkspan Ro-Ro facility is situated at the W end of No 2W berth. The Ro-Ro facility consists of an extendable semi-buoyant bridge connecting with a pontoon and is workable at all tide levels. The pontoon can be extended, retracted and ballasted, thus enabling Ro-Ro vessels of any size or type, to use Port of Darwin.

4.129

- 1 **Stokes Hill Wharf** (12°28'3S 130°50'9E) four berths, for small vessels for passengers. The two largest, No 3 outer E and W, have a total length of 292 m with a maximum depth of 6.8 m east and 6.6 m west (2003). On the seaward side of the causeway leading to Stokes Hill Wharf a fish haven (12°28'2S 130°51'1E) has been

established marked by three buoys (special), one exhibiting a light.

4.130

- 1 **Fishermen's Wharf** (12°27'6S 130°51'0E) 200 m long, depth 3 m.

Naval Waters and Arms

Darwin Naval Base

4.131

- 1 **General information.** Darwin Naval Base (12°28'S 130°49'E), protected by two breakwaters, is situated close ESE of Elliott Point.

4.132

- 1 **Directions.** The alignment (306°) of Darwin Naval Base Leading Lights leads through the breakwaters into the base:

Front light (white square, green stripe on mast) (12°27'7S 130°49'3E).

Rear light (similar structure) (82 m NW of the front light).

A light is exhibited from the head of each breakwater.

4.133

- 1 **Berths.** The berth on the N side of the harbour is aligned 297°, is teflon-faced and is designed to accommodate six patrol boats, three abreast. A second berth, also aligned 297°, has recently been constructed on the S side of the harbour, extending approximately 160 m ESE from the W shore. A light-beacon (red) is exhibited from the seaward end.



Darwin– East Arm Wharf (4.135)

(Original dated 2002)

(Photograph – Royal Australian Navy)

- 2 A ramp, similarly aligned, has been constructed in the NW corner of the bay and extends 600 m seaward, to the waters beyond the drying coastal bank.

Mooring buoys are situated in the base, their positions can best be seen from the chart.

4.134

- 1 **Repairs:** minor repair facilities and a mechanical lift dock are available, for details see 4.141.

Chart Aus 28 plan of East Arm

East Arm

4.135

- 1 **General information.** East Arm is entered between Fort Point (12°28'S 130°51'E) and the drying flats which extend NW from Wickham Point.

Leading lights:

Front light (12°29'·7S 130°53'·1E) (triangle on a pole, mounted point upward, 4 m in height).

Rear light (200 m SE of front light) (triangle on a pole, mounted point downward, 4 m in height).

- 2 The alignment (122°) of these lights leads SE, into the East Arm, passing between light-buoys No 13 and 14 which mark Walker Shoal, a gravel patch, (8 cables NW of South Shell Island) and the coastal bank extending NW from East Arm Port respectively. A wreck with a least depth of 15·3 m over it lies about 100 m NNW from light-buoy No 13, close SW of the leading line.

The pole on which the rear light (above) is mounted also carries a second navigational light, this being visible from 032°, through S, to 212°.

- 3 **East Arm Wharf,** N of South Shell Island, lies 2¾ miles SE of the city between Frances Bay and Hudson Creek (12°29'·0S 130°55'·8E). The port is formed by a jetty (12°29'·5S 130°52'·9E), 500 m 127°/307°, with a depth of 12 m alongside, giving facilities for handling bulk commodities, livestock and container traffic. The port area extends 4½ cables farther E, forming a triangular area surrounded by drying bank over which a causeway passes to the shore. East Arm Wharf is being extended (2004) to 754 m.

- 4 Above South Shell Island (12°30'S 130°53'E), East Arm is only navigable by small craft. A light-beacon (port hand) marks the S extremity of South Shell Island and a light-beacon (starboard hand) lies approximately 1½ cables S of the Island marking the starboard side of the channel, between the island and the area of partially drying flats extending ESE, which gives access for small craft to the shallow waters E of South Shell Island. Elizabeth River discharges into the head of East Arm.

4.136

- 1 **Frances Bay,** on the N side of East Arm, is almost entirely occupied with drying flats leaving only a small area on its W side with depths of more than 5 m.

Harbour. A non tidal fishing harbour mooring basin with a depth of 5 m is situated in Frances Bay close N of Fishermen's Wharf. Access to the basin is through a lock system which operates between a tidal range of 3·2 to 7·5 m. The basin provides sheltered lay-up and re-fitting accommodation for fishing vessels.

- 2 **Moorings.** There are several mooring buoys and moorings for small craft, whose position can best be seen from the chart, at the W entrance to Frances Bay.

Facilities. A shipyard, with a slipway and a mechanical lift dock, is situated on the W side of the bay, for details see 4.141. There are also two private marinas and a private wharf.

Charts Aus 26, Aus 28 plan of approach to Channel Island **Middle Arm**

4.137

- 1 **General information.** Middle Arm (12°30'S 130°50'E), the most extensive of the three arms forming the harbour, is entered between the flats which extend NW from Wickham Point and N from Stokes Point. The arm lies within naval waters, see Appendix I.

- 2 An LPG berth exists on the W side of Channel Island (12°33'S 130°52'E), 1¼ miles E of Blackmore Point. A gas pipeline, marked at its outer end by a spar buoy, extends 1 cable WSW from the coast and four unlit mooring buoys are in the vicinity.

- 3 East of Colvin Point (12°36'S 130°53'E) Middle Arm becomes a shallow creek from 1 to 2 miles wide with a narrow intricate channel, marked by buoys, and suitable only for small craft. Blackmore River discharges into the head of this creek.

Useful mark:

Peak Hill (12°31'S 130°52'E).

4.138

- 1 **Dangers.** A shoal with a least depth of 7·5 m lies 1½ miles WSW of Peak Hill. Several drying reefs and offshore dangers lie on the SW side of the fairway between Blackmore Point and Channel Island.

Chart Aus 26

West Arm

4.139

- 1 **General information.** West Arm (12°29'S 130°47'E) entered between the N extremity of Weed Reef, steep-to on its W side, and Talc Head is narrow and the depths are irregular. Above Stokes Point the channel has not been surveyed. The arm lies within naval waters, see Appendix I.

- 2 **Topography.** The W shore is fronted by extensive mud flats, and in the vicinity of Swires Bluff (12°30'S 130°46'E) these flats culminate in rocky and gravel outcrops which dry up to 4·4 m and extend up to 1½ miles offshore. Weed Reef, on the E side, consists of rocky outcrops covered by sand and gravel and is almost connected to the reef off Stokes Point.

4.140

- 1 **Dangers.** Kurumba Shoal, Plater Rock and Stevens Rock lie off Talc Head and encumber the W side of entrance to West Arm.

Dangerous wrecks lie NE of the entrance, 1¼ miles E of Talc Head.

Port services

Repair facilities

4.141

- 1 **Repairs:** light engineering facilities are available.

Docks and slips:

Darwin Naval Base; mechanical lift dock, length 42 m, breadth 14 m, lifting capacity 1140 tonnes, for small craft up to 2 m draught, 8·5 m breadth and 750 dwt.

- 2 Frances Bay; mechanical lift dock, length 62·5 m, lifting capacity 2550 tonnes; slipway, cradle length 24 m, lifting capacity 350 tonnes.

Diving facilities are available.

Other facilities

4.142

- 1 **Deratting** can be carried out. Deratting and deratting exemption certificates can be issued.

Medical. A large hospital is available.

Oily waste reception facilities Facilities are available by road tanker or on site tank dependent on the berth.

Supplies:

4.143

- 1 **Gas oil:** available at all berths.
Fresh water: available at all berths.
Provisions: available.

FISH REEF TO PENGUIN SHOAL – COASTAL ROUTE

GENERAL INFORMATION

Chart Aus 413

Scope of section

4.145

- 1 The area of this section comprises:
Fish Reef to Cambridge Gulf (4.148).
Cambridge Gulf and Wyndham (4.166).
Cambridge Gulf to Penguin Shoal (4.214).
Throughton Passage and Approaches (4.224).
Admiralty Gulf and Approaches (4.270).

Joseph Bonaparte Gulf

4.146

- 1 Joseph Bonaparte Gulf is entered between Cape Hay (14°03'S 129°29'E) and Cape Rulhieres, 125 miles W. The head of the gulf is divided into the estuary of Fitzmaurice (4.163) and Victoria Rivers (4.164) on the E side and Cambridge Gulf (4.166) on the W.

Caution.

4.147

- 1 The waters of the S and SE parts of Joseph Bonaparte Gulf are almost always turbid as sediment is held in suspension by strong tidal streams and dangers may not be apparent. In some instances overfalls and eddies indicate deep holes and trenches as well as shoals.

FISH REEF TO CAMBRIDGE GULF

General information

Charts Aus 316, Aus 318, 1047

Route

4.148

- 1 From NNW of Fish Reef (12°26'S 130°27'E) the coastal passage leads SW through Joseph Bonaparte Gulf to Cambridge Gulf, about 180 miles SW.

Surveys

4.149

- 1 The inshore area between Fish Reef and South Peron Island, 50 miles SSW, particularly in Fog Bay, has not been fully examined. Mariners transiting the area are recommended to keep outside of the 20 m depth contour. See also information on the chart.

Exercise areas

4.150

- 1 Military exercises are conducted in an area extending about 150 miles SW from Fish Reef (12°26'S 130°27'E). See 1.9, *Australian Seafarers Handbook AHP 20* for general information and *Annual Australian Notices to Mariners* for details.

Communications

4.144

- 1 **International airport** is situated 7 km from the port. Darwin railway station is situated close to East Arm Wharf and connects Darwin to Adelaide.

Climatic table

4.151

- 1 See 1.170 and 1.174.

Other aid to navigation

4.152

- 1 **Racon.** Lacrosse Island Light (14°44'S 128°18'E) (4.197).

Directions

(continued from 4.88)

4.153

- 1 From a position about 13 miles NNW of Fish Reef (12°26'S 130°27'E) the route leads generally SW passing (with positions given from Point Blaze (12°56'S 130°08'E)):
NW of Lorna Shoal (35 miles NNE) (4.88); thence:
NW of Loe Patch (25 miles NNE); thence:
2 NW of Bowra Shoals (5 miles NNE) from which shoal water extends 4 miles farther NNW; thence:
NW of Point Blaze, noting the 14 m patch which lies 11½ miles W of the point, and closer to the route; thence:
3 NW of North Peron Island (13 miles SSW) which has a grassy peak, 26 m high, on its N end. Reefs and shoals extend up to 5 miles off the W side of the island. A drying reef extends 3 miles N from the island. Mariners closing the coast in this area are recommended to pass at least 5 miles N of the N point of the island. Thence:
4 NW of Bateman Shoal (21 miles SW); thence:
NW of Cape Scott (39 miles SSW) a low sand spit terminating in a remarkable rounded clump of mangroves. Rocky ledges extend 2 miles N and SW from the cape. Thence:
NW of a rocky patch drying 0.9 m (13°45'S 129°22'E) and on which the sea breaks in heavy weather; thence:
5 NW of Howland Shoals (13°57'S 129°23'E) (4.161) which lie up to 12 miles NW of Cape Hay; thence:
To a position about 19 miles N of Lacrosse Island Light (14°44'S 128°18'E) (4.197) taking care to remain in depths greater than 30 m until about 7 miles NE of this position.

(Directions continue at 4.218 and for Cambridge Gulf at 4.199)

Anchorage and bays

Chart Aus 316 (See 1.16)

Fog Bay

4.154

- 1 **Description.** Fog Bay entered between Native Point (12°43'S 130°21'E) and Point Jenny, 15 miles SW, affords reasonable shelter during the season of SE winds.
Topography. The E coast is low and wooded with several outcrops of red cliffs.

The S coast consists of dense mangroves and tidal swamps. The coast between Point Jenny and Point Blaze, 3½ miles SW, is fronted by a reef.

- 2 Finnis River, of no navigational importance, fronted by a drying sand bank lies at the head of the bay. Peaked Hill, 41 m in height, lies 3½ miles inland.

Offshore dangers. Roche Reefs and Loe patches (4.153) lie 8 and 11½ miles NNW, respectively, of Native Point, in the N approach to the bay.

- 3 Blaze Reef lies 2½ miles NNW of Point Jenny, Bowra Shoals and associated dangers (4.153) lie 1½ miles farther N, and are the outer-most dangers off the S entrance point.

Approach. Fog Bay should be approached from the NW so as to avoid the dangers lying up to 8 miles NNW of Point Jenny.

Anchorage can be obtained in Fog Bay, as convenient, in good holding ground of sand and mud.

Anson Bay

4.155

- 1 **Description.** Anson Bay is entered between Channel Point (13°10'S 130°07'E) and Cape Ford, 21 miles SW, and provides good anchorage during the season of SE winds.

Local knowledge is required as the bay is inadequately surveyed, see information on the chart.

Topography. From Point Blaze to Channel Point, the N entrance point to Anson Bay, the coast is low and wooded, SE to the entrance to Daly River, 12 miles SE, it is also low and densely covered with mangroves.

- 2 Peron Islands lying up to 6 miles W of Channel Point are two low sandy islands surrounded by drying reef and sand flats. North Peron Island (4.153), the larger of the two, is connected to South Peron Island by a rocky ledge with extensive sand flats known as The Causeway. No deep water passage exists between the mainland and the Peron Islands.
- 3 Cape Ford, the S entrance point, is a low narrow promontory and the coast 5½ miles farther SW to Cape Scott (4.153) has a barren appearance consisting of bare sandhills. Red Cliff lies on the S side of the bay, 12 miles E of Cape Ford.

Offshore dangers. Bateman Shoal (4.153) lies on the N side of the entrance, 5½ miles SW of North Peron Island.

- 4 A 3-6 m shoal lies on the S side of the entrance, 2¼ miles N of Cape Ford, and is the N-most known danger N off that cape.

4.156

Anchorage. The recommended anchorage lies 4 miles NNW of Red Cliff (13°27'S 130°06'E) in 10 m, mud.

Caution. Wade Rock lies 2 miles NNW of Red Cliff, about 2 miles S of the recommended berth.

- 1 Anchorage is also available 3 miles E of Cape Ford (13°26'S 129°54'E), good holding ground, in about 10 m.

Daly River (13°19'S 130°14'E) flows into the E side of Anson Bay; a drying sand-bar and shallow water extend W for 5 miles from its entrance. The river has many sand-bars and requires careful navigation to avoid frequent grounding.

- 2 Palmerston Island, long and narrow, lies in the entrance; the channel N of it is the deeper.

Bore. At spring tides a bore is created as the in-going stream runs in over the out-going stream and may reach 1 m in height in places. The bore is hazardous to small craft. During the wet season the river is like a mountain torrent and not navigable.

- 3 **Approach** is towards the N shore to pass around the E end of Palmerston Island.

Landing suitable for boats can be obtained at any state of the tide on the S shore of South Peron Island (13°12'S 130°06'E).

Hyland Bay

4.157

- 1 **Description.** Hyland Bay is entered between Cape Dombey (13°54'S 129°43'E) and Tree Point, 10 miles SW. The bay is shoal. Moyle River, a small stream with a sand bar across its mouth, flows into the head of the bay.

- 2 **Topography.** The coast to the N of Cape Dombey is thickly wooded to the edge of reddish cliffs which extend from 6 miles S of Cape Scott (4.153) to Dooley Point, 13 miles S. Barthelemy Hills rise about 5 miles E of Cape Dombey and attain a maximum height of 92 m, 7½ miles ESE of the cape.

- 3 White Cliff Point, with a line of cliffs extending 2 miles SW, lies at the head of the bay, 6 miles E of Tree Point. The coast along the remainder of the bay is low.

Offshore dangers. Banks Shoal (4.158) lies in the approach to Hyland Bay and Port Keats.

Numerous other shoal patches lie in the N approach to Hyland Bay between Cape Scott (13°30'S 129°49'E) and the bay. The chart is the best guide.

Port Keats

4.158

- 1 **Description.** Port Keats is entered between Tree Point (14°01'S 129°36'E) and Kinmore Point, the NE extremity of Dorchester Island, 5 miles WSW. Both entrance points are fronted by reef.

- 2 Port Keats extends S for approximately 8 miles where it divides into two arms. The E arm leads to the foot of Mount Goodwin which is prominent. The W arm, Sandfly Creek, terminates in a salt water swamp. Wadeye, an Aboriginal settlement, is situated on Sandfly Creek at the head of Port Keats.

Local knowledge is required as the channels S of Tree Point are not marked.

- 3 **Topography.** Cape Hay (14°03'S 129°29'E) the NW extremity of Dorchester Island is low and surrounded by foul ground. A reef extends 3 miles NNW from the cape.

Offshore dangers. Emu Reefs lie on the W side of the approach with their centre about 12 miles NNW from Cape Hay. Howland Shoals (4.161) lie up to 12 miles NW of the same cape.

- 4 Banks Shoal, a long narrow spit, lies on the NE side of the approach with its shoalest part 7 miles NNW of Tree Point.

4.159

Tidal streams. Due to the low mangrove shores and the flat country behind being inundated at HW the out-going tidal stream runs out of the port with considerable strength.

The tidal stream 15 miles W of Cape Hay runs in a 330° and 170° direction, on the out-going and in-going tide, attaining a maximum rate of about 1¼ kn. See information on the chart.

- 1 **Anchorage.** Good anchorage can be obtained 3 miles W of Tree Point (14°01'S 129°36'E) in 10 m.

Smaller vessels may anchor about 3 miles SW of Tree Point, in 4 to 9 m.

Facilities. Hard at the settlement for landing craft; jetty which dries; airstrip; limited medical facilities.

Charts Aus 316, Aus 318 (see 1.16)

Joseph Bonaparte Gulf – south-east part 4.160

- 1 **Description.** The estuary of Fitzmaurice and Victoria Rivers lies between Pearce Point (14°26'S 129°21'E) and Turtle Point, 26 miles SSW.

Local knowledge is essential as the shoals and channels in the rivers alter annually. The water is generally muddy and some of the sandbanks owing to their loose nature are shifted by the force of the tidal streams.

- 2 **Topography.** The coast between Cape Hay (14°03'S 129°29'E), the E entrance point to Joseph Bonaparte Gulf (4.146), and Pearce Point, 24 miles SSW, is low and mostly wooded. Pearce Point, the N point of the estuary, is a rocky promontory. Providence Hill, prominent, stands 5 miles E of Pearce Point. From Pearce Point to Fossil Head, 12 miles SE, the coast consists of rocky points, shoal bays and creeks fringed with mangroves. Treachery Bay, the N-most of these bays, dries over the whole of its length. Fossil Head, a red cliff with trees, rises a short distance within to Fossil Summit which is prominent.

- 3 The coast on the S part of the gulf from Turtle Point (14°51'S 129°14'E) to Kanggurru Island, 36 miles WNW, consists mostly of sand dunes with some creeks flanked by mangrove swamps. Farther W to Cape Domett (14°49'S 128°23'E) the coast is more hilly than that to the E and gives the shoreline a distinctive appearance. Shakespeare Hill (14°49'S 128°26'E) (4.197) is a distinctive landmark. Pelican Island (14°46'S 128°46'E), a low rocky outcrop steep-to on its N side with its E and W sides fringed by mangroves, is connected to the coast by flats drying up to 3.1 m, 8½ miles ESE of Kanggurru Island. A large shoal inlet, mostly unexamined, extends about 22 miles S from the W side of Turtle Point and leads to Keep River. The entrance, about 9 miles across, is fronted by rocks and shoals.

- 4 **Abnormal refraction.** There is a marked absence of good visual navigational marks in the area. Navigation is considerably improved with the aid of radar but it must be borne in mind that temperature inversions give rise to variable radar performance as well as mirage effects. See *The Mariner's Handbook*.

4.161

- 1 **Dangers.** A bank with depths of less than 10 m over it extends S towards the coast from Howland Shoals (13°57'S 129°23'E), it has not been completely surveyed and undiscovered dangers may exist off this stretch of the coast.

- 2 Mermaid Bank (14°31'S 129°21'E) is situated 4 miles SSW of Pearce Point and an 11.2 m shoal lies 5 miles W of the S end of the bank. There are many sandbanks, several of which dry, and areas of sandwaves in the NW approach to Queens Channel (4.165). The most extensive area of banks extends up to 40 miles NW of Turtle Point. The water in this area is always turbid and passage through it is not recommended except for shallow-draught vessels.
- 3 A rock, which dries 3.4 m, lies 11 miles N of Pelican Island and a large sandbank with a least depth of 8.6 m lies 12 miles N of Kanggurru Island (14°43'S 128°38'E).

Overfalls. The area W of Pearce Point consists of broken ground, in this vicinity overfalls, dangerous to small craft, have been observed up to 6 miles W of the point.

- 4 **Tidal streams.** The spring rate in Gore Channel (14°49'S 129°34'E) (4.165) and in the approach (14°34'S 129°08'E) to Queens Channel is 3 kn. The in-going stream runs for 5 hours and the out-going stream for 7 hours, the out-going stream continues for nearly 1 hour after LW. See also information on the chart.

New Moon Inlet

4.162

- 1 New Moon Inlet entered between Fossil Head (14°33'S 129°32'E) and Swamp Point, 5 miles SE, extends in an E direction for about 14 miles where it divides into two branches at the foot of Table Hill, 193 m high with a flat top rising abruptly from the surrounding plain like a fortress.

The inlet is shoal. The surrounding land is low and swampy.

Keys Inlet and Fitzmaurice River

4.163

- 1 **General information.** Keys Inlet entered between Swamp Point and the NW extremity of Quoin Island (14°52'S 129°34'E) forms the approach to Fitzmaurice River which is filled with shoals and sandbanks.

Topography. Whale Flat, a low plain which covers at HW springs, intersected by several mangrove creeks extends SE from Swamp Point on the NE side of the inlet.

- 2 **Channel.** A bank which dries up to 6.2 m (14°42'S 129°33'E), about 3 miles SW of Whale Flat, extends SE from a position 7½ miles N of the N end of Quoin Island, and another bank about 5 miles long with a patch which dries 0.4 m at its S end, lies parallel to, and 2 miles W, of the larger drying bank. The best channel lies on the W side of the W bank.

Victoria River

4.164

- 1 **General information.** Victoria River rises in approximate position 18°00'S 130°30'E and flows N for about 160 miles through elevated country between deep gorges and amidst magnificent scenery. It then takes a WNW direction for about 120 miles to its mouth. In 1914 it was stated that no vessel with a draught exceeding 3.7 m could proceed safely above Blunder Bay (15°12'S 129°44'E). Beyond Shoal Reach (15°25'S 129°54'E), the river is only suitable for navigation by boats.

- 2 **Topography.** Quoin Island (14°52'S 129°34'E) is low and covers at highest spring tides, there is a distinctive clump of trees at its N end. Clump Island lies off the NE side of Quoin Island and is separated from it by Gore Channel (4.165), the island is low and mostly consists of mud flats which cover at HW spring tides, there is a clump of trees on the NW end of the island. Driftwood Islands, close E of the S end of Quoin Island, are low mudflats covered with mangroves.

- 3 Turtle Point (14°51'S 129°14'E) the S point of the estuary, consists of low scattered sandhills fronting a mangrove flat. The SW shore of Victoria River between Turtle Point and High Water Inlet, 28 miles SE, is intersected by creeks forming islands and mudflats which are frequently inundated and is fronted by shoals which also extend across the entrances to the creeks. For the first 3 or 4 miles above High Water Inlet the banks on both sides are low and are then succeeded by steep rocky heights. Entrance Island (15°10'S 129°42'E) composed of huge blocks of reddish sandstone has the appearance of a ruined fortification.

- 4 **Tidal streams.** It is considered that navigation of the river, especially by low-powered craft, would be hazardous if passage were attempted during spring tides which run at a high rate. Even during the approach of the neaps the streams attain a rate of at least 5 kn in the narrow channels. The streams flow fastest in the estuary of the river abreast Quoin Island, and between that island and High Water Inlet, whence they gradually decrease. Strong



Wyndham Port from SSE (4.166)

(Photograph – D. Jones Harbour Master Wyndham Port)

eddies and tide rips are frequently encountered in the narrow bends of the river about Entrance Island.

4.165

- 1 **Passage Directions.** Approach to Victoria River is from the NW through Queens Channel which leads close along the W side of Quoin Island and the spit extending NW from it. Several shoals and drying patches are charted on the W side of the channel, for the positions of these the chart is the best guide.
- 2 Apart from the strength of the tidal streams navigation of Victoria River is complicated by the extensive shoals and drying sandbanks, some covered with mangroves, which exist in the estuary of the river W of Quoin Island. In 1981 it was considered that the main channel had changed little over the years, but, until navigation marks are established, entry to the river should only be made with the utmost caution, preferably about LW at which time most of the banks are uncovered. Even at such time it would be advisable to send a boat ahead to sound continuously.
- 3 **Side channels.** Gore Channel (14°49'S 129°34'E), about 1 mile wide, separates Quoin Island from Clump Island. Its N entrance is almost completely blocked by shoals extending from the two islands.
A smaller channel, about 5 cables wide, which is almost blocked at its S end continues S from Gore Channel and separates Driftwood Island from the SE side of Quoin Island.
- 4 **Anchorage.** Blunder Bay (15°12'S 129°44'E) provides the best anchorage in the river. The recommended berth, almost entirely out of the tidal stream, is in the SW corner at the head of the bay.

In 1963 HMAS *Bass*, 100 tons and 2.4 m draught, anchored 3 miles below the mouth of Bullo River (15°26'S 129°52'E) and considered this position to be the safe limit of navigation for a vessel of her draught.

CAMBRIDGE GULF AND WYNDHAM

General information

Charts Aus 32, Aus 318 (see 1.16)

Position

4.166

- 1 Cambridge Gulf, located in the SW part of Joseph Bonaparte Gulf (4.146), is entered between Cape Domett (14°49'S 128°23'E) and Cape Dussejour, 10 miles WNW.
From Lacrosse Island, in the middle of the entrance, the gulf extends 45 miles in a SSW direction to Wyndham (15°27'S 128°06'E).

Function

4.167

- 1 Wyndham is the principal port in the Kimberley District of NW Australia. It supplies the region with fuel oil and general cargo and is the outlet for meat, bulk ores and other primary products.

Topography

4.168

- 1 Lacrosse Island lies, with White Stone Point its SE extremity, 4 miles NW of Cape Domett. The summit of the island lies on its SW side and forms a useful mark in the approach. A light (4.197) is exhibited from its NW side. The N coast consists of rugged sandstone cliffs.

- 2 Adolphus Island (15°07'S 128°09'E) which lies on the E side of the central part of the gulf is hilly on its W side. The W coast of the island, with the exception of Webster Bluff and Steep Head, is generally low and mostly covered with mangroves. The SE and SW sides of the island have not been surveyed.

4.169

- 1 **Cambridge Gulf east side.** Cape Domett, the E entrance point, is fronted by low cliffs on its N and W sides and bordered by a coastal reef. Shark Rock, lying 6½ cables SSW, rises to a height of 6.5 m. Cone Hill (4.199) rises 7 cables E of the cape and is prominent. Shakespeare Hill (4.197), 3 miles E of the cape, forms a distinctive landmark.

- 2 The E shore of the N part of Cambridge Gulf between Cape Domett and Nicholls Point, the N extremity of Adolphus Island, 20 miles SW, is low and fringed with mangroves. Barnett and Hardman Points, situated 8½ and 14 miles SSW, respectively, of Cape Domett are the most prominent projections on this low coast.

- 3 Bluff Head (15°11'S 128°08'E), the S entrance point to Ord River (4.210) on the E side of the gulf, is the steep rugged termination of View Hill Range extending 8 miles farther SE. View Hill and Mount Wilshire at the N end of the range are two of the highest peaks.

- 4 From Bluff Head to Hay Point, 4 miles SSW, the shore is backed by spurs from View Hill Range. From Hay Point to Sandy Point, 12 miles S, the shore consists of a wide sandy plain, covered with mangroves, terminating in the Bastion Range. Wyndham is situated at the SW base of this range.

4.170

- 1 **Cambridge Gulf west side.** The W shore of the gulf between Cape Dussejour and Black Cliff Point, 18½ miles SSW, is formed by stony spurs from hills in the background united by extensive plains covered with mangroves. Vancouver Point, 5 miles SSW of Cape Dussejour, terminates in a bluff and the land rises about 7 cables NW of the point to a height of 101m and is a useful mark from the NE.

- 2 Between Black Cliff Point and Laffan Point, 16½ miles S, the W shore is backed by hills, thence to the N entrance point of The Gut, 11 miles farther S, it consists of a sandy plain fringed with mangroves.

Port limits

4.171

- 1 The N port limit is a line, as shown on the chart, joining Cape Dussejour, Lacrosse Island and Cape Domett.

Approach and entry

4.172

- 1 Cambridge Gulf is approached between Medusa Bank on the E and King Shoals on the W, and entered either side of Lacrosse Island. The preferred entrance is W of Lacrosse Island for which Directions are given (4.199).

4.173

- 1 **Channels.** The approach channel and fairway through the greater part of the gulf are relatively deep as far as Pender Point (15°17'S 128°06'E), on the W shore 33 miles SSW of Cape Dussejour. The channel here is divided into two parts by Middle Ground.

- 2 Main Channel (4.203) which lies to the E of Middle Ground is marked by light-buoys and light-beacons leads generally S to Wyndham Wharf. Hare Channel (4.205), along the W bank, is entered between Pender Point and the

N extremity of Middle Ground and is marked by leading beacons. It is no longer used by shipping.

Traffic

4.174

- 1 In 2002 the port was used by 14 vessels totalling 267 795 dwt.

Port Authority

4.175

- 1 Ord River District Co-operative P/L Wyndham Port.
E-Mail: ordport@wn.com.au

Limiting conditions

Controlling depth

4.176

- 1 Main Channel, which is subject to seasonal siltation, had a least depth in the navigable channel of 6.6 m (2004).

Deepest and longest berth

4.177

- 1 Wyndham Wharf (4.208).

Tidal levels

4.178

- 1 Vessel operation and movement is greatly affected by tidal range and flow. The tidal range is about 8 m at MHWS. See information on reference chart and *Admiralty Tide Tables Volume 4*.

Density of water

4.179

- 1 Density: 1.004–1.018 g/cm³.

Maximum size of vessel handled

4.180

- 1 **Official limit:** 26 000 tonnes arrival displacement; length 190 m; maximum draught 8.0 m. A vessel of 40 318 grt, 69 115 dwt, has used the port with special permission.

Entry restriction

4.181

- 1 Although vessels under pilotage may enter and leave at all hours, tankers normally berth in daylight.

Local weather

4.182

- 1 Masters should be aware of strong katabatic winds blowing off Bastion Range (15°28'S 128°08'E) at times. Strong E winds can be experienced in the dry season, April until October.

Arrival information

Notice of ETA

4.183

- 1 Requirement for a pilot should be sent 7 days in advance and confirmed 48 hours and 24 hours before arrival to Harbour Master Wyndham. See *Admiralty List of Radio Signals Volume 6 (4)* for details.

Outer anchorages

4.184

- 1 **Lacrosse Island.** Mariners waiting for a pilot should anchor about 4 miles S of Lacrosse Island (14°45'S 128°19'E), as indicated on the chart, in depths of 17 to 18 m, sand and shell.

Anchorage can be obtained under the lee of Lacrosse Island, on either side, or in Turtle Bay, close S of West Bluff (14°44'S 128°18'E), as indicated on the chart.

4.185

- 1 **Myrmidon Ledge.** Anchorage, for small coasting vessels, can be obtained S of Vancouver Point (14°50'S 128°12'E) off the S edge of Myrmidon Ledge, a drying rocky ridge, in depths of from 9 to 11 m.

Caution. The out-going tidal stream sets towards this ledge and care is necessary when taking up this anchorage.

4.186

- 1 **Cherrie Cove** lying between Ina Island (15°00'S 128°07'E) and the mainland SW of Island Point affords anchorage for small coasting vessels. The cove is entered by a narrow passage S of Ina Island.

Tidal streams are very strong off the E side of the island causing overfalls and rips.

Local knowledge is required.

4.187

- 1 **Australind Bank.** Anchorage, as indicated on the chart, clear of the main tidal currents, can be obtained 2½ miles NNE of Nicholls Point (15°03'S 128°07'E) off the W side of Australind Bank in depths of from 11 to 13 m.

4.188

- 1 **Steep Head.** Mariners in ocean-going vessels waiting for the tide or slack water can anchor in mid-channel about 1 mile WNW of Steep Head (15°07'S 128°07'E), as indicated on the chart, in depths of from 22 to 31 m.

Anchorage can be obtained by smaller vessels in the bight 1 mile S of Steep Head, as indicated on the chart.

4.189

- 1 **Nellie Bay.** Anchorage, as indicated on the chart, for small coasting vessels can be obtained off Nellie Bay (15°11'S 128°07'E) in a depth of 11 m, mud.

Still Bay, 1 mile S of Nellie Bay, is reported to be the snugest anchorage in the gulf for small coasting vessels as the tidal streams here form an eddy which causes comparatively slack water at all times. The best berth is with the extremity of Red Head (15°13'S 128°07'E) bearing 248° distant 2 cables, in 10 m, mud.

- 2 **Prohibited anchorage.** Anchorage is prohibited off Wyndham Wharf as shown on the chart.

Pilotage and tugs**4.190**

- 1 **Pilotage** is compulsory for vessels of more than 500 gt, except those exempt by law, from Wyndham pilot station and optional between the sea pilot station and Wyndham pilot station.

Availability. Pilots are available 24 hours.

Pilot boarding places:

- 2 **Sea pilot station**, ¾ miles S of Lacrosse Island Light (14°48'9S 128°18'E).

Wyndham pilot station, 6 miles NE of Black Cliff Point (14°58'1S 128°10'7E).

Tugs are not available. A launch to run mooring lines is provided.

Local knowledge**4.191**

- 1 Local knowledge is desirable between Pender Point (15°17'S 128°06'E) and Wyndham.

Berthing**4.192**

- 1 Berthing and unberthing at Wyndham Wharf is dependent on the draught of the vessel and on which side alongside is preferred.

An approach from S with the in-going tide is recommended for berthing.

Quarantine**4.193**

- 1 Wyndham is a first port of entry radio pratique may be available. See *Admiralty List of Radio Signals Volume 1(2)* for details. For general quarantine regulations see 1.54.

Quarantine anchorage between Wyndham Wharf (15°27'S 128°06'E) and Anthon Landing, 6 cables S, between 2 and 7 cables off the E shore.

Caution. A shoal (4.203) lies in mid-channel abreast Wyndham Wharf.

Harbour**General layout****4.194**

- 1 Wyndham Wharf, a steel wharf with concrete decking, situated on the E bank of the gulf has two berths for general, bulk and containerised cargo.

Tidal streams**4.195**

- 1 **Approaches.** Tidal streams reach a maximum of 4 kn at springs but in more contracted portions of the channel, namely off Nicholls Point (15°03'S 128°07'E), 19 miles SSW of Lacrosse Island, and from thence to Pender Point they can attain a rate of up to 6 kn. See information on the chart.

4.196

- 1 **Harbour.** The in-going stream sets on to both ends of the wharf at an angle of about 15° and a rate of up to 2½ to 3 kn.

The out-going stream sets off the wharf at a similar angle at rates of up to 3 to 4 kn.

Principal marks**4.197**

- 1 **Landmarks:**
Shakespeare Hill (14°49'S 128°26'E) flat-topped and rocky, appears as an island from a distance and forms a distinctive landmark when making for the entrance to the gulf from the E.
Conspicuous tower (15°28'1S 128°06'2E) on Mount Albany in the centre of Wyndham.
- 2 Radio tower (15°27'2S 128°07'2E) on West Bastion, 330 m high, the highest peak of the Bastion Range.

Major light:

Lacrosse Island Light (white round metal hut, 3m in height) (14°44'S 128°18'E).

Other aid to navigation**4.198**

- 1 **Racon:**
Lacrosse Island Light (14°44'S 128°18'E) (4.197)

Directions

(continued from 4.153)

Cambridge Gulf approaches**4.199**

- 1 From a position about 19 miles N of Lacrosse Island the line of bearing 170° of Lacrosse Island summit leads in the fairway passing (with positions given from West Bluff (14°44'S 128°18'E)):

Between Outer King Shoal (6 miles NNW), a narrow sandy ridge on the W side of the fairway, and Medusa Bank (12½ miles N) on the E side of the fairway.

- 2 When 4 miles N of West Bluff the track leads SSW passing:

ESE of Entrance Shoal (3¼ miles WNW); thence:
WNW of West Bluff, the NW extremity of Lacrosse Island. Bream Ledge, a rocky reef steep-to on its W side, extends 4 cables NNW from the bluff.

- 3 When W of Lacrosse Island Light (4.197) distant 1½ miles, the track leads SE passing:

NE of Lory Rock (4 miles WSW) on a spit extending 5 cables E from Cape Dussejour. The neck of land immediately within the cape is low so that the cape appears as an island from the N.

- 4 NE of a 7.8 m patch (¾ miles S); and:
SW of the coastal bank the 10 m depth contour of which extends up to 2¼ miles SSW from White Stone Point (¾ miles ESE). Tucker Bank (¾ miles SE), drying 1.9 m, is the shoalest part of this coastal bank, a detached 8.5 m patch lies 1½ miles farther S, close NE of the track. Thence: To a position 3 miles W of Cape Domett (4.169) where a SW track can be followed.

Chart Aus 32

North part of Cambridge Gulf

4.200

- 1 From the position above, W of Cape Domett, the line of bearing 225° of Black Cliff Point (15°02'S 128°06'E), a rocky bluff surmounted by a grassy slope 19 m high, leads in the fairway across the false mouths (4.210) of the Ord River passing (with positions given from Black Cliff Point): SE of Cowan Patches (14°50'S 128°16'E); thence:
- 2 Between Guthrie Banks (10 miles NNE), the outer bank dries 2.5 m, and East Banks (11 miles ENE); thence:
Between South Patch (6 miles NNE) and the drying bank fronting Hardman Point (8 miles ENE) (4.169); thence:
- 3 NW of Australind Bank (4 miles ENE) (4.187); thence:
SE of Ina Island (2 miles NNE) with a red sandstone bluff at its E extremity, noting an 9.6 m shoal 3 cables E of the island.
- 4 The alignment (203°) of Agnew Point (1½ miles S), a bluff headland, 12 m high, formed by a spur from the hills within, with Flat Top Hill (6½ miles SSW) then leads in the fairway passing:
Between Black Cliff Point and Nicholls Point (1¼ miles E), a bluff, the N-most point of Adolphus Island, from where a light is exhibited.

North part of Cambridge Gulf – alternative route

4.201

- 1 From a position about 1 mile SSW of West Bluff (14°44'S 128°18'E) an alternative route leads SSW passing W of Cowan Patches (with positions given from Vancouver Point (14°50'S 128°12'E)): ESE of Lory Rock (5¼ miles NNE) (4.199); thence: ESE of a 9.4 m patch (¾ miles NE); thence:
- 2 Between the narrow spit with a least depth of 6.4 m at its N end (1½ miles ESE) which extends NNE from the outer bank of Guthrie Banks (4.200) and a 4.5 m patch (3 miles ESE) the SW extension of Cowan Patches.
- When Vancouver Point bears 000°, distant 6.7 miles, the route leads 225° joining the previous track (as above).

Centre part of Cambridge Gulf

4.202

- 1 East of Black Cliff Point the line of bearing 186° of Saville Island (15°09'S 128°06'E), from where a light is exhibited, then leads in the fairway passing (with positions given from Saville Island):
E of Agnew Point (5 miles N). Vans Rock, which dries, lies close offshore 2 cables SSW of the point; thence:
- 2 The track then continues in mid-channel in a general S direction passing:
Between a 2.7 m shoal (¾ miles N) and Webster Bluff (¾ miles NNE); thence:
Close E of a 5.8 m patch (3 miles N); thence
W of Steep Head (1¼ miles NNE) (4.188).
- 3 E of Saville Island; a spit, with a rock which dries 2.6 m in the middle, extends 3½ cables N from the island; thence:
W of Kent Island (1 mile SE), from where a light is exhibited, steep-to on its W side; thence:
- 4 The track then leads SE for about 1 mile passing:
Between the NE side of Fairfax Island (1 mile S) upon which stands Fairfax Island Light (15°10'3S 128°06'8E) and Channel Rock (1¼ miles SE); thence:
The track then leads SSW passing:
- 5 Between the E side of Fairfax Island (1 mile S), hilly and wooded, and Landslip Point (2½ miles SSE) a prominent landslip of dark red earth at the end of a precipitous spur from View Hill, 5 cables farther SSE.

Hay Point Leading Lights:

Front Light (15°14'7S 128°06'4E).

- 6 Rear Light (15°14'8S 128°06'4E).

From a position W of Red Head the alignment (179¼°) of these lights leads between Eddy Point (4¾ miles S) the NE extremity of Russell Island and Patch Point (4¾ miles S) a low cliff with a prominent patch of white limestone near the water's edge. Helby Island, low with cliffs on its W side, lies 3 cables farther S.

- 7 From a position about 3 cables SW of Patch Point, the alignment (045¼° astern) of Patch Point Leading Lights (15°13'6S 128°06'7E) leads through that section of the channel SE of Russell Island passing:

SE of One Ball Island, (15°14'5S 128°05'5E), from where a light is exhibited;

From a position S of Russell Island, the track leads generally S, passing:

- 8 W of Hay Point (6¼ miles S) low and wooded; thence:
W of Otway Island (7¼ miles S) low and covered with scrub; thence:
E of Pender Point (15°17'0S 128°05'6E) from where a light is exhibited; a shoal bank extends about 1 cable SE from the point.

- 9 **Caution.** When rounding Fairfax Island during the out-going tidal stream care should be taken to avoid being set towards its E shore.

The tidal streams sweep round Eddy Point at a rate of up to 6 kn forming strong eddies. Great attention to the helm is necessary when passing it.

Chart Aus 32 with plan approaches to Wyndham Wharf

Head of Cambridge Gulf

4.203

- 1 From a position E of Pender Point the track is generally S by Main Channel which leads between Roe Bank and the

E side of Middle Ground each marked by light-buoys (lateral), and between an unnamed bank (15°21'S 128°06'E), marked by Parry and Mangrove Light-buoys (E cardinal), and the drying bank which lies up to 3 cables off the E shoreline.

- 2 The track continues generally S to pass between No 11 light-buoy and No 12 light-beacon (starboard and port hand) and E of No 13 light-buoy (starboard hand) to the berth as convenient.

Caution. A bar with a least depth of 5.1 m lies at the N end of Main Channel E of Laffan Point (15°18'8S 128°03'9E).

- 3 A shoal, the position of which can be seen on the chart, lies with its N part in mid-channel abreast Wyndham Wharf. It is marked by a starboard lateral spar light-buoy (7 cables SW of Sandy Point).

An un-marked wreck (IK22), the position of which can be seen on the chart, lies close NW of the N end of the wharf face.

Shoaling has taken place close off the N end of the wharf.

Side channels

The Gorge

4.204

- 1 **General information.** The Gorge, a deep channel between Fairfax Island (15°11'S 128°06'E) and the mainland W, is entered between Dundas Point and Lyne Point.

Caution. A shoal depth of 4.1 m was reported (1990) to lie in the centre of the S entrance, about 4 cables S of the S end of Fairfax Island.

Hare Channel

4.205

- 1 **General information.** Hare Channel (15°18'S 128°05'E) marked by buoys, leads from Pender Point to Laffan Point with a set of leading beacons on the latter point. A further set of beacons shown on the chart lead SSE towards Wyndham Wharf. Hare Channel is no longer used by commercial shipping.

Stevens Channel

4.206

- 1 Stevens Channel (15°18'S 128°07'E), which leads between the E side of the foul ground extending S from Otway Island and the coastal bank off the E shore of the gulf, is too intricate for navigation unless previously marked.

Berths

Anchorage

4.207

- 1 Small vessels can anchor in an area shown on the chart, W of Anthon Landing (15°28'S 128°06'E) in a depth of 6 m, mud.

Alongside berths

4.208

- 1 **Wyndham Wharf** (15°27'2S 128°06'0E) with a berthing face 314 m in length, has two berths, maximum depth 8 m (2004). The bottom is mud and silt and is subject to siltation; the latest depth should be checked with the Port Authority.

A bulk loading gantry is situated at the S end of the wharf.

Port Services

4.209

- 1 **Repairs:** limited facilities.
Other facilities: Oily waste reception facilities are not available; government hospital.
Supplies: fresh water available at the wharf; limited quantities of diesel oil are available by road tanker
Communications: airport 100 km from the town.

Rivers

Ord River

4.210

- 1 Mullet Point (15°03'S 128°09'E) on the NE side of Adolphus Island is the W entrance point to the N mouth of Ord River; Hardman Point, the NE entrance point, lies 5½ miles farther NE.

Between Mullet Point and Cape Domett, 19 miles NE, there are numerous inlets into the plains, which are marshy during the wet season, these inlets are known as the false mouths of the Ord River.

- 2 The entrance proper to Ord River lies between Rees Point (15°10'S 128°08'E) the SW extremity of Adolphus Island and Bluff Head, 1½ miles S. The river is blocked by shoals and has not been surveyed.

Forrest River

4.211

- 1 Forrest River on the W shore of the gulf is entered N of Laffan Point (15°19'S 128°04'E); it has not been surveyed.

Boats are able to proceed up river for a distance of 23 miles where there is a settlement.

Chart Aus 413

Waters south of Wyndham

4.212

- 1 King River (15°30'S 128°05'E) on the E side of the gulf is entered ¾ miles SW of Sandy Point; it has not been examined.

4.213

- 1 South of Wyndham the gulf leads in a WSW direction for about 5 miles where it contracts to a width of 2½ cables through The Gut, a narrow passage about 2 miles in length. Tidal streams run through this passage at a rate up to 5 kn.

Beyond The Gut there is a wide shallow lagoon, about 11 miles in length, containing several mangrove islets and creeks. Pentecost River enters the head of this expanse of water from the S and Durak River from the NW.

CAMBRIDGE GULF TO PENGUIN SHOAL

General information

Chart Aus 318 (see 1.16)

Route

4.214

- 1 From N of Lacrosse Island, (4.168) in the middle of the entrance to Cambridge Gulf, the coastal route leads NW through the W part of Joseph Bonaparte Gulf to NW of Lesueur Island (4.219) about 70 miles NW. The passage then continues WNW along the E side of Holothuria Banks (4.226) to pass N of Penguin Shoal (13°05'S 125°59'E) (4.43) where it joins the main route WSW along the NW side of Holothuria Banks.

Topography

4.215

- 1 Most of the headlands between Cape Dussejour (14°45'S 128°13'E) (4.199), the W entrance point to Cambridge

Gulf, and Thurburn Bluff (14°35'S 128°00'E), 15 miles NW, are fringed by cliffs. There are numerous peaks in this area and identification of individual peaks may be difficult.

- 2 The coast between Cape Dussejour and Cape Rulhieres, 70 miles NW, is mainly rocky with a few sandy beaches. It is generally open, exposed, and fronted by rocks in places although, as far as is known, these rocks do not extend more than 2 miles offshore.

- 3 The whole of this coast is slightly wooded and sufficiently elevated to conceal the interior, no part of which can be seen from seaward except Mount Casuarina (14°24'S 127°41'E) a flat-topped hill. There are some remarkable sand dunes, up to 89 m high, which are conspicuous from 20 miles offshore, near Cape Saint Lambert (14°18'S 127°46'E).

- 4 Cape Rulhieres (13°54'S 127°21'E) has a white cliffy appearance and an island (62 m high) lies close offshore 10 miles W of the cape.

Least charted depths

4.216

- 1 **Sandwaves.** Large areas of sandwaves exist between King Shoals (14°35'S 128°13'E) and Cape Rulhieres extending to a distance of some 8 miles offshore. Wells Patches (4.219), the largest area of these sandwaves, lies to seaward of Rocky Island (14°06'S 127°33'E).

Other aid to Navigation

4.217

- 1 **Racon:**

Lacrosse Island Light (14°44'S 128°18'E) (4.197).

Directions

(continued from 4.153)

Cambridge Gulf to Cape Londonderry

4.218

- 1 **Caution.** Mariners in deep-draught vessels should exercise caution when passing through the area of sandwaves (4.216) and are advised to remain in depths of more than 50 m when passing between Wells Patches (14°02'S 127°38'E) and Lesueur Island, 25 miles NW.

4.219

- 1 From a position about 19 miles N of Lacrosse Island the passage to Cape Londonderry (13°44'S 126°58'E) leads initially NW passing (with positions given from Reveley Island (14°22'S 127°49'E)):

NE of Buckle Head (5 miles SE) rising to a height of 105 m; thence:

- 2 NE of Aunt and Uncle Islands (9 and 29 m high) (1 mile ESE) barren. Reveley Island, practically connected to the coast by a bank which partly dries, lies 1 mile WNW of the islands. Thence: NE of Cape Saint Lambert (4 miles NW) (4.215); thence:

- 3 NE of Eric and Elsie Islands (9 miles NW) which lie close together about 1 mile offshore, the larger Elsie Island is 20 m high; thence:

NE of Wells Patches a large area of sandwaves with a least depth of 8.8 m (21 miles NNW). The sandwave area may be clearly identified by day when the tidal stream transports bottom sediment causing brown discolouration. Thence:

- 4 NE of Cape Rulhieres (13°54'S 127°21'E) several points and rocky ledges project N from the cape; thence:

NE of Lesueur Island (13°49'S 127°16'E) low and sandy, surrounded by a coral reef which extends up to 1½ miles from its NE side. A light (stainless steel lattice tower, white GRP hut at base, 17 m in height) is exhibited from the NW extremity of the island.

- 5 From NE of Lesueur Island the passage leads WNW passing:

NNE of Stewart Islands (13°42'S 126°54'E) two low sandy islands near the outer edge of a reef which partly dries extending up to 5 miles offshore between Cape Londonderry (13°44'S 126°58'E), a low rocky headland, and Cape Talbot, 13 miles farther W.

(Directions for Troughton Passage are given at 4.230)

Cape Londonderry to Penguin Shoal

4.220

- 1 From a position about 16 miles N of Cape Londonderry (13°44'S 126°58'E) the passage continues WNW passing:

NNE of Warn Rock (existence doubtful) (13°09'S 126°06'E) the outermost charted danger on Holothuria Banks (4.226) noting the 19.1 m depth which lies 5 miles farther E; thence:

- 2 NNE of Penguin Shoal (13°05'S 125°59'E) to a position about 5 miles N of the same shoal where the route joins the main route WSW off the NW side of Holothuria Banks.

(Directions continue at 4.309)

Anchorage and landings

Chart Aus 318 (see 1.16)

Eric and Elsie Islands

4.221

- 1 A good sheltered anchorage for small craft is reported to exist between Eric Island (14°16'S 127°44'E), the SE-most of the two, and the mainland.

King George River

4.222

- 1 **General information.** King George River (13°58'S 127°20'E) is approached through Kooloma Bay, a sandy bay W of Cape Rulhieres. A sand bar which dries extends across the head of the bay, about 5 cables N of the river entrance. Inside the bar there is deeper water and the river leads E, between cliffs, for a distance of about 2 miles where it divides into two arms.

- 2 The W arm ends abruptly in two waterfalls about 4 miles beyond; the E arm is shallow.

Depths in the centre of the bay are from 6 to 12 m.

Anchorage, with good holding, can be obtained in Kooloma Bay.

Landing places

4.223

- 1 There are many places where a boat might land including:

Un-named bay 3½ miles NW of Thurburn Bluff (14°35'S 128°00'E), dries at its head, dangers extend 2 cables from its SE entrance point.

- 2 Un-named bays SE and NW of Buckle Head (14°26'S 127°52'E).

Un-named bay fronted by Reveley Island (14°22'S 127°49'E).

Seaplane Bay (14°06'S 127°32'E) and an un-named bay about 4 miles farther NW. The latter bay has a sandy beach; dangers are charted in this bay.

TROUGHTON PASSAGE AND APPROACHES

General information

Chart Aus 318 (see 1.16)

Description

4.224

- 1 Troughton Passage leads E and S of Troughton Island (13°45'S 126°09'E) between Cape Bougainville (13°54'S 126°05'E) and Holothuria Banks (4.226).

Topography

4.225

- 1 Cape Bougainville is the N extremity of an extensive peninsula which separates Vansittart Bay (4.257) from Admiralty Gulf (4.270). The peninsula, 60 to 100 m high, has the appearance of a table top and is deeply indented with numerous bays and creeks. Red Island, close off the E extremity of the cape, is fronted by red cliffs which show up distinctly against the land when the sun is in a favourable position.

Holothuria Banks

4.226

- 1 Holothuria Banks, with depths of less than 30 m over them, occupy a wide area lying from 14 to 47 miles N of Cape Bougainville; East Holothuria Reef and West Holothuria Reef lie on the S part of these banks. A rock (1 m high) (13°34'S 126°03'E) on the N edge of East Holothuria Reef is prominent.
- 2 Holothuria Banks are divided into two parts by Penguin Deep (13°18'S 126°00'E) where there are depths of over 50 m. The E edge of these deeps is fronted by a bank with depths of less than 10 m.

Holothuria Banks appear to consist chiefly of dead coral covered with sponges. Sea snakes, from 1 to 2 m long, are common on these banks.

Depths

4.227

- 1 Troughton Passage has depths of over 30 m in the fairway and is the recommended passage for mariners proceeding inshore of Holothuria Banks.
- Caution.** The inshore area of the peninsula of which Cape Bougainville is the N extremity is unsurveyed and unexamined and it is highly probable that uncharted dangers exist. See information on the chart.

Natural conditions

4.228

- 1 **Turbid waters.** The waters in the vicinity of Holothuria Banks are so turbid that the water colour gives no indication of danger. Uneven ground is frequently marked by overfalls and eddies during the weather going tide, during the NW Monsoon by the rising tide and during the season of SE winds by the falling tide.
- 2 **Bush fires.** Visibility in the vicinity of Cape Bougainville is often reduced to a distance of 5 or 6 miles due to bush fires.

Tidal streams on Holothuria Banks attain a rate of from 2 to 3 kn at springs. They set SW and NE. The SW-going stream commences about 45 minutes before LW by the shoal and the NE-going stream about 1 hour before HW. See information on the chart.

- 3 **Climatic table.** See 1.170 and 1.175.

Landmark

4.229

- 1 Conspicuous white building on Troughton Island (13°45'S 126°09'E).

Directions

(continued from 4.219)

Approaches to Troughton Passage

4.230

- 1 From a position N of Cape Londonderry (13°44'S 126°58'E) the route to Troughton Passage leads initially WSW giving Stewart Islands (13°42'S 126°54'E) and their associated dangers (4.219) a wide berth passing (with positions given from Troughton Island):
NNW of Koojarra Shoal (25 miles E) (4.305), thence:
NNW of a shoal patch (reported 2000) (17¼ miles E), with a least depth of 1.5 m over it, thence:
2 NNW of Jones Island (12½ miles E), from which a spit extends 2½ miles NW with a least depth of 6.6 m over it, thence:

To a position midway between the Jones Island spit and Branch Banks (9 miles NNE).

Caution. The sea N and W of Stewart Islands is often discoloured and many tide rips are found; uncharted dangers may exist.

Troughton Passage

4.231

- 1 From a position about 7 miles NW of Jones Island (13°46'S 126°21'E) the route then leads SW through Troughton Passage passing (with positions given from Troughton Island):
2 NW of Tait Bank (6½ miles E) to a position S of Troughton Island, reddish in colour and surrounded by reef. A spit extends 8 cables S and E from the S end of the island; there are tide rips off the ends of the spit. Patches of mud and slime stirred up from the bottom, and other floating matter, sometimes have the appearance of coral reefs.

(Directions continue at 4.281)

Side channels

North of Troughton Island

4.232

- 1 A channel N of Troughton Island (13°45'S 126°09'E), with a navigable width of about 2 miles, lies between Otway Bank (13°40'S 126°04'E) and the shoal bank, with depths of less than 10 m over it, extending 5 miles N from the island. Guichen Reef lies on this bank, 1½ miles ENE of Bishop Rocks. The passage between the reef and Troughton Island is foul.
- 2 **Local knowledge** is required and the passage is not recommended except for vessels of light draught.

Caution. This channel is inadequately surveyed, see information on the chart.

4.233

- 1 **Landing.** There is a fairly good landing place in an opening in the reef off the SW side of Troughton Island 2 hours either side of HW.

Charts Aus 318, Aus 319 (see 1.16)

Between Rothery Reef and Holothuria Banks

4.234

- 1 **Caution.** Due to the lack of visual marks the area between Rothery Reef (13°46'S 125°49'E) and Holothuria Banks is considered difficult to navigate, especially at HW.

4.235

- 1 **Directions.** From a position about 3 miles S of Troughton Island (13°45'S 126°09'E) a passage leads WNW passing (with positions given from Troughton Island):
NNE of Cape Bougainville (9 miles SSW) (4.225) and its associated dangers; thence:

- 2 SSW of Bishop Rocks (2 miles WNW) a small group of coral heads; thence:
SSW of Otway Bank (7 miles NW); thence:
SSW of East Holothuria Reef (12 miles NW), in two parts, the W part of which dries 3.7 m; thence:
SSW of a 3.9 m patch (15 miles WNW); thence:
- 3 NNE of a 9.5 m patch (20 miles W) the outer-most danger N of Rothery Reef (19 miles W). The dangers N of Rothery Reef do not break and mariners should pass about 7 miles N of this reef. And:
SSW of two small drying reefs (20½ miles WNW) lying midway between East and West Holothuria Reefs; thence:
- 4 SSW of West Holothuria Reef (25 miles WNW). Care should be taken to avoid the foul ground which extends up to 2½ miles SE from the reef. The reef is seldom visible as the water is turbid and the tidal streams irregular.
- The track then continues W to join the main coastal route SW off the Bonaparte Archipelago.

Napier Broome Bay

Chart Aus 318 (see 1.16)

General information

4.236

- 1 **Description.** Napier Broome Bay is entered between Cape Talbot (13°48'S 126°45'E) and the NE extremity of Anjo Peninsula, 13½ miles SW. The shores of the bay are indented by four smaller bays separated by salient points between which sheltered anchorage can be taken.

4.237

- 1 **Topography.** Cape Talbot, a low sandy point, is difficult to distinguish from seaward until it bears about ENE when the low sandy coast E of the cape is shut in.

Sir Graham Moore Islands lie off the entrance to Napier Broome Bay. Scorpion Island (4.241), the NE-most island, is conspicuous. Sir Graham Moore Island, the SW and largest island, has a prominent flat-topped hill, 54 m high, at its E extremity which is joined to the W part of the island by a low neck of land. A mast stands near the NW extremity of the island. The W and NW sides of the island have not been adequately surveyed.

- 2 Governor Islands, lying within the entrance to the bay and SE of Sir Graham Moore Islands, are very prominent as the entrance is approached. The islands are lighter in appearance than Bluff Point (14°05'S 126°39'E) (4.248) when viewed from the entrance to the bay. Steamer Rock, resembling a steamer from a distance, lies 1 mile NNE of East Governor Island.

- 3 Sir Frederick Hills, flat-topped with a conical peak near the W edge of the ridge, rise within the head of the bay to a height of about 180 m and are readily identified.

4.238

- 1 **Former mined area.** An area within a circle of radius 1 mile with centre in 14°04'S 126°40'E is dangerous due to mines, see 1.5.

4.239

- 1 **Tidal streams** off the entrance to Napier Broome Bay set strongly across in a NNE direction on the falling tide and in a WSW direction on the rising tide, until abreast of Scorpion Island, the NE-most of the Sir Graham Moore Islands.

Within the bay the tidal streams are weak.

4.240

- 1 **Discoloured water.** Due to the turbid nature of the water in Napier Broome Bay no warning of the vicinity of a shoal can be expected by eye alone.

4.241

- 1 **Landmark:**

Scorpion Island summit (13°52'S 126°37'E), 46 m high, shaped like a truncated cone. The first land sighted as the coast is approached and visible from a distance of 15 to 16 miles, when at that distance, the Sir Graham Moore Islands appear as one owing to their similarity in colour.

Directions

4.242

- 1 **East approach.** Give Stewart Islands (13°42'S 126°54'E) (4.219) and Cape Talbot a wide berth.

The line of bearing 190° of Scorpion Island summit (4.241) then leads in the approach to a position about 8 miles NW of Cape Talbot.

From the West. Make for a position about 8 miles NW of Cape Talbot.

4.243

- 1 **Entrance.** From a position about 8 miles NW of Cape Talbot the line of bearing 167° of the perpendicular W side of East Governor Island (13°57'S 126°42'E), which from the N appears as a wedge shaped mass of rock, then leads through the entrance passing (with positions given from Scorpion Island summit):

- 2 Between the spit, marked by muddy patches during the strength of the tidal streams, extending 3 miles NW from Cape Talbot (9 miles ENE) (4.237), and Koojarra Shoal (4½ miles NNW), with a least depth of 0.8 m over it. Reefs lie 5 cables NNW and 1½ miles SSE, respectively, of the shoal, the sea breaks on the N reef; thence:

- 3 ENE of the detached drying reef (1½ miles NE) lying off the N end of Scorpion Island.

The alignment (230°) of the N extremity of Carronade Island (4½ miles SSW), sandy and covered with small trees and with a prominent group of rocks lying on the E side of the island, with Anjo Point (6 miles SSW), the tip of a thickly wooded rocky promontory, then leads in the fairway passing:

- 4 NW of a 3.6 m shoal (5 miles ESE), marked by eddies when the tidal stream is running, and a dangerous rock close S. Thence:

- 5 NW of Ila Point (6 miles SE) a narrow peninsula composed of large boulders, the N extremity of West Governor Island which is high and wooded. The NE and NW sides of the island are foul and a rocky islet lies off the W side. And:

SE of Scorpion Point (1 mile SE), 11 m high, the end of a low neck of land at the E extremity of Scorpion Island.

4.244

- 1 **Useful marks:**

Pim Hill (14°11'S 126°33'E), 170 m high, a bare hill composed of red rocks the E face being steep whilst the W side slopes gradually.

Cone Mountain (14°12'S 126°27'E), 175 m high, a wooded hill with a conical peak.

(Directions for Geranium Harbour continue at 4.247, for Mission Bay at 4.249 and for Mackenzie Anchorage at 4.251)

Anchorage

4.245

- 1 A good anchorage, sheltered from strong SE conditions, exists 5 cables off the centre of a sandy beach which lies 1¼ miles SE of Cape Talbot (13°48'S 126°45'E) in 8 m. Anchorage can be obtained in a position nearly equidistant from Governor Islands, Louis Islands, Bluff Point and Carronade Island, in depths of from 14 to 17 m, mud.
- 2 **Caution.** A shoal depth of 6.6 m lies in this anchorage area, 2½ miles SSE of the S extremity of Carronade Island (13°57'S 126°36'E).

Geranium Harbour

4.246

- 1 **General information.** Geranium Harbour lies between Sir Graham Moore Island, and Carronade Island and the NE end of Anjo Peninsula, and affords sheltered anchorage for a number of vessels. Approach to Geranium Harbour is from the E in depths generally of from 13 to 20 m in the fairway.
Local knowledge is required.
 - 2 **Topography.** The SE extremity of Sir Graham Moore Island is cliffy and rocky for about 5 cables W. The remainder of the S coast, which forms the N side of the harbour, is mostly low lying. The three small Geranium Islets lie off the narrow neck of land joining the E extremity of Sir Graham Moore Island to its main part. The outer islet is about 12 m high. Anjo Point (13°57'S 126°34'E), the E extremity of Anjo Peninsula, is the tip of a rocky promontory projecting SE from Elbow Point the N extremity of the peninsula.
 - 3 **Tidal streams** in Geranium Harbour attain a rate of about 2 kn at springs, the out-going stream setting E and the in-going stream W. The tidal streams are strongest in the W entrance. Between Anjo Point and Carronade Island the out-going stream sets N but the in-going stream is not appreciable.
- 4.247**
- 1 **Directions.** (continued from 4.244) From SE of Scorpion Point the track continues 230° until Fly Point, the S extremity of the E end of Sir Graham Moore Island, bears NW.
The track then leads W passing mid-way between Fly Point and the N extremity of Carronade Island.
 - 2 **Side channels.** The S approach, between Anjo Point and Carronade Island, is obstructed by a shoal (5.4 m) in the fairway. It has not been thoroughly examined but it is reported that mariners can pass through this passage in a least depth of 14.6 m on the line of bearing 358° of the W Geranium Islet.
The W approach (4.265) is inadequately surveyed, and in parts unsurveyed.
 - 3 **Anchorage.** There is a minimum width of 1 mile between the 10 m depth contour on either side for a length of 4 miles in an E to W direction. Anchorage can be obtained in depths of from 7 to 25 m, mud.
Caution. Canoe Rock, which dries 1.1 m, lies close S of the outer Geranium Islet.

Mission Bay

4.248

- 1 **General information.** Mission Bay, so called from the ruins of a Spanish mission station in the cove at the head of the bay, is entered between Bluff Point (14°05'S 126°39'E) and an un-named point, 5 miles NE, and

provides some of the best shelter in Napier Broome Bay. Mission Cove in the S part of Mission Bay has shoal depths inshore, especially at its head.

- 2 **Topography.** Bluff Point, the S entrance point, backed by a hill is high and rocky, the hill slopes gradually S until abreast Mission Cove where it is low and covered with scrub. Red Bluff, near the N entrance point, is a remarkable red rocky bluff.

4.249

- 1 **Directions.** (continued from 4.244) From SE of Scorpion Point the line of bearing 180° of the W extremity of Bluff Point leads in the fairway passing (with positions given from Scorpion Island summit):
Between Carronade Island (4½ miles SSW) and West Governor Island (6 miles SE); thence:
E of a 6.6 m patch (7½ miles S); and:
W of a 6.6 m patch (9½ miles SSE) which lies 1¼ miles SW of Red Bluff.
- 2 The line of bearing 120° of the NE extremity of the bluff on which Tidepole Hill (15½ miles SSE) is located then leads towards the entrance to Mission Cove passing: NNE of Bluff Point (13 miles S).
When Mission Cove is open the track then leads S into the centre of the cove.
- 3 **Anchorage.** There is good anchorage in Mission Cove midway between the two entrance points in a depth of 9 m, soft mud.
Anchorage is also available in the SE part of the cove off the mission station ruins, in depths of about 8 m.
Former mined area, see 4.238.

Mackenzie Anchorage

4.250

- 1 **General information.** Mackenzie Anchorage (14°02'S 126°32'E), S of Louis Islands, affords good shelter.
Tidal streams in this anchorage are reported to be weaker than in any other part of Napier Broome Bay.
- 4.251**
- 1 **Directions.** (continued from 4.244) From SE of Scorpion Point the fairway leads SSW passing (with positions given from Scorpion Island summit):
WNW of West Governor Island (6 miles SE); thence:
ESE of Carronade Island (4½ miles SSW) noting the 3.2 m patch 5 cables ENE; the island should be given a clearance of at least 1 mile; thence:
2 WNW of a 6.6 m patch (7½ miles S); thence:
ESE of the shoal bank fronting Bird Island (9½ miles SSW), sandy and covered with scrub.
When Bird Island bears 314° the track leads W to the anchorage passing between Bird Island and Pearl Shoal (12 miles SSW).
Anchorage can be obtained in depths of from 9 to 18 m.

West Bay

4.252

- 1 **General information.** West Bay is entered between Guy Point (14°05'S 126°31'E) and an un-named point 2 miles NW. The SE shore of the bay is firm but the remainder is lined with mangroves except where interrupted by sandy beaches and rocky patches. The area is inhabited by numerous large crocodiles and extreme care should be taken if landing in a small boat.
- 2 **Local knowledge** is required.
Anchorage can be obtained in the centre of the bay, 1¼ miles W of Guy Point, in a depth of 7 m, mud.
Caution. The W side of the bay is shoal.

Deep Bay**4.253**

- 1 **General information.** Deep Bay, is entered between Bluff Point (14°05'S 126°39'E) and Guy Point, 7½ miles W.

Local knowledge is required.

Sheltered anchorage with good holding can be obtained in Deep Bay, 2 miles S of the E extremity of Guy Point (14°05'S 126°31'E), in depths of from 5 to 9 m, mud.

- 2 **King Edward River,** entered E of King Harman Point (14°08'S 126°34'E) flows into the head of Deep Bay. Mud banks extend across the estuary, the approaches to which have depths less than 2 m.

Drysdale River and approaches**4.254**

- 1 Drysdale River estuary entered between Curran Point (13°56'S 126°48'E) and Beauty Point, 2½ miles S, is nearly blocked by sandbanks and mangrove covered islands. The area is unsurveyed but there have been reported depths of from 5 to 27 m within the bar. About 15 miles up the river is blocked by a natural barrage of rocks.

- 2 **Topography.** On the N side between Curran Point, which is backed by white sandhills with a distinctive patch of white sand close N, and Cape Talbot, 9 miles NNW, the coast is generally rocky. On the S side between Beauty Point and Galley Point, 5 miles W, the coast is low and wooded. A reef extends 8 cables N from Galley Point.

- 3 **Caution.** Governor Islands (13°56'S 126°42'E) (4.237) should be approached with caution as dangers may exist for some distance NE and E of them. The channel between the two islands and the reef extending N from Galley Point is shoal, rocky and uneven.

4.255

- 1 **Circular Cove** (13°54'S 126°34'E), on the N side of Geranium Harbour (4.246), is 5 cables in diameter; it has not been closely examined.

Approach is in mid-channel in apparent depths of about 3 m.

The bay W of Circular Cove has not been examined. Rocks lie off the W entrance to this bay.

4.256

- 1 **Anjo Cove,** immediately W of Anjo Point (13°57'S 126°35'E) is 6 cables wide at its entrance but narrows considerably towards its head.

Anchorage can be obtained close within the entrance.

Vansittart Bay**General information****4.257**

- 1 **Description.** Vansittart Bay is formed by an indentation of the coast about 20 miles W of Napier Broome Bay and is entered between Mary Island (13°59'S 126°23'E) and a point on Bougainville Peninsula, 9 miles W.

4.258

- 1 **Topography.** Mary Island, 8 m high, is connected to the mainland SE by reef. The E shore of Vansittart Bay is low and rocky. Several smaller bays indent the W shore and head of the bay.

4.259

- 1 **Surveys.** The bay is inadequately surveyed and, in parts, unsurveyed.

4.260

- 1 **Pearl Farming.** Pearl culture farms which may be fixed or moving structures are in several locations within the bay. See the large scale national chart for details. See also 1.8.

4.261**1 Landmark:**

Eclipse Hill Island (13°57'S 126°17'E), which rises to a flat top summit, the W-most of Eclipse Islands.

Directions**4.262**

- 1 **Caution.** The area N of a line joining Cape Bougainville and Jones Island (13°46'S 126°21'E) has been surveyed but great care must be exercised when navigating S of that line.

4.263

- 1 From a position about 3 miles S of Troughton Island (13°45'S 126°09'E) the passage to the entrance of Vansittart Bay leads SSE passing midway between Bougainville Peninsula and the reef extending W from Eclipse Islands. These islands form the E side of the main approach and lie at the S end of reef, drying up to 2.9 m in places, which extends about 14 miles S from Jones Island (13°46'S 126°21'E). Long Island, the S-most of the group, has a rugged appearance.

4.264

- 1 **Useful marks:**

Islet (14°04'S 126°19'E), 3 m high, covered in guano, coloured white and prominent lies near the edge of the reef.

Jar Island (14°09'S 126°14'E) composed of enormous sandstone boulders of a reddish-yellow colour, easily identified when entering the bay.

Side channel**4.265**

- 1 **General information.** A passage suitable for small coasting vessels is reported to exist between Eclipse Islands and the mainland. It can be used when passing from the W entrance of Geranium Harbour to Vansittart Bay, passing E of Middle Rock (13°58'S 126°21'E).

Local knowledge is essential.

- 2 **Caution.** It must be borne in mind that this area has not been adequately surveyed, and is in parts unsurveyed, the utmost caution must be exercised.

Anchorage**4.266**

- 1 There is good anchorage, where the sea breeze is felt, in the middle of the entrance to Vansittart Bay in depths of from 13 to 16 m, mud.

Anchorage can be obtained about 1¼ miles N of Jar Island (14°09'S 126°14'E) in a depth of 15 m.

- 2 Good anchorage is also available S of Low Island (14°10'S 126°18'E) in depths of from 7 to 9 m, mud. Approach to this latter anchorage is through a channel with depths of more than 11 m between Jar and Low Islands.

Caution. Waratah Shoal lies in mid-channel, the deeper water lies to the W.

Freshwater Bay**4.267**

- 1 Freshwater Bay (14°00'S 126°12'E) lies immediately S of the W entrance point of Vansittart Bay. There is a prominent round-topped hill at the head of the bay. Pearl farming is conducted within the bay, see 4.260 and 1.8.

Sheltered anchorage can be obtained 2 miles W of the S entrance point in 7 m.

Caution. A depth of 8.8 m lies in the middle of the entrance to the bay.

Seafflower Bay

4.268

- 1 Seafflower Bay, separated from Freshwater Bay by a hilly wooded peninsula, is entered between August Point (14°05'S 126°13'E) and a point 2 miles N. The head of the bay is divided by a peninsula into two smaller bays. The N entrance point to Seafflower Bay is rocky and there is a distinctive flat-topped hill on August Point. Pearl farming is conducted within the bay, see 4.260 and 1.8.

- 2 **Anchorage.** It would appear that there is an anchorage in the outer part of this bay in depths of from 8 to 14 m, also S of the peninsula at the head of the bay in depths of from 5 to 7 m, and N of this peninsula in depths of from 7 to 11 m.

In 1986 sheltered anchorage was found by the drill ship *Regional Endeavour*, 11 000 grt, about 1 mile ENE of the E extremity of the peninsula which divides Seafflower Bay.

Encounter Cove

4.269

- 1 Encounter Cove is entered between September Point (14°07'S 126°13'E) and a point 1¼ miles SSW; the inner part of the cove and its S shore are shoal and foul.

Anchorage appears to be obtainable just within the entrance to the cove in depths of from 9 to 13 m, mud.

ADMIRALTY GULF AND APPROACHES

General information

Charts Aus 318, Aus 320 (see 1.16)

Description

4.270

- 1 Admiralty Gulf is entered between Gibson Point (14°00'S 125°58'E) and Cape Voltaire, 28 miles SW. Parry Harbour (4.295) lies on the E side of the N approach to the gulf and Port Warrender (4.297) lies at the head of the gulf. Both harbours afford good anchorage.

Approach. Admiralty Gulf is approached from N through Troughton Passage and from W by the channels between Long Reef and Cape Voltaire.

Topography

4.271

- 1 **North approach.** The coast between Cape Bougainville (13°54'S 126°05'E) and Gibson Point, 9 miles SW, on the E side of the approach is considerably indented, the land within rising to flat-topped ridges from 60 to 130 m high.

Long Reef, composed of coral with sand in the middle which dries about 3 m, forms the W side of the N approach. Sand Island (13°51'S 125°48'E) lies on its N part, 3 miles S of the N extremity.

4.272

- 1 **Admiralty Gulf.** Osborne Islands lie off the E side of the gulf from 13 to 27 miles S of Gibson Point. Middle Osborne Island, the largest of the group, lies with its N extremity 17 miles S of Gibson Point and has a bluff, 190 m high, on its W side. Steep Head Island (4.287), the S-most island of the group, is a useful mark.

- 2 Institut Islands, including Montesquieu Islands to the N and Kingsmill Islands (4.300) to the E, are a group of islands, islets and rocks lying between Cape Voltaire (14°16'S 125°34'E) and the S side of Long Reef. The larger islands are covered with bushes and stunted trees and, from all points of view, have flat-topped summits. Corneille Island (14°11'S 125°44'E) is the highest island in the group and is a useful mark for Fenelon and Oyster Rock Passages.

- 3 Pascal Island (14°04'S 125°39'E) has a sharp conical peak, capped with ironstone, and is prominent being the only island in the group with a distinctive volcanic shape. It is a useful mark for Fenelon Passage.

4.273

- 1 **West entrance.** Cape Voltaire (14°16'S 125°34'E) is the NW extremity of a peninsula separating Admiralty Gulf from Montague Sound. Flat Hill, a useful mark 122 m high, stands 2¾ miles ENE, and Sharp Peak stands 2 miles SSE, respectively, of the cape.

Cassini Island (13°57'S 125°38'E) (4.304) lies off the W side of Long Reef and, apart from Long Reef, is the N-most danger off the W entrance to Admiralty Gulf.

Historic wreck

4.274

- 1 An historic wreck lies off the S extremity of Middle Osborne Island (14°20'S 126°01'E), see 1.60.

Passages

4.275

- 1 There are three passages in the W entrance, named from N to S between Long Reef and Cape Voltaire; Oyster Rock Passage (4.292), Fenelon Passage (4.290) and Voltaire Passage (4.294).

Caution must be exercised when navigating these passages at LW spring tides in vessels with draughts of more than 4 m as the bottom is very uneven, the sea thickly impregnated with lime, and nothing as a rule can be seen 1 m below the surface. It is possible that dangers other than those charted may exist.

4.276

- 1 **Preferred passage.** Fenelon Passage, between Fenelon Island (14°08'S 125°42'E) and Descartes Island, 1½ miles SSW, is the preferred passage through the Institut group providing access to Admiralty Gulf and Port Warrender. The channel is relatively deep at its centre and the surrounding islands provide excellent marks.

Surveys

4.277

- 1 The E side of the gulf and parts of the SW side have not been adequately surveyed, and are in parts unsurveyed. See information on the large scale national chart.

Pearl Farming

4.278

- 1 Pearl culture farms which may be fixed or moving structures are in several locations within the gulf. See the large scale national chart for details. See also 1.8.

Natural conditions

4.279

- 1 **Tidal streams** in the vicinity of Low Rocks (14°04'S 125°52'E) and Tancred Bank, 2 miles SE, attain a rate of from 2 to 3 kn at springs with tide-rips occurring around Tancred Bank, the stream directions vary as the area lies at the junction of Troughton Passage and Oyster Rock Passage.

- 2 In Oyster Rock Passage the streams generally follow the line of the passage, the rising stream sets SE and the falling stream NW at a rate of 2 to 3 kn at springs. A pronounced tide rip exists between 5 cables to 1 mile E of Cassini Island (13°57'S 125°38'E) and eddies are prevalent near the reefs off the N and S sides.

- 3 In Fenelon Passage the stream sets SE through the gap between Fenelon and Descartes Islands during the rising tide and W to NW on the falling tide at a rate of 2 to 3 kn at springs. In the vicinity of Baudin Island (14°08'S

125°36'E) the stream sets S and W on the rising tide commencing about 20 minutes before LW. On the falling tide the stream sets N and E and commences 2 hours before HW. The stream close N of Corneille Island (14°11'S 125°44'E) sets in a 060° direction on the rising tide at a rate of 1½ kn.

- 4 In Voltaire Passage the streams generally follow the line of the passage setting E during the rising tide and W during the falling tide.

4.280

- 1 **Waves.** When the tidal streams in Voltaire Passage and Oyster Rock Passage are opposed by a fresh wind, dangerous steep-sided waves, up to 2 m high, are generated.

Bush fires. See 4.228.

Directions

(continued from 4.231)

North approach

4.281

- 1 From a position about 3 miles S of Troughton Island (13°45'S 126°09'E) the passage to Admiralty Gulf leads initially WSW passing (with positions given from Hat Point (13°56'S 126°01'E)):

- 2 NNW of the spit (6½ miles NE), often marked by disturbed water, extending 2½ miles N from Cape Bougainville (4.225). Eyre Reef, which dries, and Bougainville Reef lie at the NE and NW extremities of this spit and are the N-most dangers off the cape. The sea is reported not to break on Bougainville Reef. Thence:

- 3 NNW of a 5-3 m shoal (3½ miles NNE); the bottom is very uneven in this area and tide-rips are numerous; thence:

To a point 6 miles NW of Hat Point.

The passage then leads S passing:

Between Hat Point and Sand Island (12½ miles WNW).

- 4 W of Fury Rock (3½ miles SSW) noting the 9-1 m patch lying 1¼ miles N of the rock; thence:
W of Gibson Point (5 miles SSW); thence:
E of Low Rocks (11½ miles SW) (4.299) a group of white rocks lying off the SE end of Long Reef.

4.282

- 1 **Useful mark:**

Isolated hill, 52 m high, shaped like a Tyrolese hat, the only noticeable landmark in the neighbourhood, 1¼ miles E of Hat Point (13°56'S 126°01'E).

(Directions continue for Port Warrender at 4.286)

Low Rocks to Fenelon Passage

4.283

- 1 **Routes.** From E of Low Rocks (14°04'S 125°52'E) the routes to Fenelon Passage lead generally SW passing N or S of Kingsmill Islands. The route passing S of the islands is described below.

4.284

- 1 From a position E of Low Rocks the route continues initially S passing (with positions given from Corneille Island summit (14°11'S 125°44'E)):

Clear of Tancred Bank (11½ miles ENE); thence:

E of Forrest Rock (9 miles ENE).

The line of bearing 070°, astern, of the right hand edge of the bluff (129 m high) (14°06'S 126°02'E) then leads WSW passing:

- 2 SSE of a shoal with a least depth of 7.5 m lying 1½ miles NE of Lafontaine Island (3 miles ENE) (4.300).

NNW of White Island (5½ miles E), noting the 9-1 m patch lying 4 cables N; and:

SSE of Lafontaine Island noting the shoal with a least depth of 0.1 m lying close SE of the island; thence:

- 3 NNW of Lagrange Island (2½ miles SE) (4.288) surrounded by an extensive drying reef, noting the 9-1 m patch 7 cables N; thence:

SSE of Corneille Island noting the 5.3 m patch (4.290) which lies 6 cables SW of the island.

4.285

- 1 **Leading mark:**

The line of bearing 250° of Flat Hill (14°15'S 125°37'E), 122 m high, leads in the passage between Corneille Island and Kingsmill Islands to the N, and Lagrange Island and White Island to the S.

(Directions for Fenelon Passage continue at 4.290)

Low Rocks to Port Warrender

4.286

- 1 From a position E of Low Rocks (14°04'S 125°52'E) the passage continues generally S passing (with positions given from Crystal Head (14°28'S 125°51'E)):

Clear of Tancred Bank (22½ miles N); thence:

E of Forrest Rock (20½ miles N); thence:

- 2 E of a drying reef, with a rock at its N end, lying 6 cables E of White Island (16 miles N); thence:
Between Borda Island (15 miles NE) and a 4.5 m patch (13 miles N) lying 2¼ miles ESE of Moliere Island; thence:

- 3 E of Racine Island (11½ miles N) and Berthoud Island (10½ miles N); thence:

W of West Rock (8½ miles NNE), the W-most of the Osborne Islands; thence:

W of South West Osborne Island, a shoal patch (6½ miles NE) extends about 5 cables NNW from its SW extremity; thence:

- 4 E of a detached reef, drying 5-6 m, lying 8 cables NNE of Crystal Head, a steep rugged flat-topped promontory; thence:

To anchorage in Port Warrender (4.297).

4.287

- 1 **Useful mark:**

Steep Head Island (14°27'S 126°00'E) remarkable for its precipitous form.

Port Warrender to Fenelon Passage

4.288

- 1 From a position E of the detached reef lying 8 cables NNE of Crystal Head the passage through Admiralty Gulf to Fenelon Passage leads NW passing (with positions given from Corneille Island summit (14°11'S 125°44'E)):

SW of Berthoud Island (8½ miles SE) noting the 10.3 m shoal lying 1 mile SSW of the island; thence:

- 2 Between Parry Island (8½ miles SSE) and Racine Island (7 miles SE); thence:

Between Bigge Point (6 miles S) fringed with rocks and an island (4½ miles SE), 21 m high; thence:

- 3 Between a detached 7.8 m shoal (4 miles S) and the extremity of the spit (3 miles SSE), with depths of less than 5 m over it, extending 1½ miles SW from Lagrange Island (2½ miles SE). During spring tides the spit is marked by tide-rips and, when a strong

wind opposes the tidal stream, by a steep sea.
Thence:

To a position on the line of bearing 024° of the E edge of Corneille Island.

4.289

1 Useful mark:

Steep Head Island (14°27'S 126°00'E) (4.287).

Fenelon Passage and west approach

4.290

1 From a position SSW of Corneille Island the line of bearing 337° of Pascal Island (14°04'S 125°39'E) ahead, or the line of bearing 157° of the W end of Parry Island (14°19'S 125°46'E) astern, leads through Fenelon Passage passing (with positions given from Corneille Island summit (14°11'S 125°44'E)):

2 WSW of Corneille Island, noting the 5.3 m patch lying 6 cables SW of the island; thence:

Between Descartes Island (3 miles W) and Flat Island (2½ miles NW). An islet, 11 m high, lies 1 mile NW of Descartes Island and a 2.1 m patch close E. Thence:

3 Between a shoal with a least depth of 7.9 m over it (4 miles WNW) and the rock (21 m high) (3½ miles NW) lying close off the SW extremity of Fenelon Island (3 miles NNW) (4.302).

4 When the S extremity of Fenelon Island, bears 119° astern, the track then leads WNW in the W approach to Fenelon Passage passing (with positions given from Corneille Island summit):

NNE of Bullara Rock (5½ miles WNW); thence:
SSW of a 6.7 m shoal (7 miles NW) lying 1½ miles S of Pascal Island (4.272); thence:

NNE of Baudin Island (8 miles WNW) (4.303).

4.291

1 The passage then continues generally W passing:

Clear of Condillac Island (11½ miles WNW) with a summit like a table top, noting the shoal with a depth of 5.5 m, lying 6 cables N, and Randall Island, 2½ miles SSE, with a remarkable hump, 15 m high, near its S end. Thence:

2 Clear of Jamieson Reef (14°04'S 125°21'E) (4.310) and Ingram Reef (14°07'S 125°16'E) (4.310) to join the main coastal route SW off Bonaparte Archipelago.

Side channels

Oyster Rock Passage

4.292

1 **General information.** Oyster Rock Passage, between Oyster Rock (14°04'S 125°46'E) and the S side of Long Reef, provides access to Admiralty Gulf. It contains the widest and deepest channel, however, the lack of useful marks within the passage is a disadvantage.

Approach to Oyster Rock Passage should be made from SE.

4.293

1 **Caution.** See 4.280.

Directions. From a position SW of Low Rocks (14°04'S 125°52'E) the route leads initially NW passing (with positions given from Pascal Island (14°04'S 125°39'E) (4.272)):

2 SW of the 10 m depth contour joining Low Rocks to Long Reef; thence:

NE of Oyster Rock (7 miles E) a small black rock its top whitened by birds. Ivy Rock, a small coral

head, lies 4 cables farther SSE on the E edge of the same bank.

3 On the alignment (204°) of Oyster Rock with the W extremity of Corneille Island (14°11'S 125°44'E) the line of bearing 103° of Low Rocks, astern, then leads in the fairway along the S side of Long Reef, whose position is indicated at LW springs by breaking waves and drying coral heads, passing:

4 NNE of Lee Rock (7¼ miles E) which sometimes is discernible by a slight tide rip near LW springs.

When the W side of Oliver Island (14°05'S 125°44'E) bears 190° and the S end of Cassini Island (13°57'S 125°38'E) bears 303°, the track then leads W passing:

NNE of Pascal Island.

S of Cassini Island (6½ miles N); thence:

5 Between Condillac Island (6 miles WSW), noting the shoal patch (5.5 m) lying 6 cables N of the island, and Oliver Rock (7½ miles NW); the sea does not break over this latter danger.

Voltaire Passage

4.294

1 **Caution.** See 4.280.

General information. Voltaire Passage lies between Dice Rock (14°12'S 125°39'E), a remarkable cubic-shaped rock, 6 m high, and Monge Island, 3 miles W, on the N, and Lavoisier Island (14°13'S 125°39'E) and the mainland on the S. Voltaire Passage is the least recommended passage and should be used only by small coasting vessels.

Local knowledge is required.

2 **Dangers.** A shoal with a depth of 2.7 m lies in the centre of Voltaire Passage 5 cables N of Lavoisier Island; the deeper water lies to the S of the shoal.

Bays, anchorages and landings

Parry Harbour

4.295

1 **Description.** Parry Harbour, entered between Hat Point (13°56'S 126°01'E) and Gibson Point, 5 miles SSW, affords shelter to small vessels in all weathers.

Topography. The bay is divided into two arms by a hilly peninsula; the SW arm being shoal. Hecla Island (13°59'S 126°00'E), 23 m high, lies at the S side of the entrance, 2 miles NE of Gibson Point.

Depths of more than 7 m over a width of 7½ cables are to be found for a distance of 3½ miles within the entrance.

4.296

1 **Directions.** Pass 2 miles N of Fury Rock (13°59'S 125°59'E) noting the shoal patch (9.1 m) (4.281) lying 1¼ miles N of the rock, then keep in mid-channel between Hat Point and Hecla Island.

Anchorage can be obtained as convenient N of the peninsula in depths of from 7 to 11 m, mud.

Landing can be effected, in calm weather, over the rock face on the W side of Hat Point; also at HW on the beach on the SE side of the point.

Port Warrender

4.297

1 **Description.** Port Warrender, a secure harbour, lies in the area S and SE of Crystal Head (14°28'S 125°51'E). The E side of the port is formed by a reef with drying patches on it extending from a point on the coast 8 miles SSE of Crystal Head, W and N round the coast with Malcolm and Bignell Islands lying on it.

2 A sand bar extends across the head of the port, Myres Island stands on this bar 7½ miles SSE of Crystal Head.

Between the reef at the E of the port and the W shore the port appears to be free from dangers.

Anchorage can be obtained in the area S of Crystal Head in depths of from 7 to 30 m.

- 3 **Recommended berth** lies about 6 cables SSW of the SE extremity of Crystal Head in a depth of 7 m, mud and clay. Approach to this anchorage should be made on a NW course with Malcolm Island bearing 126°, astern.

Walmesly Bay

4.298

- 1 **General information.** Walmesly Bay, entered between Bigge Point (14°17'S 125°44'E) and Pickering Point, 8 miles S, is inadequately surveyed, and in parts unsurveyed. Parry Island lies 3 miles SE of Bigge Point; the area between the island and the mainland W of it appears to be foul.

- 2 Mitchell River, which flows into the head of Walmesly Bay, is about 60 miles in length. The river was explored in 1918 for a distance of 10 miles and depths of 10 m were found for the first 5 miles. Beyond this the river is suitable only for small craft.

- 3 The two bays lying to the E of Walmesly Bay, between Pickering Point (14°25'S 125°45'E) and Crystal Head, 6 miles ESE, have not been surveyed.

The W of these two bays is foul.

Low Rocks

4.299

- 1 **General information.** Low Rocks (14°04'S 125°52'E) are a group of white quartzite rocks lying 3 miles SE of Long Reef. The highest point of these rocks is a flat-topped boulder, 5 m high, on the SE rock. The remainder of the SE rock is covered by long grass and birds' nests and is a haven for sea birds.

- 2 **Landing.** A drying reef virtually surrounds the rocks with the exception of the SW corner of the SE rock, where a sandy beach provides good landing for small craft.

Kingsmill Islands

4.300

- 1 **General information.** Kingsmill Islands consist of two main islands and a smaller islet, together with several rocks, all lying close together. Lafontaine Island (14°10'S 125°47'E) the E-most and largest of the group is covered by scrub and small bushes. The W island, unnamed 33 m high, lies 5 cables W of the W extremity of Lafontaine Island, and an islet 34 m high, lies close off its N extremity.

- 2 A broad shoal of sand, coral and rocks which dry, lies between the S ends of Lafontaine Island and the W island. North of this bar there are depths exceeding 10 m.

Anchorage. The bay W of Lafontaine Island, N of the shoal, provides one of the most protected anchorages in the Institut group. The holding ground is good and the bay is sheltered from all but S conditions.

- 3 The bay can be entered from S, noting the 0.1 m patch 4 cables S of the W Island, by keeping between 1 and 2 cables E of the W island until N of the bar, or by keeping between 1 and 2 cables W of Lafontaine Island until clear of the reef.

Local knowledge is required.

Corneille Island

4.301

- 1 The W coast of Corneille Island (14°11'S 124°44'E) is steep and rocky, a reef with a rock, 5 m high, on it extends 5 cables SE from the island.

Anchorage can be obtained 4 cables off the W side of the island in 28 m.

Good landing can be found on the beaches on the W coast.

Fenelon Island

4.302

- 1 **Anchorage**, well sheltered from the SE and out of the strength of the tidal streams, can be obtained 2 cables off the SW point of Fenelon Island (14°08'S 125°42'E) under the lee of the 21 m high rock to the S, in 18 m, mud. A good holding anchorage can also be found close off the cliffs 4 cables N of the same point, in 15 m.

- 2 Anchorage can be also be obtained 2 cables off the NE side of the island in 21 m. Approach to this anchorage should be made on the line of bearing 270° of a cleft in the hills N of the island's summit, noting the rock which dries 2.9 m lying 3 cables off the NE extremity of the island.

Baudin Island

4.303

- 1 Baudin Island (14°08'S 125°36'E) is fringed by a coral reef, and rocks which dry, except on its SE side.

Anchorage can be obtained 2½ cables off a sandy beach on the SE side of the island, on the alignment (295°) of the S extremity of Baudin Island with the S extremity of Condillac Island, 3½ miles farther WNW, in a depth of 27 m, sand.

Landing can be found on the sandy beach on the SE side of the island.

Cassini Island

4.304

- 1 **Anchorage** can be obtained in the entrance to a bay on the NE side of Cassini Island (13°57'S 125°38'E) in 15 m, sand and rock, also 9 cables NE from the NW corner of the same bay, in 42 m.

- 2 **Landing** exists on the beach at the NW side of the bay on the NE side of the island. Good landing can be obtained on a beach at the head of a lagoon on the N side of the island, which can be entered by boat, except at LW spring tides, passing close to the point at the NE end of the island.

Reasonable landing can also be obtained on the beach at the SE corner of the island, but it should be avoided when winds are strong onshore as sea conditions become hazardous to small craft.

Krait Bay

4.305

- 1 **Anchorage** can be obtained 4 cables NW of Davidsons Point (14°15'S 125°35'E), the SW entrance point to Krait Bay, in 33 m, sand. The anchorage is sheltered from NE to SE but is exposed to the tidal streams setting in and out of Voltaire Passage.

Caution. Rattlesnake Shoal lies 1½ miles W of Davidsons Point.

- 2 Krait Bay, entered between Davidsons Point and a rocky point 4 cables NE affords sheltered anchorage to small craft in all weathers, except NW, in depths of 6 m.

Caution. A drying reef exists on the N and E sides of the bay and a reef, which dries 1.5 m, lies close within the S side of the entrance.

Landing. A sandy beach on the S shore affords good landing at HW.

PENGUIN SHOAL TO AUGUSTUS ISLAND

General information

Chart Aus 413

Route

4.306

- 1 From N of Penguin Shoal (13°05'S 125°59'E) (4.43) the route leads initially WSW, about 25 miles, off the NW side of Holothuria Banks to a position WNW of Bassett-Smith Shoal.

The route then divides into three, the S-most track passing NW of Bonaparte Archipelago to a position about 11 miles W of Wildcat Reefs, about 160 miles SW.

- 2 **Deep-draught vessels** making for Port of Cockatoo Island (5.92) are advised to use the offshore routes passing W of Adèle Island (15°31'S 123°09'E), see 4.58.

Bonaparte Archipelago

4.307

- 1 Bonaparte Archipelago comprises all the islands, islets and rocks lying off Montague Sound (4.311), York Sound (4.320) and Brunswick Bay (4.333) and was so named by Commodore Baudin of the French navy during his survey of 1801 to 1803.

- 2 **Caution.** The waters within Bonaparte Archipelago and the coastal areas on which it borders are inadequately surveyed, and in parts unsurveyed, see information on the large scale national charts.

Natural conditions

4.308

- 1 **Tides.** The tidal rise along the coast within the Bonaparte Archipelago attains heights as great as 8.5 m at MHWS and causes a considerable difference in the coastline and shoal areas between HW and LW.

Tidal streams set through the narrower channels with considerable force and tide rips are common near some of the outer dangers.

- 2 **Turbid water.** The banks and reefs between Robroy Reefs (14°27'S 124°52'E) and Montalivet Islands, 27 miles ENE, are steep-to whilst the water is usually turbid. Great care, therefore, is necessary when navigating in this area.

Radar anomalous propagation conditions frequently exist in Bonaparte Archipelago during the NW Monsoon period. Under such conditions the coast can be clearly detected by navigational radar in excess of 48 miles.

Directions

(continued from 4.45 and 4.220)

Chart Aus 319, Aus 320

Penguin Shoal to Bassett-Smith Shoal

4.309

- 1 For details see 4.63.

Bassett-Smith Shoal to Wildcat Reefs

4.310

- 1 From a position about 12 miles WNW of Bassett-Smith Shoal (13°18'S 125°45'S) the coastal track leads SW passing (with positions given from Colbert Island (14°52'S 124°43'E)):

NW of Jamieson Reef (14°04'S 125°21'E) with a sand cay on its E side; thence:

- 2 NW of Ingram Reef (14°07'S 125°16'E) a coral patch awash; the sea does not break on this reef until nearly LW spring tides and there is nothing in the appearance of the water to indicate danger, soundings give no warning. Thence:

NW of Heritage (Albert) Reef (14°15'S 125°10'E); thence:

- 3 NW of Maret Islands, the N island (31 miles NNE) has a flat top; thence:

NW of Robroy Reefs, a sand cay on the N reef (27 miles NNE) dries 4.8 m; thence:

NW of Colbert Island and associated dangers (4.322); thence:

- 4 NW of Keraudren Island (4½ miles SSW) and associated dangers, an unnamed island (27 m high) lies close W; thence:

NW of De Freycinet Island (13 miles WSW) and associated dangers, the island can be easily identified by its resemblance to an inverted basin; thence:

- 5 NW of a 5.6 m shoal (19½ miles WSW); thence: NW of White Island (25½ miles WSW) covered with guano; thence:

NW of Osborn Reefs (34 miles WSW) the outer-most set of reefs extending NW from Red Island (34 miles SW) (4.335); thence:

- 6 NW of Degerando Island (15°20'S 124°12'E), a light (white round metal house, 6 m in height) is exhibited from the W end of the island. Wildcat Reefs and a shoal (6.8 m) lie up to 8 miles NW from the island and are the closest dangers SW of the track. Thence:

To a position 11 miles W of Wildcat Reefs.

(Directions continue at 5.39)

Montague Sound

Chart Aus 320 (see 1.16)

General information

4.311

- 1 **Description.** Montague Sound is the area of water between the peninsula of which Cape Voltaire (14°16'S 125°34'E) is the NW extremity, and the E coast of Bigge Island, 26 miles SW., A number of islets and reefs lie NE of Bigge Island. The sound is encumbered with islets and rocks.

- 2 **Tidal streams** in the neighbourhood of Maret Islands (14°25'S 124°59'E) and Montalivet Islands, 20 miles NE, are strong and set SSW on the rising tide and NNE on the falling tide.

Pearl Farming. Pearl culture farms which may be fixed or moving structures are in several locations within the sound. See the large scale national chart for details. See also 1.8.

Montalivet group

4.312

- 1 **General information.** The Montalivet group, the outer-most of the islands in the N approach to Montague Sound, lie centred about 19 miles W of Cape Voltaire and consist of five principal islands. The group comprises East Montalivet Island with Don Island, 76 m high, and Patricia Island close NW, connected to each other by a reef awash, together with Walker Island, 34 m high, and West Montalivet Island, 76 m high.

- 2 East Montalivet Island, the largest of the group, has a flat top and its SW extremity is a prominent dark cliff, 18 m high.

Offshore dangers N of Montalivet group. A sand cay (12 m high) lies 1 mile NE of Patricia Island (14°16'S 125°19'E). Wolf Rock, a remarkable wall sided rock, 9 m in diameter, lies 4 miles ENE of the same island.

- 3 Heritage Reef lies 4 miles NW of West Montalivet Island (14°18'S 125°13'E) and is the W-most danger off the Montalivet group.

Anchorage can be obtained off a sandy beach on the SE side of West Montalivet Island in a depth of 12 m, there is good landing on this sandy beach. Snakes abound on this island.

- 4 Anchorage can also be obtained, by small coasting vessels, off a sandy beach at the SSE extremity of East Montalivet Island.

Swift Bay

4.313

- 1 **General information.** Swift Bay (14°31'S 125°34'E) in the SE corner of Montague Sound affords secure anchorage. Pearl farming; see 4.311.

Local knowledge is required since the bay is unsurveyed.

- 2 **Topography.** Murrangingi Island (23 m high) lies close offshore 6 miles S of Cape Voltaire (14°16'S 125°34'E) with a number of islets or rocks between its E side and the shore. Tancred Island (14°20'S 125°25'E), a prominent rugged island with a well defined summit having two remarkable fissures in a NW and SE direction, with Biddles Rock 2 miles farther NW, lies on the W side of the N approach to Swift Bay.

- 3 **Approach** to Swift Bay is through a wide channel between Cape Voltaire and the NE entrance point of Swift Bay, 15 miles S, on the E, and Water Island (14°21'S 121°30'E) and Katers Island, 5 miles S, on the W.

Depths in the fairway are from 12.8 to 30 m.

Anchorage can be obtained between Katers Island (14°28'S 125°32'E) and the mainland E in depths of 14 m, mud.

- 4 There is more secure anchorage in Swift Bay in depths of from 7 to 13 m, mud.

Landing can be obtained on the SE side of Water Island where there is a small sandy beach. A reef awash extends 1½ cables from the NE side of the island.

4.314

- 1 **Side channels.** Between the S side of Katers Island and the mainland there is an unsurveyed channel, 1 mile wide, with reported depths of from 5.5 to 15 m.

Approach to this channel lies between Trochus Island (14°29'S 125°29'E) surrounded by a reef on the W, and Katers Island on the E.

- 2 **Dangers.** A rock lies off the NE side of Trochus Island, and a rocky reef extending from the NW extremity of Katers Island restrict the width of the approach to the W channel into Swift Bay to 7½ cables.

Mudge Bay

4.315

- 1 **General information.** Mudge Bay (14°32'S 125°23'E) is a deep indentation on the coast 5 miles WSW of Wollaston Island (14°30'S 125°28'E).

Local knowledge is required as the bay is unsurveyed.

Combe Hill Island (14°30'S 125°20'E) and other islets lie off the N extremity of the peninsula (134 m high) which forms the W side of the bay.

- 2 **Depths** in the bay range from 7 to 15 m.

Dangers. A drying reef and a rock awash (reported 1988) lie 2½ miles SE of the W entrance point.

Anchorage can be obtained in the bay.

Scott Strait

General information

4.316

- 1 **Description.** Scott Strait, the channel separating Bigge Island (14°35'S 125°10'E) from the mainland.

Local knowledge is required and mariners should proceed with the utmost caution as large areas of the strait remain unsurveyed; see information on the large scale national chart.

4.317

- 1 **Topography.** The E shore from a point 1 mile SSW of Capstan Island (14°35'S 125°16'E), high and rocky, to Cape Pond (14°44'S 125°09'E) is composed of broken rock fronted by numerous islets and rocks. There are two bays fronted by several islets between Capstan Island and the W entrance point to Mudge Bay, 6 miles NE; they have not been examined. Augereau Island (14°45'S 125°08'E) lies 2 miles SW of Cape Pond and forms the SE entrance point to the strait.

- 2 A chain of islets and rocks extends NE from the NE side of Bigge Island terminating in Prudhoe Islands, the largest of which has a black well defined summit, 85 m high, lying 5½ miles ENE of Cape Chateaufort (14°27'S 125°10'E), the N extremity of Bigge Island. Prudhoe Rocks lie on a reef, 1 mile N of the largest Prudhoe Island. Branch Island, 18 m high, lies on the W side of the N approach to Scott Strait, 1¼ miles SE of the largest Prudhoe Island. Clerk and Bishop Islands lie in the N approach to Scott Strait, 3 miles ENE and 4 miles E, respectively, from the NE extremity of the largest Prudhoe Island.

- 3 Bigge Island, which forms the W side of Montague Sound and Scott Strait, is rugged and barren, the rocks on the island are heaped up in a confused manner with deep fissures in every direction. The coast is rugged and rocky with occasional small sandy beaches. Savage Hill, near the S extremity, is 143 m high and table-topped. A chain of islets and rocks terminating in an islet (82 m high), 2½ miles NE of Bigge Island, lie from 1 to 2 miles off the E side of the island, on the W side of the strait. Numerous islets and rocks extend 7 miles SSW from the S extremity of the island, and form the SW side of the strait. Passages which may exist between these dangers have not been examined.

- 4 Lamarck Island (14°47'S 125°01'E) and an islet from which a reef extends 1 mile SW, 6½ miles E, lie on the W and E sides, respectively, of the S approach to Scott Strait.

4.318

- 1 **Depths** in the fairway of Scott Strait are irregular, the greatest depths, from 18 to 25 m, are near the E shore.

4.319

- 1 **Dangers.** An islet, 5 m high, lies in the N approach 2½ miles SE of Branch Island (14°26'S 125°17'E).

Numerous rocks, and reefs which dry, lie in the fairway of Scott Strait and restrict its width to about 2½ cables in places. The water is muddy.

Tidal streams are strong.

York Sound

General information

4.320

- 1 **Description.** York Sound, entered between Augereau Island (14°45'S 125°08'E) and Fontanes Island, the N-most of the Coronation Islands, 14 miles SW, forms the approach to Prince Frederick Harbour (4.324), situated about 19 miles within the entrance.

- 2 **Pearl culture farms** which may be fixed or moving structures are in several locations within the sound. See the large scale national chart for details. See also 1.8.

Local knowledge is required as the sound is inadequately surveyed.

4.321

- 1 **Topography.** The E side of the sound between Augereau Island and the E entrance point to Prince Frederick Harbour, 13 miles SSE, is indented by bays and fronted by several islets and reefs. Anderdon Islands, which partially obstruct the approach to Prince Frederick Harbour, lie on the E side of the sound between 10 and 13 miles S of Augereau Island. The passage between these islands and the E shore of York Sound is reported to be foul.

Directions

4.322

- 1 **Approach** to York Sound from the NW passes SW of Robroy Reefs (14°27'S 124°52'E) (4.310) thence (with positions given from Lamarck Island (14°47'S 125°01'E)): SW of Suffren Island (15 miles NW), 23 m high, the S-most island of Albert Islands, a group of small islands connected to each other by a reef; thence:
- 2 NE of Colbert Island and Woodward Island (18 miles WSW) foul ground extends up to 2 miles N from the Colbert Island and Bonaparte Island, surrounded by a drying reef, lies 2 miles E; thence: SW of Jussieu Island (4 miles NW) low and fringed by reef; thence: NE of Desaix Islands (10 miles SW); thence: Between Lamarck Island, steep-to with Tournefort Island lying close SE, and Fontanes Island (8 miles SW).

(Directions continue for Port Nelson at 4.329)

Anchorage

4.323

- 1 In the middle of York Sound the bottom is rocky, but there is good anchorage in Port Nelson (4.327).

Prince Frederick Harbour

4.324

- 1 **Description.** Prince Frederick Harbour, a continuation of York Sound, extends approximately 15 miles ESE from Cape Torrens (14°59'S 125°05'E) its W entrance point where it divides into two branches, the N one leading NE to Hunter River, and the other one continuing ESE to Roe River.

Local knowledge is required.

- 2 **Topography.** The coast is backed by irregular ranges of steep rocky hills rising to several peaks the most prominent being:

Manning Peak (322 m) (14°59'S 125°22'E).

Mount Anderdon (480 m) (14°57'S 125°25'E).

Donkins Hill (411 m) (14°57'S 125°30'E).

The S shore of Prince Frederick Harbour is indented by two bays. The S bay is fronted by Boongaree Island (15°05'S 125°12'E) separated from the coast S and W of it by a narrow channel.

- 3 **Surveys.** Prince Frederick Harbour is inadequately surveyed, and in parts unsurveyed.

Entrance to Prince Frederick Harbour lies midway between an islet which lies close off Cape Torrens, on the W side of the harbour, and Thais Island (14°58'S 125°10'E) on the E.

- 4 **Dangers.** There are several islets and dangers in the central part of Prince Frederick Harbour, the position of which can best be seen from the chart.

Anchorage in the entrance to Prince Frederick Harbour is reported to be not very good; anchorage, out of the tidal streams, can be obtained off the N shore.

Hunter River

4.325

- 1 **General information.** Hunter River trends NE from its entrance for about 14 miles along the base of Mount Anderdon. It is 1 mile wide at its entrance and maintains nearly that width for about 4 miles. At the end of this reach the river suddenly contracts and becomes shallow.

Depths in the reach are from 9.1 to 12.8 m.

- 2 **Dangers.** A shoal with a depth of 5.5 m extends nearly into mid-channel from its S entrance point.

Anchorage can be obtained in the upper part of the reach in a depth of 13 m. This anchorage is not recommended during the rainy season.

Roe River

4.326

- 1 **General information.** Roe River estuary is about 3½ miles wide at its entrance but is obstructed by an islet (85 m high), lying nearly in mid-channel, 15 miles SE of Cape Torrens (14°59'S 125°05'E). The estuary trends E for about 6 miles and gradually narrows to 1 mile in width. The river itself is suitable only for small craft.

Depths in the estuary are from 9.1 to 12.8 m.

- 2 **Approach** to the river in 1979 lay S of the 85 m high islet, then in a general E direction passing S of the other islets shown on the chart.

Anchorage can be obtained about 5 cables SW of the 85 m high islet, in a depth of 12 m.

Caution. The tidal range is up to 8.5 m at springs. Care is necessary as the tidal streams from Roe River are strong and a tidal bore is experienced in the upper reaches.

Port Nelson

4.327

- 1 **Description.** Port Nelson, entered between Hardy Point (14°59'S 125°01'E) and Fontanes Island, 7 miles NW, is a secure harbour on the W side of the promontory which separates it from Prince Frederick Harbour and affords good anchorage. The port extends 8 miles S from Hardy Point, gradually shoaling towards its head where it forms two inner bays.

4.328

- 1 **Topography.** Coronation Islands, which form the W side of Port Nelson, comprise a large island, several smaller islands and a number of islets and rocks. Coronation Island, the large island, has two remarkable peaked hills, the highest peak, 151 m high, is near the centre of the island on the E side.

The general coastline of the port is rugged and steep with numerous small bays the lower shores of which are lined with mangroves.

4.329

- 1 **Directions** (*continued from 4.322*). From a position NE of Fontanes Island (14°54'S 124°55'E) the line of bearing 148° of a conical peak (86 m high) (8 cables ESE of Hardy Point) leads in the approach passing (with positions given from Hardy Point):

ENE of an islet (1.8 m high) (5¾ miles NW) the E-most danger extending SSE from Fontanes Island and lying 1 mile NE of Gale Island (5¼ miles WNW).

- 2 The track then leads S passing:
W of a reef drying 6.9 m (3 miles NNE) on which the sea breaks; thence:

Between Ena Island (1 mile NNE) and a reef drying 1.1 m (3¼ miles WNW) lying 1 mile SSE of the N extremity of the largest Coronation island; thence:

- 3 W of Hardy Point to anchorage as convenient.

Caution. A drying bank extends 1 cable offshore on the E side of the harbour from a point 3 miles S of Hardy Point. This part of the coast should be given a clearance of at least 4 cables.

4.330

- 1 **Anchorage.** Good anchorage, in depths as convenient, can be obtained in Port Nelson, the nature of the bottom almost everywhere is mud.

Caution. A drying reef lies 5 cables N of the NE entrance point of Careening Bay (15°06'S 125°00'E).

4.331

- 1 **Recommended berth** with good holding ground can be obtained in the bay 4 miles W of Hardy Point, on the W side of the port, 5 cables SE of a 19 m high headland, in 9 m, thick grey mud.

Caution. A reef drying 1.1 m lies 3½ cables NNE of the N headland to this bay.

Landing is possible, at HW, on a steep beach at the head of the bay.

4.332

- 1 **Side channel.** The W entrance to Port Nelson between the S-most Coronation island and the coast between Careening Bay and Cape Brewster (15°07'S 124°55'E) is about 1 mile wide at its narrowest part but the width of the navigational channel is considerably less.

- 2 **Approach,** which is inadequately surveyed, lies between Bat Island (15°06'S 124°54'E) close off Cape Brewster, and a shoal which dries 1.8 m, 2 miles farther E, passing S of this shoal then N of the patch of above-water rocks which lie 5 cables S of the S-most Coronation Island.

- 3 **Caution.** Rocks which cover and uncover were reported (1994 and 2003) approximately 5 and 2½ cables, respectively, S of Glauert Island (15°04'S 124°58'E).

Depths. The least known depth in the channel, S of the shoal, is 7.3 m. Depths in the narrower channel N of this shoal appear to be deeper but it has not been investigated.

Tidal streams set directly through the channel.

Brunswick Bay

General information

4.333

- 1 **Description.** Brunswick Bay, a large open bay, lies between Coronation Islands and White Island (15°04'S 124°20'E) with D'Arcole Islands between them on the N, and the coast between Cape Brewster (15°07'S 124°55'E) and Adieu Point, 21 miles SW, on the S. The bay forms the approach to Prince Regent River (4.340), Hanover Bay (4.343) and Port George IV (4.345).

Local knowledge is required as the bay is inadequately surveyed, see information on the large scale national chart.

4.334

- 1 **Landmark:**

Jackson Island (15°10'S 124°39'E) with a remarkable rocky peak, 55 m high.

Directions

4.335

- 1 From W pass 3 miles S of White Island (15°04'S 124°20'E) noting Osborn Reefs, Violet and Orange Shoals which lie N of Red Island, 10 miles SSW, a rounded mass of dark red sandstone with low perpendicular cliffs.

The track then leads ESE passing (with positions given from Jackson Island):

- 2 SSW of Black Rocks (14 miles WNW); thence:
NNE of the reefs lying about 2 miles N of Miawaja Island (13 miles WSW).

Clearing mark:

The summit of Jackson Island bearing 097° clears N of the reef extending N from Vulcan Islands.

4.336

- 1 From a position about 2 miles SW of Browne Island (8 miles WNW) the line of bearing (116°) of High Bluff (5 miles SSE), a cliff 91 m high connected to the mainland by a low sandy neck, leads, passing (with positions given from Jackson Island):

SSW of a rock which covers and uncovers (9 miles WNW) lying 7½ cables SW of Browne Island; thence:

- 2 NNE of Lucas Island (9 miles WSW) the outermost island of a chain of islets and reefs extending ESE to Adieu Point; thence:

SSW of a 0.5 m drying patch (5½ miles W) which lies 1 mile S of D'Aguesseau Island; thence:

- 3 SSW of the reef extending up to 4 miles WSW from the S side of Jackson Island; thence:

NNE of Adieu Point (6 miles SSW) a table-topped rocky bluff appearing as two lumps from seaward.

(Directions for Port George IV continue at 4.348)

Anchorage

4.337

- 1 Brunswick Bay is stated to afford good anchorage throughout.

Side channels

4.338

- 1 **General information.** Champagny Islands (15°18'S 124°15'E) comprises the island of that name together with the islands in its immediate vicinity and Degerando Island. A light is exhibited from Degerando Island (15°20'S 124°12'E) (4.310).

4.339

- 1 **Channels** lie NW and SE of Champagny Islands.

That to the NW is bordered on its NW side by Wildcat Reefs and Rainbow Shoals, a chain of reefs extending up to 3 miles SSW from Red Island (15°13'S 124°16'E) (4.335), however the E approach, between Vulcan Islands and Red Island, has not been adequately surveyed. That to the SE, a deep strait approximately 1½ miles wide at its central and narrowest point, bordered on its SE side by Heywood Islands (15°20'S 124°23'E) consisting of the island of that name, the larger Jungulu Island close NE, together with numerous rocks and reefs.

- 2 **Local knowledge** is essential as the area is inadequately surveyed, see information on the large scale national chart.

Dangers. In the NW channel an underwater rock lies 5 cables N of the W extremity of Degerando Island and a least depth of 8.6 m is charted in the fairway 2 miles N of the same point. In the SE channel foul ground extends up to 1 mile SE, and E, from Champagny Islands, drying patches and other dangers, whose positions can best be seen from the chart, extend SE from Degerando Island across the S entrance to the strait.

- 3 **Tidal streams** during the falling tide have been reported in the SE strait at a rate of nearly 6 kn, strong tide rips and

eddies have been observed in the S entrance where the bottom is uneven.

Prince Regent River

4.340

- 1 **Description.** Prince Regent River, at the head of Brunswick Bay, was examined in 1821, but is unsurveyed. When past the islands which encumber the entrance the river has an almost direct course into the interior for over 50 miles.

- 2 Mictyis Island and an islet 27 m high, both surrounded by foul ground, lie up to 4½ miles SW of Cape Wellington (15°10'S 124°50'E) and separate the E entrance (4.341) from the W entrance (4.344) to Prince Regent River.

- 3 About 3 miles above Greville Island (15°18'S 124°51'E) Prince Regent River narrows to a width of 7½ cables and for a farther 7 miles the SW bank is fringed by a rocky shoal which reduces the approach to Saint George Basin to a width of 5 cables. Above these narrows the river expands to form Saint George Basin which appears to be deep except near its NW shore. There are a number of islands and islets in the basin the two largest of which are Saint Andrew Island and Saint Patrick Island.

- 4 Above Saint George Basin the river trends SE about 12 miles to Alligator Island above which the river is suitable only for small craft.

Local knowledge is essential.

Topography. Uwins Island (15°16'S 124°49'E) is the largest of the islands lying in the entrance to Prince Regent River and forms the NW side of Munster Water.

- 5 Munster Water, lying SW of the entrance to Rothsay Water (15°12'S 125°00'E) is bounded seaward by Uwins Island and on the S by Midway Island (15°17'S 124°52'E) and Greville Island.

4.341

- 1 **Entrance.** The E entrance channel, between Cape Wellington and the islet 2½ miles SW, is the recommended entrance to Prince Regent River.

Width. The E channel is less than 1 mile wide between Cape Wellington and the islet 2½ miles SW. The channel between a drying reef which extends E from Midway Island (15°17'S 124°52'E) and Marigui Promontory, 1 mile farther SE narrows to less than 5 cables.

- 2 **Depths** up to 68 m exist in the channel along the E side of the islands lying S of Cape Wellington.

Dangers. A dangerous rock, position approximate, (reported 1987) lies 2¾ miles NW of Cape Wellington, in the N approaches to the E entrance channel to Prince Regent River, and a dangerous rock (reported 1986) lies 3½ miles SSE of the same cape, in the E entrance channel of the river. Two rocks (reported 1998) which cover and uncover lie 4 miles S and SSE of Cape Wellington.

- 3 **Natural conditions.** The river between Rothsay Water and Munster Water is disturbed by violent eddies and whirlpools caused by the rapid tidal streams rushing through the confined channels, rendering the passage dangerous at times.

- 4 **Tidal stream rates** vary with the width of the channels but may attain 5 to 7 kn.

Strong tide rips have been observed E of Mictyis Island and the islet 5 cables NE when the out-going tide has reached mid-level.

4.342

- 1 **Anchorage.** There is good anchorage amongst some of the islets in Munster Water in depths of from 7 to 9 m, mud, but Munster Water is an inconvenient place to stop at if bound up the river.

Good anchorage can be obtained in Halfway Bay (15°21'S 124°51'E), out of the strength of the tidal streams, close NE of an above-water rock in the bay in depths of from 7 to 15 m.

- 2 Anchorage can be obtained in the NW part of Saint George Basin, out of the tidal streams, between the SE shore of Marigui Promontory and the islands in depths of from 5 to 25 m.

- 3 **Side passage.** West of Greville Island (15°18'S 124°51'E) there is a winding passage less than ¾ cable in width which is farther contracted in one part by a bed of rocks.

Tidal streams attain a rate of from 6 to 7 knots in this passage.

Hanover Bay

4.343

- 1 Hanover Bay is entered between High Bluff (15°15'S 124°41'E) (4.336) and the W extremity of the reef extending from Mictyis Island. The E side of the bay is formed by Uwins Island, lying in the entrance to Prince Regent River, and the W side by the peninsula of which High Bluff is the NW extremity.

- 2 The bay, although exposed NNW, has some protection from the islands and reefs which front it and affords good anchorage with excellent holding ground.

Local knowledge is required.

Offshore dangers. A group of rocky islets lie 3 miles NNE of High Bluff (15°15'S 124°41'E) and there is another group (existence doubtful) 3 miles NE of the same point.

- 3 **Approach.** From W pass between the drying reef lying 1½ miles NW of High Bluff and a reef, which dries 1.5 m, lying 2¾ miles N of the same point.

4.344

Anchorage may be obtained, as convenient, in depths of from 10 to 20 m.

Caution. A 5 m patch lies in the SE corner of the bay, 5½ miles ESE of High Bluff.

- 1 **Side channel.** Treachery Head (15°18'S 124°47'E) lying 6½ miles ESE of High Bluff forms the E entrance point to an extensive inlet, which terminates in a shoal basin, in the SW corner of Hanover Bay. Between Treachery Head, from which extends a reef, and the SW side of Uwins Island (15°16'S 124°49'E) there is a narrow passage which leads to Munster Water and Prince Regent River (4.340).

Port George IV

4.345

- 1 **Description.** Port George IV, entered between High Bluff (15°15'S 124°41'E) and Adieu Point, the N extremity of Augustus Island, 6 miles W, extends about 14 miles S and terminates in Augustus Water, a narrow inlet, at its head. The port, although a good natural harbour affording safe anchorage, is obstructed by numerous islets and reefs to seaward.

- 2 The E entrance to Rogers Strait (4.351) lies on the W side of Port George IV.

Pearl farming. Pearl culture farms which may be fixed or moving structures are in several locations within the area. See the large scale national chart for details.

4.346

- 1 **Topography.** The E coast of Augustus Island, which forms the W side of the port, is high and rocky.

Entrance Island (15°17'S 124°37'E) lies in the middle of the N entrance to Port George IV; its NE extremity consists of light red cliffs, about 60 m high, and forms a useful

mark in the approach. Hummock Island, so named from its shape, lies 1½ miles S of Entrance Island.

4.347

- 1 **Entry.** Port George IV is entered from N through a channel, nearly 2 miles wide, E of Entrance Island.

Local knowledge is required.

Depths in the fairway of the channel are from 17·2 to 23·3 m.

4.348

- 1 **Directions** (*continued from 4.336*). From a position NNE of Adieu Point (15°15'S 124°34'E) the line of bearing 116° of High Bluff (15°15'S 124°41'E) (4.336) leads in the approach to a position N of the N point of Entrance Island.

The track then leads SE passing:

- 2 Between Entrance Island and the drying reef lying 1½ miles NW of High Bluff, noting the shoal reported (2002) to lie 3 cables SE of the reef.

The track then leads S through the channel E of Entrance Island.

4.349

- 1 **Anchorage** can be obtained between Entrance and Hummock Islands in a depth of 16 m, mud.

A recommended berth is also available with Hummock

Island bearing 272°, distant 1 mile, in a depth of 18 m, mud.

Cautions. A depth of 7·2 m lies 1 mile ENE of the N extremity of Hummock Island, close to the recommended anchorages. A rocky shelf extends 7½ cables from the E side of Augustus Island.

4.350

- 1 **Side channels.** There is a narrow, intricate, deep passage through the islets and reefs SE of Adieu Point (15°15'S 124°34'E) but it should not be used unless previously marked.

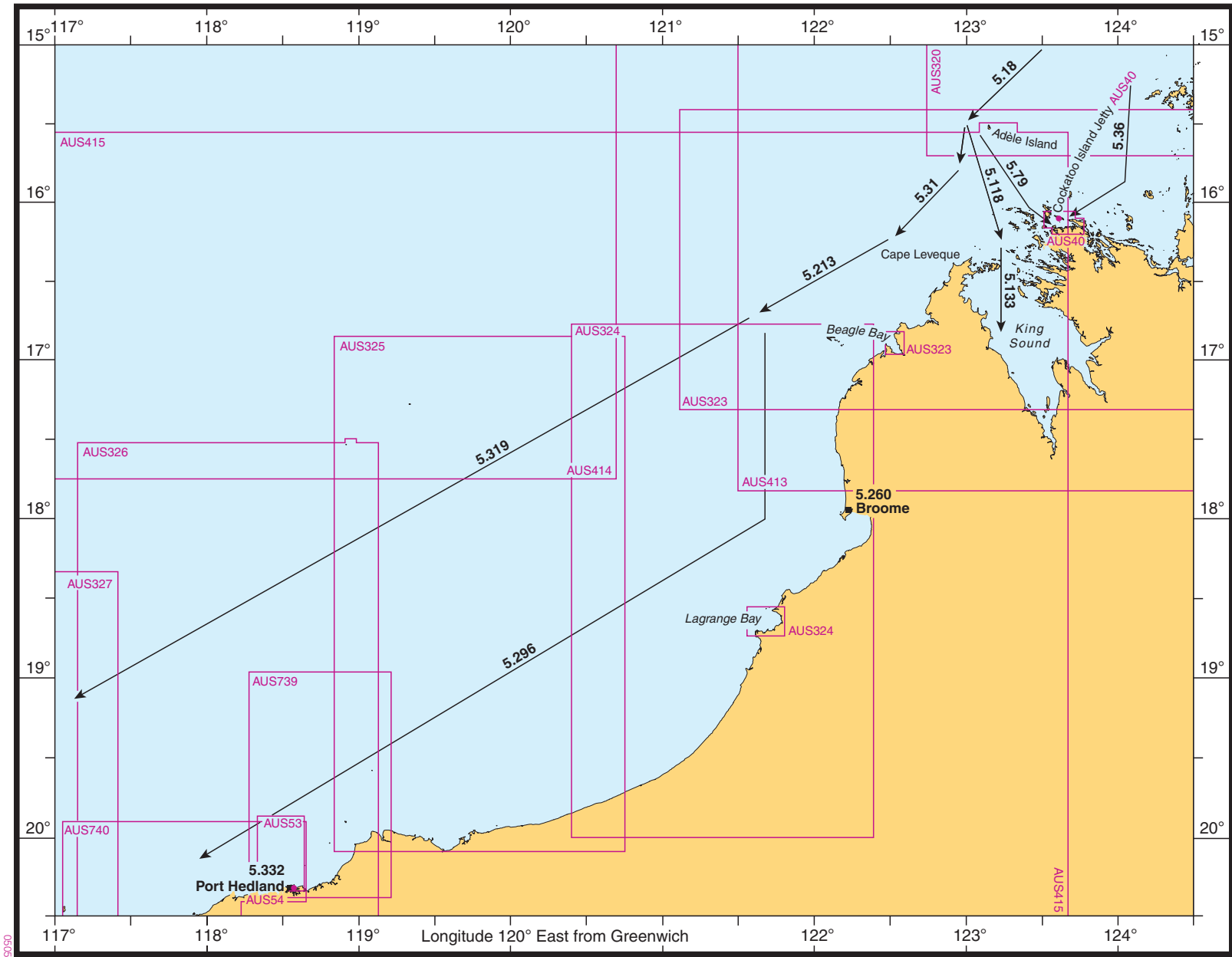
4.351

- 1 **Rogers Strait** between the SE coast of Augustus Island and the NW coast of Camden Peninsula, which forms the W side of Augustus Water, is the NE approach to Camden Harbour (5.47) and Brecknock Harbour (5.47). Brecknock Island (15°26'S 124°36'E) and associated dangers lie in the SW entrance, and, in addition, several islets and rocks lie in the strait.

- 2 **Tidal streams** are strong. The strait is suitable only for small coasting vessels.

Local knowledge is essential as the strait is unsurveyed.

Chapter 5 - Augustus Island to Port Hedland



CHAPTER 5

AUGUSTUS ISLAND TO PORT HEDLAND

GENERAL INFORMATION

*Chart 4603***Scope of chapter****5.1**

- 1 This chapter covers the NW coast of Australia between Augustus Island (15°20'S 124°35'E) and Port Hedland, about 450 miles SW.

It also covers the outlying dangers and offshore routes between Browse Island (14°07'S 123°33'E) and Rowley Shoals, about 285 miles SW.

Ports**5.2**

- 1 The ports of Cockatoo Island (5.92), Broome (5.263) and Port Hedland (5.332) are covered by this chapter.

Caution**5.3**

- 1 Parts of the coast of NW Australia covered by this chapter are as yet inadequately surveyed and shoaler water than charted may exist.

OUTLYING DANGERS

Seringapatam Reef

*Chart Aus 413***General information****5.4**

- 1 Seringapatam Reef (13°40'S 122°00'E) encloses a lagoon. The reef dries and there are large boulders round its edges with a few sandbanks which dry about 1.8 m (6 ft) on its W side. It is steep-to on all sides. On a calm night the breakers on the reef have been heard from a distance of 6 miles.
- 2 **Boat passage.** A boat passage exists at the N end of the NE side of the reef with a depth of about 1.8 m (6 ft) which allows access to the central lagoon which has depths of 5.5 to 9.1 m (18 to 30 ft).

Scott Reef

*Chart Aus 413 (see 1.16)***General information****5.5**

- 1 **History.** Scott Reef lies 11 miles SSW of Seringapatam Reef and was discovered in 1800 by the ship *Cartier* which grounded on it. It was named in 1801, after the seaman who sighted it, by Captain P. Heywood, HMS *Vulcan*.
- Description.** Scott Reef consists of three separate coral reefs. North Reef encloses a lagoon and South Reef is crescent shaped, both reefs are of considerable size and almost dry. Sandy Islet (14°03'S 121°46'E) lies on the central and smallest Scott Reef.
- 2 **Depths** are great around Scott Reef.
- Breakers.** The sea breaks heavily on the weather side of the reef, at night the breakers may be heard from some distance. The lee side is quite smooth.
- Tidal streams** are strong and caution is necessary when approaching the reef as soundings give no warning.

Landmark:

Conspicuous tower (14°03'S 121°46'E) on the N end of Sandy Islet.

5.6

- 1 **Passages.** Between North Reef and South Reef there is a passage about 1 mile wide, close along the S side of North Reef, with depths of more than 366 m (200 fm) leading N of Sandy Islet.

Caution. A detached reef which dries 0.6 m (2 ft) lies 1½ miles NE of Sandy Islet on the S side of the W entrance to this passage. There is also a passage between the reef surrounding Sandy Islet and West Hook, the W extremity of South Reef. Depths of 6.4 and 17.3 m (21 and 57 ft) have been reported in the middle of this passage.

- 2 **Lagoons.** The lagoon enclosed by East Hook and West Hook, the E and W extremities of the N ends of South Reef, has depths of over 22 m (12 fm) throughout the greater portion.

The lagoon within North Reef has not been examined but is apparently deep.

Useful mark:

Boulder which dries 2.4 m (8 ft) on the N end of the reef surrounding Sandy Islet (14°03'S 121°46'E).

Offshore Banks

*Charts Aus 323, Aus 413***General information****5.7**

- 1 **Lynher Bank** (15°30'S 122°00'E), with a least known depth of 27.1 m and incompletely surveyed, lies 80 miles NW of Cape Leveque.
- There are a number of banks between Lynher Bank and Cape Leveque, they trend in a SE direction and have depths of 15.8 to 37 m over them, their positions can best be seen from the chart.
- 2 **Anzac Shoal** (16°07'S 122°14'E), with a depth of 12.1 m over it, is the shoalest depth recorded in this area to date (1992).

Rowley Shoals

*Charts Aus 414, Aus 415***General information****5.8**

- 1 Rowley Shoals (17°20'S 119°25'E) consist of three extensive coral reefs, Mermaid Reef, Clerke Reef and Imperieuse Reef, lying 150 miles offshore.
- Breakers.** The sea breaks heavily on these reefs and in clear weather they are easily seen.
- Radar.** The reefs present poor radar targets. In favourable conditions Imperieuse Reef Lighthouse has given good radar responses at a range of 36 miles.

5.9**Major light:**

Imperieuse Reef Light (stainless steel column, 30 m in height) (17°31'S 118°57'E) exhibited from Cunningham Island.

5.10**Other aid to navigation:**

Racon: Imperieuse Reef Light (17°31'S 118°57'E).

Directions**5.11**

- 1 The recommended track through Rowley Shoals leads S between Imperieuse Reef, distant 10 miles, and Clerke Reef (17°19'S 119°21'E).

Anchorage**5.12**

- 1 All three reefs are steep-to and afford no permanent anchorage in their lee.

Temporary anchorage, however, can be obtained 1 mile ENE of Cunningham Island (17°31'S 118°57'E) in a depth of about 25 m (14 fm).

Chart Aus 325

Mermaid Reef**5.13**

- 1 **General information.** Mermaid Reef (17°06'S 119°37'E), the NE-most of the three reefs, is an atoll with a large lagoon, enclosed by a rim of coral, which dries. There is a sand cay, awash at HW, on the N end of the reef.
- 2 On the NE side of the reef there is a narrow and tortuous passage, about 60 m wide, leading into the lagoon. The passage is suitable for small craft up to 4 m (13 ft) draught, provided entry is made with the sun at a sufficiently high altitude for the many dangers to be seen.
- 3 **Tidal streams**, with violent tide rips, set through the passage at a considerable rate.
- 3 **Local knowledge** is required.
- Anchorage** can be obtained 1 cable inside the lagoon in a depth of 13 m (42 ft).
- Caution.** There are many drying patches in the lagoon.

Clerke Reef**5.14**

- 1 **General information.** Clerke Reef (17°19'S 119°21'E) lies 16 miles SW of Mermaid Reef. Bedwell Island, a bare sand cay, lies near the N end of the reef. On the E and W sides of the reef there are a number of boulders which dry at half tide. Within the reef there is a lagoon containing many detached coral patches which dry.
- 2 A narrow passage, suitable for small craft at HW slack, is situated on the NE side of the reef.
- Local knowledge** is required.
- Anchorage**, for small craft up to 15 m in length, can be obtained in the lagoon.

Imperieuse Reef**5.15**

- 1 **General information.** Imperieuse Reef, the SW-most of the three Rowley Reefs, lies about 22 miles SW of Clerke Reef. On the SE edge of the reef there are numerous coral boulders which dry about 3 m (10 ft). Large areas of the reef dry at LW and its centre is occupied by two lagoons containing many detached coral patches.
- 2 Cunningham Island, a bare sand cay, is situated close within the N extremity of the reef. A light (5.9) stands on the island.

OFFSHORE ROUTES**Browse Island to Scott Reef**

Charts Aus 320, Aus 413, 4603

General information**5.16**

- 1 **Other aid to navigation.**
Racon: Browse Island Light (14°06'.5S 123°32'.9E) (4.64).

Directions (*continued from 4.64*)**5.17**

- 1 From the vicinity of 14°14'S 123°29'E, about 8 miles SSW of Browse Island, the route leads W, about 95 miles, passing about 15 miles S of Scott Reef (5.5).
For mariners on ocean passage the route then continues clear of known dangers, WSW a farther 130 miles, for which the chart is the best guide, to ocean routing position 15°30'S 120°00'E. See *Ocean Passages for the World*.
- Useful mark.**
Browse Island Light (14°06'.5S 123°32'.9E) (4.64).

Browse Island to Adèle Island

Charts Aus 320, Aus 413

Route**5.18**

- 1 From Browse Island (14°07'S 123°33'E) the two offshore routes lead generally SW to meet NNW of Adèle Island (15°31'S 123°09'E). The route then leads S passing W of Adèle Island.
Mariners in deep-draught vessels proceeding to Cockatoo Island (5.92) or mariners proceeding to King Sound (5.133) are recommended to use this outer route passing W of Adèle Island.

Topography**5.19**

- 1 Adèle Island is sandy and covered with bushes and is surrounded by an extensive steep-to coral reef which dries from 1.6 to 3.6 m at its edges. A sand cay lies within the N extremity of the reef 4 miles NNW of Adèle Island Light.

Tidal streams**5.20**

- 1 On the W side of Adèle Island the tidal streams attain a rate of 2 to 3 kn. See information on the chart.

Major light**5.21**

- 1 Adèle Island Light (red metal framework tower, 30 m in height) (15°31'S 123°09'E).

Other aids to navigation**5.22**

- 1 **Racons:**
Adèle Island Light (15°31'S 123°09'E) (5.21).
Browse Island Light (14°06'.5S 123°32'.9E) (4.64).

Directions

(*continued from 4.64*)

Browse Island to Adèle Island**5.23**

- 1 From a position about 8 miles SSW of Browse Island (14°07'S 123°33'E) the route leads clear of known dangers SSW, about 67 miles, to a position 17 miles NNW of Adèle Island Light. The chart is the best guide.

The route then leads S about 18 miles along the W side of Adèle Island Reef to a position about 7 miles WSW of Adèle Island Light.

South-east of Browse Island to Adèle Island 5.24

- 1 From a position about 34 miles SE of Browse Island (14°07'S 123°33'E) the route continues SW passing: NW of Beagle Reef (15°20'S 123°31'E) a sand cay, its centre dries 8.1 m and is a useful mark at LW,

noting Dingo Reef lying 4½ miles farther E, to a position 17 miles NNW of Adèle Island Light.

- 2 The route then leads S about 18 miles along the W side of Adèle Island Reef to a position about 7 miles WSW of Adèle Island Light.

Useful mark.

Browse Island Light (14°06'5S 123°32'9E) (4.64).
(Directions continue at 5.34, for Yampi Sound at 5.84 and for King Sound at 5.123)

KING SOUND AND APPROACHES

GENERAL INFORMATION

Chart Aus 323 (see 1.16)

Scope of section 5.25

- 1 The area covered by this section comprises:
 - Adèle Island to Cape Leveque (5.31)
 - Wildcat Reefs to Yampi Sound (5.36)
 - Adèle Island to Yampi Sound (5.79)
 - Cockatoo Island (5.92)
 - Adèle Island to King Sound (5.118)
 - King Sound (5.133)

Topography 5.26

- 1 The coast between Hall Point (15°40'S 124°22'E) and Cape Leveque, 95 miles WSW, is indented by two large stretches of water, Collier Bay and King Sound, from the entrance points of which shoals, reefs and islands extend up to 50 miles offshore.

Buccaneer Archipelago

Description 5.27

- 1 Buccaneer Archipelago lies in the N approach to Yampi Sound and the NE approach to King Sound. It consists of numerous islands, islets and rocks lying off the NW extremity of the peninsula separating Collier Bay from King Sound, between the parallels of 15°50'S to 16°20'S and the meridians of 123°15'E to 123°47'E. The archipelago may be divided into four separate groups, the islands of each group in many cases being connected to each other by reefs which dry. In some places there are intricate channels between them where the strong tidal streams, which may attain a rate of 6 to 10 kn, form violent tide-rips and eddies and render the channels dangerous for small craft.
- 2 **North-east group.** Macleay Islands, the NE group of Buccaneer Archipelago, lie from 8 to 16 miles N of the W extremity of Koolan Island (16°08'S 123°45'E).
- South-east group.** McIntyre Island (15°59'S 123°32'E) is the N-most island of the SE group of Buccaneer Archipelago, the group also includes, amongst others, Bathurst, Irvine, Cockatoo and Koolan Islands.
- 3 **West group** of Buccaneer Archipelago comprises numerous islands of moderate size many of these being connected by coral reef. Caffarelli Island (16°02'S 123°17'E) is the W-most of the group, which extends about 20 miles SE, terminating in Chambers Island (16°16'S 123°32'E) which lies close off the mainland coast.
- 4 **South-west group.** Bedford Islands (16°09'S 123°19'E) consist of two islands connected to each other by a reef

which dries and, with the adjacent islands and dangers, form the SW group of Buccaneer Archipelago.

5.28

- 1 **Tidal streams.** During the period of observation, from June to October, in the vicinity of Buccaneer Archipelago the tidal streams were fairly regular, the in-going and out-going streams lasting about 6 hours each, with a short period of slack water. In Buccaneer Archipelago the change takes place at HW and LW by the shore.

The general direction of the in-going stream was towards King Sound. See information on the chart.

Yampi Sound

General information 5.29

- 1 Yampi Sound lies between Koolan Island (16°08'S 123°45'E) and Cockatoo Island 3 miles farther W, on the N, and the coast between Nares Point (16°08'S 123°42'E) and Woodhouse Point 7 miles W, on the S.

Deep-draught vessels. For information regarding deep draught vessels, see 4.59.

Inshore passages

General information 5.30

- 1 **Routes.** Small craft can proceed S from Yampi Sound passing through Goose Channel (5.127) between the islands and dangers SSW of Conilurus Island (16°09'S 123°35'E), thence through Whirlpool Pass (5.131), thence SSW through the channel between Cussen Island and Muddle Islands (5.173) and thence through either Fantome Passage (5.174) or Hells Gates (5.205) into the S part of King Sound.

Local knowledge is required.

Tidal streams. See 5.139.

ADÈLE ISLAND TO CAPE LEVEQUE

General information

Chart Aus 323

Route 5.31

- 1 From WSW of Adèle Island (15°31'S 123°09'E) the track for mariners bound SW off the NW coast of Australia continues S, about 12 miles, passing W of Adèle Island Reef, thence SW, about 42 miles, to a position WNW of Cape Leveque (16°24'S 122°56'E).

Major lights 5.32

- 1 Adèle Island Light (15°31'S 123°09'E) (5.21).
Cape Leveque Light (16°24'S 122°56'E) (5.143).
Cape Leveque light is at the extreme range for mariners on this track.

Other aids to navigation**5.33****1 Racons:**

Adèle Island Light (15°31'S 123°09'E) (5.21).

Cape Leveque Light (16°24'S 122°56'E) (5.143).

Directions

(continued from 5.24)

5.34

- 1 From the vicinity of 15°33'S 123°02'E, about 7 miles WSW of Adèle Island, the track continues S along the W side of Adèle Island Reef passing (with positions given from Cape Leveque (16°24'S 122°56'E)):

E of Barcoo Shoal (15°39'S 122°55'E) to a position about 9 miles SE of the same shoal.

- 2 The route then leads SW passing:
NW of Brué Reef (29 miles NNE) (5.35); thence:
NW of Shepherds Patch (23 miles N); thence:
NW of Pitt Shoals (9 miles NNW) (5.146); thence:
To a position about 28 miles WNW of Cape Leveque.
(Directions continue at 5.219 and for
King Sound at 5.145)

Anchorage

Chart Aus 323 (see 1.16)

Brué Reef**5.35**

- 1 **General information.** Brué Reef (15°56'S 123°03'E) has numerous boulders on it, chiefly at its N end, the highest part here dries 7.7 m.

Anchorage can be obtained about 5 cables off the E side of reef in depths of from 18 to 35 m, sand and coral.

This anchorage should not be used except in settled weather as a heavy swell quickly rises in the vicinity.

WILDCAT REEFS TO YAMPI SOUND**General information**

Charts Aus 323, Aus 320 (see 1.16)

Route**5.36**

- 1 From W of Wildcat Reefs (15°17'S 124°08'E) the coastal passage to Yampi Sound leads initially S, about 22 miles, passing between Rosella and Lorikeet Shoals, thence SW, about 23 miles, passing NW of Macleay Islands, thence S through Galah Channel (5.107) or SSE through Parakeet Channel (5.109).

Deep-draught vessels are advised to use the offshore route passing W of Adèle Island (15°31'S 123°09'E).

Topography**5.37**

- 1 Macleay Island (15°57'S 123°41'E), the largest island in the chain of islands of the NE group of Buccaneer Archipelago, has a flat-topped summit and its W coast consists of cliffs 50 to 60 m high. Crabbe Island lies 5 cables S of its S extremity and is connected to it by a drying coral reef.
- 2 McIntyre Island (15°59'S 123°32'E) the N-most island of the SE group of Buccaneer Archipelago has steep cliffs on its N side and may be identified by a deep cleft towards its E end. Bathurst Island (16°02'S 123°32'E) and Irvine Island close S, together with Kathleen and Flora Islands and other islets and rocks, lie together on an extensive coral reef the greater part of which is covered with sand. Cockatoo Island

lies 1¼ miles E of Irvine Island. Koolan Island (16°08'S 123°45'E) consists of numerous rocky hills with abrupt cliffs on its N side. Sanders Point, the NE extremity of the island, is faced with steep cliffs 120 m high. Roberts Island lies off the coast 1½ miles WNW of the point and another islet (33 m high) lies 4 cables WSW of Roberts Island.

Tidal streams**5.38**

- 1 See information on the chart.

Directions

(continued from 4.310)

Chart Aus 320

Wildcat Reefs to Rosella Shoal**5.39**

- 1 From a position about 11 miles W of Wildcat Reefs (15°17'S 124°08'E) the passage leads S passing (with positions given from Degerando Island (15°20'S 124°12'E)):

W of Degerando Island, a light (4.310) is exhibited from the W end of the island; and:

E of Fox Shoal (29 miles W); thence:

- 2 E of Rosella Shoal (25 miles SW) to a position SE of the same shoal about midway between it and Lorikeet Shoal (22 miles SSW).

Caution. Isolated patches of less than 20 m and reported depths of 10.6 m (1997) and 12 m (1964), the positions of which can best be seen from the chart, lie NE of Rosella Shoal and close to the route.

Chart Aus 323 (see 1.16)

Rosella Shoal to King Island**5.40**

- 1 From the vicinity of 15°38'S 123°54'E, between Rosella and Lorikeet Shoals, the recommended track shown on the chart leads generally SW passing (with positions given from Macleay Island summit (15°57'S 123°41'E)):

NW of Denman Shoal (19 miles NE); thence:

SW of Mavis Reef (27 miles NNW) on which there is a sand cay which dries 6.6 m; thence:

- 2 NW of Conway Island (5½ miles N) the N-most Macleay Island; thence:
NW of King Island (5 miles NW) on the SW extremity of an extensive drying reef to a position 2½ miles WNW of the same island.

King Island to Yampi Sound**5.41**

- 1 From a position WNW, distant 2½ miles, from King Island the passage leads S, about 13 miles to Galah Channel, or SSE about 15 miles, to Parakeet Channel passing (with positions given from Macleay Island summit):

W of Scobell Rocks (2½ miles N); thence:

W of Macleay Island (5.37); thence:

W of Sweeney Patches (3½ miles SSE); and:

E of McIntyre Island (9 miles WSW) (5.37) noting Lena Reef, 6 cables NW, which breaks heavily with a NW swell; thence:

- 2 E of an islet (30 m high) (9½ miles SW), the NE-most of a group, one of which is Wangania Island, lying near the edge of the drying reef extending 1 mile NE from the SE extremity of Bathurst Island. A detached reef, drying 1 m, and an islet, 15 m high, lie on the W side of the passage, 6 cables SSE and 1 mile S, respectively, of the 30 m high islet; thence:

- 3 If bound for Galah Channel, to a position E of Kathleen Island (11 miles SW), distant 1 mile, noting the depth of 18.7 m on the track 1½ miles NE of the island; or:

If bound for Parakeet Channel, to a position E of Kathleen Island, distant 5 miles, noting the depth of 19.7 m close W of the track, 4 miles E of the island.

5.42

1 Useful mark:

Conspicuous hill (16°05'S 123°35'E), 55 m high, cone-shaped near the NW extremity of Cockatoo Island.

(Directions continue for Galah Channel at 5.107 and for Parakeet Channel at 5.109)

Landing

5.43

- 1 Landing can be effected on either of two shingle beaches at the SE end of Macleay Island (15°57'S 123°41'E) but the fringing coral reef extends up to 6 cables offshore in this vicinity.

Camden Sound

Chart Aus 320 (see 1.16)

General information

5.44

- 1 **Description.** Camden Sound (15°26'S 124°24'E) is bounded by Augustus Island and Byam Martin Island, Heywood and Champagny Islands on the N, and by the mainland coast between the S entrance point of Rogers Strait (4.351) and Wilson Point (15°33'S 124°25'E) on the S. Brecknock and Camden Harbours lie in the E part of the sound.

- 2 The N entrance to Camden Sound between Heywood and Augustus Islands appears to be foul. On the SW side of Augustus Island there is a large bay which is inadequately surveyed and in parts unsurveyed.

5.45

- 1 **Topography.** The land behind the coast between Battery Point (15°31'S 124°27'E) and Prior Point, 13 miles SSW, rises to a long flat undulating ridge about 110 to 220 m high running in a general N to S direction. The only prominent summit is Wedge Hill, with a sharp fall on its NE side, standing 8 miles ESE of Prior Point.

5.46

1 Offshore dangers:

Drying patches and other dangers (4.339) extend SE from Degerando Island (15°20'S 124°12'E).

Hull Bank, an extensive mud bank, lies about 6 miles W of Wilson Point (15°33'S 124°25'E).

Rice Rocks, two small isolated pinnacle rocks, the S of which lies 1 mile N of Bumpus Island (15°31'S 124°24'E).

- 2 **Pearl culture farms** which may be fixed or moving structures are in several locations within the sound. See 1.8, 5.47 and the large scale national chart for details.

Tidal streams. The rising stream sets strongly towards Byam Martin and Augustus Islands.

Brecknock and Camden Harbours

5.47

- 1 **General information.** Brecknock Harbour is entered between the SW extremity of Augustus Island and the

mainland S. The entrance is about 1 mile wide but is considerably obstructed by several islands and some rocks. Kannamatju (New Island) (15°28'S 124°30'E), the S and largest of these islands, lies in the middle of the entrance and four other islets lie in a semi-circle about 5 cables off the N extremity of the island.

- 2 Brecknock Harbour is a private pearling lease and is totally obstructed by pearling float lines. Mariners should not attempt passage during hours of darkness and contact should be made with the pearling station if anchorage is required.

- 3 Camden Harbour, a continuation SE of Brecknock Harbour, although deep in places, is encumbered with rocks and many shoals rendering it an undesirable anchorage. Granite Island lies about 6 miles ESE of Kannamatju Island, on the E side of the approach to Camden Harbour, there is an 8.2 m patch midway between these two islands.

Local knowledge is required as neither of these two harbours has been adequately surveyed.

5.48

- 1 **Channels.** There is a clear channel, with depths of 10 m or more, on either side of Kannamatju Island.

South Entrance leads between two above-water rocks lying close off the SW extremity of Kannamatju Island, on the N, and Needle Rock, 6 m high, lying close off the coast S of Kannamatju Island, on the S. A 1.2 m shoal extends a short distance N from Needle Rock.

- 2 North Entrance leads between the SW side of Augustus Island and the four islets off the N side of Kannamatju Island.

Tidal streams are strong.

Sampson Inlet

5.49

- 1 **General information.** Sampson Inlet lying on the NE side of the bay between Battery Point (15°31'S 124°27'E) and Wilson Point, 3 miles SW, is a deep narrow inlet widening into a well sheltered bay which provides an excellent cyclone anchorage for mariners in vessels able to enter.

- 2 **Topography.** Battery Point, the N entrance point, is flat, rocky and about 7 m high. Wilson Point and the coast on its N side is cliffy. Lulim Island, 43 m high, lies close off Wilson Point and is connected to it by a drying reef. Wailgwin (Slate) Islands lie 4 cables W of Lulim Island. Bumpus Island (15°31'S 124°24'E), barren, rocky and surrounded by reef, lies 1 mile N of Wailgwin Islands.

5.50

- 1 **Directions.** Sampson Inlet is approached from N passing between Battery Point and Bumpus Island, noting Rice Rocks (5.46) which lie 1 mile N of the island. Approach to the anchorage is through a gorge, ½ cable wide with steep-to sides, in a least depth of 14.6 m, noting the patch with depths less than 5 m close to S shore, as shown on the national large scale chart. Once through the gorge the line of bearing ENE of a prominent red cliff leads to the anchorage.

5.51

- 1 **Anchorage,** sheltered from every direction, can be obtained 3 cables from the E shore in depths of from 6 to 15 m with good holding ground, clay and mud.

5.52

- 1 **Side channel.** There is a channel 5 cables wide, with depths of not less than 15 m, between the reef extending 1½ cables S from Bumpus Island, and that extending 2 cables N from Wailgwin Island.

Deception Bay

General information

5.53

- 1 Deception Bay entered between Hope Point (15°37'S 124°25'E) and Buckland Point, 9 cables S, is free from dangers. Its shores are rocky except at its N and S ends where there are extensive drying mud flats.

5.54

- 1 **Topography.** Bluff Hill (15°36'S 124°25'E), 89 m high, with reddish cliffy slopes stands 1½ miles NNE of Hope Point, it is readily identified from SW. Hall Point (15°40'S 124°22'E) is the W extremity of an unnamed island, 81 m high, which lies 2½ miles SW of Buckland Point, the island appears wedge-shaped when seen from N or S, the E being the steep side.

5.55

- 1 **Tidal streams** off the coast between Wilson Point (15°33'S 124°25'E) and Hall Point set NW with the falling tide and SE with the rising tide. The maximum rate at springs is about 2 kn.

Anchorage

5.56

- 1 The portion of the bay with depths of over 5 m is only 1 square mile in extent, so that it only affords secure anchorage for small vessels in other than W winds to which the bay is open.

Shelter

5.57

- 1 Between Buckland Point and the N extremity of the 81 m high island, 2½ miles SW, of which Hall Point is the W extremity, there is a bay divided into two parts by Kid Island, connected to the shore S by a sand spit which dries. Either of the two small bays affords shelter to small craft, except from N or W winds.

Claret Islands

Chart Aus 323 (see 1.16)

General information

5.58

- 1 Claret Islands (15°42'S 124°23'E) a group of rocky islands, the highest of which is 24 m high, lie in the N part of the bay entered between the islet on which Hall Point the W extremity is situated and Prior Point, 2½ miles S. The bay affords sheltered anchorage from winds between N and SE to small vessels.
- 2 **Depths** in this bay are irregular at its N and S extremities but shelve slowly towards a white sandy beach at the E centre of the bay.

Anchorage

5.59

- 1 Good anchorage, away from tidal effects, can be found 6 cables off the beach in 8 m, sand.
Caution. A coral reef, with a least depth of 2.8 m over it, lies 5 cables NW of Prior Point, the reef is marked by eddies over it during the strength of the tidal streams. A 2.6 m spit extends 7 cables from the shore about 1 mile N of the same point.

Doubtful Bay

General information

5.60

- 1 **Description.** Doubtful Bay is entered through Foam Passage, between Raft Point (16°04'S 124°27'E) and an

island, 89 m high, 2¼ miles NNE. The bay, protected from seaward by Montgomery Reef (5.70), forms a secure harbour with good holding ground.

Local knowledge is necessary as the bay is unsurveyed, see information on the large scale national chart.

5.61

- 1 **Topography.** The island forming the N entrance point to Doubtful Bay is the S extremity of a chain of high rocky islands nearly 10 miles long; the coast E of these islands has not been surveyed. The coast 10 miles farther N to Prior Point (15°43'S 124°23'E) is low, straight and rocky and affords no shelter.
- 2 A range of rocky precipitous hills attaining a height of about 275 m back the S and E shores of the bay. Red Cone Hill (5.65) is a useful mark. The SE shore of the bay is fringed with an extensive mangrove swamp intersected by numerous creeks.

5.62

- 1 **Depths.** General depths in the bay are reported to be from 16.5 to 29.5 m and in the fairway to the anchorage (5.66) appear to be not less than 18.3 m.

5.63

- 1 **Pearl farming.** Pearl culture farms which may be fixed or moving structures are located within the bay and may lie close to the recommended anchorage. See the large scale national chart for details. See also 1.8.

5.64

- 1 **Tidal streams** in Foam Passage are estimated to reach 4 kn, eddies have been observed. See also 5.71.

Directions

5.65

- 1 The approach to Doubtful Bay is inadequately surveyed, mariners approaching the bay must exercise the utmost caution as uncharted dangers may exist, see also 5.70.

Approach. Directions for the N approach to Doubtful Bay are given at 5.72.

- 2 **Entry.** From a position about 2 miles W of Foam Passage the line of bearing 110° of Red Cone Hill (16°06'S 124°35'E), conical shape, seen through the centre of Foam Passage leads through the passage passing (with positions given from Raft Point):
- 3 Between the island (89 m high) (2¼ miles NNE) forming the N entrance point and a small islet (4 m high) (5 cables NE) on the S side of the fairway; thence:
NNE of Steep Island (1½ miles ENE); thence:
NNE of a dangerous rock, (reported 1998), (2 miles ENE); thence:
SSW of a 1.8 m shoal (4½ miles NE) to a position about 4 miles E of Raft Point.

Anchorage

5.66

- 1 Anchorage out of the strength of the tidal streams can be obtained in the S part of the bay E of Steep Island (16°04'S 124°28'E).
The N part of the bay is rocky with two or more dangers and affords no convenient anchorage.
- 2 **Recommended berth,** well protected from all directions, in position 100°, distant 2½ miles from Steep Island, in 20 m. A 3.7 m shoal lies about 1 mile E of the berth. See 5.63

George Water

5.67

- 1 **General information.** George Water a landlocked bay N of Doubtful Bay affords good anchorage, a mud bar

extends across its N part. Maitland Bay lies in the NE corner of George Water.

- 2 **Entrance** from Doubtful Bay is obstructed by Storr Island leaving a narrow passage on either side. Success Strait, the W passage, is the better of the two passages and is approximately 6 miles long, and 2 to 3 cables wide, and has general depths of from 18.3 to 31 m, the sides being steep-to. The N approach to the strait is through a large shoal area which dries in places.

- 3 **Tidal streams** are strong.

Dangers. Two small reefs drying 1.8 m lie on the W side of the strait near its N end.

Collier Bay

General information

5.68

- 1 **Description.** Collier Bay is entered between Raft Point (16°04'S 124°27'E) and a point about 32 miles WSW.

Local knowledge is essential.

5.69

- 1 **Topography.** Eagle Point (16°10'S 124°24'E), on the E side of the bay, is a rocky spur extending N from a high range of hills. A high bluff, 6½ miles S, is of grey slate formation. The whole of this shore is backed by a coastal range of moderate elevation which is remarkably rugged.

The W shore of the bay is backed by a range of barren rocky hills from 150 to 290 m high rising abruptly from it, and is fronted by several islands, islets and rocks.

5.70

- 1 **Offshore dangers.** Montgomery Islands (15°57'S 124°12'E), one low sandy island, densely wooded, and several smaller barren rocky islands lying E of the main island are all on Montgomery Reef which dries up to 6.8 m. The N and E sides of this reef are unsurveyed.

- 2 The Breakwater, a long spit about 1 mile wide which dries from 2.1 to 5.8 m, extends for about 7 miles in a N direction from the NW side of Montgomery Reef towards Cockell Bank (15°47'S 124°04'E), a small sandbank situated on the W-most and largest of Cockell Reefs. Thorne Reef (15°44'S 124°09'E), with Reyne Shoal 2 miles farther NE, are the outermost dangers lying off Cockell Reefs in the N approach to Collier Bay. There are numerous detached reefs and shoals off Cockell Reefs, and, owing to the strong currents and the discolouration of the water, they should be given a wide berth.

- 3 Between The Breakwater and Sanders Point (16°07'S 123°47'E), the NE extremity of Koolan Island, there are several islands, islets and rocks which obstruct the NW and W approach to Collier Bay. Viney Passage (5.73), the NW approach, and Caesar Channel (5.74), the W approach, are the preferred routes through these dangers, see information on the large scale national chart.

5.71

- 1 **Tidal streams.** In the N approaches, S of Hall Point (15°40'S 124°22'E), the tidal streams set S on the rising tide and N on the falling tide, the maximum rate near the coast is from 2 to 3½ kn.

In the NW and W approaches, between Cockell Reefs and Koolan Island, tidal streams set SE with the rising tide and NW with the falling tide, turning 1 hour after HW and LW by the shore. The maximum rate at springs is from 2 to 3 kn.

Directions

5.72

- 1 **North Approach** to Collier Bay and Doubtful Bay (5.60) leads generally S passing (with positions given from Ngalanguru Island (15°55'S 124°21'E), the largest High Clifty Island):

Between Prior Point (12 miles NNE) and Barron Banks (9 miles NNW); thence:

- 2 E of a shoal spit with a depth of 3.8 m over it (5 miles N) extending N from Montgomery Reef; thence:

E of Ngalanguru Island; and:

W of Lizard Island (5 miles ESE) noting the foul ground which extends up to 6 miles NNW from the island; thence:

- 3 E of a rocky patch (position doubtful) (3 miles SSE); thence:

Between Raft Point (11 miles SSE) and Mulgudna Island (10 miles SSW), noting the 4.1 m patch 1 mile E.

5.73

- 1 **Viney Passage.** From position 15°50'S 123°56'E, between Nicolle Reef (15°46'S 124°00'E) and Challis Rocks, 17 miles WSW, the preferred route shown on the large scale national chart leads 147° along the W side of The Breakwater (5.70) passing (with positions given from Caesar Island (16°04'S 123°56'E)):

- 2 Between Niblock Rocks (15 miles N) and Gibbings Reefs (12 miles NW), two dangerous patches which are difficult to see and should be given a wide berth; thence:

Between the SW extremity (8 miles NE) of Montgomery Reef and Viney Island (5 miles NE); thence:

- 3 ENE of Muir Island (6 miles E), distant 2 miles, noting Gadayim Pyramid Island, a small cone-shaped island, close NNE and closer to the track.

The preferred route then leads 120° passing:

Between Station Reef (11 miles E) and Kingfisher Island (8 miles ESE).

5.74

- 1 **Caesar Channel.** From position 16°04'S 123°49'E, NE of Koolan Island, the preferred route, shown on the large scale national chart, leads 113° passing (with positions given from Caesar Island (16°04'S 123°56'E)):

NNE of Sanders Point (8½ miles WSW) (5.37); thence:

- 2 NNE of Scaddan Island (6 miles SW) to a position ENE of the same island, distant 3½ miles.

The preferred route then leads 124° passing:

SW of Caesar Rock (1 mile SW), noting the 6.7 m patch which lies 5 cables SSW of the rock and closer to the track; thence:

NE of Moresby Rock (4 miles SSW); thence:

- 3 Between an islet (6 m high) (3 miles E), surrounded by reef, and Advance Island (5 miles S); thence: NE of an islet (48 m high) (8 miles SSE); a drying reef extends up to 7 cables N and 1 mile NE from its N side and upon which are two smaller islets; thence:

SW then S of Melomys Island (9 miles SE), distant 1¼ miles.

- 4 The preferred route then leads 069° passing: Between Melomys Island (9 miles SE) and Traverse Island (14 miles SE), noting the several smaller

islands which lie on a drying coral reef close W of Traverse Island; thence:
NNW of Helipad Island (18 miles SE).

Anchorage

5.75

- 1 The coast between Raft Point (16°04'S 124°27'E) and Eagle Point, 7 miles SSW, forms a bay fringed by a broad coastal bank which dries.

Temporary anchorage, out of the tidal streams, can be found off the bank.

Anchorage has been obtained in position 249°, distant 3 miles, from Eagle Point (16°10'S 124°24'E) in a depth of 9 m.

- 2 **Caution.** A rocky patch drying 0.9 m lies 7½ cables W of Eagle Point.

Tidal streams up to 4 kn were observed at the anchorage.

There appears to be an anchorage SW of a high bluff (16°17'S 124°23'E) in depths of from 9 to 20 m, sand and mud.

Walcott Inlet

5.76

- 1 Yule Entrance (16°21'S 124°24'E), entered 4 miles S of a high bluff, leads into Walcott Inlet, a landlocked bay which extends about 32 miles E from its entrance and then trends about 6 miles N. The inlet is unsurveyed.

Tidal streams in the narrowest part of Yule Entrance attain a rate of about 8 kn, they cause whirlpools and violent eddies.

Secure Bay

5.77

- 1 Secure Bay (16°26'S 124°21'E) at the S end of Collier Bay is entered through a narrow entrance, named The Funnel, which is obstructed by several islets. The bay is inadequately surveyed.

On the E side of Secure Bay there is a channel leading into an area of water of similar size and bounded on all sides by mangrove banks and creeks. A very strong tidal stream sets through this narrow channel making the passage both difficult and dangerous.

- 2 **Tidal streams** attain a rate of from 4 to 6 kn in The Funnel.

Anchorage has been obtained in position 130°, distant 2 miles, from The Funnel where tidal streams of 4 kn and violent eddies were experienced.

Talbot Bay

General information

5.78

- 1 Talbot Bay, entered between the W entrance point (16°13'S 123°55'E) of Collier Bay and Koolan Island, 7½ miles WNW, is much encumbered with islets, reefs and shoals, and there are several islets off its entrance. Dugong Bay is an extension S of Talbot Bay.

The coast W of the E entrance point of Talbot Bay, as far as a point 1 mile S of the SE extremity of Koolan Island, has not been surveyed.

ADELE ISLAND TO YAMPI SOUND

General information

Chart Aus 323 (see 1.16)

Route

5.79

- 1 From WSW of Adèle Island (15°31'S 123°09'E) the route to Yampi Sound leads generally SE, about 45 miles, through the channel immediately W of Bathurst Island (16°02'S 123°32'E) passing between Irvine and Powerful Islands.

Topography

5.80

- 1 Bathurst Island rises in steep cliffs from the W coast; an islet, 5 m high, lies on the end of a drying spit at the N end of the island. Tanner Island (16°06'S 123°32'E), 5 cables W of the SW extremity of Irvine Island, has two peculiar finger-shaped rocks, 10 m high, at its S end. A light (5.85) is exhibited from the island.

- 2 Caffarelli Island (16°02'S 123°17'E) is the W-most island of the W group of Buccaneer Archipelago, a light (5.124) is exhibited on the summit. Cleft Island (5.84), 2 miles E of the E extremity of Caffarelli Island, is one of the most prominent islands in the whole archipelago. Fraser, Admiral, Bruen and King Hall Islands, together with several islets, are all connected by a coral reef which dries extending about 5 miles ESE from a position 1¼ miles SSW of Cleft Island (16°02'S 123°21'E). These islands are mostly flat-topped and covered with scrub. Powerful Island is separated from the SE extremities of Admiral and King Hall Islands by a narrow channel through which the tidal streams set at a considerable rate. The E side of the island is much indented by bays and creeks which dry and there are several islets and drying reefs within 9 cables of it.

Pearl farming

5.81

- 1 Pearl culture farms which may be fixed or moving structures are in located in the waters separating Powerful Island, Sir Frederick Island (16°08'S 123°24'E) and King Hall Island. See 1.8 and the large scale national chart for details.

Major light

5.82

- 1 Adèle Island Light (15°31'S 123°09'E) (5.21).

Other aid to navigation

5.83

- 1 **Racon:**
Adèle Island Light (15°31'S 123°09'E) (5.21).

Directions

(continued from 5.24)

Adèle Island to Cleft Island

5.84

- 1 From the vicinity of 15°33'S 123°02'E, about 7 miles WSW of Adèle Island Light, the track leads SSE passing (with positions given from Adèle Island Light):

Between Adèle Island reef and Barcoo Shoal (16 miles WSW); thence:

- 2 WSW of Adèle Island Shoal (12 miles SSE); there are heavy tide rips on this bank during the strength of the tidal streams.

The line of bearing 133° of Irvine Island summit (16°04'S 123°32'E) then leads in the fairway passing:
NE of Brué Reef (26 miles SSW) (5.35); thence:

- 3 SW of Frost Shoal (20 miles SE); there are usually heavy tide rips over this shoal during the strength of the tidal streams; thence:
Very close SW of Tasmanian Shoal (15°53'S 123°22'E); thence:
- 4 NE of Caffarelli Island from where a light (16°03'S 123°17'E) (5.124) is exhibited; thence:
NE of Cleft Island (16°02'S 123°21'E), a bare cone split in two by a chasm, the highest of a group of five islands lying together on the same reef.

Cleft Island to Yampi Sound

5.85

- 1 From a position 9 miles NW of Irvine Island summit (16°04'S 123°32'E) the track leads SSE in mid-channel passing (with positions given from Cleft Island):
Between the NW extremity of Bathurst Island (9 miles E) and Bowles Rock (4 miles ESE), the NE-most danger off Admiral Island; thence:
- 2 Between Flora Island (9 miles E), difficult to identify as it appears more as a point projecting from Irvine Island, and islets and dangers lying close off the E side of Powerful Island (5 miles ESE); thence:
- 3 WSW of the detached reef drying 5.3 m (10 miles ESE) lying close off the W side of Irvine Island; thence:
Between Tanner Island (11 miles ESE) and Finch Islands (9 miles SE), the NE-most dangers off Lord Island. Tanner Island Light (white concrete tower and lantern, 6 m in height) is exhibited from the island's summit.

5.86

- 1 **Useful mark:**
Dampier's Monument (16°08'S 123°26'E), conical in shape with a rounded summit on which there is a solitary bush. The island, though small, is the most distinctive island in the archipelago.
(*Directions for Yampi Sound continue at 5.106*)

Side channels

Charts Aus 320, Aus 323 (see 1.16)

Channel east of Adèle Island

5.87

- 1 **General information.** Churchill Reef (15°28'S 123°16'E), an extensive coral reef, is separated from the E side of the reef surrounding Adèle Island by a channel about 1½ miles wide with the greatest depths, over 70 m, on the W side. The 30 m depth contour line off the W side of Churchill Reef is usually clearly defined by discolouration extending from the reef towards it. A light (5.21) is exhibited from Adèle Island (15°31'S 123°09'E).
- 2 Albert Reef, with another reef drying 2.1 m close off its NW extremity, lies on the SE side of the channel 10 miles SE of Adèle Island. The S side of Albert Reef is steep-to.
Fraser Inlet; both the entrance and the inlet are foul and should only be entered at LW.
Local knowledge is required.
Tidal streams in the channel between Adèle Island and Churchill Reef set SE with the rising tide and NW with the falling tide, with a maximum rate of from 3 to 4 kn.

Chart Aus 323 (see 1.16)

Channel south of Adèle Island

5.88

- 1 Between Adèle Island (15°31'S 123°09'E) and the dangers surrounding it, on the N, and Buccaneer

Archipelago on the S, there is a relatively clear channel about 20 miles wide. The channel can be safely navigated by keeping the N islands of Buccaneer Archipelago in sight noting Tasmanian Shoal (15°53'S 123°22'E) and Frost Shoal (15°47'S 123°21'E) (5.84) which lie in the channel between Adèle Island Shoal and Caffarelli Island.

Tidal streams attain a rate of from 2 to 3 kn, see information on the chart.

Channel east of Caffarelli Island

5.89

- 1 Cleft Island (16°02'S 123°21'E) (5.84) lies 2 miles E of the E extremity of Caffarelli Island and a rocky islet, 3 m high, lies 5 cables WNW of Cleft Island. Two reefs, the E-most drying 6.5 m, lie between this islet and the E extremity of Caffarelli Island.
Barrett Rock (16°04'S 123°20'E) lies 1¼ miles SSE of the E extremity of Caffarelli Island and there is a detached reef, 4 cables W of this rock.

5.90

- 1 **Directions.** There is a channel between Caffarelli Island and Cleft Island. Mariners using this channel from N should pass the 3 m high islet, which has deep water at a distance of 1 cable all round it, at a distance of not more than 2 cables on either side on a SSW track and thence pass midway between Caffarelli Island and the detached reef lying W of Barrett Rock.
- 2 **Local knowledge** is required.
Caution. Tide rips have been reported close W of Cleft Island and a depth of 5.8 m was reported (1984) to lie 2½ cables N of the NW point of Cleft Island, on the E side of the channel.

Anchorage

5.91

- 1 For anchorage E of Brué Reef (15°56'S 123°03'E) see 5.35.

COCKATOO ISLAND

General information

Charts Aus 40, Aus 323 (see 1.16)

Position and function

5.92

- 1 Cockatoo Island (16°06'S 123°37'E) is a well sheltered deep-water port and is situated in Yampi Sound (5.29).
The sole function of the port of Cockatoo Island is the export of iron ore.

Topography

5.93

- 1 Cockatoo Island (16°06'S 123°37'E), on the N side of Yampi Sound, lies 1¼ miles E of Irvine Island from which it is separated by Galah Channel (5.107). A deep valley leads up the centre of the island in a NW to SE direction and there is a conspicuous hill near the NW extremity of the island. Usborne Island, with steep cliffs on its S and E sides, lies close off the E extremity of Cockatoo Island and forms the W side of Parakeet Channel (5.109).
- 2 Koolan Island (16°08'S 123°45'E) has steep timbered slopes on the S side. The island is separated from the mainland S by The Canal, a passage deep throughout in the fairway, 6 cables wide at its W entrance but narrowing considerably towards its E entrance. The E entrance is obstructed by Round Island forming two channels, The Drain and The Gutter, to the N and S, respectively, of the island. Tarrant Island, bare and rocky with steep cliffs on

its N side, lies close off the W extremity of Koolan Island and forms the E side of Parakeet Channel.

5.94

- 1 The coast on the S side of Yampi Sound, W from Nares Point (16°08'S 123°42'E), is rocky with numerous bays and coves. The coastal ridge in general varies between 100 and 180 m in height and is sterile. Conilurus (Margaret) Island (16°09'S 123°35'E) with a bare conical summit lies close to the mainland on the S side of the sound and is the W point of approach to Yampi Sound. Gibbings Island lies on the S side of the fairway 2¾ miles W of Conilurus Island; its summit is a bare rock.

Approach and entry

5.95

- 1 Cockatoo Island is approached from the NW between Irvine and Gibbings Islands, from the N through Galah Channel, and from the NE through Parakeet Channel.

Limiting conditions

Chart Aus 40

5.96

- 1 **Tidal levels.** To conform to the datum of depths given in this volume for the area covered by chart Aus 40, as well as depths on the chart itself, 1 m (3.3 ft) should be subtracted from tidal heights obtained from both *Admiralty Tide Tables* and *Australian National Tide Tables*.

A tide gauge is positioned at No 4 dolphin at the berth.

Density of water: 1.025 g/cm³.

Arrival information

Notice of ETA

5.97

- 1 ETA should be sent on departure from the previous port and updated at subsequent periods, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages

5.98

- 1 Good anchorage, in all weathers, is available 9 cables WNW of Nares Point (16°08'S 123°42'E) with the E extremity of Tarrant Island bearing 341°, distant 10½ cables, in a depth of 14 m (48 ft), mud.

Caution. A 9.9 m (34 ft) patch (16°08'S 123°41'E) lies close SSW of this anchorage.

Tidal streams at this anchorage are slight, a maximum rate of 1 kn was observed at springs.

- 2 Anchorage, off the wharf on Cockatoo Island, can be obtained 1½ miles SSE of Bubb Point (16°05'S 123°35'E), the W extremity of Cockatoo Island, in depths of from 18 to 29 m (60 ft to 16 fm), mud.

Pilotage and tugs

5.99

- 1 **Pilotage** is compulsory. The boarding position is 1½ miles WSW of Cockatoo Island Jetty.

Tugs. It is reported (1995) that one tug is available.

Berthing

5.100

- 1 Vessels are berthed during daylight hours at any stage of the tide. Vessels unberth on completion of loading.

Harbour

General layout

5.101

- 1 **Cockatoo Island Jetty.** The jetty has been re-opened to traffic (1994) for the sole purpose of loading iron ore concentrate. The light on the top of the old power station 5 cables NW of the jetty, has been re-commissioned; it is exhibited 24 hours before the arrival and after departure of vessels scheduled for loading at the jetty.

Unexploded ordnance

5.102

- 1 Two areas, each radius 5 cables, centred in positions 16°06'S 123°35'E and 16°07'S 123°37'E, off the S side of Cockatoo Island, are dangerous due to unexploded depth charges with regard to anchoring, fishing or any form of submarine or seabed activity. See *Annual Australian Notices to Mariners* for details.

Natural conditions

5.103

- 1 **Tidal streams.** Tidal streams within Yampi Sound generally set E with the rising tide and W with the falling tide. It has been reported that the tidal stream attains a rate of 3 kn on both the rising and falling stream.

At Cockatoo Island Jetty the tidal stream sets E except for a period from 1 hour before to 3 hours after HW when the tidal stream sets W. During spring tides the tidal stream may reach 1¼ kn.

- 2 The Canal, in the vicinity of Arbitration Cove, the tidal stream sets E except for a period from ½ hour before to 2½ hours after HW when the tidal stream sets W.

Tidal streams through The Drain and The Gutter, at the E entrance to The Canal, attain great rates rendering these two passages dangerous.

5.104

- 1 **Local weather.** Yampi Sound lies near the S extremity of the S zone of tropical storms, the season extends from November to April and storms could be expected during this period. The prevailing winds from November to March are W and strong at times, especially in the afternoon. From April to October there are frequent periods of strong SE winds in the mornings followed by light W winds in the afternoons.

Landmarks

5.105

- 1 Dampier's Monument (16°08'S 123°26'E) (5.86).
Conspicuous hill (16°05'S 123°35'E) on the NW extremity of Cockatoo Island.

Directions for entering harbour

(continued from 5.86 and 5.42)

North-west approach

5.106

- 1 From a position about 1½ miles SW of Tanner Island the track leads E for about 4½ miles passing (with positions given from Tanner Island Light (16°06'S 123°32'E) (5.85)):

N of Laxton Point (2¾ miles SSW); thence:

S of the S-most point (1 mile ESE) of Irvine Island; thence:

- 2 NNE of a 9.9 m (34 ft) patch (3 miles SSE); thence:
S of the coastal bank, with depths of less than 18.3 m (60 ft) extending 1¼ miles SW from Bubb Point (5.98) (3¼ miles E); thence:

N of Woodhouse Point (16°09'S 123°35'E) (4½ miles SE); a reef drying 5.5 m (18 ft) extends 3½ cables N from the point;

- 3 The track then leads ENE from the pilot boarding position to the berth, noting the 7.6 m (25 ft) patch at the E end of the coastal bank extending SW of Bubb Point.

Galah Channel

5.107

- 1 Galah Channel (16°05'S 123°34'E), between Irvine Island and Black Rock, is a clear passage with depths of more than 37 m (20 fm) over a width of 3 cables close to the W side of the channel. A depth of 18.7 m (64 ft), which is less than general in the area, lies in the N approach to Galah Channel, 1¼ miles N of the conspicuous hill (16°05'S 123°35'E) on Cockatoo Island.

It is reported (1991) that this channel has fallen into disuse.

5.108

- 1 From a position about 1 mile E of Kathleen Island (16°04'S 123°33'E) the track leads initially SSW through Galah Channel passing (with positions given from the conspicuous hill (16°05'S 123°35'E) on Cockatoo Island):
ESE of Kathleen Island (1½ miles WNW); thence:
Between Black Rock (4 cables WNW), distant at least 2½ cables, and Jonas Point (1¼ miles W); thence:
- 2 Between the coastal bank, with depths of less than 18.3 m (60 ft) extending 1¼ miles SW from Bubb Point (3 cables SW), and Hardstaff Point (2 miles WSW).

The track then leads SE to the pilot boarding position marked on the chart.

Parakeet Channel

5.109

- 1 Parakeet Channel, the passage between Usborne Island (16°07'S 123°39'E) and Tarrant Island, is about 1½ miles wide and is deep except for Comber Rock which lies in mid-channel.

From a position about 5 miles E of Kathleen Island (16°04'S 123°33'E) the track continues in a general S direction passing (with positions given from Comber Rock (16°07'S 123°40'E)):

- 2 W of a shoal with a least depth of 20.3 m (11 fm) (2 miles NE); thence:
Between Comber Rock, and Tarrant Island (8 cables E) (5.93).
The track then leads SW for about 3½ miles passing:
Between the E island of The Piccaninnies (1¼ miles SW) and a 17.7 m (58 ft) patch (2 miles S); thence:
NW of a 18 m (59 ft) patch (2¼ miles SSW)
- 3 The track then leads W for 1½ miles passing S of The Piccaninnies, noting a detached reef drying 2.9 m (8 ft) 2 cables S, before leading NW towards the pilot boarding position shown on the chart.

Useful mark

5.110

- 1 **Cockatoo Island:**
Radio tower (16°05'4S 123°35'6E) at an elevation of 98 m (321 ft).

Berth

Alongside berth

5.111

- 1 **Cockatoo Island Jetty.** It is reported that the depth alongside is 10.5 m at LAT. The berth comprises seven berthing dolphins, extending 170 m E and 110 m W of the shiploader. An additional mooring dolphin lies 80 m farther W.

Port services

5.112

- 1 **Repairs** are not permitted at the berth.
Other facilities. Medical services are not available; medical evacuation to Derby can be arranged in emergencies. Shore leave is not possible, ships' crew are to remain on board. Oily waste: there are no facilities.
Supplies. Fuel, fresh water and provisions are not available.

Coppermine Creek

Chart Aus 40

General information

5.113

- 1 Coppermine Creek entered between the W extremity of Conilurus (Margaret) Island (16°09'S 123°35'E) and an 82 m (269 ft) high bluff on the mainland, 6 cables S, extends 4½ miles in a SE direction and terminates in a mangrove swamp. An island lies 1½ miles within the entrance and the narrow passage between it and the shore NE is reported to be clear.
- 2 **Pearl farming.** Pearl farms, which may be floating or fixed, are located throughout the Creek. See 1.8 and the large scale national chart for details.
Local knowledge is required.
Anchorage can be obtained between the entrance and the island.

Inshore passages

General information

5.114

- 1 For routes for small craft from Yampi Sound to King Sound, see 5.30.

Minor bays

Chart Aus 40

Collins Cove

5.115

- 1 Collins Cove a sandy inlet on the SW side of Cockatoo Island, 7 cables ESE of Bubb Point (16°05'S 123°35'E), affords a good landing place at HW.
Two radio masts stand at the head of the cove and a settlement lies on the low neck of land close NE.
- 2 **Tidal streams** about 4 cables off the cove set E during the rising tide and W during the falling tide and may attain a rate of from 1 to 2 kn.
Berth. A small pier is situated on the W side of the entrance to the cove.

Silver Gull Creek

5.116

- 1 Immediately S of Nares Point (16°08'S 123°42'E) there is a bay divided into two parts by a reef, with an islet (38 m (124 ft) high) on it, extending 1¼ miles NW from the head of the bay. A detached reef drying 1.2 m (4 ft) lies close off the extremity of this reef.

- 2 Silver Gull Creek extends 1½ miles S from the head of the SW part of this bay. During spring tides small craft, with a draught not exceeding 2.7 m (9 ft), can enter Silver Gull Creek from about half rising tide to half falling tide.

Local knowledge is required.

Excellent shelter can be obtained in both parts of the bay.

Myridi Bay

5.117

- 1 Myridi Bay entered 2 miles ESE of Woodhouse Point (16°09'S 123°35'E) is a narrow inlet which extends 2 miles in a SE direction terminating in a mangrove swamp. The bay provides excellent shelter during the cyclone season.

Depths over the greater part of this bay are from 3.7 to 9.1 m (12 to 30 ft).

ADÈLE ISLAND TO KING SOUND

General information

Chart Aus 323 (see 1.16)

Route

5.118

- 1 From WSW of Adèle Island (15°31'S 123°09'E) the route to King Sound leads initially SSE, about 30 miles. The route then leads S, about 20 miles, passing W of Caffarelli Island, the W-most island of the W group of Buccaneer Archipelago (5.27). Thornbury Reef (5.124), 1½ miles W of Caffarelli Island, may be passed on either side.

Topography

5.119

- 1 Godsmark Island (16°07'S 123°18'E) lies on a reef extending from the NW extremity of the NW Bedford Island. The island has a very rugged appearance and is easy to identify, being composed of dark-coloured rock, whereas Bedford Islands are chiefly yellow sandstone.
- 2 Tide Rip Islands, known locally as Kurui, are a group of rocky islands at the entrance to King Sound. Doris Island (16°18'S 123°18'E), the NW-most of the group, is separated from the remainder of the group, which lie together on one drying reef, by a narrow channel. Salier Islands, SW of Tide Rip Islands, are separated from the latter islands by a narrow channel about 1 mile wide.

Tidal streams

5.120

- 1 West of Caffarelli Island the tidal streams are strong setting SSW to SE on the rising tide and NNW to NNE on the falling tide, the streams change direction N and S of the island.
- 2 West of Bedford Islands, in the vicinity of Pincombe Reef (16°05'S 123°10'E) and Fraser Rock, 7 miles WSW, the tidal streams turn from 1 to 2 hours after HW and LW at those islands. They attain a rate of 3 kn at springs, increasing in strength when passing over the shoaler patches and forming heavy tide-rips and swirls. See also information on the charts.

Major light

5.121

- 1 Adèle Island Light (15°31'S 123°09'E) (5.21).

Other aid to navigation

5.122

1 Racons:

Adèle Island Light – as above.

Cape Leveque Light (16°24'S 122°56'E) (5.143).

Directions

(continued from 5.24)

Adèle Island to Caffarelli Island

5.123

- 1 From the vicinity of 15°33'S 123°02'E, about 7 miles WSW of Adèle Island Light, the track leads initially SSE passing (with positions given from Caffarelli Island Light (16°03'S 123°17'E)):
- Between Adèle Island Reef (27 miles NNW) and Barcoo Shoal (31 miles NW); thence:
- WSW of Adèle Island Shoal (21 miles N) (5.84); thence:
- 2 Between Frost Shoal (16 miles NNE) (5.84) and Brué Reef (15 miles WNW) (5.35); thence:
- WSW of Tasmanian Shoal (10 miles NNE).

Caffarelli Island to King Sound

5.124

- 1 From the vicinity of 15°59'S 123°13'E, about 5 miles NNW of Caffarelli Island Light, the route leads S passing (with positions given from Caffarelli Island Light (16°03'S 123°17'E)):
- 2 Between an islet 37 m high, with a rock awash close S of it, lying close W of Caffarelli Island and Thornbury Reef (2 miles W), steep-to, and usually visible due to the tidal eddies around it. Alternatively, the track may be shaped to pass W of Thornbury Reef. A light (white metal tower, white lantern, 6 m in height) is exhibited from a summit at the W end of Caffarelli Island. Thence:
- 3 E of Pincombe Reef (6½ miles WSW), a pinnacle rock steep-to on all sides; the tidal swirls around this reef extend at least 5 cables during the strength of the tidal streams and make it appear much greater than it really is; thence:
- W of Brown Reef (4 miles S). Its position can usually be seen from the tide rips around it; thence:
- 4 W of Asshlyn Islands (5 miles S) lying close together on the edge of the reef extending W from Bedford Islands; thence:
- W of Tucker Reef (6¾ miles S); thence:
- E of Fitzgerald Patch (12½ miles SW) (5.146); thence:
- 5 W of Fairthlough Ridge having its least depth on its S extremity (14 miles S); thence:
- To a position about midway between the NW-most Salier island (15½ miles S) and Otway Shoal (18½ miles SSW).

5.125

1 Useful marks:

Cleft Island (16°02'S 123°21'E) (5.84).

Cape Leveque Light (16°24'S 122°56'E) (5.143).

(Directions continue at 5.147)

Anchorage

5.126

- 1 For anchorage E of Brué Reef (15°56'S 123°03'E) see 5.35.

Side channels

Goose Channel

5.127

- 1 **General information.** Goose Channel leads between Gibbings Island (16°09'S 123°31'E) and the mainland SW and is suitable only for small coasting vessels. The channel is also used by small craft proceeding S from Yampi Sound through Whirlpool Pass (5.131).

Local knowledge is required.

- 2 **Topography.** The coast between Woodhouse Point (16°09'S 123°35'E) and Chambers Island, 8 miles SSW, is fronted by a number of islands and reefs, the position of which can best be seen from the chart. Gibbings Island, the outermost island, lies 4 miles W of Woodhouse Point. A drying coral reef extends from its E side and Dorothy Island, a bare rocky island with smaller islets S of it, stands on this reef.

5.128

- 1 **Directions.** From Yampi Sound the passage leads generally SW passing (with positions given from Gibbings Island summit (16°09'S 123°31'E)):

W of Conilurus Island (3 miles E) noting the 9.9 m patch in mid-channel 1¼ miles NW; thence:

Between a rock, 14 m high, standing on a detached drying reef (2 miles ESE) and Dorothy Island (5 cables E); thence:

- 2 Between a 21 m high islet (2 miles S) which stands on the N extremity of the drying reef extending W from Arbidej Island (2½ miles SSE) and a reef drying 1.3 m (1¼ miles SSE); thence:

Either SW or NW of a reef drying 1.9 m (2¼ miles SSW).

Channel south of Byron Island

5.129

- 1 **General information.** Gagg Islands a group of islands and rocks, some of them connected by drying reefs, lying parallel to the S side of Bryon Island (16°10'S 123°27'E) are separated from it by a deep, narrow passage. The largest island (51 m high) lies 5 cables S of the W extremity of Bryon Island and the remainder extend from 1½ miles W to 1¼ miles ESE of the largest island.

- 2 Lord Island and Byron Island lie close together on the same reef. The W side of both islands consist of steep cliffs fronted by a drying coral reef. The S side of Bryon Island is steep-to.

Offshore dangers. Reefs which dry lie within a distance of 1¼ miles WNW of the W extremity of Bryon Island, the outer-most drying 1.9 m.

Channel north of Tyrer Islands

5.130

- 1 **General information.** Tyrer Islands, together with Dorney Island, Verco and Shirley Island, lie on the same drying reef 2 miles SW of Hidden Island (16°15'S 123°29'E). The N and NE sides of Shirley Island are steep-to and an islet, 35 m high, stands on a drying reef 7½ cables NE of Shirley Island in the channel between that island and Hidden Island.

- 2 Dickenson Ridge, with its least depth at its N end, is a narrow ridge of submerged coral extending in a SSE direction from a point 1½ miles ESE of Pope Island (16°11'S 123°20'E).

Passage. There is a clear passage, about 5 cables wide, with depths of from 17 to 26 m between the S extremity of Dickenson Ridge and the drying reef extending N from Tyrer Islands.

- 3 **Local knowledge** is required.

Offshore dangers. Witcomb Reefs, a group of coral reefs, lie in the W approach to the passage. The W-most reef, drying 1.9 m, lies 4½ miles W of Tyrer Islands and the remainder of Witcomb Reefs lie in a group together 1½ miles E of the W-most reef. Several shoal patches with depths of less than 10 m, the positions of which can best be seen from the chart, lie within 3 miles ESE of Witcomb Reefs.

Whirlpool Pass

General information

5.131

- 1 **Description.** Whirlpool Pass between the SE part of Hidden Island (16°15'S 123°29'E), the largest island in Buccaneer Archipelago, on the N and W, and between Chambers and Dunvert Islands, on the S and E, is 2 cables wide at its narrowest part and connects with Goose Channel (5.127). The pass should only be attempted at slack water.

Local knowledge is required.

- 2 **Topography.** A bay, with a mangrove swamp at its head, on the SE side of Hidden Island is mostly occupied by the W part of Chambers Island, the E extremity of which is practically connected to the mainland. An islet lies close off the N coast of Chambers Island and forms the E side of the N entrance to Whirlpool Pass. Dunvert Island lies close S of Chambers Island and forms the E side of the S entrance to the pass. Steep Head (16°18'S 123°31'E), the S extremity of Dunvert Island, is a remarkable rocky mass rising abruptly from the sea to a height of 89 m, its remarkable column shaped rocks scattered over its level summit give it the appearance of an ancient turreted fortress. Packer Islands, a group of islands and rocks with coral reefs around them, lie from 1 to 4 miles W of Steep Head, in the S approaches to Whirlpool Pass.

- 3 **Tidal streams** set through the pass at a great rate forming whirlpools.

Dangers. The N-most danger on the E side of the approach to Whirlpool Pass, from N, is the 21 m high islet which stands on the drying reef extending W from Arbidej Island, 6¼ miles N of Steep Head. A reef, drying 1.9 m, on the S side of Goose Channel lies 8 cables farther E in the middle of the N approach.

- 4 An islet connected to the SE side of Hidden Island by a drying reef lies on the W side of the pass (1 mile NE of the S extremity of Hidden Island) with a rock, 1 m high, 6 cables SSW of it and a reef drying 1.3 m close S.

5.132

- 1 **Approach** to Whirlpool Pass, from N, is through a channel nearly 4 cables wide with depths of more than 10 m between the shoal water extending E from Bayliss Islands (16°14'S 123°30'E) and the shoal water and reefs extending SW from Arbidej Island 3 miles farther NE.

- 2 **Side channel.** Bayliss Islands (16°14'S 123°30'E), a group of three islands connected to each other at LW, run parallel to the NE part of Hidden Island and are separated from it by a channel about 4 cables wide.

Dangers. Detached reefs lie within a distance of 1¼ miles NW of the N extremity of the N Bayliss Island. A rock (16°12'S 123°28'E), 19 m high, stands on the N-most reef.

- 3 There is a drying reef 7½ cables N of the N extremity of Hidden Island, foul ground was reported (1937) to lie between this reef and the island.

KING SOUND

General information

Chart Aus 323 (see 1.16)

Description

5.133

- 1 King Sound is entered between the S extremity (16°17'S 123°30'E) of Hidden Island and Swan Point, 27 miles W, and extends about 60 miles SSE to the town of Derby, which stands at the entrance of Fitzroy River.

Topography

5.134

- 1 Cape Leveque (16°24'S 122°56'E), in the W approach to the sound, is fringed by red cliffs with white sandhills within; a light (5.143) is exhibited from the cape. The coast between Cape Leveque and Swan Point, 7 miles ENE, is low, sandy and fringed by coral ledges and sandflats. A chain of islands, islets and reefs extends 11½ miles E from the coast between Swan Point (16°22'S 123°02'E) and One Arm Point, 5 miles SSE. Sunday Islands, known locally as Yuwan, are the largest and E-most of this chain and consist of two rugged islands, sparsely covered with scrub, lying on the same reef and separated from each other by a narrow channel which dries. Roe Islands, known locally as Thurlan, lie about 1½ miles N of Sunday Islands. The W island is a rugged mass of quartz rock, the E island has its summit at its E end and tapers away at its W end to a narrow rocky ridge with a knob on its extremity.
- 2 High Island (16°21'S 123°20'E) on the E side of Sunday Strait, known locally as Urtala, is high and cliffy on its W side, whilst the S coast is considerably indented and has a fringing reef. A drying reef with a rock on it (13 m high) extends 2½ cables SE from the SE extremity of the island.

5.135

- 1 **Historic wreck** of the vessel *Karrakatta* lies close N of Swan Point. See 1.60.

Channels

5.136

- 1 The whole of the N part of King Sound is obstructed by islands, islets and dangers, with various passages between them, which lead into the sound.
- 2 Sunday Strait (5.147), E of Sunday Islands, is the main entrance to King Sound and leads between Salier Islands (16°19'S 123°16'E), High Island, Tree Island and Mermaid Island, on the E, and Otway Shoal (16°21'S 123°12'E), East Roe Island and Sunday Islands, on the W. Menmuir Rock (16°22'S 123°15'E) (5.147), situated in the fairway of Sunday Strait, can be passed on either side, the preferred route shown on the large scale national chart passes E of the rock.

Depths

5.137

- 1 Depths of 16 m or more lie in the fairway, to within 20 miles of the head of the Sound, shoaling gradually towards the shore in most places.

Pearl farming

5.138

- 1 Pearl farms, which may be floating or fixed, are located either side of the N part of the Sound. See 1.8 and the large scale national chart for details.

Natural conditions

5.139

- 1 **Tidal information.** The entrances to the sound are deep but the tidal streams set through most of them at a considerable rate. See information on the chart.

5.140

- 1 **Tidal streams** N of Cape Leveque, during E winds, change at from ¼ to 1½ hours before HW and LW, and during W winds at similar intervals after HW and LW. They set E on the rising tide and WNW on the falling tide.
- 2 Tidal streams attain a rate of 5 to 10 kn through Sunday Strait. In Sunday Strait, Meda, Escape and Hadley Passes the tidal streams turn at about 1½ hours after HW and LW in Sunday Strait and Karrakatta Bay. On the E side of Sunday Strait, near Mermaid Island (16°26'S 123°21'E) and among the islands E of that island, the streams change at about 2 hours after HW and LW.
- 3 From a position close to Swan Island (16°21'E, 123°03'E) the rising, or E-going stream, sets directly towards Escape Pass, and from midway between Swan Point and Twin Islands, 5 miles NE, it sets towards and sweeps along the N shores of Roe and Sunday Islands.
- 4 About 2 miles N of Twin Islands the in-going stream sets to the E and then SE towards Sunday Strait increasing in strength until, on passing between East Roe Island and Tree Island (16°23'S 123°19'E), it has attained a rate of from 5 to 10 kn. The tidal streams rushing over the rocky ridges on which Menmuir Rock (5.147) lies cause heavy races and overfalls.
- 5 From Menmuir Rock the main tidal stream, with reduced strength, sets S up the fairway of King Sound, but a portion sets SW and, joining the stream which has entered by Escape and Pearl Passes, follows the curve of Cygnet Bay to Cunningham Point (16°41'S 123°08'E). Where the tidal stream from Cygnet Bay rejoins at right angles the main stream off Cunningham Point, a heavy race occurs on the in-going stream.
- 6 The out-going tidal stream sets, generally, in the opposite direction to the in-going stream, except on the E side of Sunday Strait close to Tree Island (16°23'S 123°19'E), where, after passing Hancock Reef (5.147), it splits, one portion setting N between Salier Islands and the W islands of the Tide Rip group.
- 7 From a position about 1 mile E of Sunday Islands the out-going stream sets towards the rocky S shore of East Roe Island.
In the fairway of the S part of King Sound tidal streams attain a maximum rate of 5 kn, near the W shore from 5 to 6 kn, and abreast Point Torment (17°02'S 123°35'E) from 3 to 4 kn.
- 8 About 8 miles W of Port Usborne (16°39'S 123°29'E) the in-going stream sets ESE towards Stokes Bay, and due allowance for this set must be made when approaching Fitzroy River on a rising tide. Between Point Torment and Mary Island North and South the in-going stream sets SSE to SE, ceasing at HW. The out-going stream sets, generally, in the opposite direction to the in-going stream.

5.141

- 1 **Eddies and overfalls.** In King Sound at spring tides there are extensive eddies and overfalls over all shoal and other areas where marked changes of depths occur.

Tide-rips. In strong winds at spring tides, dangerous tide-rips occur in the vicinity of Fairway Islands (16°34'S 123°19'E), S and SE of Long Island (5.178) and off Cunningham Point and Foul Point (16°48'S 123°09'E).

- 2 **Water discolouration.** South of the 20 m depth contour NW of Point Torment the colour of the water changes to a

dirty yellow darkening to brown as Derby is approached, where at springs the water is thickly impregnated with mud and sand.

5.142

- 1 **Climatic table.** See 1.170 and 1.176.

Major light

5.143

- 1 Cape Leveque Light (white metal tower and lantern, 13 m in height) (16°24'S 122°56'E) exhibited on the summit of the cape.

Other aid to navigation

5.144

- 1 **Racon:**
Cape Leveque Light – as above

Directions

(continued from 5.125 and 5.34)

Navigation

5.145

- 1 A knowledge of the tidal streams (5.139) is essential for the safe navigation of the approaches to King Sound and the estuary of Fitzroy River at the head of the sound. Mariners in low powered vessels and sailing vessels should endeavour to make Sunday Strait at LW. It is usual to navigate the approaches during daylight hours, and as a general rule, the passages in the N part of the area are negotiated at or about the time of LW so as to arrive at Derby at or about HW.

Approach from west-north-west

5.146

- 1 From a position about 28 miles WNW of Cape Leveque (16°24'S 122°56'E), the track leads initially E passing (with positions given from Cape Leveque Light):
N of Pitt Shoals, the NW-most danger off Cape Leveque, with their least depth an isolated patch 3.6 m (9 miles NNW). The main ridge of these shoals lies in an E to W direction 1¼ miles S of the isolated patch. Thence:
2 S of Etheridge Patch (18 miles N); thence:
S of Breeding Patch (20 miles NNE); and:
N of Ferret Reef (10 miles NE), almost awash; thence:
S of Fraser Rock (18½ miles NNE), a dangerous pinnacle rock; and:
3 N of NW Twin Island (10 miles NE), noting the rocky ledge which extends 6 cables NE from the island; thence:
S of Fitzgerald Patch (17 miles NE); and:
N of SE Twin Island (11 miles ENE), distant 5 miles, noting that foul ground extends 5 cables NE from this island.
4 The route then leads SE passing between Salier Islands (20 miles ENE) and Otway Shoal (16½ miles E) to join the preferred route S through Sunday Strait.
Tide-rips. The depths between Fitzgerald Patch and Breeding Patch are irregular and long lines of tide-rips are seen at springs.

Sunday Strait

5.147

- 1 From the vicinity of 16°19'S 123°13'E, about midway between Salier Islands and Otway Shoal, the preferred route shown on the large scale national chart leads 129½°

passing (with positions given from the largest Fairway Island (15 m) (16°34'S 123°19'E)):

- NE of East Roe Island (13 miles NNW); thence:
2 NE of Menmuir Rock (12½ miles NNW) on a narrow ridge of rocky ground marked by dangerous overfalls, distant 1½ miles.
The preferred route then leads 168° passing:
ENE of an 8.1 m shoal lying 7½ cables ENE of Menmuir Rock (12½ miles NNW); and:
3 WSW of High Island (13 miles N) (5.134); thence:
WSW of Hancock Reef (11½ miles N), connected to the W extremity of Tree Island by a rocky ridge, and ENE of Rip Rock (11½ miles NNW) the E-most danger off East Sunday Island; thence:
WSW of Wood Islands (10½ miles N) (5.175); thence:
4 WSW of Mermaid Island (8 miles NNE) (5.174); thence:
Between Wybron Islets (7 miles NNE) (5.174) and Amur Reef (6¾ miles NNW), noting the 6.3 m shoal which lies 3 cables E of the reef and closer to the route; thence:
Between Vickery Islet (5½ miles NNE) (5.174) and Alert Rock (5¾ miles NNW), distant 1 mile.

5.148

- 1 **Alternative route west of Amur Reef.** From the vicinity of 16°25'S 123°17'E, about 2½ miles WSW of Wood Islands, an alternative route shown on the large scale national chart, leads 220° passing (with positions given from the largest Fairway Island (15 m) (16°34'S 123°19'E)):
2 Between Amur Reef (6¾ miles NNW) and Pelican Rock (10½ miles NW), noting the reef drying 7 m which lies close SE of the rock and closer to the route, the S-most danger off East Sunday Island; thence:
To a position W of Alert Rock (5¾ miles NNW), distant 3½ miles.

King Sound

5.149

- 1 From a position at the S entrance to Sunday Strait, E or W of Alert Rock (16°29'S 123°16'E) as shown on the large scale national chart, the route leads generally SSE passing (with positions given from the largest Fairway Island (15 m) (16°34'S 123°19'E)):
2 WSW or clear of Fairway Islands, a group of rocky islands lying 2½ miles W of Long Island, noting the detached reef, drying 1.4 m, lying 1½ miles farther N. The wider channel lies to the W. And:
ENE of a 9.3 m shoal (6½ miles WSW); thence:
ENE of Cunningham Point (12 miles WSW) (5.187); thence:
3 WSW of Rip Reef (9 miles ESE) (5.181); thence:
WSW of detached patches, the shoalest (6.3 m) (19 miles SE), which front Helpman Islands (19 miles ESE); and:
ENE of South Meda Shoal (20 miles S) to a position 14 miles NW of Black Rock Light (17°05'S 123°35'E) (5.199).

5.150

- 1 **Useful marks:**
Carlisle Head (16°43'S 123°09'E), a conspicuous cliff.
Foul Point (16°48'S 123°09'E), faced by conspicuous cliffs marks the S end of a range of cliffs on the W side of King Sound.

Conspicuous white sandpatch (17°01'S 123°16'E)
24 m high.
(*Directions continue at 5.199*)

Side channels

Channel between Pitt and Alarm Shoals

5.151

- 1 **General information.** The route leads between Pitt Shoals (16°15'S 122°53'E) and Alarm Shoal to a clear passage, with depths of over 10 m, between the foul ground around SE Twin Island (16°18'S 123°05'E) and the NW extremity of Anchor Shoal, about 2 miles SE.

Local knowledge is required.

5.152

- 1 **Directions.** From a position about 6½ miles NNW of Cape Leveque Light, the line of bearing 089° of SE Twin Island (16°18'S 123°05'E) leads in the fairway passing (with positions given from Cape Leveque Light):

Between Pitt Shoals (9 miles NNW) (5.146) and Alarm Shoal (4 miles N), a long narrow shoal on the S side of the fairway, to a position about 4 miles W of SE Twin Island.

- 2 When Whirl Island (16°26'S 123° 08'E) (5.156) bears 142° and is seen in the middle of the N entrance to Escape Pass the track then leads generally E passing:

- 3 The track then leads generally E passing:
S of Ferret Reef (10 miles NE); thence:
S of NW Twin Island (10½ miles NE), noting the drying coral reef extending 1 cable from its S side; thence:

- 4 S of SE Twin Island (11 miles ENE), noting the foul ground extending up to 3 cables S from the island and the small bank, with a least depth of 11.9 m, which lies 1½ miles ESE of the island. Between the bank and the island there is a 15.6 m patch with a 15.3 m patch 8 cables SE of the bank; And:

- 5 N of the W extremity (12 miles ENE) of Anchor Shoal.

The line of bearing 106° of the summit of High Island (16°21'S 123°20'E) then leads in the fairway passing N of Otway Shoal (16½ miles E) to join the preferred route (5.147) through Sunday Strait. Mariners should guard against the S set of the rising stream on this track.

Meda Pass

5.153

- 1 **General information.** Meda Pass (16°22'S 123°11'E) between Roe and Sunday Islands is approached from W between Alarm Shoal and Twin Islands (16°17'S 123°05'E). This pass is preferred by many mariners for entering King Sound as the tide-rips are less violent than in the entrance to Sunday Strait.

Local knowledge is required.

- 2 **Tidal streams** attain a rate of 4 to 8 kn and set nearly parallel through the pass, the in-going stream inclining towards the S side and the out-going stream towards the N side. See also 5.139.

5.154

- 1 **Directions.** From a position about 4 miles W of SE Twin Island (16°18'S 123°05'E) and when Whirl Island (16°26'S 123°08'E) (5.156) is seen in the middle of the N entrance to Escape Pass bearing 142°, the route to Meda Pass leads generally ESE passing (with positions given from Cape Leveque Light):

SSW of NW Twin Island (10½ miles NE); and:

NNE of the E end (7 miles ENE) of Alarm Shoal; thence:

NNE of Swan Island (7¼ miles ENE); thence:

SSW of SE Twin Island (11 miles ENE); thence:

- 3 SSW of Anchor Shoal (13 miles ENE), noting the detached 12.8 m patch 1¼ miles S; and:

NNE of the reefs surrounding Salural and Poolngin Islands (12 miles E); thence:

The route then leads generally E passing:

- 4 Between West Roe Island (14½ miles E) and Sunday Island (14 miles E) noting Hadley Rock, with a depth of 8.2 m, which lies in mid-channel between these two islands, and Dean Island which lies close off the N side of Sunday Island; thence:

Between East Roe Island (17 miles E) and East Sunday Island (16½ miles E).

- 5 The route then rounds East Sunday Island to join the main route (5.147) S through Sunday Strait E of Rip Rock (17½ miles E).

Escape Pass

5.155

- 1 **General information.** Escape Pass entered at its N end between Rees Island (16°23'S 123°06'E) and Howard Island, 2 miles W, leads between Tallon Island, on the E, and the reef on which Leonie and Jackson Islands lie, on the W.

The channel is deep and not less than 4 cables wide and is the shortest route into King Sound from W.

- 2 **Local knowledge** is required.

Tidal streams are strong and attain a rate of from 5 to 10 kn. See also 5.139.

5.156

- 1 **Directions.** From a position about 4 miles W of SE Twin Island (16°18'S 123°05'E) the line of bearing 142° of Whirl Island (16°26'S 123°08'E), a conical island 7 m high close E of Jackson Island, seen in the middle of the N entrance to the pass leads generally SE in the fairway passing (with positions given from Rees Island (16°23'S 123°06'E)):

NW of the E extremity of Alarm shoal; thence:

NW of Swan Island, noting the rock and shoal patch extending 3 cables NE; thence:

- 2 Between Gammon Bank (1¾ miles NW) and a shoal with a least depth of 6.2 m over it (2½ miles WNW); thence:

Midway between Foal Rock (6 cables WNW) and Dickie Rock (1½ miles W); thence:

- 3 Between Rat Island (1 mile SE) and Leonie Island (1½ miles SSW).

Between Tallon Island (1½ miles SE) and Jackson Island (2¼ miles S); thence:

The track then continues E and SE in mid-channel passing:

- 4 Between Lalowan Island (4 miles SE) and Evans Rocks (4¼ miles SSE).

If proceeding N through Escape Pass keep fairly close to Whirl Island so as to guard against the strong out-going stream setting through Hadley Pass – see below.

Hadley Pass

5.157

- 1 **General information.** Hadley Pass, the E-most side passage through the island chain E of Cape Leveque, leads from SW of Rees Island (16°23'S 123°06'E) and is narrow and intricate with a least width of about 3 cables between the 20 m depth contours.

Local knowledge is essential.

5.158

- 1 **Directions.** From SW of Rees Island the track leads E and SSW passing (with positions given from Rees Island (16°23'S 123°06'E));

S of an 8·2 m patch (2 cables SW); thence:

N of an 8·2 m patch (7½ cables SSE); thence:

Between the reefs surrounding Salural and Poolngin Islands (1½ miles E) and Tallon Island (1½ miles SE); thence:

- 2 Between Allora Island (3 miles ESE) and Dingo Rock (2½ miles SE) lying close off the reef extending E from Tallon Island; thence:

W of Hancock Island (3¾ miles SE) where it unites with the S entrance to Escape Pass (5.155).

Channel south of Alarm Shoal**5.159**

- 1 **General information.** Between Karrakatta Rock (16°21'S 123°02'E) and the E extremity of Alarm Shoal there is a passage about 5 cables wide which leads to Escape Pass or Meda Pass.

Tidal streams set around Swan Island at a great rate causing a tidal race, 7 miles in length, rendering the pass hazardous for small or low powered craft.

Local knowledge is essential.

5.160

- 1 **Directions.** From W, round Cape Leveque at a distance of about 2 miles. The line of bearing 093° of the N extremity of Swan Island (16°21'S 123°03'E) then leads in the approach, S of Alarm Shoal and N of Jonas Shoal, passing (with positions given from Cape Leveque Light):

N of Ball Rock (1 mile N); thence:

- 2 N of a 10·3 m coral patch (3½ miles NE).

When Leveque Islet (6 cables NNW) bears 247° the line of bearing 247° of that islet astern leads in mid-channel passing:

Between Karrakatta Rock (7 miles ENE) and the E extremity (6¾ miles ENE) of Alarm Shoal.

Alternative leading mark for the E end of this channel: Line of bearing 050° of SE Twin Island (16°18'S 123°05'E).

Anchorage**King Sound****5.161**

- 1 King Sound affords anchorage almost throughout but should not be attempted in the vicinity of Fairway Islands (16°34'S 123°19'E).

Strickland Bay**General information****5.162**

- 1 Strickland Bay is entered between Steep Head (16°18'S 123°31'E) and the NW Mary Island, 4 miles SSW. The head of the bay is entirely occupied by mangrove swamps and foul ground.

Local knowledge is required.

5.163

- 1 **Topography.** The shores of the bay are considerably indented and are mostly steep and cliffy.

Cecilia Islands are the outer-most of a chain of islands extending SE and dividing Strickland Bay into two parts. They lie together on a drying reef with the NW island of the group, 25 m high, 3 miles SE of Steep Head. A group of three islets, the E-most 26 m high, lies from 6 to 8 cables W of the NW Cecilia Island. Edeline Islands

(16°22'S 123°36'E) are separated from Cecilia Islands by a channel about 5 cables wide having a rock, with a depth of 9·6 m over it, nearly in mid-channel.

- 2 The S side of the bay is formed by Gerald Peninsula, the N coast of which is high and cliffy. Several islets and reefs extend NW from Gerald Peninsula to the larger of the two Mary Islands which lies 4 miles SSW of Steep Head.

5.164

- 1 **Tidal streams** are not strong S of Cecilia and Edeline Islands but N of Edeline Islands both streams attain a considerable rate.

Approach**5.165**

- 1 The best approach to Strickland Bay appears to be by passing either side of the reef on which Tyrer, Dorney, Verco and Shirley Islands (16°17'S 123°26'E) (5.130) lie.

A number of islets, rocks and drying reefs lie between Dorney Island and Folly Island, 5 miles S, and are divided into two groups by a narrow passage. The N islet of the two groups, 70 m high, lies 1¼ miles S of Dorney Island and there is a small reef, drying 3·6 m, lying 4 cables E of its NE extremity.

- 2 **Dangers.** Vickery Reef (16°19'S 123°30'E) and associated dangers lie in the N entrance to the bay 1½ miles SSW of Steep Head.

A dangerous rock, with a coral ridge with a least depth of 5 m over it 5 cables farther W, lie 1 mile NW of the NW Mary Island, and are the outer-most dangers off the S entrance point to the bay.

- 3 **Depths.** An islet, 53 m high, is situated 3½ miles SE of Steep Head and rocky patches drying 5·5 m lie 5 cables SW of this islet. There are some patches with depths of less than 10 m, whose positions can best be seen from the chart, between the rocky patches drying 5·5 m and the reefs extending SE from Mary Islands (16°22'S 123°30'E).

Anchorage**5.166**

- 1 Anchorage can be obtained, as convenient, in any part of Strickland Bay S of Cecilia and Edeline Islands, mud bottom.

Caution. On the S side of the S part of the bay a reef, drying 1·5 m with some rocks on it, lies 1¾ miles S of the 53 m high islet (16°21'S 123°33'E). A small reef, drying 1·2 m, lies 2½ miles SE of the same islet, in the E part of the S bay.

The Graveyard**5.167**

- 1 The Graveyard, so called from the number of pearl divers who have lost their lives there, is a large lagoon on the NE side of Strickland Bay with numerous islands mostly connected together by drying reefs. Aveling Island (16°21'S 123°37'E), the outer-most of these islands, lies in the middle of the entrance to the lagoon. The deeper channel lies to the S of Aveling Island. An islet, 49 m high, lies midway between Aveling Island and the largest Edeline Island, 1 mile SW.

- 2 Within the islands the shores of The Graveyard are fronted by mangrove flats leaving a narrow channel, suitable only for small craft, and many patches which dry.

Cone Bay**General information****5.168**

- 1 Cone Bay, which derives its name from Cone Hill a conical hill situated at the head of the bay, is entered

between the W extremity of Sir Richard Island (16°25'S 123°29'E) and the W extremity of a peninsula, 4 miles S. The bay is shoal in its inner part.

5.169

- 1 **Topography.** Sir Richard Island, steep and cliffy, has its summit at its E extremity from which the hills slope down gradually to a long narrow point at the W extremity. The peninsula forming the N side of Cone Bay rises to a rocky and sparsely wooded plateau from 140 to 180 m high, which gradually increases in height E.

- 2 The S shore of Cone Bay is cliffy and precipitous. Porter Hill (16°30'S 123°32'E) is the highest hill on the S side of the bay.

5.170

- 1 **Tidal streams.** Through the chain of islets which extends from High Island (16°21'S 123°20'E) to the N entrance point of Cone Bay, 7 miles ESE, the tidal streams attain a considerable rate in the openings and passages, the intervening water between these streams is comparatively still.

Directions

5.171

- 1 **Approach.** Cone Bay is approached from W between High Island and Tree Island (16°23'S 123°19'E). The out-going tidal stream sets at a rate of from 4 to 8 kn towards the S side of High Island.

5.172

- 1 From a position S of High Island the alignment (111°) of the summit of the E Razor Island (57 m) (16°27'S 123°33'E) with the centre of Square Topped Hill (7½ miles ESE) at the head of Cone Bay leads in the fairway to the anchorage S of Sir Richard Island (5.177) passing (with positions given from Porter Hill (16°30'S 123°32'E)):
 - 2 SSW of Wall Island (12 miles NW); thence:
 - Between Margaret Island (10½ miles NW) (5.176) and Way Rock (9½ miles NW), noting the 8·7 m patch 1 mile farther SSE; thence:
 - Between a 3·3 m patch (9 miles NW), the S-most danger off Folly Island, and a 8·9 m patch 6 cables N of Tiffy Reef (7½ miles NW); thence:
 - 3 NNE of Herald Rock (6½ miles NW), steep-to; thence:
 - SSW of Cone Rock (7 miles NNW); thence:
 - Very close NNE of a 5·7 m shoal (6 miles NNW) if the leading line is maintained; thence:
 - SSW of Sir Richard Island (5½ miles NNW).

Side channels

5.173

- 1 **Cone Bay to Strickland Bay.** Cussen Island (16°23'S 123°28'E) is separated from Muddle Islands by a deep channel about 9 cables wide.

Local knowledge is required and the channel is suitable only for small coasting vessels.

Directions. Approach is from S passing (with positions given from Cussen Island):

- 2 W of Cone Rock (1 mile S); thence:
 - Between Muddle Islands (1 mile W) and Cussen Island noting the rock, which covers and uncovers, which lies 5 cables SW of Cussen Island; thence:
 - Clear of Split Rock (1½ miles N) which lies in the fairway between a reef drying 7 m (1½ miles NW) and a drying reef (1¼ miles NE) on which there are several rocky islets; thence:
- 3 Between a bank with a least depth of 3·7 m over it (2¼ miles NW) and a coral ridge with a least

depth of 5 m (2¼ miles NNE) with a dangerous rock 5 cables farther E (5.165), the outer-most dangers off the S entrance point to Strickland Bay.

5.174

- 1 **Fantome Passage** between Wybron Islets and Vickery Islet (16°29'S 123°21'E), 1½ miles S, is about 1¼ miles wide and free from dangers. It is the best passage for mariners in small coasting vessels proceeding from King Sound to Yampi Sound.

Local knowledge is required.

- 2 **Topography.** Vickery Islet on the S side of the passage is the NW islet of two parallel chains of rocky islets extending from Fantome Passage to Faint Point, the S entrance point of Crawford Bay, about 5 miles ESE. Scott Islet lies with its NW extremity 4 cables E of Vickery Islet.
- 3 Mermaid Island (16°26'S 123°21'E), on the N side of the passage, is rugged and fairly steep-to on its E side but a drying reef, with three islets and some rocks on it, extends up to 5 cables from its SE side. Wybron Islets are a group of four rocky islets lying together on a reef 6 cables S of Mermaid Island.
- 4 A chain of islets and rocks extends between Mermaid Island and the S entrance point of Cone Bay, about 6½ miles ESE. Farr Islets, the outer-most islets in this chain, lie 2¼ miles ESE of Mermaid Island, whilst Channel Rock (16°26'S 123°23'E), the outer-most danger in this chain, lies about midway between Mermaid Island and Farr Islets.

- 5 **Anchorage**, out of the strength of the tidal streams, can be obtained NE of Scott Islet (16°29'S 123°21'E) about 5 cables offshore in a depth of 25 m, sand and coral.

Caution. Reefs and depths of less than 10 m extend 2½ cables N from the NW extremity of Scott Islet.

5.175

- 1 **Mermaid Pass**, between the reefs extending SE from Tree Island (16°23'S 123°19'E) and Mermaid Island, 2¾ miles SE, has a bank in mid-channel with a least depth of 14·5 m over it; it is marked by strong tide rips.

Local knowledge is required and the passage is suitable only for small coasting vessels.

- 2 **Topography.** Wood Islands, a group from 1 to 5 m high, and Pillar Rock lie on the NW side of the passage on the edge of the reef extending SE from Tree Island. Mermaid Island, on the SE side of the passage, is fairly steep-to on its W side, a drying reef with an islet 17 m high extends 3 cables N from its N extremity.

Off-lying danger. A detached reef, drying 2·4 m, on the SE side of the passage lies 4 cables N of the N extremity of Mermaid Island.

Anchorage

5.176

- 1 **Margaret Island** (16°23'S 123°23'E) has two hills on it, the E and higher being 40 m high. There is a bay with two small islets in it, on the S side, and another islet lies 2 cables SW of the E summit.

Anchorage can be obtained, out of the tidal streams, S of Margaret Island.

5.177

- 1 **Anchorage** can be obtained, if clear of the pearl farms, in Cone Bay, S of Sir Richard Island (16°25'S 123°29'E), with the E extremity of Sir Richard Island bearing 351°, and the summit of the E Razor Island bearing 109° in a depth of 18 m. Tidal streams are weak.

Offshore dangers. An extensive shoal, with depths of less than 5 m over it, lies N of Porter Hill (5.169) and has a rock drying 0·1 m on its S side, 1½ miles N of that hill.

Cascade Bay

General information

5.178

- 1 Cascade Bay lies between Long Island (16°34'S 123°22'E) and the coast and islands 4½ miles NE. The bay has only been partially examined.

The N entrance, between Pasco and Long Islands, appears to be deep in the fairway. A small reef which dries lies 3 cables W of a small (3 m) islet lying 3 cables SW of the W extremity of Pasco Island.

- 2 The S entrance (16°37'S 123°26'E), about 2½ miles wide, with depths of from 15 to 30 m in the fairway is the recommended entrance.

The E side of the bay is encumbered by a series of sandbanks, some of which dry up to 2.6 m, through which channels lead to extensive lagoons E of the bay.

5.179

- 1 **Topography.** Pasco Island, on the E side of the N entrance, is fringed by a drying coral reef which extends up to 5 cables from its N side and on it are Leila and Hazel Islets. MacMahon Islet lies 1¼ miles farther NW and its fringing coral reef extends 3 cables WSW from it.

On the NE side of the bay cliffs backed by two summits, 162 and 174 m high, are distinctive.

5.180

- 1 **Tidal streams.** In the S entrance to Cascade Bay the falling tidal stream sets NW and attains a rate of 6 to 8 kn at springs. Over the uneven ground in this area there are violent eddies. During the rising tidal stream, at springs with a SE wind, there is a heavy tide rip dangerous to small craft.

Directions

5.181

- 1 **Approach** to Cascade Bay should be made from the SSW. With a falling tide constant care is necessary to prevent being set W.

From King Sound the line of bearing 017° of the E extremity of Pecked Island (16°32'S 123°26'E) leads in the approach passing (with positions given from Sanderson Point (16°37'S 123°27'E)):

- 2 WNW of Rip Reef (2 miles SSW), noting the 8.6 m shoal 3 cables SW of the reef; thence:
Between an island (34 m high) (2½ miles WNW) lying off the S extremity of Long Island, noting the drying reef which extends 5 cables E from its E extremity, and Sanderson Point, the W extremity of Lachlan Island; thence:
- 3 Between Long Island Shoal, which dries from 0.2 to 1.1 m in places, (3 miles NW) and sandbanks drying 0.2 m (1¼ miles N) on the E side of the bay.

The line of bearing 083° of low red cliffs below the 174 m high summit (4½ miles NNE) on the NE side of the bay then leads towards the anchorage.

Anchorage

5.182

- 1 Anchorage in Cascade Bay is unsafe anywhere in the strong tideway, or in the W part of the bay, which is obstructed by Long Island Shoal (16°35'S 123°25'E) and a shoal, with a least depth of 4.1 m, lying with its shoalest part 1 mile SE of Pasco Island (16°31'S 123°23'E).
- 2 **Recommended berth.** Anchorage can be obtained in the NE part of the bay, where the tidal streams are weak and

variable, with the E extremity of Pecked Island (16°32'S 123°26'E) bearing 354°, distant 1½ miles, good holding ground.

Stokes Bay

General information

5.183

- 1 Stokes Bay is entered between Point Torment (17°02'S 123°35'E) and a point 17 miles NNE. There are many sandy ridges in the bay, which is unsurveyed in its inner part.

- 2 The E shore of King Sound between Point Usborne (16°40'S 123°30'E) and a cliffy point 6½ miles E is high and rocky, but thence to the NE entrance point of Stokes Bay, 9½ miles farther SSE, it is low muddy and fringed with mangroves. The soft muddy shores of Stokes Bay are fringed with mangroves throughout, through which the tide flows, inundating many miles of the surrounding country at spring tides.

Karrakatta Bay

General information

5.184

- 1 Karrakatta Bay, on the W side of King Sound, lies between Swan Island (16°21'S 123°03'E) and Dickie Rock, 2¾ miles SE, and affords convenient anchorage.

Topography. Storry Hill (16°23'S 123°01'E) covered with scrub, is the highest hill in the neighbourhood.

Anchorage

5.185

- 1 Anchorage can be obtained with Nellie Point (16°22'S 123°02'E) bearing 248°, distant 5 cables, on the alignment (011°) of the E extremity of Swan Island with the NW Twin Island (16°17'S 123°04'E) in depths of from 20 to 22 m, sand.

Caution. Home Patch (16°23'S 123°03'E), the N extremity of a rocky tongue which extends N from Curlew Bay, lies close S of the anchorage and a 6.2 m shoal (16°22'S 123°04'E) lies 1 mile ENE of Home Patch.

Cygnets Bay

General information

5.186

- 1 Cygnets Bay is entered between Shenton Bluff (16°28'S 123°03'E) and Cunningham Point, 14 miles SSE. Only the N portion of the bay within 3½ miles S of Shenton Bluff has been thoroughly examined.

5.187

- 1 **Topography.** The shores of the bay are almost everywhere fringed with mangroves, the land within rising gradually to an average level of 60 m. Most of the points along this indented coast are fringed by drying reefs.

- 2 Shenton Bluff is a remarkable peninsula connected to the mainland by a narrow ridge of sandhills. Cygnets Hill, 1½ miles NNE, is a fairly prominent sandhill covered with scrub. Cunningham Point, a steep rocky cliff, is the N extremity of a peninsula connected to the mainland by a narrow isthmus which covers at spring tides.

5.188

- 1 **Offshore dangers.** Shell Bank, with depths of less than 10 m over it, has been sounded for a distance of about 6 miles SW from a position 5 miles E of Shenton Bluff.

The least known depth over it is 6.9 m charted 3 miles SE of the bluff.

- 2 Meda Shoal (16°35'S 123°07'E) lies 8 miles SSE of Shenton Bluff. A bank, with depths of from 5.4 to 9.1 m over its N part, lies 3 miles NNE of the shoal and may be connected to it. Other shoal patches, whose positions can best be seen from the chart, lie inshore N, S and W, of Meda Shoal.

Anchorage

5.189

- 1 Most of the smaller bays in Cygnet Bay afford good anchorage between 5 cables and 2 miles offshore, and out of the strength of the tidal streams, in depths of from 7 to 9 m. The bottom is generally sand in the outer parts of the bays, with mud farther in.
- 2 The best anchorage for small coasting vessels is in the bay immediately W of Cunningham Point in depths of from 4 to 5 m.

Caution. Care must be taken, when approaching this bay, to avoid the shoals (5.188) lying between Meda Shoal and Cunningham Point. See also 5.138

Lugger Cove

5.190

- 1 Lugger Cove, the NE part of Catamaran Bay entered between Shenton Bluff (16°28'S 123°03'E) and Riddell Point, 1½ miles WNW, is mostly occupied by a sandflat with coral reefs extending from the head. Newman Ledge lies on the edge of the coastal reef ¼ miles ESE of Shenton Bluff. A rocky ledge, which dries in places, extends 7½ cables S from Shenton Bluff and Gilbert Rock, 2 m high, lies on the E part of this ledge. See also 5.138
- 2 **Local knowledge** is required.

Good anchorage for small craft can be obtained in the cove with Shenton Bluff bearing 107°, distant 9 cables.

Caution. Care must be taken when approaching this anchorage to avoid a rocky spit extending 5 cables W from Shenton Bluff.

Disaster Bay

General information

5.191

- 1 Disaster Bay lies between Cornambie Point (16°52'S 123°11'E) and Repulse Point, 7½ miles SSE, the bay dries out up to 2 miles from its head.

Topography. There are some conspicuous red cliffs at the head of the bay, 2 miles SSW of Cornambie Point.

Anchorage

5.192

- 1 A long narrow shoal, which dries 2.6 m, lies 5 miles N of Repulse Point (16°58'S 123°14'E) and forms a natural breakwater fronting Disaster Bay. Anchorage may be obtained within this breakwater and the shoal flats off Disaster Bay in depths of from 9 to 15 m.

Fitzroy River estuary

General information

5.193

- 1 Fitzroy River flows into the head of King Sound and forms an extensive shoal estuary which is entered between Point Torment (17°02'S 123°35'E) and Valentine Island, 15 miles W.
- 2 Derby (17°17'S 123°39'E), the capital of West Kimberley District, is situated on the SE side of the estuary

where the land rises perceptibly above the swampy ground which extends towards the river.

The W side of the estuary and the river S of Derby is mainly unsurveyed.

5.194

- 1 **Topography.** The E shore of the estuary between Point Torment and the E entrance point of Fitzroy River, 20 miles S, is low, irregular, lined with mangroves and fronted by mud flats.

The W shore of the estuary is similar but the land behind is slightly elevated and thickly wooded. A conspicuous sandpatch (5.150) stands on the coast, 4 miles NW of Valentine Island.

5.195

- 1 **Channel.** The channel from Point Torment to Derby and into Fitzroy River passes between the E shore and Mary Islands.

Local knowledge is required owing to its shallow nature and the number of dangers which encumber it.

5.196

- 1 **Controlling depth.** The least depth in the approach to the berth is 2.9 m; the mooring buoys may be approached W of Inner Rip Shoal in depths greater than 5 m.

5.197

- 1 **Tidal Streams.** In the vicinity of Inner Rip Shoal the falling tidal stream sets W.

At springs the in-going tidal stream attains a rate of about 2½ kn and sets slightly out from the jetty.

5.198

- 1 **Landmarks:**

Radio tower (17°18'6S 123°39'0E) approximately 24 m in height.

White water tower (17°18'7S 123°38'4E).

Directions (continued from 5.150)

5.199

- 1 **Caution.** The channel is liable to constant change and tidal streams are strong.

From a position 16°55'S 123°25'E, 14 miles NW of Black Rock Light (steel structure, 20 m in height) (17°05'S 123°35'E), the line of bearing 135° of Black Rock Light leads in the fairway along the SW side of Torment Spit, which extends about 6 miles NW from Point Torment, passing (with positions given from Black Rock Light):

- 2 NE of a 3.8 m shoal (5¾ miles NW) to a position 4 miles NW of Black Rock Light.

The track then leads S, about 11 miles, passing:

W of Black Rocks (1½ miles W); thence:

E of Outer Rip Shoal (4½ miles WSW); thence:

- 3 Between Elbow Shoal (5 miles S) which lies on the E side of the fairway and Inner Rip Shoal (6 miles SW); thence:

To the lighted mooring buoys lying 1½ miles N of the N end of Mary Island North

From the vicinity of the mooring buoys, the alignment (138¾°) of Derby Jetty Leading Lights then leads in the approach until 6 cables from the jetty passing over an outer bar consisting of detached sandbanks, which dry, which extend across the main fairway E of Mary Island North (10½ miles SSW).

- 4 Front light (orange triangle, point up, white stripe) (17°17'6S 123°36'6E).

Rear light (orange triangle, point down, white stripe on metal tower, 26 m in height) (460 m from front light).

Caution. The leading lights are not fully maintained and are unreliable.

Anchorage**5.200**

- 1 North of Outer Rip Shoal (17°06'S 123°31'E) with Black Rock Light (17°05'S 123°35'E) bearing 090°, distant 4 miles, in depths of from 11 to 13 m.

Anchorage can be obtained NNW of Mary Island North (17°16'S 123°33'E) with Derby Front Leading Light bearing 141°, distant 6½ miles, in depths of from 7 to 9 m.

Berth**5.201**

- 1 At Derby there is a jetty constructed of steel and concrete, 157 m in length. The berth alongside dries.

The jetty is in a deteriorated state and closed to commercial shipping. The fender system is unsafe for berthing.

Port services**5.202**

- 1 **Facilities:** government hospitals.
Communications: air links with all major Australian centres.

Fitzroy River**5.203**

- 1 Fitzroy River, which flows into the head of King Sound, is about 6 miles wide at its entrance just above Mary Island South (17°19'S 123°33'E). The river is about 225 miles in length, but at LW, with the exception of a few holes, there is nothing more than a rivulet draining the extensive mud flats left to dry by the tide.

- 2 The entrance is difficult to approach owing to the strength of the tidal streams.

Bore. The in-coming tide enters the river as a tidal bore several feet high.

Side channels and anchorages**Inshore passage****5.204**

- 1 For a route from Yampi Sound to King Sound, see 5.30.

Hells Gates**5.205**

- 1 **General information.** Hells Gates includes the various channels between Heney Islet and Pasco Island (16°31'S 123°23'E), on the W, and Faint Point, the S entrance point to Crawford Bay, and Pecked Island (16°32'S 123°26'E), on the E. The area is obstructed by numerous small islets, reefs and rocks.

- 2 **Tidal streams.** The rising tide sets S through Hells Gates and the falling tide sets N, attaining rates of from 5 to 10 kn and causing strong tidal races.

Local knowledge is required and the channels are suitable only for small craft.

Pearl Pass**5.206**

- 1 **General information.** Pearl Pass is the narrow passage connecting Karrakatta Bay (5.184) with the S part of King Sound and leads between the reefs on which Apex Island (16°24'S 123°03'E) and Jackson Island lie, on the E, and the reefs fronting the coast between Talboys Point (16°23'S 123°02'E) and One Arm Point, 4 miles SE, on the W.

- 2 A drying reef lies in mid-channel off the SW entrance to Pancake Pass (16°24'S 123°05'E) (5.207) and there appears to be a navigable channel on either side of the reef.

Local knowledge is required and the pass is suitable only for small craft.

Pancake Pass**5.207**

- 1 **General information.** Pancake Pass (16°24'S 123°05'E) between the reefs on which Howard, Talboys and Apex Islands lie, and the reef close SE of it, is navigable by small craft and leads to Pearl Pass (5.206) and Malumbo Anchorage (5.210).

Local knowledge is required and the pass is suitable only for small craft.

Port Usborne**5.208**

- 1 **General information.** Port Usborne, a small harbour, lies NW and N of Point Usborne (16°40'S 123°30'E) and S of Lachlan Island.

Entrance to the harbour is from S between Tree Island (16°39'S 123°29'E) and Point Usborne, 7½ cables E, noting that drying reefs extend 1½ cables off both entrance points.

- 2 The W entrance is obstructed by Rip Reef (5.181) which lies 3 miles WNW of Point Usborne. Swirl Shoal lies in the middle of the W entrance with Towndrow Rock 5 cables farther NE.

Local knowledge is required and the harbour is suitable only for small craft.

5.209

- 1 **Anchorage,** out of the tidal streams, can be obtained S of Brolga Shoal, with a depth of 1.7 ft over it, off the entrance to McKellar Bay.

Tidal streams in the W entrance and in the clear area N of Tree Island are very strong and this area is unsuitable for anchorage.

Malumbo Anchorage**5.210**

- 1 Malumbo Anchorage, an opening in the reef, is entered about 1 mile NW of One Arm Point (16°26'S 123°05'E) on the W side of King Sound.

Local knowledge is required and the anchorage is only suitable for small craft.

CAPE LEVEQUE TO PORT HEDLAND**General information****Scope of section****5.211**

- 1 The area covered by this section comprises:
Cape Leveque to Lacepede Islands (5.213)
Lacepede Islands to Roebuck Bay (5.253)
Roebuck Bay and Port of Broome (5.260)
Roebuck Island to Bedout Island (5.296)

Lacepede Islands to Port Hedland Approaches (5.319)
Port Hedland and Approaches (5.332)

Pearl farming**5.212**

- 1 Pearl culture farms are located in Beagle Bay (5.225) and pearling is conducted along the coast out to the 30 m contour from Lacepede Channel to Port Hedland between March and November. See 1.8 and the chart for details.

CAPE LEVEQUE TO LACEPEDE ISLANDS

General information

Charts Aus 323, Aus 324

Route

5.213

- 1 From WNW of Cape Leveque (16°24'S 122°56'E) the route leads WSW, about 52 miles, passing NNW of Lacepede Islands.

Topography

5.214

- 1 The coast between Cape Leveque and Cape Bertholet (17°15'S 122°11'E), about 65 miles SW, is generally low, fronted by rocks and shoal water and indented with shoal or drying bays.

Lacepede Islands (5.233) are a group of four low islands lying together on a coral reef between 10 and 19 miles NW of Red Bluff (17°04'S 122°19'E).

Depths

5.215

- 1 The 30 m depth contour extends from 20 to 40 miles offshore on this stretch of the coast, except in the area of Lacepede Islands and Baleine Bank, where it extends to 60 miles offshore. See also 5.7.

Tidal streams

5.216

- 1 Tidal streams between Cape Leveque (16°24'S 122°56'E) and James Price Point (17°30'S 122°09'E) are rotary in the offing. When the tide begins to rise the stream sets a little E of S, gradually turning through E, and at HW it sets between NE and N.

Major light

5.217

- 1 Cape Leveque Light (16°24'S 122°56'E) (5.143).

Other aid to navigation

5.218

- 1 **Racon.**
Cape Leveque Light as above.

Directions

(continued from 5.34)

5.219

- 1 From the vicinity of 16°12'S 122°29'E, about 28 miles WNW of Cape Leveque, the track leads WSW, passing: NNW of Lord Mayor Shoal (16°30'S 122°38'); and: SSE of Anzac Shoal (16°07'S 122°14'E) (5.7); thence:
- 2 NNW of Baleine Bank, the 10 m depth contour of which extends about 17¼ miles WNW from West Island (16°51'S 122°07'E), the W-most of the Lacepede Islands. The edges of this bank are generally clearly marked by tide-rips, but the water is usually so discoloured that it is difficult to detect the shoalest spots, and rocks other than those charted may exist. Thence:
- 3 To a position WNW of Lacepede Islands passing NNW, distant 13 miles, from Walker Rock (16°52'S 121°49'E) (5.256).

(Directions continue for Roebuck Bay at 5.256, for Port Hedland at 5.327 and for Rowley Shoals at 5.326)

Pender Bay

General information

5.220

- 1 Pender Bay is entered between Cape Borda (16°41'S 122°45'E) and Emeriau Point, 11½ miles SW, and affords anchorage in good weather. The head of the bay dries throughout.

5.221

- 1 **Topography.** Cape Borda, the N entrance point, a low rocky point with a white sandy patch near its extremity, is backed by red cliffs behind which are white sandhills rising to a height of 42 m.
- 2 Emeriau Point, the S entrance point, is fronted by light-coloured sandstone cliffs, 17 m high. The four Chimney Rocks lie close NE of the point, the outer-most and largest rock, 13 m high, is readily identified when seen clear of the land. The S coast between Emeriau Point and Bell Point, 7 miles E, consists mostly of red cliffs broken in places by small sandy beaches. The cliffs from 1 to 2 miles WSW of Bell Point are conspicuous.

5.222

- 1 **Dangers.** Woodhouse Rocks (16°43'S 122°42'E) lie about midway between Cape Borda and Perpendicular Head, 9 miles WSW, and are the outer-most dangers in Pender Bay.

Anchorage

5.223

- 1 Anchorage can be obtained 1 mile E of Perpendicular Head (16°46'S 122°37'E), with Chimney Rocks (5.221) in line with the head, in 7 m.

Caution. Foul ground extends 2½ cables from Perpendicular Head, and foul ground which dries in places, extends up to 1¼ miles offshore between the head and Bell Point.

Kelk Creek

5.224

- 1 Kelk Creek, entered between Cape Borda and Bell Point, 6½ miles SSW, dries throughout and is only navigable at HW by mariners in small craft.

Local knowledge is required.

Caution. A rock, 3 m high, lies in mid-channel, 3½ miles SSE of Cape Borda.

Beagle Bay

General information

5.225

- 1 Beagle Bay, entered between North Head (16°50'S 122°32'E) and Sandy Point, 4½ miles SW, is free from dangers, except close inshore, and affords good anchorage. Beagle Bay is now an Aboriginal settlement and there is a pearling station in the bay. See 1.8 and 5.212

Although open NW strong winds are seldom experienced from that quarter, and on rare occasions when they do blow, last a few hours only.

5.226

- 1 **Topography.** North Head, the N entrance point, is conspicuous. The E coast between North Head and Cliff Point, 1½ miles SSE, is cliffy and about 7½ cables SE of Cliff Point there is a conspicuous sand-faced ridge.

Sandy Point, the S entrance point, consists of sandhills with their tops and inshore slopes sparsely covered with bushes. The coastal bank, with several rocks awash on it, extends 1 mile N and 6 cables NE from Sandy Point.

5.227

- 1 **Depths** decrease regularly from the entrance towards the head of the bay.

5.228

- 1 **Tidal streams** set in and out of the bay with rates of $\frac{1}{2}$ to $1\frac{1}{2}$ kn, but set directly across the shoal ground N of Sandy Point.

5.229

- 1 **Landmarks:**

North Head ($16^{\circ}50'S$ $122^{\circ}32'E$) a low dark-coloured cliff with a conspicuous rocky hummock above it. Conspicuous green peak ($16^{\circ}53'S$ $122^{\circ}33'E$), 24 m high.

Anchorage**5.230**

- 1 Good anchorage can be found on either side of Beagle Bay according to the direction of the wind and the draught of the vessel.

Caution. Pearl beds are situated in the inner part of the bay, see information on the chart.

5.231

- 1 **Landing** can be obtained at HW within Cliff Point. The best landing, under ordinary circumstances and at HW, is on the sandy beach N or S of the mangrove-covered ledge WNW of the charted 23 m hill, 5 miles SSE of North Head.

Lacepede Channel**General information****5.232**

- 1 **Description.** Lacepede Channel ($16^{\circ}56'S$ $122^{\circ}16'E$), between Lacepede Islands and the mainland, is about 4–5 miles wide between the 10 m depth contours on either side but several shoal patches, with depths of less than 10 m, in the fairway reduce the width of the channel to about $1\frac{1}{2}$ miles.

5.233

- 1 **Topography.** The coast on the E side of the channel from Camp Inlet ($16^{\circ}56'S$ $122^{\circ}28'E$), for 10 miles SW, is low and backed by parallel ridges of sandy hillocks from 6 to 20 m high. It then rises to more conspicuous sandy cliffs of a reddish colour which extend for a farther 7 miles SW, with little break, to Cape Baskerville.

- 2 Lacepede Islands on the W side of the channel are a group of four low islands lying together on a coral reef between 10 and 19 miles NW of Red Bluff ($17^{\circ}04'S$ $122^{\circ}19'E$) (5.238). West Island ($16^{\circ}51'S$ $122^{\circ}07'E$) the largest and highest of the group has a sandy knoll at its E end. Middle Island lies close E of West Island, whilst Sandy Island and East Island, from where a light (5.241) is exhibited, lie 2 and 4 miles SE, respectively, of Middle Island.

5.234

- 1 **Historic wreck** (uncharted) of the ship *Manfred* lies at the W extremity of Middle Island. See 1.60.

5.235

- 1 **Pearling.** See 1.8 and 5.212.

5.236

- 1 **Wildlife.** Turtles are numerous in the season, and during March and April Lacepede Islands form a breeding place for several species of sea birds.

5.237

- 1 **Tidal streams** attain a maximum rate of $1\frac{3}{4}$ kn, see information on the charts.

5.238

- 1 **Landmarks:**

Red Bluff ($17^{\circ}04'S$ $122^{\circ}19'E$) surmounted by a square-topped sandhill, 45 m high, covered with grass and scrub.

King Peaks ($17^{\circ}04'S$ $122^{\circ}26'E$) two conspicuous peaks, the W of which lies 4 miles W and is known as Carnot Peak, on a wooded range of hills and surmounted by bushes resembling boulders.

- 2 Cape Baskerville ($17^{\circ}08'S$ $122^{\circ}15'E$) a sandy cape rising to a conspicuous sandy hillock, 44 m high, close within. About $7\frac{1}{2}$ cables E of this hillock there is a wooded summit, 50 m high, considerably higher than the land farther S.

5.239

- 1 **Major light:**

Red Bluff Light (white hut, 4 m in height) ($17^{\circ}04'S$ $122^{\circ}19'E$).

5.240

- 1 **Racons:**

Red Bluff Light – as above.

Lacepede Islands, East Island Light ($16^{\circ}54'S$ $122^{\circ}12'E$) (5.241).

Directions**5.241**

- 1 Approaching Lacepede Channel from N there are two routes, one E and the other W, of Sloper Shoal ($16^{\circ}52'S$ $122^{\circ}19'E$). The route to the E, leading SW, passing over the 10 m depth contour is described first passing (with positions given from Red Bluff):

Midway between Eclipse Shoals (10 miles N) and Sloper Shoal (12 miles N); thence:

- 2 In mid-channel between Awong Patch ($5\frac{1}{4}$ miles NW), noting the isolated shoal patch of 11.9 m in the fairway, and the shoal ground extending SE from Lacepede Islands. Lacepede Islands reef dries and at HW its S edge is marked by heavy breakers. East Island Light (stainless steel framework tower) ($11\frac{1}{2}$ miles NW) is exhibited from the E-most of the Lacepede Islands. Thence:
- 3 NW of Tangier Shoals ($5\frac{1}{2}$ miles WSW) (5.249) noting the 8.2 m patch, 2 miles NW of the shoals, closer to the track; and:
- SE of Surprise Reef (10 miles WNW) over which the sea breaks occasionally at LW; thence:
- NW of Baskerville Shoal (10 miles W); thence:
- 4 NW of a shoal with a depth of 7.8 m over it ($13\frac{1}{2}$ miles WSW); thence:
- NW of a 9.6 m patch ($19\frac{1}{2}$ miles WSW) which lies $5\frac{3}{4}$ miles N of Talboys Rock ($22\frac{1}{2}$ miles SW) (5.256).

5.242

- 1 **Alternative route.** The channel between Sloper Shoal ($16^{\circ}52'S$ $122^{\circ}19'E$) and Lacepede Islands is about 4 miles wide with general depths of 11 m in the fairway, noting that the bank with a least depth of 7.3 m near the centre of the passage must be avoided. Noting also the reported patches of less than 10 m whose position can best be seen from the chart, which lie NW of Sloper Shoal.

5.243

- 1 **Useful mark:**

North Head ($16^{\circ}50'S$ $122^{\circ}32'E$) (5.229).

Anchorage**5.244**

- 1 Anchorage can be obtained N of Lacepede Islands. The anchorage is exposed NE from which direction the wind occasionally blows with sufficient strength to cause an unpleasant sea.

Tidal streams at the anchorage set SE with the rising tide and NW with the falling tide. See information on the charts.

- 2 **Dangers.** Baleine Bank (5.219), of sand and coral, extends about 18 miles WNW from West Island (16°51'S 122°07'E). Weston Patch (16°46'S 122°02'E) lies on the N side of Baleine Bank about 6½ miles NW of West Island, a shoal, with a least depth of 7·8 m over it, lies 4 miles E of the patch. Robber Rocks (16°47'S 122°01'E), a narrow coral ridge, lies 6 miles NW of West Island and Danger Rocks (16°52'S 122°03'E) lie on the edge of the foul ground extending 3 miles WSW from the same island.

- 3 Numerous other patches and detached shoals lie on and in the vicinity of Baleine Bank, their positions and depths can best be seen from the chart.

5.245

- 1 **Recommended brth** for small coasting vessels is on the line of bearing 171° of the E extremity of West Island, distant 1¼ miles, in about 8 m noting the 4·8 and 3·9 mpatches close E and W of the approach respectively.

Mariners in vessels with a draught of 5·5 m or more should anchor farther NE.

Caution. The bottom in this vicinity is uneven.

Minor bays and inlets

5.246

- 1 **Lacepede Islands.** West Island (16°51'S 122°07'E) is separated from Middle Island by a channel ¾ cable wide with depths of from 0·9 to 5·2 m, known locally as The Pool.

Tidal streams set through this channel at a considerable rate.

- 2 **Anchorage.** In fine weather, when the reef on which the islands stand is dry, The Pool affords a convenient boat anchorage.

A break in the surrounding reef on the N side of Middle Island gives access for boats to the island.

5.247

- 1 **Camp Inlet,** on the mainland, is entered about 2 miles S of Sandy Point (16°54'S 122°29'E), the S entrance point to Beagle Bay, and dries throughout and for 1½ miles W from its entrance.

The coast between Sandy Point and the N entrance point of this inlet is bordered by a drying reef extending 4 cables offshore, and by a bank which dries extending a farther 8 cables offshore.

The head of the inlet is filled with mud flats.

5.248

- 1 **Baldwin Creek.** Low Sandy Point (17°00'S 122°22'E), the N entrance point of Baldwin Creek, lies 9½ miles SW of Sandy Point. The coast N of the creek from Camp Inlet to Low Sandy Point is fringed by foul ground.

Entrance. A bank which dries 3·3 m extends 1 mile NW from the S entrance point of Baldwin Creek leaving only a narrow passage, which nearly dries, between it and a spit extending from Low Sandy Point.

- 2 **Shelter.** Baldwin Creek affords good shelter to mariners in small craft which are able to lie aground.

5.249

- 1 **Carnot Bay,** entered between Cape Baskerville (17°08'S 122°15'E) and a low point, 3½ miles SSW, dries for a distance of 2 miles outside the line joining the entrance points. The land S of the bay between Cape Bertholet (17°15'S 122°11'E), an ill-defined point, and Cape Baskerville, 8½ miles NNW, is inundated at HW spring tides.

The shores of the bay are flat and swampy and are intersected by creeks. In the NE corner there is a creek reported to be navigable, at HW, by mariners in small craft.

- 2 **Dangers.** Panton Shoals, 5 miles WSW of Cape Baskerville, lie on the edge of the coastal bank off the entrance to Carnot Bay. Other dangers and foul ground lie between Panton Shoals and Tangier Shoals, 5 miles NNE, which lie on the outer edge of the foul ground fronting Cape Baskerville. A coral reef, with a depth of 3·7 m over it, on the E part of which there is a coral head awash (17°08'S 122°10'E) is the outer-most danger off Carnot Bay.

Minor bays and inlets

Chart Aus 323 (see 1.16)

Thomas Bay

5.250

- 1 **General information.** Thomas Bay is entered between Chile Head (16°30'S 122°52'E), the S entrance point, and a point 2½ miles NE.

Topography. The coast from Cape Leveque (16°24'S 122°56'E) to the N entrance point of Thomas Bay, about 5 miles SSW, is mostly formed by sandy beaches backed by sandhills of from 15 to 26 m high. Four miles SSW of Cape Leveque there are some low red cliffs with red sandhills within. Chile Head, formed of boulders, rises to a conical hill, 11 m high.

- 2 The coast is fronted by rocks and drying rocky ledges extending up to 1½ miles offshore.

Depths. The SW part of the bay dries but there are depths of from 1·1 to 4·8 m over the remainder.

- 3 **Dangers.** Rocky ledges, which dry up to 7·4 m, extend 1¼ miles N and about the same distance SW from Chile Head, forming natural breakwaters to the adjacent bays, and a drying reef extends from the N entrance point.

A detached drying reef lies in the entrance, 2 miles NNE of Chile Head.

Chart Aus 323

Packer Island

5.251

- 1 **Description.** Packer Island lies, with Lombadina Point (16°32'S 122°49'E) its NE extremity, 3 miles SW of Chile Head and is separated from the mainland by a narrow mangrove swamp having a narrow creek, which dries, running through it. The N part is known as Lombadina Creek and the S part as Tilbata Creek.

Local knowledge is required.

- 2 **Topography.** Lombadina Point, cliffy, 6 m high, is almost connected to the rocky ledge which extends SW from Chile Head. The coast between the SW extremity of Packer Island and Cape Borda, 6 miles SSW, is sandy and backed by low sandhills.

- 3 **Depths.** The bay within Lombadina Point almost dries but it is reported that depths of from 3·7 to 6·4 m (12 to 21 ft) can be found in the middle of the entrance channel, which leads to Lombadina Creek, by keeping close to Lombadina Point.

- 4 **Dangers.** Black Rod Rock, a small pinnacle, lies 3 miles SW of Lombadina Point, and 5 cables offshore. A rocky ledge, which dries, extends 3 miles SW from the SW extremity of Packer Island, Shag Rocks lie on this ledge 6 cables from its NE extremity. McVilly Rock lies 3 miles NNW of Cape Borda and is the NW-most danger on the S side of the entrance to Tilbata Creek NW of that cape. Dangerous rocks lie on the coastal bank N of McVilly Rock.

Shelter. Both creeks are used by mariners in small craft seeking shelter.

Tappers Inlet**5.252**

- 1 **General information.** Tappers Inlet, entered about 3 miles SSW of Emeriau Point (16°46'S 122°34'E), dries throughout.

The coast on either side of the inlet between Emeriau Point and North Head, 5 miles SSW, consists of low dark cliffs and sandy beaches fronted by rocks, many of which dry.

- 2 **Berth.** Mariners in small craft, which are able lie aground, can obtain a secure berth in its S part.

Entrance. The position of the entrance to the inlet is liable to shift.

LACEPEDE ISLANDS TO ROEBUCK BAY**General information**

Charts Aus 323, Aus 324

Route**5.253**

- 1 From WNW of Lacepede Islands (16°52'S 122°08'E) the passage to Roebuck Bay leads S, about 80 miles, to W of Gantheaume Point.

Topography**5.254**

- 1 The coast between Cape Bertholet (17°15'S 122°11'E) to 2½ miles S of Coulomb Point, 7 miles SSW, is sandy and backed by sandhills which are covered with scrub. The remainder of the coast to James Price Point, 15 miles S, consists of conspicuous red cliffs from 8 to 24 m high.
- 2 From James Price Point to Gantheaume Point, about 29 miles S, the coast is generally sandy and backed by sandhills. Three miles S of Willie Creek (17°46'S 122°12'E) there is a densely wooded hill, 38 m high to the tops of trees, its W face is abrupt whilst its E side slopes gradually for a considerable distance inland; the hill is charted as a red bluff.

Pearling**5.255**

- 1 See 5.212

Directions

(continued from 5.219)

5.256

- 1 From a position about 24 miles WNW of West Island (16°51'S 122°07'E) Lacepede Islands, the passage to Roebuck Bay leads S passing (with positions given from Gantheaume Point Light (17°59'S 122°11'E)):
- W of Baleine Bank (5.219); thence:
- W of Walker Rock (16°52'S 121°49'E), the W-most known danger on a bank which has only been partially examined; thence:
- 2 W of Talboys Rock (17°18'S 122°02'E), generally plainly marked by tide-rips, noting the 10.4 m (34 ft) coral patch, 5¾ miles N, and the 13.1 m (43 ft) depth, closer to the track, 7½ miles SW; thence:
- W of James Price Patches (29½ miles N); thence:
- W of Grey Shoal (21 miles NNW); thence:
- 3 W of Naringla Shoal (18 miles NNW); thence:
- W of patches of less than 11 m (36 ft), the W-most shoalest of which is 8.5 m (28 ft) (14 miles WNW); thence:
- To a position about 17 miles W of Gantheaume Point Light.

Cautions. Vessels engaged in underwater operations, including anchoring and trawling, SW of Baleine Bank are advised to do so with caution as wellheads are reported in the area.

- 4 When approaching Roebuck Bay mariners are advised to remain in depths greater than 15 m (49 ft) until on the line of bearing 094½° of Gantheaume Point Light. Fish aggregation devices, marked by special spar buoys (with legend *FAD*), are moored approximately 12 miles NW of Gantheaume Point and should be given a wide berth by mariners.

5.257

- 1 **Useful marks:**

Gantheaume Point Light (17°59'S 122°11'E) (5.282).

Broome Aero Light (17°57'S 122°14'E) (5.283).

(Directions for the coastal passage continue at 5.301, and for Roebuck Bay at 5.284)

Minor inlets

Chart Aus 324

Barred Creek**5.258**

- 1 Barred Creek is entered immediately E of Cape Boileau (17°40'S 122°11'E), the S extremity of a conspicuous red cliff from 3 to 6 m high. The creek dries.

Dangers in the approach. Farm Shoal lies 2 miles NNW of Cape Boileau; Boileau Patches, with depths of from 8.2 to 9.1 m (27 to 30 ft) over them, lie between Naringla Shoal (17°41'S 122°07'E) and Cape Boileau.

Willie Creek**5.259**

- 1 Willie Creek (17°46'S 122°12'E) dries.
- Dangers** in the approach. Cary Patch (17°45'S 122°11'E) lies 1¼ miles NW of the N entrance point to the creek and a rock, which dries 7.3 m, lies close off the same point.

ROEBUCK BAY AND PORT OF BROOME**General information**

Chart Aus 324 (see 1.16)

Description**5.260**

- 1 Roebuck Bay, entered between Gantheaume Point (17°59'S 122°11'E) and Cape Villaret, 22 miles SSW, appears as a spacious sheet of water at HW, but at LW a large portion of the bay is occupied by drying sandbanks.
- Roebuck Bay is one of the best harbours on this coast.

5.261

- 1 Roebuck Deep, a deep channel about 7½ cables wide, separates the coast at Gantheaume Point from the NE side of Pearl Shoals, an extensive area with general depths of less than 5.5 m (18 ft) over them, which obstruct the entrance to Roebuck Bay, the shoalest heads are near the NE extremity which forms the W side of Roebuck Deep.

5.262

- 1 **Irregular depths.** Numerous isolated depths of less than 11 m (36 ft), to which the chart is the best guide, lie outside the charted 6 fm (11 m) depth contour for distances of up to 20 miles off the salient points on the coast in this area.



Port of Broome (5.263)

(Photograph – Capt. Chris Geraghty, Port of Broome)

Position and function

5.263

- 1 Port of Broome (18°00'S 122°13'E) is situated on the N shore of Roebuck Bay, close within the entrance to the bay.

The port is a major export outlet for cattle to middle and far-eastern countries and is also a supply centre and base for vessels.

Topography

5.264

- 1 Station Hill (17°55'S 122°13'E), a conical sandhill, is the N-most and highest of a range of sandhills which fringe the shores of Gantheaume Bay. Entrance Point (18°01'S 122°12'E) has some sandhills on it of which Beacon Hill, the NE-most, is 28 m high. Radio masts stand within 3½ cables N of the point.
- 2 The E shore of Roebuck Bay is fringed with mangroves and several creeks discharge into the NE and SE corners of the bay. The low E shore continues WSW to Sandy Point (18°14'S 122°11'E) and then rises to Cape Villaret, a hillock with some red patches under it, the S entrance point, 9 miles farther SW. Church Hill and Barn Hill, both prominent, lie within 3 miles of the cape.

Port limits

5.265

- 1 Port limits extend about 3 miles offshore, as indicated on the large scale national chart, between a point on the coast W of Station Hill and Fall Point (17°59'S 122°20'E).

Approach and entry

5.266

- 1 The harbour is approached through Roebuck Deep and entered between Channel Rock (18°01'S 122°13'E) and the reef extending SE of Entrance Point.

Traffic

5.267

- 1 In 2002, 28 vessels totalling 816 049 dwt used the port.

Port Authority

5.268

- 1 Department of Marine and Harbours, PO Box 402, 1 Essex Street, Fremantle, Western Australia 6160, or locally, PO Box 46, Broome, Western Australia 6725. Website: www.broomeport.com

Limiting conditions

5.269

- 1 **Controlling depths:**
 - Approach:** 10 m on the line of approach (5.284) of Gantheaume Point Light (17°59'S 122°11'E).
 - Entrance channel:** 11.3 m SSW of Channel Rock (18°01'S 122°13'E).
 - Deepest and longest berth.** Broome Jetty outer berth (5.291).
 - Tidal levels.** The maximum tidal range is about 8 m, see also information on the chart.
- 2 **Density of water:** 1.025 g/cm³.
Maximum size of vessel handled. "Superstar Virgo", 76 800 grt, LOA 268 m has used the port.

Tropical storms are likely from November to April each year, see also 1.129.

Arrival information

Port radio

5.270

- 1 A coast radio station and a port radio station operate from Broome. See *Admiralty List of Radio Signals Volumes 1 (2) and 6 (4)*.

Notice of ETA

5.271

- 1 One weeks notice of ETA should be given to the Port Operations Manager and should be confirmed 48 and 24 hours in advance.

Outer anchorages

5.272

- 1 **Waiting anchorage** is situated about 4½ miles W of Gantheaume Point (17°59'S 122°11'E) in the vicinity of the pilot boarding area. Holding ground is reported good but the anchorage is exposed.

5.273

- 1 **Gantheaume Bay.** During E winds anchorage in smooth water with good shelter can be found about 2 miles N of Gantheaume Point, with Station Hill (5.264) bearing 062°, in about 12 m.

Caution. Whale Rock (17°58'S 122°11'E), the outermost of several rocky patches which dry, and Swirl Rock, usually marked by tide rips, lie 8 cables N and 5 cables NW, respectively, of Gantheaume Point, and on the S side of the anchorage.

- 2 Several banks, with depths of less than 10 m over them, lie N and W of Whale Rock, their positions and depths can best be seen from the chart.

5.274

- 1 **Roebuck Deep.** Anchorage, as convenient and according to draught, can be found in Roebuck Deep, the holding ground is reported to be good.

5.275

- 1 **South of Middle Ground,** the anchorage berth lies about 3½ miles ESE of Entrance Point Light (18°00'S 122°12'E) in depths of from 15 to 16 m.

Pilotage and tugs

5.276

- 1 **Pilotage** is compulsory for vessels over 500 grt. **Request** for a pilot should be sent 48 hours in advance to the Broome Port Authority See *Admiralty List of Radio Signals Volume 6 (4)* for details.

Boarding position: 5 miles W of Gantheaume Point (17°59'S 122°11'E).

Tugs are not available.

Quarantine

5.277

- 1 Port of Broome is a first port of entry, radio pratique may be available. See *Admiralty List of Radio Signals Volume 1 (2)* and 1.54.

Harbour

General layout

5.278

- 1 Broome Jetty, which extends across the ledges fronting Entrance Point (18°01'S 122°12'E), has a berth on each side of its head in deep water NE of Entrance Point.

Pearling

5.279

- 1 For details of pearling activity off Roebuck Bay, see 5.297.

Obstruction

5.280

- 1 Platforms, previously used for the production of cultured pearls with depths over them of about 3 m, are situated in an area centred 5½ miles SSE of Entrance Point.

Natural conditions

5.281

- 1 **Tidal streams.** Near the shore the out-going tidal stream makes 1 hour before, and in the offing 2 hours before HW by the shore.

In Roebuck Deep and at the entrance to Inner Anchorage the tidal streams attain a rate of from 4 to 5 kn during springs. At other times the rate seldom exceeds 2 kn.

- 2 In Inner Anchorage S of Mangrove Point (17°58'S 122°14'E) the tidal stream turns N about 1½ hours before HW, and W about ¾ hour later. The in-going and out-going tides set, respectively, over Middle Ground and the ledges E and W of Entrance Point.

- 3 Tidal streams, both on the in-going and out-going tide, set in the direction of the line of the jetty. The tide has an apparent out-going period of 8 hours, and an in-going period of 4 hours; the two slack water periods being 2½ hours before HW and about the expected time of LW.

Climatic table, see 1.170 and 1.177.

Principal marks

5.282

- 1 **Landmarks:**

Gantheaume Point Lighthouse (white lantern on stainless steel framework tower, 24 m in height) (17°59'S 122°11'E).

Saddle Hill (17°58'S 122°12'E), bare and conspicuous.

Red Hill (18°00'S 122°12'E), conspicuous.

Conspicuous water tower (46 m) (17°58'S 122°13'E).

Conspicuous tanks (18°00'3S 122°12'3E).

5.283

- 1 **Major lights:**

Gantheaume Point Light – as above.

Broome Aero Light (17°57'S 122°14'E).

Directions

(continued from 5.257)

Approach

5.284

- 1 When approaching Roebuck Bay mariners should keep to seaward in depths of not less than 15 m.

From the vicinity of 17°57'S 121°53'E, about 17 miles W of Gantheaume Point Light (17°59'S 122°11'E), the line of bearing 094½° of Gantheaume Point Light leads in the approach to Roebuck Deep passing (with positions given from Gantheaume Point Light):

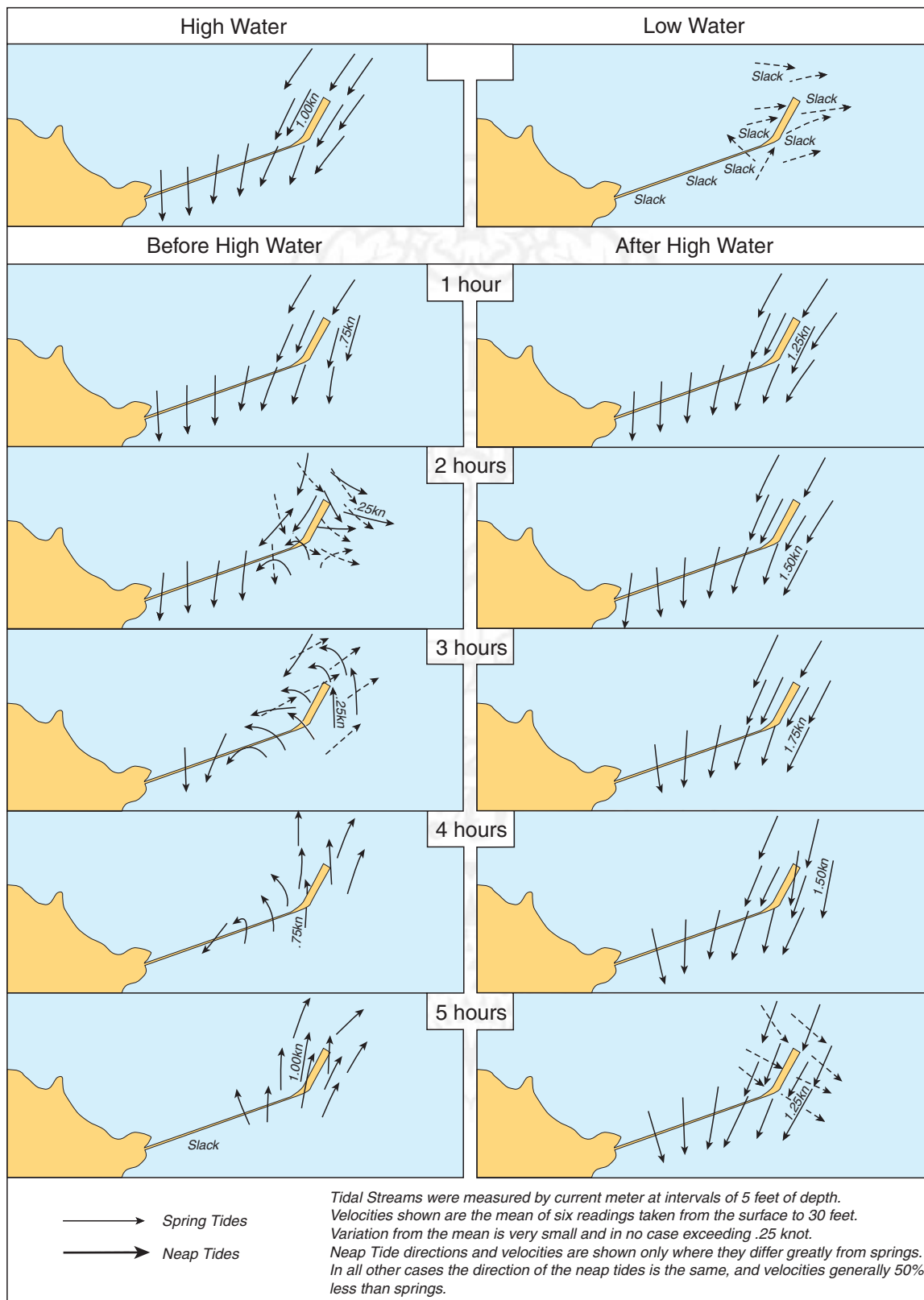
- 2 N of Disaster Rock (18°04'S 122°05'E); thence:
S of Declaration Rock (3¾ miles NNW), noting the 4-6 m patch 5 cables SSW of the rock which lies closer to the track; and:

N of North Rock (2¼ miles WSW).

Caution. Depths of less than 10 m, whose position can be seen from the chart, lie close N and S of the line of approach. See also caution at 5.256.

Australia, North West Coast - Broome

Lat 18°00'S, Long 122°13'E



Roebuck Deep**5.285**

- 1 From a position about 2 miles W of Gantheaume Point Light, when the conspicuous tanks (5.282) can be seen over Riddell Point (18°00'S 122°12'E) bearing 117°, the route leads SE through Roebuck Deep, the fairway of which is discernible by its blue water, passing (with positions given from Gantheaume Point Light):
- 2 SW of Gantheaume Point, noting the rock with a depth of 0.3 m over it which lies 5 cables W of the point; and:
NE of Escape Rocks (1¼ miles SW). A light-buoy (starboard hand) is moored 3 cables WNW of the rocks and marks the NE side of Pearl Shoals. Thence:
- 3 SW of Nab Rock (1 mile S), the outer-most danger on the NE side of Roebuck Deep; thence:
NE of East Rock (3 miles SSW) situated near the E edge of Pearl Shoals; and:
SW of Riddell Point (2 miles SE) fronted by foul ground; thence:
- 4 SW of Entrance Point (2¾ miles SE), fringed by foul ground which mostly dries. Bittern Rock lies off the W side of the point about 1 cable offshore. Entrance Point Light (framework tower, 5 m in height) is exhibited 3 cables NW of the S extremity of the point. And:
NE of a 9.7 m patch (3 miles SSE); thence:
SW of a detached 8.5 m patch (3 miles SE).

Entrance**5.286**

- 1 **Broome Jetty Leading Lights:**
Front light-beacon, on new main jetty (orange triangle, point up, on galvanised metal tower, 12 m in height) (18°00'·14S 122°13'·02E).
Rear light-beacon (new main jetty) (orange triangle, point down, on galvanized metal tower, 17 m in height).
- 2 The alignment (022°) of these lights leads in the approach to the wharf, passing (with positions given from the front light):
ESE of the detached 8.5 m patch (8 cables SSW) (5.326), thence:
WNW of Channel Rock Light-beacon (isolated danger) (5½ cables SSW), thence:
- 3 ESE of a light-buoy (E cardinal) (4 cables SSW), thence:
To the wharf or inner anchorage as required, noting the shoals with a least depth of 9 and 6.1 m (1½ cables SE and 2 cables E, respectively).

5.287

- 1 **Leading lights** for the approach to the inner side of the wharf from the NE are occasionally exhibited from the NE side of Entrance Point, near the root of the jetty. In line these lights bear 234¼°.
Leading line. The line of bearing 244° of the S extremity of Entrance Point (18°01'S 122°12'E), astern, leads close NNW of Middle Ground to Inner Anchorage.

Useful mark**5.288**

- 1 Broome radio mast (red obstruction light) (17°58'S 122°14'E) may be sighted before either Saddle Hill or Gantheaume Point Lighthouse.
Chimney 17°58'·9S 122°12'·2E.

Berths**Anchorage****5.289**

- 1 **Inner Anchorage** (17°59'S 122°15'E) is situated N of Middle Ground with depths of from 13 to 16 m. At LW this anchorage is protected by Middle Ground, a large proportion of which dries from 0.3 to 1.2 m, but at HW with strong E winds a troublesome sea may be experienced. The ledges off Entrance Point are fairly steep-to and are discernible at LW, which is a good time for entering or leaving Inner Anchorage.
- 2 **Prohibited anchorage area** is situated in the approach to Broome Jetty and in a large area surrounding the wharf, as indicated on the large scale national chart.

Mooring**5.290**

- 1 A mooring buoy is situated in Inner Anchorage 2 miles ENE of Broome Jetty.

Alongside berths**5.291**

- 1 **Broome Jetty** (18°00'·1S 122°13'·0E) is a steel plated structure with a concrete deck and spring fendering. The outer berth is 183 m long with a depth alongside of 9.4 m; the inner berth being 170 m long with a depth alongside of 8.7 m.
Caution. Spring tides produce large tidal ranges and the Port Authority should be contacted to establish depths alongside the berths.

Port services**5.292**

- 1 **Repairs.** No facilities.
Other facilities. There is a District hospital at Broome. Oily waste removal.
Supplies. Diesel fuel and water are available at the wharf. Provisions are not available.
Communications. Airport at Broome, 10 km from the port.

Dampier Creek**General information****5.293**

- 1 Dampier Creek, with the town of Broome on its W side, forms the head of the bay between Entrance Point and Fall Point, 7½ miles ENE, it dries throughout. The creek is used by mariners in the pearl fisheries as a place of refuge in bad weather.

There are several rocky patches on the flat which fronts the entrance to Dampier Creek.

5.294

- 1 **Offshore dangers.** Buccaneer Rock (17°58'S 122°15') lies on the W side of the creek. Black Ledge lies 2¾ miles ESE of Buccaneer Rock, on the E side of the bay, on the edge of the drying flat.

Beaching**5.295**

- 1 In an emergency, with an additional rise of 1.8 m at spring tides, a vessel with a draught of up to 6 m could be beached in mid-channel in Dampier Creek.
The colour of the water indicates the greatest depths.

ROEBUCK BAY TO BEDOUT ISLAND

General information

Charts Aus 324, Aus 325

Route

5.296

- 1 From Roebuck Bay (18°05'S 122°15'E) the passage to Bedout Island leads WSW, about 190 miles, passing N of the island.

Pearling

5.297

- 1 Extensive pearling activity takes place in an area bounded by the parallels of 17°50'S to 20°00'S and from the 30 m depth contour to the coast of Eighty Mile Beach (5.315). Pearlshell dumps can be marked with up to 40 or more radar and flag marker buoys and mariners are advised to stay clear.
- 2 When approaching pearling vessels which are engaged in diving mariners are warned that gear may be streamed up to 2 cables astern and that manoeuvring is extremely difficult.

Tidal streams

5.298

- 1 See 5.324 and information on the charts.

Caution

5.299

- 1 Between Cape Bossut (18°42'S 121°37'E) and Bedout Island, 150 miles WSW, the charting of the inshore waters is based on reconnaissance or incomplete surveys. See information on the large scale charts.

Other aid to navigation

5.300

- 1 **Racon.**
Bedout Island Lighthouse (19°35'S 119°06'E) (5.327)

Directions

(continued from 5.257)

5.301

- 1 From a position about 17 miles W of Gantheaume Point Light (17°59'S 122°11'E) the passage to Bedout Island leads WSW passing:
NNW of Justice Shoal (18°27'S 121°41'E) which lies 9 miles W of Cape Latouche Treville; thence:
- 2 NNW of Roy Bank, with a least known depth of 7.3 m (24 ft) over it, 6½ miles W of Cape Bossut (18°42'S 121°37'E); less water has been reported. The sea has been observed to break heavily on this bank with a W swell. Noting also a shoal with a depth of 11 m (36 ft) over it (reported 1963) and a rocky patch with a depth of about 11 m (36 ft), and probably less, which breaks at times which lie 8 miles NW and 11½ miles W, respectively, of Cape Bossut. This area should be avoided. Thence:
- 3 NNW of Patterson Shoals (position doubtful) which are reported to lie 12 miles WSW of Cape Jaubert (18°56'S 121°33'E), noting the 6.7 m (22 ft) unexamined depth which lies 6 miles to seaward of these shoals, closer to the route; thence:
NNW of Bedout Island (19°35'S 119°06'E); a light stands on the centre of the island; thence:
To a position NW of the same island.

5.302

Useful marks:

Gantheaume Point Light (17°59'S 122°11'E) (5.282).
Broome Aero Light (17°57'S 122°14'E) (5.283).
(Directions continue at 5.328)

Gourdon Bay

Chart Aus 324

General information

5.303

- 1 Gourdon Bay entered between Cape Gourdon (18°24'S 121°59'E), a low sandy point 7 miles SW of the S entrance point of Roebuck Bay, and Cape Latouche Treville, 9 miles WSW, is open N.
The S shore of the bay dries but depths of 5.5 m (18 ft) are charted 2 miles N of the S shore.
The bay is free from dangers except for some rocks on both the N and S extremities.

Lagrange Bay

General information

5.304

- 1 Lagrange Bay entered between False Cape Bossut (18°35'S 121°44'E) and Cape Bossut, 9½ miles SW, is suitable only for small coasting vessels as there are depths of less than 5.5 m (18 ft) within the line joining the two entrance points.

5.305

- 1 **Topography.** False Cape Bossut, the N entrance point, is a rocky projection and appears as an island. The NE shore of the bay is rocky for nearly 3 miles SE of False Cape Bossut, and then changes to a dense mangrove swamp.
Cape Bossut, the S entrance point, consists of low dark rocky cliffs with a ridge of sandhills close within. A tower (5.308) is on the summit of the cape. Tryon Point, 2½ miles S of Cape Bossut, is similar in appearance to the cape and forms the SW extremity of the same peninsula.

5.306

- 1 **Dangers.** Outer Reef, 3 miles W of False Cape Bossut, is the outer-most danger off the N entrance point.
Spit Patch, Shell Patch and Casuarina Reef, 1¼ miles N 1½ miles NW and 2 miles W, respectively, of Spit Point (18°42'S 121°38'E) the N extremity of Cape Bossut, are the outer-most dangers off the S entrance point.

Offshore danger: Roy Bank (18°42'S 121°30'E) (5.301).

5.307

- 1 **Tidal streams** in the area attain a rate of from 2 to 3 kn at springs.

5.308

Useful mark:

Cape Bossut Tower (red framework, 12 m in height) (18°42'S 121°37'E).

Minor inlets

5.309

- 1 **Cowan Creek** entered E of Rocky Point (18°42'S 121°44'E) lies within a ridge of sandhills and is used by mariners in small craft as a watering place. Drying sands extend 1½ miles N from its entrance.
Local knowledge is required.
- 2 **Dangers** in the approach. Nandanarr Rocks extend up to 5 cables N from Black Rock Point (18°40'S 121°45'E), 2 miles NE of the entrance. Outer Rock, the termination of drying rocky ledges which extend 7½ cables N from Islet Point (18°42'S 121°42'E), 2 miles W of the entrance.

- 3 **Anchorage.** The usual anchorage for mariners using the creek lies WNW of Black Rock Point (18°40'S 121°45'E) on the line of bearing 159° of the E entrance point of the creek, distant 2½ miles, in a depth of 3 m (10 ft), sand. **5.310**

- 1 **Cape Bossut Creek** entered between Spit Point, the N extremity of Cape Bossut and Neck Point, 5 cables SE, is reported to provide shelter for a large number of small craft.

Local knowledge is required.

Beaching. A good beaching place exists on the first sandy beach within Spit Point, the W entrance point of the creek.

Minor bays and inlets

General information

5.311

- 1 **Local knowledge** is required. See also caution at 5.299.

Port Smith

5.312

- 1 **General information.** Port Smith, a creek with a narrow entrance channel which dries, is situated 4½ miles SSW of Cape Latouche Treville (18°27'S 121°50'E). Inside the entrance isolated holes can be found with depths of 3 m (10 ft).

A sandbank, which dries at LW, extends 1½ miles seaward from the entrance.

Admiral Bay

5.313

- 1 **General information.** Admiral Bay, entered between Tryon Point (18°44'S 121°37'E) and Cape Frezier, 8 miles S, faced with red cliffs, is shoal throughout. There is a creek at the head of the bay with extensive swamps in the direction of Lagrange Bay.

Dangers. Ledges, which dry, extend 1 mile N from Cape Frezier the S entrance point and Pinnacle Rock (18°49'S 121°38'E) is situated 4 miles NNE from the same cape.

Geoffroy Bay

5.314

- 1 **General information.** Geoffroy Bay is entered between Cape Frezier (18°52'S 121°36'E) and Cape Jaubert, 5 miles SSW. Cape Jaubert, the S entrance point, has a remarkable white sand patch over it at a height of 14 m, and there are some low dark cliffs close S.

Dangers. Ledges which dry extend up to 1 mile from Cape Frezier, the N entrance point, and submerged reefs and foul ground extend up to a similar distance from Cape Jaubert.

Eighty Mile Beach

5.315

- 1 **General information.** Eighty Mile Beach is the stretch of low sandy coast between Cape Jaubert (18°56'S 121°33'E) and Red Hill, nearly 80 miles SW. It is backed by a range of sandhills from 5 to 6 m (16 to 20 ft) high but presents no distinctive features except for a high bare sandhill about 10 miles SSW of Cape Jaubert, and another bare sandhill 22 miles ENE of Red Hill (19°48'S 120°34'E).

- 2 Desault Bay, at the N end of the beach, is entered between Cape Jaubert and Cape Missiessy, 6 miles SSW. Cape Missiessy, covered with mangroves, projects 1½ miles from the coast. There are some rocks, with depths of less than 1.8 m (6 ft) (charted as dangerous rocks) over them, close off Cape Missiessy. The bay has not been examined.

5.316

- 1 **Approach.** The beach can generally be approached, by mariners in small craft, to a depth of about 7.3 m (24 ft) or to a distance of about 5 miles, noting the spit, with depths of less than 5.5 m (18 ft) over it, which extends nearly 10 miles from the coast from a position on the coast about 37 miles ENE of Red Hill.

Caution is necessary and with onshore winds it should be given a much wider berth.

- 2 **Offshore dangers.** A narrow ridge with depths of less than 11 m (36 ft) extends from the vicinity of Patterson Shoals (position doubtful) (19°00'S 121°21'E) (5.301) SW for a distance of 65 miles to a position about 12½ miles NW of Red Hill.

Chart Aus 325

Eighty Mile Beach to Bedout Island

5.317

- 1 **General information.** The coast between Red Hill (19°48'S 120°34'E) and Cape Keraudren, 47 miles WSW, continues to be low and sandy but there are occasional rocky points. A reef, awash at HW, is situated 2 miles offshore and Planaires Bank, a similar reef, is situated 1½ miles offshore, 12 miles W, and 25 miles WSW, respectively, of Red Hill.

- 2 Between Cape Keraudren (19°57'S 119°46'E) and Mount Blaze, 6 miles WSW, the coast consists of shoal mangrove bays with cliffy points between them. Mount Blaze (20°00'S 119°41'E), a sandhill, is situated on a point having two rocky islets on either side. The country behind Mount Blaze is swampy.

- 3 Immediately W of Mount Blaze there is a sandy bay which appears to be shoal. The W entrance point of this bay lies 12 miles W of Mount Blaze.

Cartaminia Point (19°59'S 119°25'E) forms the N entrance point to Condon Creek which affords shelter and a landing place to mariners in small craft. There is another landing place at Condini in Mangrove Creek situated 6 miles W of Cartaminia Point.

- 4 De Grey River, entered between Poissonnier Point (19°57'S 119°11'E) and Larrey Point, 5 miles W, both low sandy points, is about 250 miles in length and extends in a general SE direction from its mouth. It has a number of tributaries.

- 5 **Caution.** Sandbanks, which partly dry, as well as breakers lie from NE of Cartaminia Point (19°59'S 119°25'E) to Larrey Point, 18 miles W, and extend up to 10 miles offshore. The W edge of this drying sandbank lies off Larrey Point (19°58'S 119°06'E), and a spit, with depths of less than 5.5 m (18 ft) over it, extends 10 miles NW from the point.

Landing on this part of the coast is hazardous at all times.

5.318

- 1 **Offshore dangers.** The waters NW of Red Hill (19°48'S 120°34'E) WSW to Amphinome Shoals, 70 miles W, are encumbered with numerous shoal patches, which must be avoided, and to which the chart is the best guide. Tide-rips have been reported between 6 to 10 miles NE of Solitary Island (19°55'S 119°55'E).

- 2 Amphinome Shoals, some of which dry with long lines of breakers, irregular soundings and tide-rips between, front the coast to distances up to 23 miles offshore between Mount Blaze (20°00'S 119°41'E) and Spit Point, 39 miles W. The outer-most patch 9.2 m (30 ft) lies 27 miles NNW of Mount Blaze. These shoals have not been thoroughly examined.

LACEPEDE ISLANDS TO PORT HEDLAND APPROACHES

General information

Chart Aus 415

Route

5.319

- 1 From a position about 24 miles WNW of West Island (16°51'S 122°07'E) Lacepede Islands, the passage continues WSW, about 50 miles. The route then divides:

The N-most track continuing WSW passing SSE of Rowley Shoals (17°20'S 119°25'E) for mariners continuing offshore around the coast of Australia.

The S-most track leading SW, about 225 miles, for mariners proceeding to Port Hedland.

Historic wreck

5.320

- 1 The historic wreck (uncharted) of the vessel *Koombana* (19°05'S 118°52'E) lies about 33 miles NNW of Bedout Island. See 1.60.

Pearling

5.321

- 1 For details of pearling activity, see 5.297.

Charts Aus 325, Aus 326

Irregular depths

5.322

- 1 Numerous shoals, with depths of less than 15 m (49 ft) over them, lie SW of Bedout Island to Coxon Shoal (20°04'S 118°28'E). The bottom in the area of these shoals is very irregular and the area has not been thoroughly surveyed, shoaler depths may exist. See information on large scale charts.
- 2 **Deep-draught vessels** are recommended to keep to seaward of the 20 m depth contour in this vicinity, and, in thick weather, it is advisable to keep in depths greater than 40 m.

Local magnetic anomaly

5.323

- 1 A local magnetic anomaly, which increases the normal magnetic variation by from 9 to 10°, is reported to exist about 9 miles NW of North Turtle Island (19°54'S 118°54'E).

Tidal information

5.324

- 1 **Tide-rips.** During the strength of the tidal streams heavy tide-rips exist along the 200 m (100 fm) edge of the bank of coastal soundings 60 miles E of Mermaid Reef (17°06'S 119°37'E), Rowley Shoals. These tide-rips are about 2 cables wide and, at a distance of 1 mile, resemble heavy breakers.
- 2 **Tidal streams** in the vicinity of Bedout Island (19°35'S 119°06'E) set SE with the rising tide and NW with the falling tide, at average rates of from 1 to 2 kn.
In the vicinity of Turtle Islands (19°57'S 118°52'E), the tidal streams set SE during the rising tide, towards the shore, at a rate of from 1 to 2 kn. See also information on the larger scale charts.

Other aids to navigation

5.325

- 1 **Racons:**
Rowley Shoals, Imperieuse Reef Light (17°31'S 118°57'E) (5.9).

Bedout Island Light (19°35'S 119°06'E) (5.327).
Port Hedland Approach C1 Light-beacon (20°00'S 118°26'E). (5.328).

Directions

(continued from 5.219 and 5.302)

Charts Aus 323, Aus 325, Aus 415

Lacepede Islands to Rowley Shoals

5.326

- 1 From a position about 24 miles WNW of West Island (16°51'S 122°07'E) Lacepede Islands, the route leads WSW, about 170 miles, passing SSE of Rowley Shoals (5.8), the chart is the best guide.

Useful mark:

Rowley Shoals, Imperieuse Reef Light (17°31'S 118°57'E) (5.9).

(Directions continue at 6.12)

Lacepede Islands to Bedout Island

5.327

- 1 From a position about 24 miles WNW of West Island (16°51'S 122°07'E) Lacepede Islands, the route leads WSW, about 50 miles, to the vicinity of 17°06'S 121°00'E. The chart is the best guide.

The passage then leads SW passing:

- 2 NW of Bedout Island (19°35'S 119°06'E). Shoals with depths of less than 4 m (13 ft) extend for 5 miles WSW of this island and are marked by pronounced overfalls during the tidal streams, noting also the 11 m (36 ft) sounding (reported 1959) which lies 7½ miles W of the island. Bedout Island Light (stainless steel framework tower white lantern, 20 m in height) is exhibited from the centre of the island.

Charts Aus 739, Aus 326

Bedout Island to Port Hedland

5.328

- 1 From a position NW of Bedout Island (19°35'S 119°06'E) the passage continues SW passing:
NW of a 9.1 m shoal (reported 1952) (19°48'S 118°49'E), the outer-most danger charted NW of North Turtle Island; thence:
NW of a 9.7 m shoal (19°55'S 118°40'E) which lies 10 miles NW of Little Turtle Island; thence:
- 2 To the vicinity of the reporting position for Port Hedland which is situated 3½ miles NNE of Port Hedland Approach C1 Light-beacon (20°00'S 118°26'E), noting the 9.6 m patch which lies 4 miles ENE of C1 Light-beacon.

*(Directions continue for Port Hedland at 5.361
and for Port Walcott at 6.33)*

Anchorage

Chart Aus 739

General information

5.329

- 1 **Topography.** The coast for 17 miles SW of Spit Point (20°02'S 119°00'E) is bordered by a ridge of sparsely covered sandhills rarely more than 12 m high forming a barrier between the sea and the low land behind. The whole of the coast between Spit Point and Cooke Point, 26 miles SW, is an extensive swamp and is fronted by sandbanks which dry up to 5 miles offshore in some places. A sandspit, with depths of less than 5 m, extends 9 miles NW from Spit Point towards North Turtle Island. The inner part of the spit dries and there is a patch which dries, 6½ miles NW of the point, near the outer end of the spit.

5.330

- 1 **Irregular depths.** Between Bedout Island and the coast S and SE, and between that island and North Turtle Island, there are many detached shoals with depths of less than 10 m over them, for the position of these the chart is the best guide.

Mariners are strongly advised to pass N of Bedout Island.

Anchorage**5.331**

- 1 Between the reef surrounding North Turtle Island (19°54'S 118°54'E) and the shoal spit extending NW from Spit Point, 10 miles SSE, there is a passage nearly 1 mile wide.

Local knowledge is required.

- 2 **Anchorage** can be obtained on the line of bearing 000° of the SE extremity of North Turtle Island in a depth of 9 m in the mile-wide passage.

Landing by boats at North Turtle Island is only possible at HW spring tides as the reef dries 4.9 m in many places.

PORT HEDLAND AND APPROACHES**General information**

Chart Aus 53

Position and function**5.332**

- 1 Port Hedland (20°18'S 118°35'E) is situated on the NW coast of W Australia, about 1000 miles N from Fremantle. The port has been developed as a major iron ore and salt exporter and for the servicing of offshore oil and gas rigs.

Topography**5.333**

- 1 Cooke Point (20°18'S 118°38'E) which terminates in black steep-faced rock is sharply defined. Airey Point, a low ill-defined point 3½ miles W of Cooke Point, forms the E entrance point to the harbour. A drying sandspit and spoil ground extends N from the foreshore close E of Airey Point and E of the dredged channel, the inner part of this ground dries up to 6 m and acts as a breakwater during E winds.
- 2 Finucane Island, with Hunt Point (20°18'S 118°34'E) its E extremity, forms the W entrance point to the harbour. The island is separated from the mainland by West Creek, a drying creek which flows into the head of Port Hedland. There are a number of prominent tanks, masts and towers charted on both sides of the entrance to the port.

Port limits**5.334**

- 1 Port limits, as indicated on the chart, lie within a radius of 10 miles from No 47 Light-beacon situated 1 cable SE of Hunt Point (20°18'S 118°34'E). The inner harbour commences from a line drawn between Hunt Point Beacon (No 47) and Airy Point Beacon (No 46).

Approach and entry**5.335**

- 1 **Routes.** Separate inward and outward routes exist in the approaches to Port Hedland.
Deep-draught vessels which need to use the main fairway approach inward enter the port through a dredged

channel, the seaward end of which lies 22 miles NNW of the coast at the harbour entrance. The channel is entered about 7 miles NE of Cornelisse Shoal (20°02'S 118°22'E).

- 2 **Other vessels,** not constrained by draught, follow the recommended eastern inward passage route, as indicated on the chart to the E of the main fairway, which leads SE, passing between 2E and 3E Light-beacons (20°03'2S 118°32'6E) then S, from Port Hedland reporting position (19°56'S 118°28'E) to the pilot boarding place.

- 3 The harbour is entered between Airey Point (20°19'S 118°35'E) and Hunt Point, the E extremity of Finucane Island, 4 cables NNW.

Outward bound vessels use the main fairway dredged channel.

Traffic**5.336**

- 1 In 2002 the port was used by 389 vessels totalling 96 278 892 dwt.

Port Authority**5.337**

- 1 Port Hedland Port Authority, PO Box 2, Port Hedland, Western Australia 6721. Website: www.phpa.wa.gov.au

Limiting conditions**Controlling depths****5.338**

- 1 **Dredged channel:** the dredged channel has varying depths in order to make maximum use of the tidal range. The controlling depth between Port Hedland Approach C1 Light-beacon and Port Hedland swinging basin is 14.3 m off Hunt Point (20°18'S 118°34'E).

Eastern inward passage route: 10.2 m between No 2E Light-beacon (W cardinal) (20°03'S 118°33'E) and No 3E Light-beacon (E cardinal), close WSW.

Port Hedland swinging basin: 9.3 m maintained depth.

Deepest and longest berths**5.339**

- 1 **Ore carriers:**
Nelson Point Wharf (5.374).
Tankers, salt carriers and general cargo vessels:
Common User Wharves No 3 is the deepest (5.373).

Tidal levels**5.340**

- 1 Mean spring range about 5.9 m; mean neaps range about 1.4 m. See *Admiralty Tide Tables Volume 4*.
Mariners may request the exact height of tide by calling Port Hedland Harbour. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Density of water**5.341**

- 1 Density: average 1.026 g/cm³.

Maximum size of vessel handled**5.342**

- 1 A vessel of 328.6 m LOA, 259 287 dwt, 129 325 grt has used the port. Vessels up to 55 m beam have used Nelson Point Wharf.

Local weather**5.343**

- 1 The port is occasionally closed due to cyclones which may occur between December and March.

Arrival information

Vessel Traffic Service

5.344

- 1 A VTS is in operation on VHF for the control of shipping, for details see *Admiralty List of Radio Signals Volume 6* (4).

The position of a reporting point is shown on the chart.

Coast Radio Station

5.345

- 1 There is a Coast Radio Station at Port Hedland, for details see *Admiralty List of Radio Signals Volume 1* (2).

Notice of ETA

5.346

- 1 Notice of ETA should be sent 48, 24 and 2 hours in advance, see *Admiralty List of Radio Signals Volume 6* (4).

Outer anchorages

5.347

- 1 **Anchorage** can be obtained 2 miles E of No 16 Light-beacon (20°10'S 118°31'E) near the pilot boarding place. The bottom is sandy and the holding ground reported to be good.

Deep-draught vessels. To provide safe under-keel clearance for deep-draught vessels during extreme spring tidal ranges vessels of more than 9.5 m draught are permitted to anchor N of the pilot boarding place, within the 15 m depth contour, but not N of a line drawn E from C10 Light-beacon (20°06'S 118°28'E).

5.348

- 1 **Prohibited anchorages** lie within the areas indicated on the chart, between Spoil Ground Light-buoy (special) (20°13'S 118°34'E) and the dredged channel, also in the spoil grounds centred 1¼ miles ENE, and 4 miles N, respectively, of this light-buoy.

- 2 **Channel escape areas.** Prohibited anchorages also lie within channel escape areas Nos 1E and 1W, lying on either side of the dredged channel, centred 7 cables N, and NW, respectively, of No 16 Light-beacon (20°10'S 118°31'E) and in channel escape area No 2, lying W of the dredged channel, centred 5 cables W of C6 Light-beacon (20°04'S 118°25'E).

- 3 The channel escape areas, which are indicated on the chart, provide safe grounding areas in the event of engine failure preventing timely transit of the channel on a falling tide.

Pilotage and tugs

5.349

- 1 **Pilotage area** extends 10 miles beyond port limits to a distance of 20 miles from No 47 Light-beacon, situated 1 cable SE of Hunt Point (20°18'S 118°34'E).

Pilotage. Pilotage is compulsory for all vessels of 150 gt and over, with the following exceptions:

- 1 Australian commercial fishing vessels of less than 35 m in length,
2 Australian defence force vessels, and
Vessels under the command of a master holding a valid exemption.

Inward pilotage is optional within the extended pilotage area, which extends 10 miles beyond port limits.

Outward pilotage is compulsory for all vessels of 150 000 dwt or more outside of port limits to the limit of the extended pilotage area, and optional for vessels of less than 150 000 dwt outside of port limits.

- 3 **Availability:** 24 hours per day.

Boarding position: 20°10'S 118°33'E, about 2½ miles E of No 16 Light-beacon (20°10'S 118°31'E).

Pilots will board by launch, or, if the vessel is suitable by helicopter which will land on a hatch cover.

Tugs are available.

Traffic regulations

5.350

- 1 **Radio contact.** All vessels must contact Port Hedland Harbour before entering the extended pilotage area (5.349). If contact cannot be made vessels must not enter port limits.

Deep-draught vessels which need to use the main fairway inwards must obtain permission from Shipping Control before arrival at C1 and C2 Light-beacons (20°00'S 118°26'E).

- 2 **Other vessels** not constrained by draught should follow the recommended E inward passage route (5.363) situated E of the dredged channel.

Vessels over 315 m length overall are berthed during daylight hours only.

Inward bound vessels should avoid impeding outward bound vessels constrained by their draught, such action could be taken by reducing speed to avoid meeting outward bound vessels in restrictive areas.

Regulations concerning entry

5.351

- 1 **Under-keel clearance.** The minimum under-keel clearance required is from 2.1 to 3.7 m, dependent upon swell, at Port Hedland Approach C1 Light-beacon to 1.2 m in the inner harbour.

5.352

- 1 **Minimum arrival draught.** The port experiences strong winds on occasions and in order to reduce windage during transit of the dredged channel, and berthing, vessels should be ballasted to the following minimum arrival draughts:

Dwt	Forward draught (m)	After draught (m)
Up to 10 000	2.0	No more than 0.6 m of
10 000 to 20 000	2.0 to 2.5	the propellor to be
20 000 to 30 000	2.5 to 3.0	exposed
30 000 to 50 000	3.0 to 5.0	6.5
50 000 to 100 000	5.0 to 7.0	6.5 to 7.5
100 000 to 150 000	7.0 to 8.0	7.5 to 8.5
150 000 to 200 000	8.0 to 8.5	8.5 to 9.5
200 000 to 250 000	9.0	9.5 to 10.0

- 2 Mariners in vessels over 100 000 dwt may be required to vary their draught due to tidal conditions in the swinging basin and under the ship loader. See 5.338.

Caution. Vessels without chart Aus 53 will be denied entry.

Regulations concerning departure

5.353

- 1 **Maximum permitted departure draught.** A computer programme determines the maximum permitted departure draught which takes into account a number of factors including, amongst others: channel depths; height of tide; sea state; under-keel clearance; passage time from inner harbour to C1 Light-beacon.

The maximum loading draughts will be determined by the Port Authority at 12 hours prior to departure and will not be varied in this period.

Quarantine

5.354

- 1 Port Hedland is a first port of entry, radio pratique may be available on request see *Admiralty List of Radio Signals Volume 1* (2) and 1.54.

Harbour

Charts Aus 54, Aus 53

General layout of harbour

5.355

- 1 The harbour is crescent-shaped with a swinging basin at its head.
Berths. Finucane Island Piers, on the W side of the harbour on Finucane Island, is a privately owned ore loading berth.
- 2 Common User Wharves, two separate steel and concrete structures the property of the port authority, lie on the E side of the harbour W of the Shipping Control Tower.
Nelson Point Wharf, on the NE side of the swinging basin, is a privately owned wharf for the loading of ore.

Tidal signals

5.356

- 1 Tidal signals are exhibited from the Shipping Control Tower to indicate the state of the tide, for details see 1.63.
Mariners may also request the exact height of tide by calling Port Hedland Harbour on VHF.

Natural conditions

5.357

- 1 **Local magnetic anomaly.** Local deflection of the compass is reported to occur E of the approach channel, about 5 miles N of Cooke Point (20°18'S 118°38'E).
Strong currents exist off the coast, especially during spring tides.
- 2 **Tidal streams** at the anchorage attain a maximum rate of 1½ kn at springs.
On the Newman Leads and in the N half of the Goldsworthy Leads the tidal streams set SE on the in-going tide and NW on the out-going tide. From the S end of Goldsworthy Leads to the harbour entrance the tidal streams generally follow the line of the channel.
- 3 Tidal streams in the harbour attain a rate of from 2 to 2½ kn, the out-going stream is the stronger. On the in-going tide a pronounced set towards the W bank is experienced. On the out-going tide a strong tidal stream sets off the S end of Common User Wharves No 1.
See also information on the charts.
- 4 **Climatic table:** see 1.170 and 1.178.

Principal marks

5.358

- 1 **Landmarks:**
Conspicuous dome (20°17'9S 118°34'1E) on North Point, the N extremity of Finucane Island.
Conspicuous water tank (20°18'1S 118°33'9E) on Finucane Island.
Port Hedland Shipping Control Tower (20°19'0S 118°34'5E).
- 2 Crushing Plant (20°19'0S 118°35'3E), an oblong shape.
Conspicuous water tower (20°18'4S 118°38'0E) SW of Cooke Point.

5.359

- 1 **Major light:**
Airport Aero Light (20°23'S 118°38'E) (occasional) chart Aus 326.

Other aids to navigation

5.360

- 1 **Racon.**
Port Hedland Approach C1 Light-beacon (20°00'S 118°26'E).
Radar assistance. A bearing and distance from Port Hedland Shipping Control Tower is given on request, maximum range 64 miles. For details see *Admiralty List of Radio Signals Volume 6* (4).

Directions for entering harbour

(continued from 5.328)

Western inbound approach

5.361

- 1 **Dredged channel**, marked by light-beacons and leading lights has a width of from 183 to 520 m.
Caution. Mariners in deep-draught vessels are warned to remain within the limits of the charted dredged areas.
- 2 **5.362**
From the vicinity of 19°56'S 118°28'E, about 3½ miles NNE of Port Hedland Approach C1 Light-beacon, the route leads initially 204¼°, about 6½ miles, passing (with positions given from C1 Light-beacon (20°00'S 118°26'E)):
2 Between C1 Light-beacon (starboard hand) and C2 Light-beacon (port hand) (close ESE) the outer pair of light-beacons which lie 3 miles inside the channel entrance; thence:
Between C3 and C4 Light-beacons (starboard and port hand) (3 miles SSW).
3 The track then leads 177°, about 2 miles, passing:
W of C6 Light-beacon (port hand) (4½ miles SSW); and:
E of C7 Light-beacon (starboard hand) (5 miles SSW).
The track then leads 125¾°, about 3½ miles, passing:
4 SW of C8 Light-beacon (port hand) (5 miles S); thence:
Between C9 and C10 Light-beacons (starboard and port hand) (7¼ miles SSE).
The track then leads 150¾°, about 3 miles, passing:
Between numbered light-beacons to No 13 and No 14 Light-beacons (starboard and port hand) (20°09'S 118°30'E).
- 5 Inbound vessels using the dredged channel are not normally required to exit the dredged channel to embark the pilot and should do so only on request from the pilot, or as advised by Port Control. See 5.361.

Eastern inbound passage

5.363

- 1 A recommended E inbound track, indicated on the chart, for vessels of lighter draught exists from the N end of the dredged channel, SE then S to the pilot boarding area.
Mariners using this route should note the controlling depth (5.338) between No 2E Light-beacon (20°03'S 118°33'E) and No 3E Light-beacon, close WSW, known as Sarus Towers, and ensure there is sufficient height of tide to provide safe passage.

5.364

- 1 From the vicinity of 19°56'S 118°28'E, about 3½ miles NNE of Port Hedland Approach C1 Light-beacon, the route leads initially 146°, for about 9 miles, passing (with

positions given from No 2E Light-beacon (20°03'S 118°33'E));

SW of a 10 m patch (5¼ miles NNW); thence:

NE of a 10 m patch (4½ miles WNW); thence:

SW of a 9.6 m patch (2½ miles NNE); thence:

- 2 Between No 2E Light-beacon (W cardinal) and No 3E Light-beacon (E cardinal) (close WSW); thence:

To a position 6 cables SSE of No 2E Light-beacon.

The track then leads 180°, about 6 miles, to the pilot boarding area noting the patches of less than 10 m, the positions of which can best be seen from the chart, in the vicinity of the pilot boarding area.

Outer port area

5.365

- 1 From between No 15 and No 16 Light-beacons (starboard and port hand) (20°10'S 118°31'E) the track continues 150¾°, about 1½ miles, passing between numbered light-beacons to No 19 and No 20 Light-beacons (E cardinal and port hand) (20°12'S 118°31'E).

Newman Leads

5.366

- 1 **Newman Leading Lights:**

Front light (20°15'8S 118°35'1E).

Rear light (760 m SE of the front light).

The alignment (138°) of these leading lights situated on the N end of the drying sandspit and spoil ground which extends N from the foreshore E of the harbour entrance, then lead through the centre of the channel, about 4 miles, passing between numbered light-beacons to No 30 and No 31 Light-beacons (W cardinal and starboard hand), 1½ miles NW of the front leading light.

Goldsworthy Leads

5.367

- 1 **Goldsworthy Leading Lights:**

Front light (20°17'6S 118°35'4E).

Centre light (400 m SSE of the front light).

Rear light (red framework tower) (11 cables SSE of the front light).

- 2 The alignment (156°) of these leading lights, the front and centre light of which are situated near the S end of the same sandspit on which Newman Leading Lights stand, the rear light is situated on the foreshore about 1¼ miles E of the harbour entrance and forms part of the same leading line, then lead through the centre of the dredged channel, about 2¼ miles, passing (with positions given from the front light):

- 3 Between numbered light-beacons to No 36 and No 37 Light-beacons (port hand and E cardinal) (8 cables NNW).

Chart Aus 54

5.368

- 1 The track then leads generally S in mid-channel between numbered pairs of light-beacons to No 44 and No 45 Light-beacons (port and starboard hand) (7 cables SW).

Spoil Ground Leads

5.369

- 1 **Spoil Ground Leading Lights:**

Front light on same structure as Goldsworthy Front Light (20°17'6S 118°35'4E).

Rear light (613 m NE of the front light).

The alignment (047°), astern, of these leading lights then leads in the centre of the dredged channel to SE of Hunt Point, 2½ cables N of Airey Point.

Harbour

5.370

- 1 The track then continues passing between No 46 and No 47 Light-beacons (port and starboard hand) (the inner harbour limit), through the harbour, on successive pairs of leading lights, to the swinging basin at the head of the harbour. The positions of the respective leading lights, together with their alignments, can best be seen from the chart.

- 2 Bulk carriers are normally berthed, bows out, at slack water in-going tide using the easing flood stream, and tugs, to assist turning.

Basins and berths

Swinging basin

5.371

- 1 Port Hedland swinging basin (20°19'4S 118°34'5E) at the head of the harbour is 650 m wide and is marked by special light-buoys around its S perimeter. For depth in the basin see 5.338.

Alongside berths

5.372

- 1 **Finucane Island Pier** (20°18'6S 118°34'2E) The pier consists of two berths situated on the W side of the harbour SW of Hunt Point Beacon (No 47). The N berth extends over a distance of 360 m with seven breasting dolphins and an eighth mooring dolphin lying N of the berth basin. The S berth extends over a distance of 220 m with seven breasting dolphins. There are two dolphins ahead and three astern of the S berth to facilitate mooring. The combined berth pocket is 738 m long with a width of 65 m. A depth of 19.2 m is maintained along the majority of the mooring basin.

5.373

- 1 **Common User Wharves** (20°19'1S 118°34'3E).

No 1 Berth, longest of the Common User Wharves with a berthing face of 213 m in length and a maintained depth of 11.4 m. Used by tanker and general cargo vessels up to 230 m in length. The S end of the wharf is a service point for rig tenders. Mooring dolphin 58 m from N end.

- 2 No 3 Berth, deepest of the Common User Wharves with a berthing face of 183 m in length and a maintained depth of 13.4 m. Used as a tanker, general cargo and bulk salt berth for vessels up to 230 m in length. Mooring dolphin 46 m from each end.

5.374

- 1 **Nelson Point Wharf** (20°19'2S 118°34'6E). Double berth for loading ore, 658 m in length with a maintained depth of 19.2 m.

5.375

- 1 **Tug harbour** (20°19'8S 118°34'3E). A basin for tugs lies close N of Common User Wharves No 1, depth 5.7 m.

Port Services

Repairs

5.376

- 1 Light engineering facilities for comprehensive minor repairs. Diving facilities.

Other facilities

5.377

- 1 **Deratting** exemption certificates can be issued.

Hospital in the town.

Oily waste removal facilities by road tanker are limited.

Supplies**5.378**

- / **Fuel and fresh water.** are available at Common User Wharves and can be supplied by barge to Finucane Island Pier.

Provisions are available with prior notice.

Communications**5.379**

- / **Airport,** 12 km from the port, with connecting flights to international airports at Perth and Darwin.

Harbour recommendations**5.380**

- / Owing to the tidal range and the movement of large

vessels within the port, Masters should ensure that mooring lines are properly attended at all times.

Oyster inlet*Chart Aus 53***General Information****5.381**

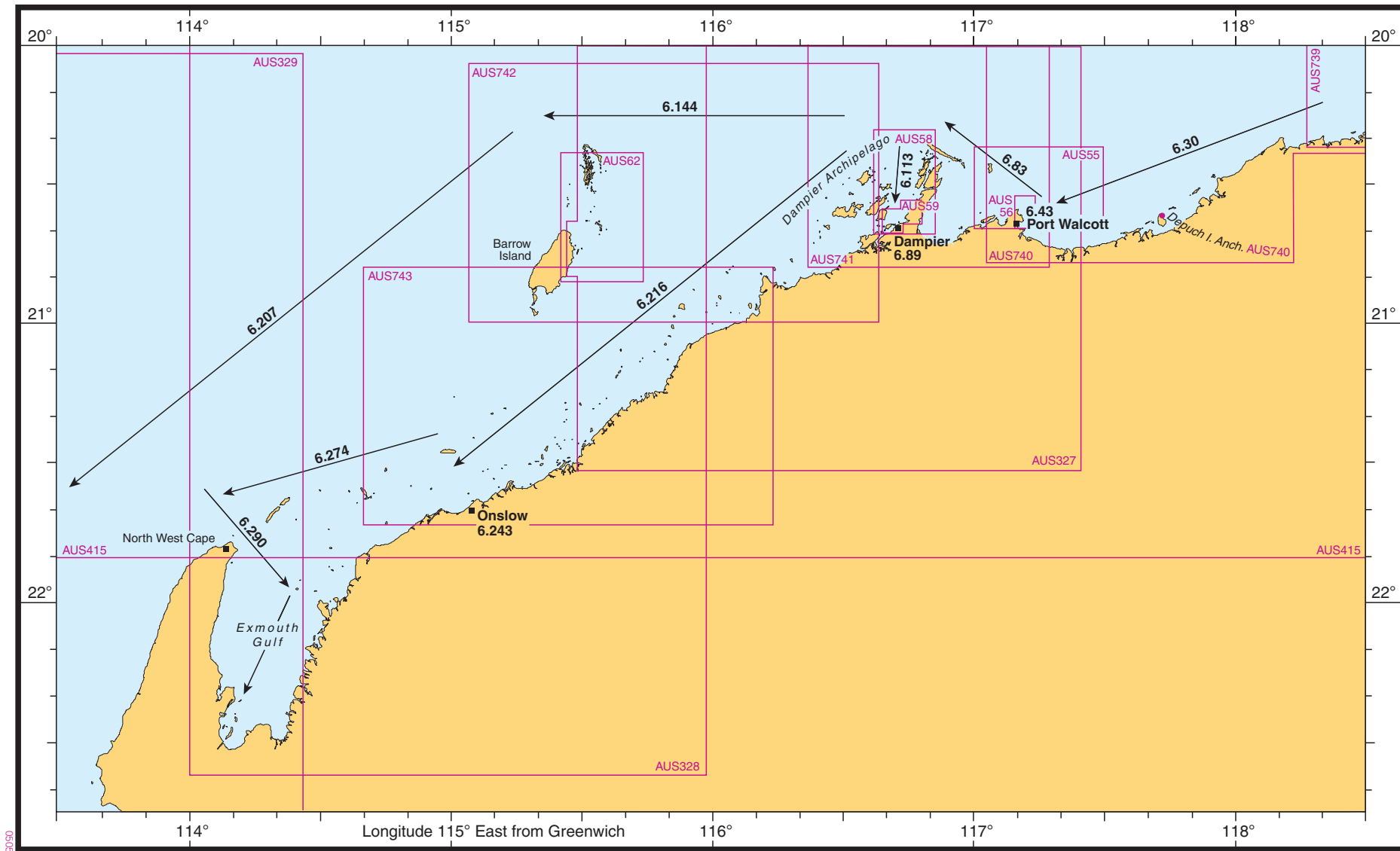
- / **Description.** Oyster Inlet, entered between Downes Island (20°19'S 118°31'E) and Weerde Island, 2 miles W, affords shelter to small craft. The inlet contains mussel culture beds.

Local knowledge is required.

Approach. The inlet should only be approached from E and at LW when the ledges, which extend up to 2 miles offshore, are partly dry.



Chapter 6 - Port Hedland to North West Cape



220

0505

CHAPTER 6

PORT HEDLAND TO NORTH WEST CAPE

GENERAL INFORMATION

Charts Aus 415, Aus 416

Scope of chapter**6.1**

- 1 This chapter covers the NW coast of Australia between Port Hedland (20°18'S 118°35'E) and North West Cape, about 270 miles WSW, and includes Exmouth Gulf (22°00'S 114°15'E).

It also covers the outlying dangers and offshore route between Rowley Shoals (17°20'S 119°25'E) and North West Cape.

Ports**6.2**

- 1 The ports of Port Walcott (6.43), Dampier (6.89), Onslow (6.243) and Exmouth (6.300), together with the marine terminals of Wanaea (6.14), Wandoo (6.19), Stag (6.23) and Legendre (6.26), Varanus Island (6.189), Barrow Island (6.195), Airlie Island (6.260) and Saladin (6.267) are covered by this chapter.

Oil and Gasfields**North West Shelf****6.3**

- 1 North Rankin Gasfield, part of the North West Shelf Natural Gas Project, is in the vicinity of Rankin Bank (19°46'S 115°38'E).

North Rankin A platform (19°35'S 116°08'E) is situated 30 miles ENE of Rankin Bank and pipelines have been laid SE to a processing plant at Withnell Bay. There are supply vessel moorings, marked by buoys, in close proximity to the platform. The platform is conspicuous. A restricted area, radius 5 miles, surrounds the platform, it should be avoided by mariners in transit, see 1.11.

- 2 **Goodwyn A gas production facility** is in position 19°39'S 115°56'E and a gas pipeline is laid between its wells and North Rankin A platform. A restricted area, as shown on the chart surrounds the platform.

- 3 The marine terminals of Wanaea (19°35'S 116°27'E), Wandoo (20°09'S 116°25'E), Stag (20°17'S 116°15'E) and Legendre (19°41'S 116°43'E) lie between North Rankin A and Dampier Archipelago.

Harriet gas project**6.4**

- 1 Campbell, Linda and Sinbad gas platforms are situated E of Montebello Islands (20°30'S 115°30'E), for details see 6.174.

Mary Anne Passage**6.5**

- 1 The area NW of Mary Anne Passage (21°12'S 115°28'E) (6.216) is an oil and natural gasfield and numerous production platforms and wells exist in this area.

Suspended wells**6.6**

- 1 Numerous suspended wells (1.13) the positions of which can best be seen from the large scale charts are charted in the area covered by this chapter. For full details see *The Mariner's Handbook*.

Caution**6.7**

- 1 Gas pipelines contain flammable natural gas at high pressure. See 1.38 and *The Mariner's Handbook*.

OFFSHORE ROUTE – ROWLEY SHOALS TO NORTH WEST CAPE

General information

Chart Aus 415

Route**6.8**

- 1 From SSE of Rowley Shoals (17°20'S 119°25'E) the offshore passage continues WSW, about 230 miles, to NNW of Rankin Bank.

Mariners on the trans-ocean route to South Africa continue generally W, for details see *Ocean Passages for the World*.

For mariners continuing around the NW coast of Australia the passage then leads SW, about 150 miles, passing NW of Montebello Islands and Barrow Island to a position NW of North West Cape.

Restricted area**6.9**

- 1 For details of a restricted area surrounding North Rankin A Platform (19°35'S 116°08'E) see 6.3.

Principal marks**6.10**

- 1 **Landmark:**

North West Cape Light structure (21°49'S 114°10'E) (6.296).

Offshore marks:

North Rankin A Platform (19°35'S 116°08'E) (6.3).

Goodwyn A Platform (19°39'S 115°56'E) (6.3).

Major lights:

Imperieuse Reef Light (17°31'S 118°57'E) (5.9).

North West Cape Light (as above).

Other aid to navigation

6.11

1 **Racon:**

Imperieuse Reef Light (17°31'S 118°57'E).

Directions

(continued from 5.326)

Charts Aus 326, Aus 327, Aus 415

Rowley Shoals to Rankin Bank

6.12

- 1 From SSE of Imperieuse Reef (17°35'S 118°56'E) the passage leads WSW passing:

Clear of Mutineer Production Well (19°15'·6S 116°38'·2E), Exeter Production Well (19°18'·7S 116°33'·6E) and their associated FPSO, *Modec Venture II* (19°16'·6S 116°36'·5E) from where a light is exhibited; thence:

NNW of Glomar Shoal (19°32'S 116°48'E); thence:
NNW of Wanaea Marine Terminal (19°35'S 116°27'E) (6.14); thence:

- 2 NNW of North Rankin A platform (19°35'S 116°08'E) (6.3) from where a light is exhibited; thence:
NNW of Goodwyn Gas Platform (19°39'S 115°56'E) from where a light is exhibited; thence:
NNW of Rankin Bank (19°46'S 115°38'E).

Chart Aus 328

Rankin Bank to North West Cape

6.13

- 1 From NNW of Rankin Bank the passage then leads SW passing:

NW of Tryal Rocks (20°16'S 115°23'E) (6.210), the outermost danger NW of Montebello Islands; thence:

- 2 NW of Griffin Oilfield (21°12'S 114°38'E) (6.211); thence:
NW of the two Muiron Islands (21°40'S 114°21'E) (6.275); thence:
NW of North West Reef (21°46'S 114°10'E) (6.297), the outermost danger off North West Cape.

(Directions continue at 7.14 and for
Exmouth Gulf at 6.297)

Wanaea Marine Terminal

Chart Aus 741

General information

6.14

- 1 **Position and function.** Wanaea Marine Terminal (19°35'S 116°27'E) consists of a FPSO converted from a 150 000 dwt tanker named *Cossack Pioneer*. It is situated in the Indian Ocean, about 70 miles NNW of Dampier, and is the outlet for Wanaea Oilfield. A cautionary area radius 2½ miles surrounds the facility. An oil/gas pipeline extends 8 miles NNE, beyond the Cautionary Area, to a wellhead in position 19°27'·4S 116°29'·3E (see chart). A further gas pipeline extends 18 miles W to link with North Rankin A platform (6.3).

- 2 **Operator.** Woodside Petroleum (W.A.Oil) Pty Ltd, 1 Adelaide Terrace, Perth, Western Australia 6000.

Limiting conditions

6.15

- 1 **Maximum size of vessel.** Vessels up to 150 000 dwt can be accommodated at the terminal.

Local weather and sea state. As the terminal is an open and unsheltered mooring there may be times when mooring operations may be difficult or inadvisable. Under these circumstances the terminal will be closed until conditions improve.

- 2 **Tropical Cyclones.** During an average season four or five storms develop in the area, and one or two of these usually reach storm force. December through to April is the most active period.

Swell. Except during the cyclone period, or during other isolated severe storms, seas are generally slight. Seas of 2 m and less can be expected 95% of the time. Larger seas are more prevalent during the winter months when swells as high as 4 m can be generated during E gales.

Arrival information

6.16

- 1 **Ballast.** There are no facilities for the acceptance of any type of ballast.

Notice of ETA should be sent 72 hours in advance and thereafter at shorter intervals, for details see *Admiralty List of Radio Signals Volume 6* (4).

- 2 **Anchoring** is prohibited in the cautionary area as shown on the chart and tankers should avoid anchoring closer than 10 miles N or S of the FPSO facility. Glomar Shoal (20 miles E) has depths of 22 m to 30 m and is reported to have been used previously as an anchorage for tankers.

Pilotage is compulsory. Pilots will embark and disembark the vessel off Dampier Port in a position 246° 6·9 miles from Legendre Island Light (6.117). See *Admiralty List of Radio Signals Volume 6* (4) for details.

- 3 **Tug.** A support vessel will assist in the mooring operation.

Flow

6.17

- 1 The terminal is close E of the branch of Western Australian Current which flows NE along the continental shelf, and W of the return current flowing along the coast. Currents are quite intense for the open ocean and a maximum flow rate of 1½ kn can be expected during spring tides. In 1995 it was reported that a maximum flow of up to 3 kn can be experienced at the terminal.

Berth

6.18

- 1 Vessels are moored bow to stern of the FPSO facility. Berthing will only normally take place between 0600 and 1630 local time.

Wandoo Marine Terminal

Charts Aus 741, Aus 742

General information

6.19

- 1 **Position and function.** Wandoo Marine Terminal (20°09'S 116°25'E) consists of two production platforms and a CALM buoy about 35 miles NNW of Dampier which serves as the outlet for Wandoo Oilfield. A cautionary area, as shown on the chart, surrounds the facility.

Authority/Operator. Wandoo Production Alliance/West Australian Petroleum

Limiting conditions

6.20

- 1 **Maximum size of vessel,** not more than 100 000 dwt.
Local weather and sea state, see 6.15.

Arrival information**6.21**

- 1 **Ballast.** Dirty ballast is not accepted.
Notice of ETA: 72 hours and thereafter at shorter intervals, see *Admiralty List of Radio Signals Volume 6 (4)* for details.
- 2 **Anchorage,** as shown on the charts, is in the vicinity of 20°05'S 116°23'E, about 3½ miles NW of the CALM buoy.
Pilotage is compulsory for all vessels.
Tug will assist berthing and unberthing.

Flow**6.22**

- 1 The following are reported (1995): spring 1.3 kn, neap 0.4 kn; flood towards SE, ebb towards NW.

Stag Marine Terminal

Chart Aus 742

General information**6.23**

- 1 **Position and function.** Stag Marine Terminal (20°17'S 116°15'E) consists of a lighted production platform, a CALM buoy 1 mile N, and the FSO *Dampier Spirit*. A cautionary area surrounds the facility as shown on the chart.
Port authority. Apache Energy Ltd, Level 3, 256 St Georges Terrace, Perth, WA 6000. Website: www.apachecorp.com

Limiting conditions**6.24**

- 1 **Maximum size of vessel handled.** Vessels between 25 000 and 150 000dwt can be accommodated at the facility.

Berthing is conducted normally during daylight hours only.

Arrival information**6.25**

- 1 **Ballast.** There is no dirty ballast reception facility.
Notice of ETA is required 10 and 7 days in advance and thereafter at shorter intervals, for details see *Admiralty List of Radio Signals Volume 6 (4)*.
Anchorage. An anchor berth, shown on the chart, has been established 2 miles NW of the CALM buoy.

Legendre Marine Terminal

Chart Aus 741

General information**6.26**

- 1 **Position and function.** Legendre Marine Terminal (19°41'S 116°43'E) consists of a lighted production platform, a CALM buoy 1½ miles NE and the FSO *Karratha Spirit*. A cautionary area, as shown on the chart, surrounds the facility.
Operator. Woodside Offshore Petroleum Pty Ltd, Karratha.

Arrival information**6.27**

- 1 **Notice of ETA:** 72 hours and thereafter at shorter intervals, see *Admiralty List of Radio Signals Volume 6 (4)* for details.
Anchorage. An anchor berth, as shown on the chart, has been established 4 cables NW of the platform.
Pilotage is compulsory. Pilots will embark and disembark the vessel off Dampier Port in a position 246° 6.9 miles from Legendre Island Light (6.127). See *Admiralty List of Radio Signals Volume 6 (4)* for details.

PORT HEDLAND TO DAMPIER**GENERAL INFORMATION**

Chart Aus 415

Scope of section**6.28**

- 1 The area covered by this section comprises:
Port Hedland Approaches to Port Walcott Approaches (6.30).
Port Walcott and Approaches (6.43).
Port Walcott Approaches to Dampier Approaches (6.83).
Dampier (6.89).

Dampier Archipelago

Chart Aus 327

Description**6.29**

- 1 Dampier Archipelago, a group of generally high, rocky islands of a dark red colour, extends about 40 miles in a general E to W direction from Delambre Island (20°27'S 117°05'E) to Eaglehawk Island, 37 miles WSW, and front the N approach to Port Walcott, Nickol Bay and the port of Dampier.
Delambre Island, the E-most island, lies 10 miles NNW of Cape Lambert.

- 2 Cape Legendre (20°21'S 116°50'E), the NW extremity of Legendre Island (6.90) and the E-most entrance point to Dampier, lies 14 miles WNW of Delambre Island.
Rosemary Island (20°29'S 116°36'E), 15 miles WSW of Cape Legendre, lies on an extensive bank with numerous rocks and islands on it on the W side of the approach to Dampier.

PORT HEDLAND APPROACHES TO PORT WALCOTT APPROACHES**General information**

Chart Aus 740

Route**6.30**

- 1 From the approach to Port Hedland, about 3½ miles NNE of Port Hedland Approach C1 Light-beacon (starboard hand) (20°00'S 118°26'E), the passage to Port Walcott approaches leads WSW, about 65 miles.

Topography**6.31**

- 1 Cape Thouin (20°20'S 118°11'E) lies 22 miles W of Port Hedland and the coast between is intersected by creeks which are backed by swamps. The coast between Cape Thouin and Cape Cossigny, 16 miles SW, is formed by sandhills from 9 to 12 m high. A conspicuous tower stands on a sandhill about 8½ miles SW of Cape Thouin.

- 2 From Cape Cossigny to the entrance to Sherlock River, about 26 miles SW, the coast is low, lined with mangroves and intersected by creeks which sometimes inundate much of the low country at spring tides. Peawah Hill (20°39'S 117°56'E) (chart Aus 326), about 6 miles inland, is situated 10 miles S of Cape Cossigny and is a useful mark for approaching Depuch Island Anchorage (6.34).

- 3 Forestier Islands form a chain of seven islands and reefs extending SW from Cape Cossigny between Reef Island (20°28'S 117°55'E) and West Moore Island, 16 miles SW. Ronsard Island, 3½ miles SW of Reef Island, when seen from the N shows two peaks with a white patch under each.

Legendre Island (20°24'S 116°53'E) (6.90) (chart Aus 741) lies on the boundary between Port Walcott (6.43) and Dampier (6.89).

Other aids to navigation

6.32

1 Racons:

Port Hedland Approach C1 Light-beacon (20°00'S 118°26'E).

Port Walcott C1 Light-buoy (20°23'S 117°26'E).

Directions

(continued from 5.328)

6.33

- 1 From a position about 3½ miles NNE of Port Hedland Approach C1 Light-beacon (starboard hand) (20°00'S 118°26'E) the passage leads WSW passing:

NNW of Cornelisse Shoal (20°02'S 118°22'E), noting the 8.7 m patch which lies 3 miles NE of the shoal; thence:

- 2 NNW of Geographe Shoals, a number of rocky patches lying about 15 miles WNW of Cape Thouin (20°20'S 118°11'E). The sea generally breaks on these shoals. The 20 m depth contour lies close outside the N shoal which should not be approached, in thick weather, to a depth of less than 30 m. Thence:

- 3 NNW of Beagle Reef (20°24'S 117°48'E); shoals with a depth of 5 m over them lie ¾ and 5 miles WNW of Beagle Reef. These shoals are marked by tide-rips. Noting also the depths of less than 10 m which lie to seaward of Beagle Reef, closer to the track. Thence:

- 4 NNW of a reef (20°24'S 117°38'E) with a depth of 3.1 m over it which lies 3 miles N of a 2.7 m reef, noting the depths of less than 10 m which lie to seaward and closer to the track; thence:

To the vicinity of Port Walcott C1 Light-buoy (E cardinal) (20°23'S 117°26'E).

(Directions continue at 6.87 and for Port Walcott at 6.63)

Depuch Island anchorage

General information

6.34

- 1 **Description.** Depuch Island anchorage, situated E of the N part of Depuch Island is entered between North Point (20°37'S 117°43'E) and the sandbank extending SW from Sable Island.

The anchorage is sheltered from NE by the above sandbank.

6.35

- 1 **Topography.** Depuch Island, the largest of the Forestier Islands, lies with North Point, its NE extremity, 2 miles SW of the W extremity of Sable Island. The island consists of an irregular pile of reddish hills, in some parts resembling basaltic columns, rising to its summit in the SW part. East Moore, Sandy and West Moore Islands, the three W-most Forestier Islands, lie on a bank of sand and coral which dries and extends 4½ miles SW from the N extremity of Depuch Island.

- 2 Sable Island, on the E side of the anchorage, is connected to the coast by a bank of sand and coral which dries. The island is divided into two parts connected to each other by a rocky causeway awash at HW with Table Rock, a conspicuous table-top rock situated near its W extremity.

6.36

- 1 **Historic wrecks,** uncharted, of the vessels *Eddystone* and *Crown of England* lie 1½ miles SW of the W extremity of Sable Island and close E of Wreck Point (20°37'S 117°44'E). See 1.60.

6.37

- 1 **Landing.** Depuch Island is an Aboriginal reserve, landing is restricted.

6.38

- 1 **Depths** in the approach to the anchorage are not less than 6 m.

Directions

6.39

- 1 The best approach to Depuch Island is on the line of bearing 120° of the summit.

The line of bearing 102° of Peawah Hill (20°39'S 117°56'E) (chart Aus 326) then leads in the approach to the anchorage passing (with positions given from North Point (20°37'S 117°43'E)):

- 2 NNE of a 5.2 m patch (2½ miles WNW); thence: SSW of a 4.9 m patch (2 miles NW).

The track then continues in a general ESE direction along the W side of the bank, with depths of less than 5 m over it, which extends 3 miles NW from the W extremity of Sable Island (2 miles NE) to NE of North Point, distant about 6½ cables, noting the shoal bank extending up to 3½ cables N from the point.

- 3 The track then leads SE to the anchorage noting the stranded wreck, and an isolated drying patch 1½ cables farther SW, which lies at the edge of the bank extending W from Sable Island.

Anchorage

6.40

- 1 The recommended anchorage is on the line of bearing 283° of North Point (20°37'S 117°43'E), distant 6½ cables, with the two white cairns on Wreck Point, 7 cables SE, in line bearing 204°, in a depth of about 8 m, as indicated on the chart.

Smaller vessels can obtain anchorage off Anchor Hill (20°38'S 117°45'E), which has a small cairn (13 m) on it, taking care to avoid the shoals which extend 5 cables N from this hill.

6.41

- 1 **Tidal streams** at the anchorages attain a rate of 3 kn at springs causing tide-rips off North Point and Anchor Hill. The in-going tide sets SE and the out-going tide NW.

Balla Balla harbour**6.42**

- 1 Balla Balla, a small land-locked harbour in the creek of the same name, is entered 3 miles SE of Anchor Hill. All but the narrow and tortuous entrance channel dries out.

Local knowledge is required.

Anchorage. About 5 cables within the entrance there is restricted anchorage for small craft and ramps which are suitable for small landing craft.

PORT WALCOTT AND APPROACHES**General information**

Charts Aus 55, Aus 740, Aus 741

Position and function**6.43**

- 1 Port Walcott (20°35'S 117°12'E) is situated on the NW coast of Australia between Port Hedland and Dampier. The port is essentially for the export of iron ore.

Topography**6.44**

- 1 From the entrance to Sherlock River (20°43'S 117°33'E) to Point Samson, about 20 miles WNW, the coast is generally low, flat and intersected by several rivers which discharge into swampy and mangrove covered land bordering the coast. Mount Wangee, the highest summit of a double ridge of grassy hillocks, is situated 4½ miles SW of Picard Island (20°41'S 117°16'E), a bare rock.
- 2 Delambre Island (20°27'S 117°05'E), the E-most island in Dampier Archipelago, lies 10 miles NNW of Cape Lambert. The island has a broken sandstone cliff and a peculiar pinnacle rock at its N end, which, when approaching from W has the appearance of a square building.
- 3 Nickol Bay (6.73) is entered between the point 12 miles WSW of Cape Lambert (20°36'S 117°11'E) and Sloping Point (20°31'S 116°52'E), the NE extremity of Burrup Peninsula, 10½ miles further NW. The SE and NW sides of the bay are hilly, but the head of the bay is low and lined with mangroves.
- 4 Dolphin Island lies between Sloping Point and Legendre Island (20°24'S 116°53'E) and is separated from the mainland by Searipple Passage, a narrow boat passage which is reported to be foul. There is foul ground between Legendre Island (6.90) and Haüy Island. A rocky ledge, with depths of less than 2 m over it, extends E towards Delambre Island and heavy tide-rips extend to the island itself. The area immediately N is incompletely surveyed, see information on the chart.

Port limits**6.45**

- 1 The port limits, as shown on the charts, extend generally E from a point at the N of Dolphin Island to Delambre Island (20°27'S 117°05'E); thence generally SE and S to a point on the coast on the meridian of 117°32'E in the vicinity of Sherlock River.

Approach, entry and departure**6.46**

- 1 The port is approached by a preferred route, shown on the chart, passing E and S of Tessa Shoals (20°30'S 117°20'E) and entered by the inner section of the buoyed channel to the berths.
- Shallow-draught** vessels (with draughts less than 6 m) can approach Port Walcott between Delambre Island

(20°27'S 117°05'E) and Delambre Reef, 9 miles E. It is not recommended for bulk carriers or tankers.

Departure from the port is via the dredged channel through Bass Pass (6.69).

Traffic**6.47**

- 1 In 2004, 249 vessels totalling 52 361 638 dwt used the port.

Port Authority**6.48**

- 1 Robe River Iron Associates, PO Box 21, Wickham, WA 6720.

Limiting conditions**Controlling depths****6.49**

- 1 The following depths relate to LAT::
 Approach to Cape Lambert Ore Jetty; 9.6 m for Berth 2 and 10.6 m for Berths 1 and 3.
 Approach to Cape Lambert Service Jetty; 7.8 m.
 Dredged channel; 15.6 m maintained depth.

Deepest and longest berths**6.50**

- 1 **Ore carriers:** Cape Lambert Ore Jetty No 1 and 3 Berths (6.70).
Tankers and general cargo vessels: Cape Lambert Service Jetty (6.71).

Density of water**6.51**

- 1 Density: 1.024 to 1.025 g/cm³.

Maximum size of vessel handled**6.52**

- 1 A vessel of 322 941 dwt, 330 m length overall, 55 m beam has used the port.

Arrival information**Notice of ETA****6.53**

- 1 Notice of ETA should be sent 7 days and 24 hours before arrival, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Anchorage**6.54**

- 1 Numbered anchor berths, as shown on the chart, for ore carriers awaiting a berth are situated from 2½ to 10 miles ENE of Cape Lambert (20°36'S 117°11'E). Anchorage 1A is reserved for small vessels, and anchorage 1 for pilot boarding.

Depths in the numbered anchor berths vary from 11 to 15 m, sand.

Pilotage and tugs**6.55**

- 1 **Pilotage inward.** Pilotage is optional for inbound vessels on the inward recommended route from C1 Light-buoy (20°23'S 117°26'E) to position 20°33'2.1S 117°17'7E, then compulsory from this position to the berth. See information on the chart.

Pilotage will be provided, on request, from C1 Light-buoy to the berth. The pilot will board when a berth is available; vessels anchor N of C1 until berth is available.

- 2 **Pilotage outward.** Pilotage for outward bound vessels is compulsory to the extent of the port limits and for deep

draught vessels needing assistance to transit the Outer North Channel and is available 24 hours per day.

Position. Pilot boards at the inner pilot boarding point, 5¾ miles ENE of the seaward end of Cape Lambert Ore Jetty, or close E of C1 Light-buoy.

- 3 **Boarding.** Pilot boards all vessels with a landing area, except tankers, by helicopter. Vessels unable to accept a helicopter should notify the Harbour Master 48 hours in advance.

Tugs. Two are available.

Traffic regulations

6.56

- 1 **Buoyed channel.** Entry into Port Walcott via the buoyed channel is prohibited.

Restricted area. All vessels must keep clear of large bulk carriers that are moored or manoeuvring within the area, indicated on the chart, surrounding Cape Lambert.

Regulations concerning entry

6.57

- 1 **Under keel clearance** of 10% of draught is required.
Berthing. Berthing may take place at any stage of the tide except during spring tides when vessels are required to wait for slack water.

Quarantine

6.58

- 1 Port Walcott is a first port of entry, radio pratique may be available, for details see *Admiralty List of Radio Signals Volume 1* (2) and 1.54.
Quarantine line is an arc with a 3 mile radius centred on Cape Lambert.

Harbour

General layout of harbour

6.59

- 1 **Alongside berths.** Cape Lambert Ore Jetty extends nearly 1½ miles NE from Cape Lambert to open water. The jetty carries two ore conveyor belts and has berths on each side of its seaward end.
Cape Lambert Service Jetty situated W of Cape Lambert Ore Jetty extends 3 cables NNE from Cape Lambert and has a berth on its NW side.
- 2 **Dredged channel.** A dredged channel marked by light-buoys, for outward bound laden ore carriers, leads from Cape Lambert Ore Jetty, via Bass Pass, to E of C1 Light-buoy (20°23'S 117°26'E).
Fishing boat harbour is situated at John's Creek, close W of Point Samson (20°38'S 117°12'E).
- 3 **Nickol Bay** (20°38'S 116°54'E), an unsurveyed bay with discoloured water, is situated on the W side of the port area.

Local magnetic anomalies

6.60

- 1 Local magnetic anomalies are reported to exist with Cape Lambert bearing about 211°, distant 3 and 4½ miles. At the inner position the compass was deflected 55°. It seems likely that other magnetic anomalies may exist in this area, probably on the line of the submarine extension of the basaltic Cape Lambert. Although very careful observation is necessary to guard against these deflections they will be observed only when passing over small areas of magnetic disturbance.

Landmarks

6.61

- 1 Conspicuous chimneys (20°35'·8S 117°10'·2E) at an elevation of 56 m.
Ore stockpiles on Cape Lambert (20°36'S 117°11'E).
Conspicuous tanks (20°37'·5S 117°11'·6E) close NW of the Port Authority office.
Radio mast (20°38'·03S 117°09'·08E) with red lights 3 miles SW of Cape Lambert.

Other aid to navigation

6.62

- 1 **Racon:**
C1 Light-buoy (20°23'S 117°26'E).

Directions for entering harbour

(continued from 6.33)

Caution

6.63

- 1 Owing to the incomplete nature of the survey in the approaches to Port Walcott mariners should navigate on the recommended tracks indicated on the chart.
No reliance should be placed on the light-buoys always maintaining their exact position.

Approaches

6.64

- 1 From a position about 1 mile E of C1 Light-buoy (E cardinal) (20°23'S 117°26'E) the preferred track, shown on the chart, leads initially 183° passing:
E of No 3 Light-buoy (starboard hand) (20°25'S 117°24'E); thence:
W of No 60 Light-buoy (W cardinal) (20°27'S 117°27'E); thence:
- 2 W of No 62 Light-buoy (port hand) (20°29'S 117°27'E); thence:
E of No 61 Light-buoy (starboard hand) (20°30'S 117°26'E) marking the E side of Tessa Shoals.
The track then leads 256° passing:
- 3 SSE of No 63 Light-buoy (S cardinal) (20°31'S 117°21'E) marking the S side of Tessa Shoals; thence:
To the pilot boarding area or anchorage as required.

Channel between Delambre Island and Delambre Reef

6.65

- 1 **Shallow-draught vessels.** Mariners in vessels not exceeding 6 m draught can approach Port Walcott between Delambre Island (20°27'S 117°05'E) and Delambre Reef, 9 miles E.
Local knowledge is required.
From a position about 3½ miles ENE of Delambre Island summit the route leads S, about ¾ miles, passing (with positions given from Delambre Island summit):
- 2 W of an 8·8 m patch (5 miles ESE) which lies 4½ miles W of Delambre Reef; and:
E of a 5·6 m patch (3 miles SE). Foul ground, irregular depths and strong tide-rips extend 3 miles from Delambre Island (6.44) which should be approached with caution.
- 3 The route then leads SSE, about 2 miles, passing:
ENE of a 3 m patch (5½ miles SE).
The route then leads SE passing:
NE of Boat Rock (20°33'S 117°11'E) which lies 5 cables E of Bezout Island, to join the inner part of the dredged channel.

Charts Aus 56, Aus 55

Entry

6.66

- 1 If bound to Cape Lambert Ore Jetty enter the inner part of the dredged channel N of No 28 Light–buoy (port hand) (20°34'S 117°12'E).

If bound to Cape Lambert Service Jetty pass NW of No 27 Light–buoy (starboard hand) (20°34'S 117°12'E) and SE of Boat Rock (20°33'S 117°11'E) which lies 5 cables E of Bezout Island.

6.67

- 1 **Berthing lights.** The alignments of Cape Lambert Service Jetty Berthing Lights assist in the approach and departure from the Service Jetty berth.

The alignment (160°):

Common front light (20°35'4S 117°11'1E) on the Service Jetty head.

- 2 Rear light (260 m from the front light) on the Ore Jetty.

The alignment (136°):

Common front light (as above).

Rear light (235 m from the front light) on the Ore Jetty.

6.68

- 1 **Useful marks:**

Conspicuous disused light tower (20°39'5S 117°13'0E) on the N part of Jarman Island.

Light–beacon (N cardinal) (20°35'6S 117°12'2E) marking the NE extremity of reefs, drying 4.4 m, extending NE from the E entrance point of Sams Creek.

Directions for leaving harbour

Dredged channel

6.69

- 1 The dredged channel, used by laden outward bound ore carriers via Bass Pass, passing S of Delambre Reef and N of Tessa Shoals, is marked by light–buoys. The channel is 210 m wide at its inner end and widens gradually to 600 m between No 8 and No 9 Light–buoys (port and starboard hand) (20°28'S 117°22'E)

- 2 From Cape Lambert Ore Jetty the track leads generally NE in mid–channel passing:

Between numbered light–buoys to E of No 3 Light–buoy (starboard hand) (20°25'S 117°24'E).

The track then leads NE to pass E of C1 Light–buoy (E cardinal) (20°23'S 117°26'E).

The alternative Outer South Channel, with a minimum depth of 15.6 m, leads E the NE from No 8 and No 9 Light–buoys as shown on the chart.

Berths

Alongside berths

6.70

- 1 **Cape Lambert Ore Jetty** (20°34'7S 117°12'0E) three berths. Berth 2 (NW side), 366 m in length with a maximum maintained depth of 19.4 m and Berths 1 and 3 (SE side) total length 531 m with a maintained depth of 19.1m, as shown on the chart. A mooring dolphin is situated 67 m from the seaward end. Vessels berth bow out secured to dolphins parallel to the jetty.

6.71

- 1 **Cape Lambert Service Jetty** (20°35'4S 117°11'1E), one berth, 155 m long, depth 9.6 m, used for general cargo and petroleum products. Mooring dolphins 27 m from each end of the jetty. Can accept vessels up to 190 m in length.

Point Samson Anchorage

6.72

- 1 Sheltered anchorage can be found about 2 miles SE of Cape Lambert, in a depth of 7 m, sand.

Charts Aus 55, Aus 741

Nickol Bay

6.73

- 1 **General information.** Nickol Bay (20°38'S 116°54'E) was the original starting place for the pearl shell fishery of Western Australia.

Local knowledge is required.

6.74

- 1 **Approach.** The only safe approach to Nickol Bay appears to be the passage between Bezout Island (20°33'S 117°10'E) and the foul ground extending S from Delambre Island, passing 5 miles N of Dixon Island (20°38'S 117°04'E), noting the 3 m and 3.1 m shoals which lie 5½ miles SE and 4¼ miles SSW, respectively, of Delambre Island summit.

- 2 **Caution.** A rocky patch, with depths of less than 2 m (charted dangerous rock) (position approximate) on which the sea breaks, is charted 4 miles NNW of the SW end of Dixon Island.

6.75

- 1 **Anchorage** can be obtained on the N side of the entrance in depths of from 11 to 12 m, sand. During strong E winds a breaking sea is experienced.

Landing may be effected on a beach near the S extremity of Delambre Island.

Port services

6.76

- 1 **Repairs.** No repair facilities.

Other facilities: a hospital is available. Oily waste reception facilities are not available.

Supplies. Fuel not available. Fresh water available at both jetties. Provisions available, advance notice preferred.

Communications. Airport 67 km from the port at Karratha, with connecting flights to international airports at Perth and Darwin.

Minor harbour and anchorage

Charts Aus 56, Aus 740

John's Creek

6.77

- 1 **General information.** Between Point Samson (20°38'S 117°12'E) and Reader Head, a dark bluff point 2 miles S, the NW entrance point to Butcher Inlet, there is a bay which dries entirely. A fishing boat harbour, protected by a breakwater, is situated in the N part of the bay, in John's Creek, close W of Point Samson.

6.78

- 1 **Approach.** A light–beacon (E cardinal) (20°38'S 117°12'E) marks the NE extremity of some drying rocks which extend 4 cables E from the vicinity of Point Samson town.

The harbour is approached between Point Samson and Popes Nose Rock, 3 cables SW, through a short channel marked by light–beacons.

6.79

- 1 **Facilities:** 40 ton slipway.

Charts Aus 55, Aus 741

Port Robinson**6.80**

- 1 **General information.** Port Robinson (20°39'S 117°02'E), a small craft harbour whose shores are fronted by an extensive mud flat which dries, is situated SW of Dixon Island and affords secure anchorage. The coast between Cape Lambert and the NE extremity of a hilly promontory, about 12 miles WSW, has only been partially surveyed. Dixon Island lies close off the central part of this coast and its SW side forms the NE side of Port Robinson. On the E side of the harbour a shoal channel, which dries 2.7 m, separates Dixon Island from the mainland.

- 2 **Local knowledge** is required.

Topography. Mount Anketel (20°40'S 117°04'E), a round green hill at the head of the harbour, is conspicuous and is a useful mark. Roebourne Gap, 1 mile SW of the S entrance point is prominent.

Dangers. Detached patches of 2.3 m lie 1 mile N and 2 miles NNW, respectively, of the SW end of Dixon Island.

Tidal streams are not strong in the entrance.

6.81

- 1 **Approach.** Detached reefs, which dry, lie in the middle of the entrance leaving a passage on either side. The NE passage, between the NE reef and the reef extending from the W extremity of Dixon Island, is barely 2 cables wide and has depths of less than 2 m. The line of bearing 138° of Mount Anketel leads through the NE passage at a distance of 1¼ cables from the N shore.

6.82

- 1 **Anchorage** can be obtained 2½ cables inside the reefs in 2 m, sand and mud.

PORT WALCOTT APPROACHES TO DAMPIER APPROACHES

General information

Charts Aus 740, Aus 741

Route**6.83**

- 1 From the approach to Port Walcott, in the vicinity of C1 Light-buoy (20°23'S 117°26'E), the passage to Dampier leads WNW, about 40 miles, along the N side of the E islands of Dampier Archipelago (6.29).

Topography**6.84**

- 1 For topography of Delambre, Haiü, and Legendre Islands, see 6.44 and 6.90.

Surveys**6.85**

- 1 The area N of the E islands of Dampier Archipelago between Legendre Island (20°24'S 116°53'E) and Port Walcott C1 Light-buoy, 28 miles E, is incompletely surveyed, see information on the charts.

Other aids to navigation**6.86**

- 1 **Racons;**
Port Walcott C1 Light-buoy (20°23'S 117°26'E).
Dampier Sea Light-buoy (20°25'S 116°43'.0E).

Directions

(continued from 6.33)

6.87

- 1 From the vicinity of Port Walcott C1 Light-buoy (E cardinal) (20°23'S 117°26'E) the passage leads WNW passing (with positions given from Delambre Island summit (20°26'S 117°05'E)):

NNE of a 7 m shoal (15½ miles E) noting the 7.9 m shoal 2 miles further E; thence:

- 2 NNE of Delambre Reef (9 miles E), and clear of the buoy (special) 1½ miles WNW of the reef; thence: NNE of Haiü Island (6 miles W) (6.44); thence: Clear of Madeleine Shoals (15 miles WNW); thence: To a position NNW of Cape Legendre (15 miles WNW), the NW extremity of Legendre Island, distant 7¼ miles.

Useful mark**6.88**

- 1 Legendre Island Light (20°22'S 116°51'E) (6.117).
*(Directions continue for Dampier at 6.113,
for Montebello Islands at 6.148 and for
Mary Anne Passage at 6.154)*

DAMPIER

General information

Charts Aus 58, Aus 741,

Position and function**6.89**

- 1 Dampier (20°39'S 116°43'E) is located in the NW part of Australia on the SW side of Burrup Peninsula.
Dampier is a major iron ore and salt exporting port. The port is also the main operational base for contractors working on the North West Shelf natural gas project.

Topography**6.90**

- 1 Legendre Island (20°24'S 116°53'E), the N-most island of the Dampier Archipelago (6.29) and the outer-most island on the E side of Mermaid Sound, is of rocky formation sparsely covered with scrub and vegetation, there are three hillocks on its SE part. A light (6.117) is exhibited near Cape Legendre, its NW extremity.

A conspicuous radio mast, marked by red lights, stands at an elevation of 240 m on a hilltop on Burrup Peninsula, 1¾ miles E of the N entrance point to Withnell Bay (20°35'S 116°47'E).

- 2 Rosemary Island (20°29'S 116°36'E) on the W side of the approach to Mermaid Sound shows as three hummocks when seen from the NNE. A light (6.119) is exhibited on the island.

Intercourse Islands, seven in number, front the coast at the head of the sound between Parker Point (20°38'S 116°43'E) and a point about 10 miles SW. East Intercourse Island (20°39'S 116°41'E) is connected to the mainland by an artificial causeway. Mistaken Island (20°39'S 116°40'E) and East Mid Intercourse Island are also connected by a causeway which continues SSE from the latter island to the mainland.

Port limits**6.91**

- 1 Port limits are complex, encompassing the N and W approaches and entrances, and are best seen on chart Aus 741.

Approach and entry**6.92**

- 1 The port is approached from N of the Dampier Archipelago, and entered through Mermaid Sound.

Mermaid Strait, on the SW side of Mermaid Sound, is used by vessels of light draught, for details see 6.156.

Traffic**6.93**

- 1 In 2002 the port was used by 199 vessels totalling 26 312 261 dwt.

Port Authority**6.94**

- 1 Dampier Port Authority, PO Box 285, Dampier, Western Australia 6713. Website: www.dpa.wa.gov.au

Limiting conditions**Controlling depths****6.95**

- 1 **Outer dredged channels:**

Hammersley Channel (20°32'S 116°42'E) to East Intercourse Island 15.5 m and to Parker Point 15.3 m maintained depth.

Woodside Channel (20°26'S 116°44'E) to Withnell Bay Terminal; 12.2 m maintained depth.

6.96

- 1 **Inner channels:**

Channel to Mistaken Island Salt Berth (20°39'S 116°40'E); 11.4 m.

Channel to Dampier Cargo Wharf (20°37'S 116°45'E) and new development berth; 11 m maintained depth.

Channel to King Bay Supply Base (20°38'S 116°45'E); 6.0 m maintained depth.

Dredged channel to Hampton Harbour (20°40'S 116°41'E); 5.5 m (1974).

Deepest and longest berths**6.97**

- 1 **Ore carriers:** East Intercourse Island Ore Jetty (6.131).
Salt carriers: Mistaken Island Salt Berth (6.109).

Tankers and general cargo vessels: Parker Point Service Wharf (6.132).

Liquid gas carriers: Withnell Bay Terminal (6.133).

Density of water**6.98**

- 1 Density: 1.025 g/cm³.

Maximum size of vessel handled**6.99**

- 1 The "Bergeland" of 322 941 dwt, LOA 339 m and beam 55 m.

Local weather**6.100**

- 1 Dampier is situated in the cyclone belt with an incidence of about three cyclones per year. The season lasts from

December to April. The prevailing winds are E in winter and SW in summer and can blow for sustained periods at more than 20 kn.

Arrival information**Coast and port radio****6.101**

- 1 A coast radio station, as part of the Telstra Seaphone system, operates from Dampier, for details see *Admiralty List of Radio Signals Volume 1* (2). A port radio station operates on VHF, for details see *Admiralty List of Radio Stations Volume 6* (4).

Notice of ETA**6.102**

- 1 Vessels arriving from overseas should send notice of ETA 7 days in advance, other vessels 72 hours in advance, for details see *Admiralty List of Radio Signals Volume 6* (4).

All arrival notices and other communications from arriving vessels to the Harbour Master should be directed via vessel's local agents. The agent, in consultation with the relevant terminal operator, will send pilot boarding, berthing or anchoring instructions for the vessel by facsimile, telex or VHF radio.

Outer anchorages**6.103**

- 1 Anchorage can be obtained within port limits.

Western Anchorage is bounded by the port limit and positions:

20°25'0S 116°36'0E, on the port limit, thence E to:

20°25'0S 116°41'3E, thence N to:

20°21'2S 116°41'3E, on the port limit.

- 2 **Petroleum and Explosives Anchorage** is bounded by the port limit and positions:

20°19'9S 116°45'0E, on the port limit, thence S to:

20°22'0S 116°45'0E, thence ENE to:

20°20'5S 116°50'0E, thence N to:

20°18'2S 116°50'0E, on the port limit.

6.104

- 1 **Prohibited anchorages.** A submarine gas pipeline is laid from near the S entrance point of Withnell Bay, N to the entrance of Mermaid Sound, thence NW to North Rankin A platform (6.3) (chart Aus 327). Within port limits unauthorised vessels are prohibited from anchoring within 5 cables of the pipeline or as described in 6.103.

- 2 Anchoring is strictly prohibited in the area between the anchorages at 6.103 and N of the pilot boarding area shown on the chart.

See also information on the chart and 6.7.

Pilotage and tugs**6.105**

- 1 **Pilotage** is compulsory for all vessels over 150 tonnes grt, except those exempt by law.

Availability. Pilots are available 24 hours.

Position. Pilots boarding area, 1½ miles N of the Sea Buoy (6.130), as shown on the chart.

Boarding arrangements. Pilot boards by helicopter or boat. Vessels unable to accept a helicopter should advise the Harbour Master at least 48 hours prior to arrival.

Tugs are available.

Restricted area**6.106**

- 1 Unauthorised navigation is prohibited within areas adjacent to Withnell Bay Terminal and Dampier Cargo Wharf, as shown on the chart.

Quarantine**6.107**

- 1 Dampier is a first port of entry, radio pratique may be available, for details see *Admiralty List of Radio Signals Volume 1* (2).

Quarantine line is the parallel of Courtenay Head. For general quarantine regulations see 1.54.

Harbour**General layout of harbour****6.108**

- 1 Mermaid Sound is entered about 7 miles SW of Cape Legendre (20°21'S 116°50'E). It is bounded on its E side by Legendre, Gidley, Angel and Conzinc Islands and the Burrup Peninsula, on its S side by the Intercourse Islands, and on its W side by the dangers extending W from Rosemary Island, and the Malus and Lewis Islands.

Marked channels, the S portions of which are dredged, lead S through Mermaid Sound to the main berthing areas.

6.109

- 1 **Main berthing areas.** East Intercourse Island Ore Jetty (20°39'S 116°40'E), carrying a deck and rail traverse of a slewing boom shiploader, lies on the NW side of East Intercourse Island.

Mistaken Island Salt Berth (20°39'S 116°40'E), on the N side of the island, consists of an approach structure carrying a conveyor belt to a fixed position shiploader.

- 2 Parker Point Ore Jetty (20°38'S 116°43'E) extends 1 cable NW from Parker Point and thence W to form the berth consisting of a structure carrying a deck and rail traverse of a slewing boom shiploader. See 6.131.

Parker Point Service Wharf extends 2½ cables NNW from the shore 5 cables ESE of the root of the ore loading jetty. Mooring buoys are laid off the NE and SW extremities of the wharf.

- 3 Withnell Bay Terminal (20°35'S 116°46'E), consists of a basin bounded by two arms each with a jetty. The NE jetty is the LPG berth and the SW jetty is the LNG berth. A turning basin lies to the N of the berths at the end of the approach channel.

Dampier Cargo Wharf (20°37'S 116°45'E) for receiving items of plant for the offshore gas industry lies on the W side of Burrup Peninsula, 6 cables NNE of Phillip Point (20°38'S 116°45'E).

- 4 King Bay (20°38'S 116°45'E), contains Woodside Petroleum Supply Base, and Mermaid Supply Base. The former is a basin for servicing the construction and production activities of the North West Shelf natural gas project, and is situated on the N side of King Bay, E of Phillip Point. Mermaid Supply base is situated at the head of the bay.

- 5 Hampton Harbour (20°40'S 116°41'E), situated between East Intercourse Island and the mainland, affords well sheltered anchorage for small coasting vessels, and is used by small craft during the cyclone season. A jetty extends from the East Intercourse Island causway into the basin at the end of the dredged channel (see 6.129)

Natural conditions**6.110**

- 1 **Tidal streams** are weak within the archipelago. The rising stream sets S with a maximum rate of less than 1 kn at springs in the berthing areas. See also information on chart.

Swell. The port facilities are situated in sheltered waters and experience only slight seas and occasional low N swell in summer months.

Landmarks**6.111**

- 1 Flare (149 m) (20°36'S 116°47'E) exhibited from a tower.
Conspicuous building (Port Authority) (20°37'·1S 116°45'·1E).
Conspicuous tanks and a radio mast on Kangaroo Hill (20°39'S 116°44'E).
2 Conspicuous group of chimneys (20°39'S 116°43'E), 6 cables S of Parker Point.
Conspicuous group of tanks (20°39'S 116°43'E), 4 cables SSE of Parker Point.

Other aids to navigation**6.112**

- 1 **Radar assistance.** An approximate bearing and distance from the Port Control Tower (20°39'S 116°41'E) on East Intercourse Island is available on request.

Racon.

Sea Light-buoy (20°25'·5S 116°43'·0E).

Directions for entering harbour

(continued from 6.88)

Caution**6.113**

- 1 No reliance should be placed on the light-buoys in the approaches to the port of Dampier maintaining their exact position.

Channels**6.114**

- 1 **Hammersley Channel.** A recommended track, marked by light-buoys and indicated on the chart, leads generally S from Sea Light-buoy (20°25'·5S 116°43'·0E) (6.120) to the entrance of the dredged channel 2 miles SSE of Courtenay Head (20°30'S 116°41'E).

A dredged channel, 168 m in width, marked by light-beacons and indicated on the chart, leads from Fairway Light-beacon (20°32'S 116°42'E) (6.120) to East Intercourse Island Ore Jetty.

- 2 A dredged branch channel, 170 m in width, leads generally E from the main dredged channel at Mid Ground Light-beacon (20°38'S 116°41'E) (6.122) to Parker Point Ore Jetty.

6.115

- 1 **Woodside Channel.** A dredged channel, to the E of the main channel marked by light-buoys and leading lights and indicated on the chart, leads generally S then SE from Channel Light-buoy (20°26'S 116°44'E) (6.124) to Withnell Bay Terminal.

6.116

- 1 **Depths.** For depths in the channels see 6.95.

Charts Aus 741, Aus 327

Distant approach**6.117**

- 1 Mariners approaching direct from the Indian Ocean usually make their landfall on the conspicuous North

Rankin A platform (19°35'S 116°08'E) (6.3) keeping clear of the restricted area. The route then leads generally SSE passing:

WSW of Glomar Shoal (19°32'S 116°48'E) and:

Clear of the cautionary areas surrounding Wanaea

Terminal (19°35'S 116°27'E) (6.14) and Legendre

Terminal (19°41'S 116°43'E) (6.26)

- 2 The line of bearing 157° of Legendre Island Light (white GRP hut, 4 m in height) (20°22'S 116°51'E) then leads in the approach to a position NNW of Cape Legendre (20°21'S 116°50'E), distant 7¼ miles.

Charts Aus 58, Aus 741

Approach from north

6.118

- 1 From a position about 7¼ miles NNW of Cape Legendre (20°21'S 116°50'E) the track leads SSW passing (with positions given from Cape Legendre):

WNW of Madeleine Shoals (2 miles N); thence:

WNW of Cape Legendre; thence:

WNW of Hammersley Shoal (4 miles SW), the W-most danger on the E side of the approach; thence:

To the pilot boarding area (6.105).

Approach from west

6.119

- 1 The NW side of Rosemary Island (20°29'S 116°36'E) is fronted by Sailfish Reef, which breaks; the 20 m depth contour runs close along the seaward side of the reef. Rosemary Island Light (white hut, 2 m in height) is situated on high ground near the centre of the island. From a position about 5 miles N of Rosemary Island, the track leads ESE passing (with positions given from Point O'Keefe, the N extremity of Rosemary Island):
- 2 NNE of Brigadier Island (1 mile NE); thence:
NNE of a drying patch (0.2 m) (1½ miles ENE); thence:
NNE of Miller Rocks (2 miles ENE); thence:
NNE of Nelson Rocks (4 miles E); thence:
To the pilot boarding area (6.105).

Charts Aus 58, Aus 59

Hammersley Channel

6.120

- 1 From the vicinity of the pilot boarding area the recommended track, shown on the chart, leads 216° passing (with positions given from Courtenay Head (20°30'S 116°41'E)):
SE of Sea Light-buoy (starboard hand) (4¾ miles NNE); thence:
To the entrance of Hammersley Channel marked by No 1 Light-buoys (port and starboard hand) (3¾ miles NNE).
- 2 The track then leads 180° and 146° between numbered light-buoys passing:
E of Nelson Rocks (3½ miles NNW); thence:
E of Courtenay Shoal Light-buoy (starboard hand) (2¼ miles NE) moored 5 cables off the E side of Courtenay Shoal.
- 3 The track then leads 198°, between numbered light-buoys, passing:
ESE of Courtenay Head, a remarkable bluff, the NE extremity of the E Malus Island. Courtenay Head Light (hut, 2 m in height) is exhibited about 1 cable S of the head. Thence:
ESE of Mawby Island (1 mile SSE); thence:

ESE of Fairway Light-beacon (green triangle on pile) (2 miles SSE) marking the N end of the dredged channel.

6.121

- 1 The track then leads S, about 5¼ miles, in mid-channel between numbered light-beacons passing (with positions given from Ledge Point (20°39'S 116°42'E), the NE extremity of East Intercourse Island):
E of High Point (20°32'S 116°41'E), the N extremity of a small island off West Lewis Island; and:
W of Mermaid Sound Leading Lights (20°33'S 116°43'E) (6.124); thence:
- 2 E of Pueblo Shoal (4½ miles N); thence:
E of Boiler Rock (3¾ miles N); thence:
E of East Lewis Island (2 miles NW); thence:
Between Beta and Gamma Light-beacons (port and starboard hand) (1½ miles NNW).

6.122

- 1 The channel then divides, mariners bound to East Intercourse Island Ore Jetty or Mistaken Island Salt Berth continue generally SW passing (with positions given from Ledge Point):
W of Mid Ground Light-beacon (triangle, point up, on pile structure) (1¼ miles NNW).
- 2 Mariners bound to Parker Point berths continue generally SE then E passing:
E of Mid Ground Light-beacon (as above); thence:
N of Ledge Point; thence:
N of Tidepole Island (7 cables E).

6.123

- 1 **Useful marks:**
Light (20°39'·4S 116°40'·7E) on Port Control Tower.
Light (20°39'·3S 116°40'·9E) on the centre of East Intercourse Island.
Light-beacon (starboard hand) (20°38'·0S 116°39'·8E) situated 1 cable S of Roe Point.
Dampier Cargo Wharf Light (20°37'S 116°45'E)

Withnell Bay Terminal

6.124

- 1 **Woodside Channel.** From Channel Light-buoy (port hand) (20°26'S 116°44'E) the track leads initially S, about 2½ miles, through Woodside Channel to W of No 4 Light-buoy (port hand) (20° 29'S 116°44'E)).

Mermaid Sound Leading Lights:

- 2 Common front light No 9 Light-beacon (double triangle, point up, on yellow and green pile structure) (20°33'S 116°43'E).
Rear light No 9S Light-beacon (triangle, point down, on yellow and green pile structure) (577 m S of the front light).
- 3 The alignment (189°) of these leading lights then leads S, about 3½ miles, in mid-channel passing (with positions given from the front light):
W of numbered light-buoys marking the E side of the channel to No 7 Light-buoy (port hand).
The track then leads S, then SE, passing between No 9 Light-beacon (as above) and No 8 Light-buoy (port hand) (2½ cables E) to SW of No 10 Light-buoy (port hand) (7 cables SE).

6.125

- 1 Mermaid Sound Leading Lights, astern, and Withnell Bay Terminal Leading Lights, ahead, then lead in the channel.

Mermaid Sound Leading Lights:

Common front light No 9 Light-beacon (as above).

Rear light No 9W Light-beacon (triangle, point down, on yellow and green pile structure) (286 m NW of the front light).

2 Withnell Bay Terminal Leading Lights:

Front light No 16 Light-beacon (white triangle, point up, on black pile structure) (20°35'·3S 116°45'·9E).

Rear light Onshore A Light-beacon (triangle, point down, on orange pile structure) (480 m SE of the front light).

- 3** The alignment (312°/132°) of the above pairs of leading lights then leads SE, about 2 miles, in mid-channel between numbered light-buoys marking the NE and SW sides of the dredged channel to the turning basin passing NE of Star Rock, marked on its N side by a light-beacon, 9 cables NW of Onshore A Leading Light.

4 Useful mark:

Light-beacon (red on grey post, 5 m in height) (20°35'·2S 116°45'·6E) on the seaward end of the LNG wharf.

6.126

- 1** The berth is best approached from the NW, within the maintained channel, passing NE of the light-beacon (N cardinal) (20°36'·2S 116°42'·9E), to permit a minimum approach depth of 11 m.

King Bay Supply Bases

6.127

- 1 Woodside Petroleum Supply Base** (20°37'·6S 116°44'·9E) is the N of two berths within King Bay.

Leading lights:

Front light No 7 Light-beacon (starboard hand) (250 m W of the rear light).

Rear light Directional Light A (white triangle, point down, on black beacon) (20°37'·8S 116°44'·9E).

- 2** The alignment (095°) of the above light-beacons leads E passing (with positions given from Directional Light A): Clear of Fairway No 1 Light-beacon (safe water) (8 cables W); thence:

Between No 2 and No 3 Light-beacons (port and starboard hand) (6 cables W) marking the N and S sides of the dredged channel.

- 3** On passing No 4 Light-beacon (port hand), the track leads generally NE to the basin.

Mermaid Supply Base (20°38'·0S 116°44'·9E) lies at the head of King Bay and is approached from W through a channel 50 m wide, with a maintained depth of 6·0 m and marked by light-buoys.

Hampton Harbour

6.128

- 1** The line of bearing 200° of the SE Causeway Directional Light (20°40'·2S 116°41'·3E) leads in the approach to Hampton Harbour passing (with positions given from Ledge Point (20°38'·8E, 116°41'·7E)):

- 2** Between No 1S Light-beacon (starboard hand) marking the NE extremity of a ledge of drying rocks extending NE from Ledge Point and No 1P Light-beacon (port hand) (1½ cables E) marking the NE extremity of the spoil ground extending W from Tidepole Island; thence:

- 3** ESE of No 2S Light-beacon (starboard hand) (1½ cables SSE) marking shallow water off the E side of East Intercourse Island; thence:

Between No 3S Light-beacon (starboard hand) (3½ cables S) and No 2P Light-beacon marking the W side of Conflict Reef (4½ cables SSE).

- 4** The line of bearing 227° of the NW Causeway Directional Light, situated at the head of the harbour, then leads in the fairway passing:

NW of No 3P Light-beacon (6 cables S); thence:

NW of Channel Island (7 cables S); thence:

Between numbered light-beacons, marking the SE and NW sides of the dredged channel, to the basin at the head of the harbour.

Basins and berths

Inner anchorages

6.129

- 1** A designated anchorage, as shown on chart Aus 58, is available for small craft and supply vessels W of the Withnell Bay Terminal and N of Phillip Point.

Spoil ground. A spoil ground, the position of which is marked on the chart, lies centred about 1½ miles WNW of Conzinc Island (20°32'S 116°47'E). A further spoil ground lies close NW of Withnell Bay approach channel, between No 11 and 12 light-buoys, as shown on the chart.

6.130

- 1** Designated anchor berths with 740 m swinging circle:

PIE 1 20°37'·7S 116°42'·7E

PIE 2 20°37'·0S 116°42'·0E

PIE 3 20°36'·1S 116°42'·2E

PIW 4 20°38'·5S 116°40'·1E

Chart Aus 59 plan of Dampier Wharves

Alongside berths

6.131

- 1 East Intercourse Island Ore Jetty** (20°39'·0S 116°40'·4E) single berth, 341 m long, for the loading of bulk ore. Vessels berth starboard side to alongside dolphins parallel to the jetty: length of fendering 430 m; size in the 250 000 dwt range; maximum displacement for berthing 100 000 tons; depth alongside 21·5 m as shown on the chart. In 2004 the addition of 5 dolphins to the SW, with a depth alongside of 19·5 m, increased available berth length.

- 2 Mistaken Island Salt Berth** (20°39'·2S 116°39'·6E) single dolphin berth, 358 m long, for the loading of bulk salt. Vessels can berth either side to: size up to 40 000 dwt; depth alongside 12 m as shown on the chart.

Parker Point Ore Jetty (20°38'·3S 116°43'·1E) single berth, 269 m long, for the loading of bulk ore. Vessels berth port side to alongside dolphins parallel to the jetty: length of fendering 355 m; size up to 140 000 dwt; depth alongside 17·2 m as shown on the chart.

- 3** An extension to the jetty is under construction (2004) and the depth alongside is being increased to 19·5 m.

6.132

Parker Point Service Wharf (20°38'·3S 116°43'·7E) a general cargo or tanker berth with a berthing face 70 m long. Berthing basin 244 m in length and 38 m wide adjacent to berth. Can accept vessels up to 175 m in length. Vessels generally berth port side to: depth alongside 7·0 m as shown on the chart.

- 1 Hampton Harbour** (20°39'·8S 116°41'·1E) with a basin about 1¼ cables square is dredged to a depth of 7·1 m and approached by a 40 m wide dredged channel.

Chart Aus 59 plan of Withnell Bay to King Bay

6.133

- 1 Withnell Bay Terminal** (16°35'·3S 116°45'·8E) consists of:

LPG dolphin berth on the E jetty, length 350 m, width 75 m and depth alongside berth of 13·5 m.

LNG dolphin berth on the W jetty, length 425 m, width 80 m and depth alongside berth of 13.2 m.

6.134

- 1 **Dampier Cargo Wharf** (20°36'9S 116°44'9E) can accept vessels up to 35 000 tonnes displacement on the W side which is 209 m long with dolphins N and S of the wharf from which lights are exhibited; depth alongside 10 m as shown on the chart. Smaller berth 142 m available on E side of wharf with a depth of 6.5 m.

- 2 **New development.** A new berth is being constructed (2004) 2½ cables SW of Dampier Cargo Wharf with a maintained depth alongside of 13 m.

Woodside Petroleum Supply Base King Bay (20°37'6S 116°44'9E), a basin for contractors working on the North West Shelf natural gas project has a maintained depth of 5.5 m and can accept vessels up to 11 000 dwt. Berths, with a total length of 230 m and a maintained depth of 7.5 m alongside as shown on the chart, are situated on the NW side of the basin. A mole, enclosing tug pens, extends about 150 m NW from the SE side of the basin.

- 3 **Mermaid Supply Base King Bay** (20°38'0S 116°44'9E) The main berth is 68 m in length with 42 m of fendering and a depth alongside of 7.5 m. An adjacent smaller berth, 30 m in length with a depth of 5.5 m, lies at the SE end of the main berth.

Port services

6.135

- 1 **Repairs.** General ship repairs are available. Slipways, up to 500 tons, for small coasting vessels.
Other facilities: a hospital is available. Oily waste reception facilities available for limited quantities, using road tankers.
- 2 **Supplies:** no bunker fuel for large vessels; limited amount available by road tanker at Dampier Cargo Wharf. Fresh water, limited supply available in an emergency. Provisions, limited supply available, advance notice required.
Communications. Airport 15 km from port at Karratha, with connecting services to international airports at Perth and Darwin.

Flying Foam Passage

Chart Aus 58, Aus 741

General information

6.136

- 1 **Description.** Flying Foam Passage (20°30'S 116°49'E)

between Dolphin, Tozer and Wilcox Islands on the E, and Angel and Gidley Islands on the W, is about 5 cables wide and is only used by small craft. Pearl farming is undertaken in these waters. A dangerous underwater rock (20°27'03S 116°50'25E) has been reported (2003) about 1 cable WNW of Wilcox Island, as shown on the chart. The N end of the passage is very narrow and tortuous and at LW the navigational width here narrows to a little over 1 cable. Several islands and numerous rocks lie between Gidley Island and Legendre Island.

Local knowledge is required.

Chart Aus 58

Marney Bay

6.137

- 1 Marney Bay (20°30'S 116°41'E) on the NE side of the Malus Islands, four islands all connected by sandy spits, affords good anchorage for small craft in depths of less than 5 m.

Local knowledge is required.

Cyclone mooring area

6.138

- 1 A cyclone mooring area, indicated on the chart at the S entrance to the boat passage between the two Lewis Islands, lies off Marks Point (20°37'S 116°38'E) the SE extremity of West Lewis Island. See also information on the chart.

Chart Aus 59 plan of Dampier Wharves

Hampton Harbour

6.139

- 1 **Anchorage** for small craft, as shown on the chart and indicated between buoys, can be obtained in Hampton Harbour S of Boat Rock (20°39'4S 116°42'0E), and between Channel Island and Foul Point (20°39'8S 116°41'9E), in depths of from 2 to 4 m.

Prohibited anchorage lies between the above two anchorages.

- 2 **Approach** to the anchorages leads either E or W of Conflict Reef (6.128), marked by port and starboard lateral light-beacons, thence between Boat Rock and East Rock, also marked by port and starboard lateral light-beacons.

DAMPIER TO NORTH WEST CAPE

GENERAL INFORMATION

Charts Aus 327, Aus 328

Scope of section

6.140

- 1 The area covered by this section comprises:
Dampier to Montebello Islands (6.144)
Dampier to Mary Anne Passage (6.150)
Montebello Islands and Barrow Island (6.169)
Montebello Islands to North West Cape (6.207)
Mary Anne Passage to Onslow (6.216)
Onslow and Approaches (6.243)
Onslow to North West Cape (6.274)
Exmouth Gulf (6.290)

Routes

6.141

- 1 From Dampier to North West Cape (21°47'S 114°10'E) the route leads W passing N of Montebello Islands (20°30'S 115°30'E) then SW, passing NW of Barrow Island (20°48'S 115°23'E).
- 2 **Inshore channel.** From abreast Fortescue Road (20°53'S 116°07'E) there is an inshore channel for a distance of about 130 miles SW, to N of North West Cape (21°47'S 114°10'E), leading through Mary Anne Passage (6.216) and passing S of Airlie Island (21°20'S 115°10'E). This route affords a considerable amount of shelter and smooth water when proceeding against either monsoon and the various anchorages along this coast can be conveniently reached from it.

Oil terminals**6.142**

- 1 Airlie Island Marine Terminal (21°18'S 115°10'E) and Saladin Marine Terminal (21°24'S 115°03'E), at the W end of the inshore channel, are approached from W from the deep water of the Indian Ocean, see 6.260 and 6.267. The chart would indicate that vessels of suitable draught may also approach from the inshore channel.

Nature reserves**6.143**

- 1 The greater majority of the islands of the inshore channel are classified as nature reserves and, as such, landing without permission is prohibited, see 1.61.

DAMPIER TO MONTEBELLO ISLANDS**General information**

Charts Aus 741, Aus 742

Route**6.144**

- 1 From Dampier the passage to Montebello Islands leads W, about 62 miles, passing N of North West Island (20°22'S 115°31'E).

Topography**6.145**

- 1 For topography of Montebello Islands see 6.170.

Harriet gas project**6.146**

- 1 For details of offshore gas production platforms E of Montebello Islands, see 6.174.

Major light**6.147**

- 1 North West Island Light (white hut, 4 m in height) (20°22'S 115°31'E)

Directions

(continued from 6.88)

Rosemary Island to Trimouille Island**6.148**

- 1 From a position about 5 miles N of Rosemary Island (20°29'S 116°36'E) the passage leads W, about 50 miles, to a position about 10 miles NE of Trimouille Island (20°24'S 115°34'E); the chart is the best guide.

Useful marks:

Rosemary Island Light (20°29'S 116°36'E) (6.119).
Trimouille Island Light (20°25'S 115°34'E) (6.149).
(Directions continue for the E sides of Montebello Islands and Barrow Island at 6.179)

Trimouille Island to North West Island**6.149**

- 1 From position 20°18'S 115°43'E, about 10 miles NE of Trimouille Island, the recommended track shown on the chart leads 275° passing:
N of Trimouille Island (20°24'S 115°34'E). Trimouille Island Light (white hut, 2 m in height) is exhibited from Elephant Hill, the S summit of the island.
Thence:
2 N of North West Island (20°22'S 115°31'E), surrounded by reef which extends 1½ miles N and NW from it. The reef dries in parts and has some flat-topped rocks up to 3 m high on it. North West

Island Light (6.147) stands on the N side of the island.

(Directions continue at 6.210)

DAMPIER TO MARY ANNE PASSAGE**General information**

Charts Aus 742, Aus 743, Aus 327

Route**6.150**

- 1 From N of Rosemary Island (20°29'S 116°36'E) the route to Mary Anne Passage leads generally SW passing NW of the islands of the W part of Dampier Archipelago.

Topography**6.151**

- 1 Enderby Island (20°36'S 116°30'E) lies 5 miles SSW of Rosemary Island and Rocky Head, its SW extremity, is a bold cliff.

Cape Preston (20°50'S 116°12'E) is the N extremity of a hilly peninsula which is separated from the land about 3 miles S of the cape by a low strip which is occasionally flooded. Regnard Bay, entered between West Intercourse Island (20°43'S 116°36'E) and Cape Preston, 22 miles WSW, is very shoal. The shores of the bay and the land within for some distance, except near Cape Preston, are flooded at HW. North East Regnard Island and South West Regnard Island lie near the outer edge of the coastal bank extending NE from Cape Preston.

Harriet gas project**6.152**

- 1 For details of offshore gas production platforms E of Montebello Islands and submarine pipelines, see 6.174.

Pearl farming projects**6.153**

- 1 It was reported (1999) that Fisheries Western Australia had granted permission for a pearl oyster farm to be established between the islands of Enderby (20°36'S 116°30'E) and Goodwyn (20°32'S 116°32'E). A further site, E of Eaglehawk Island (20°40'S 116°27'E), is also under consideration. Mariners should navigate with caution when in the vicinity of these sites.

Directions

(continued from 6.88)

Rosemary Island to Mermaid Strait**6.154**

- 1 From a position about 5 miles N of Rosemary Island (20°29'S 116°36'E) the route leads SW passing (with positions given from Rocky Head (20°37'S 116°28'E)):
NW of Kendrew Island (9 miles NNE); thence:
NW of Roly Rock (7 miles NNE); thence:
NW of Bare Rock (¾ miles NNW); thence:
2 NW of North West Reefs (3 miles WSW) which lie on the S side of the W approach to Mermaid Strait (6.156).

Useful mark:

Rosemary Island Light (20°29'S 116°36'E) (6.119).

Mermaid Strait to Mary Anne Passage**6.155**

- 1 From a position about 7 miles NW of North West Reefs (20°38'S 116°24'E) the route leads SW passing (with positions given from Cape Preston (20°50'S 116°12'E)):

- NW of Cod Bank (11 miles NNE), noting the 5.9 m patch which lies 3 miles WSW; thence:
 NW of McLennan Bank (8 miles WNW); thence:
 2 NW of Steamboat Island (7½ miles W); thence:
 NW of Stewart Rocks (15½ miles W) which lie on the NW extremity of a rocky ledge extending from Stewart Island, 1 mile SE; thence:
 NW of Sholl Island (18 miles WSW) which is sandy and has a flat appearance. The reef which surrounds the island dries in parts and on its S part are Round and Long Islands. And:
 3 SE of a 9.8 m patch (20°50'S 115°38'E); thence:
 NW of Meda Reef (21°03'S 115°46'E), noting the isolated patches of less than 10 m which lie NW of the reef closer to the track, and to a position 9 miles N of North Sandy Island Light (21°06'S 115°39'E) (6.226).

(Directions continue at 6.226)

Mermaid Strait

Charts Aus 57, Aus 58, Aus 741 (see 1.16)

General information

6.156

- 1 Mermaid Strait lies between Lewis Islands (20°36'S 116°39'E) and Enderby Island on the N, and Intercourse Islands and Eaglehawk Island (20°40'S 116°27'E) on the S, and is used by vessels of light draught proceeding to or from the port of Dampier to Mary Anne Passage.

6.157

- 1 **Controlling depth** is 5.6 m on the recommended track in position 1½ miles W of King Point (20°38'S 116°38'E), the SW extremity of East Lewis Island.

6.158

- 1 **Flow.** The rising tidal stream enters Mermaid Strait from both ends and meets on the sandbank extending W from Intercourse Island (20°39'S 116°39'E). The rate and direction of the tidal streams in the strait are greatly influenced by prevailing winds, rates of up to 2½ kn can be expected after prolonged blows.

Directions

6.159

- 1 From Mermaid Sound the line of bearing 092°, astern, of the conspicuous tanks (20°39'S 116°43'E) (6.111) on Parker Point leads in the fairway passing (with positions given from King Point (20°38'S 116°38'E)):

Between Channel Reef Light-beacon (starboard hand) (1 mile ESE), marking the S side of Channel Reef, and South Reef Light-beacon (port hand) (1¼ miles SE); thence:

- 2 N of Intercourse Island (1 mile SSE); thence:
 S of King Point a white metal lattice beacon, 2 m in height, stands on the point; thence:
 N of Haycock Island (2 miles SSW).

6.160

- 1 **Useful marks:**
 Light (20°39'4S 116°40'7E) on Dampier Port Control Tower on East Intercourse Island.
 Light (20°39'3S 116°40'9E) from a structure on the centre of East Intercourse Island.

6.161

- 1 The alignment (117°), astern, of the N extremity of the W part of Intercourse Island (1 mile SSE) with the N extremity of East Mid Intercourse Island (2¾ miles SE) then leads in the fairway passing (with positions given from King Point):

SSW of a mooring buoy (1½ miles W), thence:
 Close NNE of a 5.8 m patch (5.3 m on large scale national chart) (2 miles W).

- 2 The line of bearing 257° of the summit of Eaglehawk Island (10½ miles W) then leads in the fairway passing:
 SSE of Bluff Point (4¾ miles W), the SE extremity of Enderby Island; thence:

Between Dockrell Reef (6¾ miles WSW) and the SE extremity (7 miles W) of Enderby Reef; thence:
 To a position, distant 1¾ miles, from Eaglehawk Island (10½ miles W).

- 3 The recommended track then leads 302½° along the SW side of Enderby Reef passing:

NE of South East Reef (9½ miles WSW); thence:
 NE of Eaglehawk Island, distant about 7½ cables, noting the stranded wreck, lying close N of the N extremity, and Egret Island, 13 m high, which lies close off its W extremity; and:

- 4 SW of a 4.6 m (4.1 m on large scale national chart) patch which lies 1 mile SSW of Rocky Head (10 miles W) (6.151), the SW extremity of Enderby Island; thence:

Between North West Reefs (12½ miles W) and the S extremity of a bank, with depths of less than 10 m over it, which extends generally S from Bare Rock (12 miles WNW).

Anchorage

6.162

- 1 Anchorage can be obtained, as convenient, in Mermaid Strait.

For details of a cyclone mooring area see 6.138.

Fortescue Road

Charts Aus 742, Aus 743

General information

6.163

- 1 **Position.** Fortescue Road is bordered on the E and S side by the coastline between Cape Preston (20°50'S 116°12'E) and the entrance to Fortescue River, 12 miles SSW, and on the W by a chain of islands, shoals and reefs which lie from 5 to 9 miles offshore and extend 15 miles SSW from McLennan Bank (20°46'S 116°05'E), the N-most danger in the approach to the road.

- 2 Fortescue Road affords anchorage to small coasting vessels but considerable swell is experienced during strong winds.

6.164

- 1 **Topography.** The coast between Cape Preston (6.151) and James Point, 8½ miles SSW, is backed by a rocky range of hills.

Mount Nicholson (21°17'S 116°07'E) (chart Aus 327) situated on the W side of Fortescue River, 16 miles above the mouth, is conspicuous. Delaney Hill (21°02'S 116°03'E), 7½ miles WSW of James Point, is prominent.

Directions

6.165

- 1 Approaching Fortescue Road keep Cape Preston (20°50'S 116°12'E) bearing more than 135° passing (with positions given from Cape Preston):

NE of McLennan Bank (8 miles WNW), noting the depths of less than 10 m which lie up to 3½ miles ENE of the bank; thence:

- 2 NE of Petersen Rock (7 miles WNW).
 When Steamboat Island (7½ miles W) bears 248° the track then leads SSW passing:

Between Preston Island (1 mile NW) and the E edge of the shoal, with depths of less than 5 m over it, extending 2¾ miles ENE of Steamboat Island; thence:

- 3 Between Preston Spit (3½ miles SW) and O'Grady Shoal (7½ miles WSW); thence:
To the anchorage.

Anchorage

6.166

- 1 Anchorage is usually taken up on the line of bearing 187° of the mouth of Fortescue River with the summit of Fortescue Island (20°55'S 116°02'E) bearing 281°, distant 4¼ miles, in a depth of 6 m.

Mariners in smaller vessels can anchor about 1 mile S of the above position, W of Potter Island (20°56'S 116°09'E), noting Eliassen Rocks which lie 4 miles WSW of the island.

6.167

- 1 **Tidal streams** in the anchorage set SW on the rising tide and NE during the falling tide, the average rate being 1 to 1½ kn.

Fortescue River

6.168

- 1 Fortescue River (21°00'S 116°06'E) is navigable by mariners in small craft for a distance of about 1 mile within the entrance.

Dangers. A shoal with a depth of 0.7 m lies 1½ miles N of the river mouth, 1¾ miles ESE of Eliassen Rocks (20°58'S 116°05'E).

Landing can be effected on the W bank, about 5 cables within the entrance.

MONTEBELLO ISLANDS AND BARROW ISLAND

General information

Charts Aus 742, Aus 328 (see 1.16)

Route

6.169

- 1 Montebello Islands (20°30'S 115°30'E) and Barrow Island should be approached from N passing E of the islands. Mariners, in vessels of suitable draught, can also approach from S through Mary Anne Passage (6.216).

Topography.

6.170

- 1 Montebello Islands consist of a group of islands and rocks, lying on an extensive coral reef extending about 22 miles N from position 20°42'S 115°34'E. This reef is continuous, and awash in places on its W side, but its E and S sides are mostly below water and are considerably broken up. The islands are of limestone and coral formation, their coastlines consisting of limestone cliffs, mainly low, but rising to 12 m in places, and interspersed with white sandy beaches. The tops of the hills are bare, the highest being 37 m high.
- 2 North West Island (20°22'S 115°31'E), the N-most island of the group, is 25 m high and surrounded by reef. A light (6.147) is exhibited from the island.
Trimouille Island lies 7½ cables SE of North West Island, the greater part of the island is covered by spinifex and low shrubbery with some sand blown up by the wind. A light (6.149) is exhibited from the island.

- 3 Hermite Island, the largest of the group, lies 3 miles S of North West Island and between these islands there is a chain of islands, the positions of which are best seen from the chart. Hermite Island is covered with grass and has several hillocks on it, the highest being at its S end. There are numerous islands and rocks around Hermite Island especially off its E and S sides.

- 4 Lowendal Islands (20°39'S 115°34'E), the S-most of the Montebello Islands group, lie at the S end of a chain of islands and rocks extending 11½ miles S from the SE extremity of Hermite Island.

6.171

- 1 Barrow Island lies with Cape Dupuy (20°40'S 115°26'E), its N extremity, 7½ miles W of Lowendal Islands. Irregular steep sandhills, thickly covered with grass and small bushes, extend through the greater part of the island in a N and S direction. An ill-defined hill, 49 m high, stands 4 miles S of Cape Dupuy and from this hill the land slopes down to some rounded hills at the cape. At the S end and in the middle of the island there are a number of oil refinery flares visible from seaward.

- 2 A communication mast is situated 3 miles NW of Shark Point (20°52'S 115°25'E), the top of which is at an elevation of 174 m and visible from seaward. A high intensity flashing white strobe light is exhibited during the day and three red lights vertically disposed at night.

Middle and Boodie Islands, two sandy islands, lie close off the SW extremity of Barrow Island.

History

6.172

- 1 The first European to discover Montebello Islands would appear to have been Captain Baudin, who was sent by the French Government to explore this coast in 1805. There is no evidence that this group has ever been inhabited, probably due to the absence of surface water after a period of drought.

- 2 In 1952 and 1956 Montebello Islands were used as a nuclear weapon test site.

Historic wreck of the vessel *Tryal* lies close SW of Tryal Rocks (20°16'S 115°23'E). See also 1.60.

Oil and Gasfields

6.173

- 1 **Harriet Oilfield.** Harriet A, B and C oil production platforms are situated ¾, 5½ and 4½ miles NNE, respectively, of Varanus Island (20°39'S 115°34'E) the largest of the Lowendal Islands, Bambra platform is situated 6 miles N and Gypsy Production Well 8½ miles E of the same island. All are protected by a safety zone, see 1.11.

- 2 A further four unnamed oil platforms are located E of Barrow Island (6.171) as follows:

20°40'S 115°35'E
20°42'S 115°34'E
20°44'S 115°34'E
20°45'S 115°30'E

6.174

- 1 **Harriet gas project.** Campbell (20°25'S 115°44'E), Sinbad (20°29'S 115°43'E) and Linda (20°33'S 115°43'E) gas platforms are situated E of Montebello Islands. The platforms are readily identified on the radar display and exhibit lights. Mariners are warned to navigate with caution in this area.

- 2 Agincourt monopod gas platform is situated between Barrow Island and Varanus Island in position 20°40'S

115°31'E. Wonnich gas platform is situated W of the Montebello Islands in position 20°30'S 115°26'E.

Submarine gas and oil pipelines are laid in the vicinity of all of the above platforms and can best be identified on the appropriate charts.

Unexploded ordnance

6.175

- 1 An area (20°23'S 115°40'E), radius 5 cables, centred about 5 miles ENE of Trimouille Island Light is dangerous with regard to anchoring, fishing or any form of submarine or seabed activity due to unexploded depth charges. See *Annual Australian Notices to Mariners* for details.

Pearl farming

6.176

- 1 Pearl culture farms which may be fixed or moving structures are located throughout Montebello Islands. See 1.8 and the large scale national chart for details.

Natural conditions

6.177

- 1 **Local weather.** Easterly gales may be experienced during July and August.

Marine life. Tiger sharks and sea snakes abound and bathing is not recommended anywhere.

Major light

6.178

- 1 North West Island Light (20°22'S 115°31'E) (6.147)

Directions

(continued from 6.148)

Trimouille Island to Barrow Island Oil Terminal

6.179

- 1 From position 20°18'S 115°43'E, about 10 miles NE of Trimouille Island, the route leads S passing (with positions given from Flag Island (20°28'S 115°35'E) (6.185)):
 - E of Trimouille Island from where a light (3 miles N) (6.149) is exhibited; thence:
 - E of South East Island (2 miles NNE); and:
- 2 Clear of Campbell gas platform (9 miles ENE) (6.174); thence:
 - E a detached 8.5 m shoal (5 miles ESE), marked by tide-rips, the E-most known danger off Montebello Islands; and:
 - Clear of Sinbad gas platform (7½ miles E) (6.174); thence:
- 3 Clear of Linda production platform (9 miles SE) (6.174)
 - E of Harriet B platform (7½ miles SSE), the E-most production platform of the Harriet Oilfield, all of which are marked by lights; thence:
 - E of Varanus Island Oil Terminal (10 miles S) (6.189); thence:
- 4 Clear of Gypsy Production Well (13 miles SSE) (6.173)
 - E of Varanus Island (11 miles S), noting Abutilan Island close S; thence:
 - E of Barrow Island Oil Terminal (20°49'S 115°33'E) (6.195).

6.180

- 1 **Useful marks:**
 - Tanks (20°39'S 115°35'E) on the S part of Varanus Island.

Light (20°33'S 115°36'E) exhibited from Bambra platform.

Side channel

Channel between Montebello Islands and Barrow Island

6.181

- 1 **General information.** Overhanging Rock (20°39'S 115°30'E) stands on the edge of the foul ground extending W from Lowendal Islands and Tringa Rock lies 2 miles farther WSW. Foul ground extends about 7½ miles SSW from Lowendal Islands to a position about 2 miles ESE of Latitude Point (20°47'S 115°28'E) on the E coast of Barrow Island.

- 2 A channel, from 4 to 12 cables wide, runs S from between Tringa and Overhanging Rocks to 5 cables N of Double Island (20°44'S 115°30'E).

Local knowledge is required.

- 3 **Dangers.** Rocks and boulders, which dry, lie on the N side of the approach about 1¼ miles within the W side of the reef around Montebello Islands with their S extremity 4 miles N of Cape Dupuy. They are difficult to see owing to the heavy breakers in this vicinity.

6.182

- 1 **Directions.** From a position E of Tringa Rock, distant 4 cables, the line of bearing 170° of the N extremity of Double Island leads through this channel, clear of the dangers off the E coast of Barrow Island and the foul ground lying SW of Lowendal Islands, to 5 cables N of Double Island.

- 2 **Useful marks:**

Double Island Light (metal post, 2 m in height) (20°44'S 115°30'E) exhibited from the N island.
Agincourt platform (20°40'S 115°31'E) (6.174)

6.183

- 1 **Landing.** Wapet Landing is situated on the E coast of Barrow Island, 1¼ miles WNW of Double Island.

Parting Pool

Chart Aus 742 (see 1.16)

General information

6.184

- 1 Anchorage can be obtained in Parting Pool (20°27'S 115°35'E) out of the tidal streams. The anchorage is subject to a moderate swell in E weather but the holding ground is good. This anchorage would, however, be dangerous at night in an E gale as the approach channel is confined and unmarked, and there is little sea room.

Local knowledge is required.

6.185

- 1 **Topography.** A chain of islands extends 2¼ miles S from Churchill Point, the S extremity (20°25'S 115°35'E) of Trimouille Island, and terminates in Flag Island.

South East Island (20°26'S 115°35'E), at the head of the pool, is grassy with a well-defined summit on its NW part. Foul ground extends 4¼ miles SSE from the island and on it are a number of islets, rocks and drying reefs.

6.186

- 1 **Landmark:**
 - Conspicuous tin building (20°30'S 115°32'E) near the S extremity of Hermite Island.

Directions

6.187

- 1 From E of Ah Chong Island (20°32'S 115°33'E) the line of bearing 279° of the conspicuous tin building leads in the

approach until about 5 miles distant from Hermite Island passing (with positions given from Flag Island (20°28'S 115°35'E)):

S of an 8.5 m patch (5 miles ESE).

- 2 The line of bearing 321° of Flag Island then leads in the fairway until about 5 cables distant from it passing:

SW of the foul ground and depths of less than 6 m extending 4¼ miles SSE from South East Island (2 miles NNE).

The line of bearing 002° of the summit of South East Island (above) then leads to the anchorage in Parting Pool noting Whale Rock (8 cables ENE), which dries 0.9 m.

Anchorage

6.188

- 1 Anchorage can be obtained in Parting Pool 1½ miles S of South East Island (20°26'S 115°35'E) in about 16 m, sand and shell.

During W winds anchorage can be obtained 6 cables SE of Flag Island in depths of from 6 to 11 m.

Varanus Island Oil Terminal

General information

6.189

- 1 **Position and function.** Varanus Island Oil Terminal (20°38'S 115°36'E) is situated on the SE side of Montebello Islands, about 2 miles NE of Varanus Island, and is the outlet for Harriet Oilfield.

Port limit is the circumference of a circle about 3 miles in radius, as shown on the chart, centred on the terminal.

Operator. Apache Energy Ltd, PO Box 477, Perth, Western Australia 6005. Website: www.apachecorp.com

Limiting conditions

6.190

- 1 **Controlling depth:** 19.9 m in the 60° approach sector (6.193) 4½ miles ENE of the terminal.

Maximum size of vessel handled. The terminal is designed to accommodate vessels from 20 000 to 140 000 dwt, length 300 m, beam 46 m, maximum draught 17 m.

Arrival information

6.191

- 1 **Notice of ETA** should be sent to the operators 96 hours before arrival, for details see *Admiralty List of Radio Signals Volume 6* (4).

Anchorage can be obtained in position 20°40'0S 115°40'5E, about 4¼ miles SE of the terminal, in a depth of about 24 m, variable holding ground.

- 2 **Pilotage and tugs.** Pilotage is compulsory. The pilot boards by launch in position 20°40'S 115°40'E, about 4 miles SE of the terminal. Tugs are available.

Regulations concerning entry. Entry to the port of Varanus Island is restricted unless permission has been granted by the Terminal Superintendent. Only vessels with bridge wing searchlights are permitted to berth at night.

- 3 **Ballast.** Clean segregated ballast will be discharged consecutively within the loading operation. There is no facility for the discharge of dirty ballast.

Quarantine. Mariners arriving from foreign ports must make prior arrangements for quarantine and customs clearance through their agents. See *Admiralty List of Radio Signals Volume 1* (2) and 1.54.

Terminal

6.192

- 1 **General layout.** The terminal consists of an eight-leg multi-point mooring, with four buoyed legs and four swamped legs.

Depths within 5 cables of the terminal are 20.4 m.

Tidal streams at the terminal set 173° on the rising tide and 353° on the falling tide and may attain a rate of 2 kn at springs.

Directions

6.193

- 1 The terminal should be approached from E, remaining clear of Gypsy Production Well (6.173), with the terminal bearing between 240° and 300°.

Port services

6.194

- 1 There are no repair or other facilities available.

Barrow Island Oil Terminal

General information

6.195

- 1 **Position and function.** Barrow Island Oil Terminal (20°49'S 115°33'E) is situated on the E side of Barrow Island and is for the export of crude oil.

Port limit is as indicated on the chart, within the arc of a circle, radius 7 miles, centred on Latitude Point (20°47'S 115°28'E).

Approach. The terminal is approached in open water from the E.

- 2 **Operator.** Chevron Australia Pty Ltd, 250 St George's Terrace, Perth, Western Australia 6000.

Limiting conditions

6.196

- 1 **Controlling depth:** 13.1 m in the berth.

Under keel clearance:

For vessels up to 33 m beam; 1.56 m.

For vessels over 33 m beam; as declared by the operators.

Maximum size of vessel handled: The terminal is restricted to tankers which have:

- 2 A loaded displacement of 105 000 tonnes.
- A maximum beam of 47 m.
- A maximum slab side area of 4838 square m being the product of the LOA and moulded depth.

Arrival information

6.197

- 1 **Notice of ETA** should be sent to the operators 96 hours in advance, for details see *Admiralty List of Radio Signals Volume 6* (4).

Anchorage can be obtained 3 miles E of the terminal, good holding reported.

- 2 **Prohibited anchorage.** In the vicinity of the submarine pipeline, indicated on the chart, which extends ESE from Latitude Point to the terminal.

6.198

- 1 **Pilotage** is compulsory, the Mooring Master boards 2 miles E of the terminal and remains onboard throughout.

Tugs A tug and a mooring vessel will assist berthing.

Berthing and unberthing take place during the falling tide and in daylight unless otherwise approved by the Mooring Master.

- 2 **Ballast.** Where possible tankers should arrive with clean segregated ballast to be discharged during the loading operation. There is no facility for the discharge of dirty ballast.

Quarantine. Mariners arriving from overseas must make prior arrangements for quarantine and customs clearance through their agent; Dampier is the nearest port of entry. See *Admiralty List of Radio Signals Volume 1* (2) and 1.54.

Terminal 6.199

- 1 An eight-point mooring system comprising six mooring buoys and two swamped moorings is situated about 5 miles ESE of Latitude Point. The line of the berth is 230°.

Tidal streams at the terminal moorings set approximately 245° on the rising tide and 065° on the falling tide with rates about 1 kn at springs. Slack water occurs about 1 hour after HW or LW.

6.200

- 1 **Landmark:**

Conspicuous tanks (20°47'S 115°28'E) on the E side of Barrow Island.

Directions

6.201

- 1 From E of Barrow Island the line of bearing 270° of the terminal moorings, marked by spar buoys, leads in the approach passing (with positions given from Latitude Point (20°47'S 115°28'E)):

N of a 9.8 m patch (10 miles ESE); thence:

N of a 9.8 m patch (sounding doubtful) (8 miles ESE); thence:

- 2 To the berth or anchorage as convenient.

Caution. The 10 m depth contour extending S from Lowendal Islands lies 1½ miles N of the terminal.

Port services

6.202

- 1 There are no repair or other facilities available.

Anchorage

6.203

- 1 **North West Island.** Anchorage is available 1¼ miles NE of Walpole Point, the SE extremity of North West Island (20°22'S 115°31'E), in a depth of 29 m but there is a fairly heavy swell there and it is close to the shoal extending from Trimouille Island.

South East Island. Anchorage is available N of South East Island (20°26'S 115°35'E).

Local knowledge is required for this anchorage and the one below.

Hermite and Trimouille Islands

Hermite Island

6.204

- 1 **General information.** Hermite Island (20°28'S 115°32'E) is nearly divided into two portions by Willy Nilly Lagoon, a large lagoon which is used by small craft in the cyclone season and provides excellent security. The lagoon is entered from E.
- 2 The landlocked bay, known as Home Lagoon, on the E side of the N part of Hermite Island, where there are depths of from 2 to 5 m, is also a secure spot.

Local knowledge is essential.

Trimouille Island

6.205

- 1 **General information.** Between Trimouille Island (20°24'S 115°34'E) on the E and Hermite Island and Alpha Island (20°25'S 115°31'E) on the W, is a lagoon the W part

of which, especially at its N end, is shoal with numerous coral heads. The E part is comparatively deep.

6.206

- 1 **Anchorage** can be obtained, by mariners in small craft, in the gully off the W side of Trimouille Island entering by the channel between this island and the S extremity of North West Island.

- 2 From S mariners approach this anchorage through Parting Pool (6.184) then passing through the chain of islands extending from the S extremity of Trimouille Island to Flag Island when 1 mile S of Trimouille Island, thence the W side of the latter island is kept close aboard.

Local knowledge is essential.

MONTEBELLO ISLANDS TO NORTH WEST CAPE

General information

Charts Aus 742, Aus 328

Route

6.207

- 1 From N of Montebello Islands (20°30'S 115°30'E) the passage to North West Cape leads generally SW, about 120 miles.

Topography

6.208

- 1 For topography of Montebello Islands, Barrow Island and the two Muiron Islands see 6.170, 6.171, and 6.275.

Principal marks

6.209

- 1 **Landmark:**

North West Cape Light structure (21°49'S 114°10'E) (6.296).

Major lights:

North West Island Light (20°22'S 115°31') (6.147)

North West Cape Light – as above.

Directions

(continued from 6.149)

Montebello Islands to Barrow Island west coast

6.210

- 1 From position 20°17'S 115°30'E, about 5 miles N of North West Island, the recommended track shown on the chart leads 238° passing (with positions given from North West Island Light (20°22'S 115°31'E)):

NW of a 5.2 m patch (3 miles W), the outermost danger off the reef extending W from North West Island; and:

- 2 SE of Tryal Rocks (9 miles NW), two coral heads, noting the depths of less than 20 m, on which the sea breaks in bad weather, which lie 3 miles farther NW; thence:

SE of depths of less than 20 m (12 miles W) on which the sea breaks in bad weather.

- 3 The track then continues SW passing:

NW of Wonnich oil production platform (20°30'S 115°26'E), thence:

SE of John Brookes production platform (20°26'S 115°07'2E), thence:

NW of Cape Poivre (20°48'S 115°19'E) on the W side of Barrow Island.

Useful mark:

Trimouille Island Light (20°25'S 115°34'E) (6.149).

Barrow Island west coast to North West Cape

6.211

- 1 From a position about 18 miles NW of Cape Poivre (20°48'S 115°19'E) the route continues SW passing:
Clear of East Spar Well (20°43'S 114°59'E); thence:
Clear of FPSO *Four Vanguard* (20°54'·6S 114°54'·4E), moored in Woollybutt Production Wells, about 29½ miles WSW of Barrow Island and enclosed within a safety zone, thence:
- 2 Clear of Griffin Oilfield, an area of suspended wells (1.13) the positions of which can best be seen from the chart, and Griffin Marine Terminal which lie about 24 miles NW of Thevenard Island (21°28'S 115°00'E); thence:
- 3 NW of North and South Muiron Islands (21°40'S 114°21'E) (6.275); thence:
NW of North West Reef (21°46'S 114°10'E) (6.297), the outer-most danger off North West Cape.
(*Directions continue at 7.14 and for Exmouth Gulf at 6.297*)

Griffin Marine Terminal

Chart Aus 328

General information

6.212

- 1 **Position and function.** Griffin Marine Terminal (21°13'S 114°39'E) consists of the purpose built floating production storage and offloading facility (FPSO) *Griffin Venture*. The facility has a crude oil storage capacity of 99 000 tonnes. It is situated about 24 miles NW of Thevenard Island, and is the outlet for the Griffin Oilfield. A safety zone surrounds the facility.
- 2 **Operator.** BHP Petroleum Pty Ltd, 152–158 St George's Terrace Central Park, Perth WA 6000.

Limiting conditions

6.213

- 1 **Maximum size of vessel handled,** not more than 150 000 dwt.
Local weather and sea state. As the terminal is an open and unsheltered mooring, there may be times when mooring operations may be difficult or inadvisable. Under these circumstances the terminal will be closed until conditions improve. During the summer months from October to March the prevailing winds will be in the S-SW quadrant; in the winter months, June to August the prevailing winds will be in the S-SE quadrant.
- 2 **Tropical cyclones.** During the summer months the area is subject to occasional cyclones. December through to April is the most active period. In January and February in particular, weather and sea state conditions may prevent mooring and loading for periods of up to a few days. Weather conditions and forecasts are closely monitored before the arrival of a vessel and during loading. In the event of deteriorating weather conditions or the approach of a cyclone the facility will be closed down and the offtake vessel released.

Arrival information

6.214

- 1 **Port radio.** *Griffin Venture* has radio communication hours of 0600 to 1800 on VHF.
Notice of ETA should be sent to the Terminal's Marine Supervisor Dampier and the FPSO, 72, 48, and 24 hours in advance. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Anchorage. The Master of the facility will advise on an anchorage; a recommended anchorage is shown on the chart 6 miles SSW of the terminal.

- 2 **Pilotage and tugs.** Pilotage by the Facility Master is compulsory, the Facility Master boards 3 miles from the FPSO. Neither tug or supply boat services are available. The pilot, berthing superintendents and equipment will be transferred to the vessel by the facility workboat weather permitting, or by helicopter.

Quarantine. A radio pratique message should be sent to the vessel's agent 12 to 24 hours before arrival.

Berth

6.215

- 1 Vessels are moored bow to the stern of the FPSO facility. The FPSO with attached export tanker can rotate a full 360° in response to current, wind and wave conditions.
Berthing is during daylight hours only, unberthing at any time.
Caution. An unlit wave rider buoy is moored 1 mile SSW from the facility.

MARY ANNE PASSAGE TO ONSLOW

General information

Chart Aus 743

Description

6.216

- 1 Mary Anne Passage at the NE end of the inshore channel (6.141) leads between Barrow Island Shoals (21°07'S 115°29'E) and Ripple Shoals, 9 miles WSW, on the NW, and the islands and dangers fronting the mainland between Fortescue Road (20°53'S 116°07'E) and Coolgra Point (21°34'S 115°15') on the SE. Its narrowest part, between Barrow Island Shoals and Fairway Shoals, is 1½ miles wide.

6.217

- 1 **Route.** From Mary Anne Passage (21°12'S 115°28'E) the recommended track through the inshore channel to the W limits of Onslow port area leads generally SW passing S of Airlie Island (21°20'S 115°10'E) and is shown on the chart.

Topography

6.218

- 1 **Passage Islands,** which form the SE side of Mary Anne Passage, are a chain of eight islands and reefs extending 20 miles SW from Stewart Island (20°53'S 115°56'E), the NE-most of the group, to South Passage Island, the SW-most of the group. All the islands in the group are of sandy formation, sparsely vegetated, with flat summits.
 - 2 **Mary Anne Islands** consist of a group of islands, as well as several sand cays all of which lie on coral reefs drying up to 2·7 m, and are surrounded by foul ground. Mary Anne Reef Light (21°16'S 115°28'E) (6.226) is exhibited from Mary Anne Island, the N-most of the group a sand cay on Mary Anne Reef, 3 miles NW of Large Island (6.236). Little Rocky Island, the S-most of the group, lies 10½ miles SSW of Mary Anne Reef Light.
 - 3 **Mangrove Islands** consist of three sandy, sparsely vegetated islands, surrounded by mangroves and drying reefs, situated 12 miles SSW of Mary Anne Reef Light.
- 6.219**
- 1 **Mainland coast.** The coast for 2 miles W of Delaney Hill (21°02'S 116°03'E) (6.164) is fronted by a drying rocky ledge and thence to a point 8 miles SW of Delaney Hill the coast is backed by sandhills. Between the unnamed

point (21°05'S 115°55'E) 3 miles W of Mount Salt, a hillock 21 m high, and Robe Point (21°17'S 115°42'E) there is a shoal bay, which has not been surveyed, the shore of which is a mangrove swamp flooded at HW and backed by low sandhills at its head. The coast between Robe Point and Coolgra Point (21°34'S 115°15'E), 32 miles SW, is low, and for the first 24 miles, as far as the mouth of Cane River (21°33'S 115°23'E), consists of mangrove swamps flooded at HW and backed by a ridge of low sandhills. Thence there is a ridge of partially vegetated sandhills but there is another mangrove swamp immediately SE of Coolgra Point. The interior is low flat country many parts being inundated occasionally.

- 2 This coast is fronted by numerous coral reefs on which are several islands, which are merely accumulations of sand, mostly a few metres high, and partly covered with vegetation.

Controlling depth

6.220

- 1 The controlling depth for Mary Anne Passage is 11.1 m between Barrow Island Shoals and Fairway Shoals (21°07'S 115°36'E).

Hazards

6.221

- 1 **Deep-laden tankers.** Mariners navigating Mary Anne Passage should keep a good lookout for deep-laden tankers in the approach channel to Saladin Marine Terminal (21°24'S 115°03'E) (6.267).

6.222

- 1 **Oil and natural gasfields.** The area NW of Mary Anne Passage is an oil and natural gasfield and numerous production platforms and well heads exist in this area. In addition exploration rigs and seismic survey vessels may be encountered in the area.

6.223

- 1 **Submarine pipelines.** South Pepper Light-beacon (platform decommissioned) (21°07'S 115°16'E) and North Herald Light-beacon are situated 13 and 10½ miles NNE, respectively, of Airlie Island. A submarine gas pipeline is laid between the beacons and from South Pepper Light-beacon to Airlie Island. Chervil A oil production platform stands on the E side of Taunton Reef (21°19'S 115°13'E). A submarine pipeline is laid between the platform and Airlie Island. See information on the chart regarding oil and gas pipelines, and also *The Mariner's Handbook*.

- 2 For details of submarine pipelines extending N and S from the E extremity of Thevenard Island (21°28'S 115°00'E) see 6.250.

Pilotage

6.224

- 1 Pilotage is not available for the passage. Pilotage for Onslow, see 6.248.

Recommended track. Mariners are advised not to deviate from the recommended track without local knowledge, which is advisable. The route is suitable for vessels of up to 10 m draught.

Natural conditions

6.225

- 1 **Tidal streams** in Mary Anne Passage change with the times of HW and LW by the shore. During the rising tide the stream sets NE, and SW with the falling tide. The average rate is from 1 to 2 kn, and there is hardly any

slack water. The streams meet in the vicinity of North Sandy Island (21°06'S 115°39'E).

- 2 Tidal streams set approximately along the tracks and have a maximum rate of about 1 to 2 kn.

In the area between Taunton Reef (21°19'S 115°13'E) and Ripple Shoals, 10 miles NE, the tidal streams set NW to SE at rates of up to 4 kn at springs. The tidal streams can be considerably influenced by strong winds in the area.

Overfalls are evident in the area immediately surrounding Ripple Shoals (21°10'S 115°20'E) and Flinders Shoal, 8 miles ESE, particularly at LW springs.

- 3 **Sea and swell.** The area around Mary Anne Passage is exposed to winds from all directions and the sea can rise quickly, becoming choppy. The areas of reef surrounding the passage protect it from the swell from all directions except N, and the swell height within the reefs is low. Additional precautions should be taken during the period of tropical storms, which can occur between October and April.

- 4 **Sandwaves.** Mariners are advised to navigate in the area with caution as the sea bed is composed of sandwaves which may be mobile. There are numerous shoals in the area, the positions of which can best be seen from the chart.

Directions

(continued from 6.155)

Chart Aus 743 (see 1.16)

North Sandy Island to Ripple Shoals

6.226

- 1 From the vicinity of 20°57'S 115°38'E, about 9 miles N of North Sandy Island Light, the recommended track shown on the chart leads 209¼° passing (with positions given from North Sandy Island Light (21°06'S 115°39'E)):

ESE of a 8.8 m shoal (10 miles NNW); thence:

ESE of a 9.9 m patch (6 miles NNW); thence:

- 2 WNW of North Sandy Island, noting the 9.5 m patch which lies 3½ miles WNW of the island closer to the track. A light (stainless steel framework tower white lantern, 20 m in height) stands near the centre of the island. Thence:

WNW of Fairway Shoals (3 miles WSW).

When Great Sandy Island Light (white hut, 2 m in height) (6 miles S) exhibited near the SW extremity of Great Sandy Island bears 138°, distant 8 miles, the recommended track leads 152° passing:

- 3 Between Fairway Shoals (3 miles WSW) and Barrow Island Shoals (9 miles W). The latter extend nearly 18 miles from the S extremity of Barrow Island; the sea seldom breaks on them but they generally have an area of smooth water over them or a tide-rip near their edge. Thence:

- 4 ENE of Corner Shoals with a depth of 7.2 m over them (7 miles WSW). Fairway and Corner Shoals have not been thoroughly examined and less water than charted may exist.

The line of bearing 059°, astern, of North Sandy Island Light then leads in the fairway passing:

SSE of Corner and Barrow Island Shoals; and:

- 5 NNW of Lightfoot Reef (11½ miles SW), noting the depths of 10 m and less, whose position can best be seen from the chart, which lie S of the track between Great Sandy Island and Lightfoot Reef.

When Mary Anne Island Light (white GRP hut on concrete base, 6 m in height) (14 miles SW) bears 195°, distant 3¾ miles, the recommended track leads 255° passing:

- 6 NNW of Flinders Shoal (13 miles SW), noting the depths of 5.9 and 6.2 m and the reported (1987) depth of 7.5 m which lie 7 cables NNE, 1 and 2¼ miles W, respectively, of the shoal and closer to the recommended track. The sea seldom breaks on Flinders Shoal but the uneven depths in the vicinity cause overfalls on the SE-going tidal stream and it should be given a wide berth. And:
- 7 SSE of the S side of Barrow Island Shoals; thence: Between Ripple Shoals (18 miles WSW), which have not been thoroughly examined and over which less water than charted may exist, and a 8.5 m patch (17 miles WSW), the NW-most patch off West Island (17 miles SW) surrounded by an extensive drying reef; thence:

To a position SE of Ripple Shoals.

6.227

1 Useful marks:

- Two conspicuous white masts (21°12'S 115°38'E) near the NE end of Great Sandy Island.
North Herald Light-beacon (21°11'S 115°16'E) approximately 25 m in height.

Ripple Shoals to Taunton Reef

6.228

- 1 From the vicinity of 21°14'S 115°22'E, about 6 miles WNW of Mary Anne Island Light, the recommended track shown on the chart leads 228½° passing (with positions given from Mary Anne Reef Light (21°16'S 115°28'E)): NW of a 9.4 m patch (5½ miles W) which lies NW of West Reef (5 miles SW); thence:
- 2 SE of Taunton Reef (14 miles WSW) on which the sea breaks only when there is a swell. Chervil A oil production platform, from which a light is exhibited, stands on the E side of the reef. Thence: To a position between Taunton Reef and a 5.2 m shoal (5.1 m on large scale national chart) (15 miles WSW)).

Taunton Reef to Thevenard Island

6.229

- 1 From the vicinity of 21°21'S 115°13'E, about 3 miles S of Taunton Reef the recommended track shown on the chart leads 270°, about 16 miles, passing (with positions given from Airlie Island Light (21°19'4S 115°10'0E)): S of Airlie Island. Airlie Island Light (stainless steel framework tower white lantern, 24 m in height) stands near the centre of the island. Thence:
- 2 N of Sultan Reef (6½ miles SW), marked by a light-buoy (port hand) on its NW side; the sea only breaks on this reef when there is a swell; thence: N of Saladin Marine Terminal (8¼ miles SW) (6.267) situated NNE of Thevenard Island; and: S of Rosily Cays (9 miles WNW), noting a 8.8 m patch which lies 4 miles SE of these islands closer to the track; thence:
- 3 Clear of the N buoys of Saladin Marine Terminal approach channel, marked by light-buoys, which leads N of Thevenard Island to Saladin Marine Terminal, noting Trapp Reef (10 miles WSW). The sea only breaks on Trapp Reef at LW.
- 4 When the conspicuous tanks on Thevenard Island bear 172°, distant 6½ miles, the recommended track leads 230¾° for 4½ miles and is marked by light-buoys on its SE side, passing (with positions given from the conspicuous tanks): NW of a 6.9 m patch (5¼ miles N); thence:

SE of Rosily Shoals (6 miles NNW) (6.271); thence; NW of a 4.4 m patch (4 miles NNW).

- 5 When the conspicuous tanks on Thevenard Island bear 130°, distant 5½ miles, the recommended track leads 270° passing:

Between two light-buoys (lateral port and starboard hand); thence:

S of a light-buoy (W cardinal) marking the end of the buoyed approach to Saladin Marine Terminal.

Useful marks

6.230

- 1 Conspicuous tanks on Airlie Island (21°20'S 115°10'E).
Conspicuous tanks (21°27'S 115°01'E) near the NE extremity of Thevenard Island.
(Directions continue at 6.280)

Side channels

Taunton Reef to Bessieres Island passing south of Thevenard Island

6.231

- 1 From the vicinity of 21°21'S 115°13'E, about 3 miles S of Taunton Reef, the recommended track, shown on the chart, leads 228½° passing (with positions given from Direction Island (21°32'S 115°08'E)): NW of a 5.1 m shoal (10 miles NNE); and:
- 2 SW of Airlie Island (12½ miles N), from where a light is exhibited (6.229); thence: NW of Moresby Shoals (7 miles NE); thence: NW of Herald Reef (5½ miles ENE) which lies on the N part of the shoal on which Twin Islands (6.258) and some sand cays stand; thence: SE of Sultan Reef (7½ miles NNW) (6.229); thence: SE of Saladin A and B oil production platforms (7 miles NW) from which lights are exhibited; thence: NW of Weeks Shoal (2 miles WNW), noting the 3.1 m patch about 4 cables N of the shoal closer to the recommended track, and crossing the approach route to Onslow (6.233); thence:
- 4 SE of a rocky patch, drying 0.4 m, which lies close within the edge of the reef extending S from the E extremity of Thevenard Island (7½ miles WNW). Saladin C oil production platform, from which a light is exhibited, stands on the W side of this reef. And: NW of a 6.0 m patch, marked by a light-buoy (starboard hand), (4½ miles W).

6.232

- 1 When the conspicuous tanks on Thevenard Island bear 344°, distant 3 miles, the recommended track then leads 244¾° for 4½ miles passing (with positions from the conspicuous tanks): SSE of the 10 m contour 2 miles S of Thevenard Island; thence: SSE of a 9.8 m patch (3¼ miles (SSW))
- 2 NNW of Paroo Shoal (6½ miles S), noting the patches with depths of less than 10 m within 1 mile N of the shoal and closer to the track ; thence: S of Cowle oil production platform (4½ miles SSW) noting a 7.0m patch close W of the platform. Yammaderry and Saladin C oil production platform stand 2½ and 3½ miles NNE respectively. A light is exhibited from each platform.

- 3 When the conspicuous tanks on Thevenard Island bear 033°, 5¾ miles distant, the recommended track leads 272½° for 8¼ miles passing (with positions from Bessieres Island (21°32'S 114°46'E) (6.280)):

N of Miles Shoal (11½ miles ESE); thence:

- 4 S of a 4.4 m patch which lies near the S end of the bank extending S from Brewis Reef (8 miles E); and:

N of Australind Shoal (9 miles ESE), noting the patches with depths less than 10 m which lie N and S of the track as shown on the chart; thence:

- 5 N of Tortoise Island (6 miles SE) (6.287); thence: To a position 4 miles NW of the same island.

The recommended track then leads 318° passing:

NE of a 9.8 m patch (2½ miles ESE); thence;

- 6 NE of Bowers Ledge (1¼ miles S); thence:

NE of Bessieres Island (6.280) from where a light is exhibited.

Approach to Onslow passing east of Thevenard Island 6.233

- 1 From a position 2 miles E of Saladin Marine Terminal (21°24'S 115°03'E) (6.267), the recommended track leads 180° for 2¾ miles passing (with positions from conspicuous tanks on Thevenard Island):

W of Sultan Reef (5 miles ENE) (6.229); thence:

E of Saladin A platform (2¼ miles ENE).

- 2 When the conspicuous tanks on Thevenard Island bear 262° distant 3½ miles, the recommended track leads 199½° for about 4½ miles to a position about 4 miles WNW of Direction Island (6.254).

Anchorage

Chart Aus 743 (see 1.16)

Great Sandy Island anchorage 6.234

- 1 **General information.** Great Sandy Island is surrounded by a drying reef, on the NE part of this reef, 1 mile from the island, there is a sand cay which dries from 0.6 to 3 m. A light (21°12'S 115°38'E) (6.226) stands near the SW extremity of the island. Pup Island, surrounded by a drying reef, lies 2 miles NNE of Great Sandy Island.

6.235

- 1 **Anchorage,** fairly well sheltered from the prevailing wind, can be obtained on the line of bearing 315° of the summit, near its SW end, of Great Sandy Island, distant about 5 cables, in a depth of 7 m, or on the line of bearing 262°, distant about 1 mile as indicated on the chart, in a depth of 8 m, sand and mud.

Caution. Depths of 5.6 m and less are charted S of the island.

Large Island anchorage

6.236

- 1 **General information.** Middle Mary Anne Island, 4 miles E of Large Island (21°18'S 115°30'E), is flat and rocky, of a light appearance, and, with the sun behind it resembles a sand cay. East Island is situated 5½ miles ENE of Large Island and a reef drying 1.4 m lies 1 mile farther NE.

6.237

- 1 **Anchorage** can be obtained 5 cables E of Large Island in a depth of 7 m.

Approach is from NE passing about 1¼ miles W of East and Middle Mary Anne Islands.

Caution. Depths of less than 6 m are charted 2½ miles W, and 2 miles WNW, respectively, from East Island and a

spit, with depths of 5 m over it, extends 1½ miles ENE from Large Island.

Landing can always be obtained at the SW extremity of Large Island.

Inshore passage

Chart Aus 743

General information

6.238

- 1 There is an inshore passage with general depths of from 2.7 to 3.7 m between Robe Point (21°17'S 115°42'E) and Coolgra Point, 32 miles SW, leading between the coastal reef and the off-lying islands and reefs. Several detached reefs, the positions of which can best be seen from the chart, lie between Little Rocky Island (21°26'S 115°25'E) and the coast, one of these drying 1.2 m, 2 miles SE of the island, lies in the fairway.

- 2 Mangrove Passage leads between the coast around Cane River entrance (21°33'S 115°23'E) (6.242) and Mangrove Islands. A dangerous rock lies in the fairway of Mangrove Passage about 4 miles SW of South Island (21°31'S 115°21'E), the S-most island of the Mangrove Islands group.

6.239

- 1 **Robe River** flows out on the E side of Robe Point (21°17'S 115°42'E) but it is only navigable by boats for a distance of about 1 mile above the entrance.

6.240

- 1 **Port Weld** an inlet on the mainland coast within Weld Island (21°23'S 115°33'E) affords good anchorage for small craft not exceeding 2.7 m draught.

Weld Island is sandy with mangrove bushes off its N extremity. A rocky shoal with depths of less than 1.8 m, charted as dangerous rocks, extends 1 mile N from the island.

Entry is made from NE.

6.241

- 1 **Yammadery Creek.** Yammadery Island (21°31'S 115°26'E), 8 miles SW of Weld Island, is separated from the coast by Yammadery Creek in which small craft lie up during the winter months.

Yammadery Island has a sandy ridge on it and is surrounded by mangroves.

6.242

- 1 **Cane River** (21°33'S 115°23'E) enters the sea about 2¾ miles SW of the SW extremity of Yammadery Island but it is only navigable by boats for a distance of about 1 mile within the entrance.

Landing. Yardi Landing is situated on the W bank of the river close within the entrance.

ONSLOW AND APPROACHES

General information

Chart Aus 743 (see 1.16)

Position and function

6.243

- 1 Onslow is situated on Beadon Point (21°38'S 115°06'E) and is the terminal for the Onslow Solar Salt Project. Beadon Creek (21°39'S 115°08'E) (6.257) is used by fishing vessels and oil rig tenders.

The port area also includes Airlie Island Marine Terminal (6.260) and Saladin Marine Terminal (6.267).

Topography**6.244**

- 1 Coolgra Point (21°34'S 115°15'E) is separated from the mainland at HW by a mangrove creek. The coast between Coolgra Point and Entrance Point, 16½ miles WSW, is backed by low sandhills, sparsely vegetated, interspersed by shoal mangrove creeks draining the swampy low country within.

Port limits**6.245**

- 1 The port limit is shown on the chart extending N from Coolgra Point, about 25 miles, and enclosing Airlie, Rosily, Thevenard and Ashburton Islands before returning to the coast at Entrance Point.

Approach and entry**6.246**

- 1 The port is approached SE of Thevenard Island (21°28'S 115°00'E) and entered through a buoyed channel.

Limiting conditions**Controlling depths****6.247**

- 1 The controlling depth for Onslow is 10.8 m, the maintained depth in the buoyed approach channel.
For controlling depths at Airlie Island and Saladin Marine Terminals, see 6.261 and 6.268.

Arrival information**Pilotage and tugs****6.248**

- 1 **Pilots** are available for Onslow and will board ¾ miles ESE of the E end of Thevenard Island. See 6.260 and 6.267 for pilots for Airlie Island and Saladin Marine Terminals.
Tugs are not available.

Harbour**General layout of harbour****6.249**

- 1 Onslow Salt Jetty and ship-loader projects about 7 cables to seaward in a NNW direction from a point about 6 cables SW of Beadon Point.
Beadon Creek (21°39'S 115°08'E) (6.257) is used by oil rig tenders, small craft and fishing vessels.

Submarine pipelines**6.250**

- 1 Submarine pipelines extend N and S from the E end of Thevenard Island (21°28'S 115°00'E) to oil production platforms, the positions of which can be seen on the chart. See information on the chart regarding oil and gas pipelines, and also *The Mariner's Handbook*.
For details of submarine pipelines extending N and E from Airlie Island (21°20'S 115°10'E) see 6.223.

Principal marks**6.251**

- 1 **Landmark:**
Conspicuous tanks (21°27'S 115°01'E) near the NE extremity of Thevenard Island.
Major Light:
Onslow Light (white metal tower, 18 m in height) (21°39'S 115°07'E).

Directions for entering harbour*(continued from 6.231 and 6.233)***Approach****6.252**

- 1 Approach to Onslow should be made on the recommended tracks, shown on the chart, passing either S or E of Thevenard Island (21°28'S 115°00'E) to a position about 4 miles WNW of Direction Island (21°32'S 115°08'E) (6.254).

6.253

- 1 From the above position, the recommended track leads 158½° for about ¾ miles to the entrance to the buoyed channel passing (with positions from Direction Island (21°32'S 115°08'E):

Close SSE of a shoal with a depth of 6 m over it, marked by a light-buoy (starboard hand) (4 miles W).

The track continues in a buoyed channel marked by light-buoys (lateral), 120 m wide, to Onslow Salt Jetty.

Useful marks**6.254**

- 1 Conspicuous white building with black stripes, which is not visible from N, on Direction Island (21°32'S 115°08'E).
Light on Saladin A oil production platform (21°26'S 115°03'E).
Light on Saladin B oil production platform (21°27'S 115°02'E).
2 Light on Cowle oil production platform (21°31'S 114°58'E).
Light on Yammaderry oil production platform (21°29'S 114°59'E).
Light on Saladin C oil production platform (21°29'S 115°00'E).
Light-beacon at a groyne head (21°39'S 115°08'E) at the entrance to Beadon Creek.

Berth**6.255**

- 1 At the end of the Onslow Salt Jetty, four large berthing dolphins on a line of 070°/250° extend for 200 m. Depth alongside is 13 m.

Port services**6.256**

- 1 **Medical facilities:** small hospital in the town.

Beadon Creek**General information****6.257**

- 1 A groyne projects about 2 cables N from the coast about 1½ miles SE of Beadon Point, the W entrance point of Beadon Bay, and marks the entrance to Beadon Creek, which can be entered by small craft at a quarter rising tide. The entrance channel was dredged to 1.6 m (1999) and to 2.6 m adjacent to the berths.
2 **Approach.** The entrance to the dredged channel is marked by a light-beacon at the groyne head (6.254) and by a buoy (port hand).
Caution. Mariners should enter the creek on the rising tide and only when the state of tide permits.
Berths. There are two privately owned wharves in Beadon Creek and a number of dolphins which are mainly used by fishing vessels.
3 **Port services.** Limited repair facilities and a sheerlegs crane, for lifting small craft from the water, are available.

Fuel available by road tanker; fresh water, limited supply; provisions, limited supply.

Anchorage and landing

North East Twin Island anchorage

6.258

- 1 **Temporary anchorage** can be obtained by small craft, except in NW winds, between North East Twin Island (21°31'S 115°13'E) and Herald Reef, 1 mile NNE.

Recommended berth is on the line of bearing 190° of North East Twin Island, distant 4 cables, in a depth of 7 m, sand.

Ashburton Island

6.259

- 1 **Landing.** Ashburton Island (21°36'S 114°56'E) is surrounded by a coral reef. A shoal, with a depth of 4.7 m, extends about 5 cables NE from the island.

The best landing place is on the E side of the island under the summit.

Caution. A shoal with a depth of 3.8 m lies close SE of the island.

Airlie Island Marine Terminal

Chart Aus 743 (see 1.16)

General information

6.260

- 1 **Position and function.** Airlie Island Marine Terminal (21°18'S 115°10'E) is situated 1 mile NNE of Airlie Island and is the outlet for the Chervil Oilfield. A safety zone surrounds the terminal.

Port Authority and operator. The terminal lies within the limits of Onslow Port Authority, see 6.245.

The terminal is operated by Apache Energy Pty. Ltd.

Limiting conditions

6.261

- 1 **Controlling depth:** least depth 15.3 m in the approach channel and berth.

Restricted draught: maximum arrival or departure draught 13.8 m.

Maximum size of vessel handled. The terminal is designed to accept vessels up to 120 000 dwt, length 300 m, beam 50 m, draught 13.8 m, but, in practice the maximum size of vessel is less than 100 000 dwt.

- 2 **Density of water:** 1.025 g/cm³.

Local weather. Berthing may be delayed if a N wind is forecast. If the vessel is in the berth and the wind shifts N the pilot will assess the situation and decide whether to vacate the berth or stay in position.

Arrival information

6.262

- 1 **Notice of ETA** should be sent to the operators 96 hours before arrival and updated at the 72, 48 and 24 hour intervals. When within VHF range of Airlie Island contact should be established on VHF.

Outer anchorage in position 21°10'S 115°06'E, about 10 miles NNW of Airlie Island, the holding ground is poor.

Mooring. A mooring buoy (lighted) is located 3 miles NW of Airlie Island.

- 2 **Pilotage** is compulsory. The pilot boards in the outer anchorage position, as indicated on the chart.

Tugs are not available.

Regulations concerning entry. A minimum under-keel clearance of 1.5 m is to be maintained at all times. If the berth or channel is subject to swell in excess of 0.5 m the under-keel clearance may be increased at the discretion of the pilot or berthing master.

- 3 **Berthing:** 24 hours per day but night berthing preferred due to less wind and heat.

Ballast. There are no facilities for the reception of dirty ballast and ballast water from other ports is not permitted to be discharged at the terminal.

Terminal

6.263

- 1 **General layout.** A CBM, consisting of eight buoys, all fitted with swamped lines which are used in addition to ship's moorings and made fast on bitts. The berth is very exposed from W and N and is 7 cables from reefs to the S.

Submarine pipelines see 6.223 and information on the chart.

- 2 **Tidal streams** set 094° on the rising tide and 291° on the falling tide, with a rate of 0.5 kn at springs. The tidal range is approximately 2 m.

Directions

6.264

- 1 **Approach** to the pilot boarding position (6.262) should be made from the deep water of the Indian Ocean.

From the pilot boarding position the track leads SSE passing (with positions given from Airlie Island Light (21°20'S 115°10'E) (6.229):

- 2 Between Penguin Bank (9 miles NW) on which the sea seldom breaks except with a heavy swell, noting the 13.5 m patch 1½ miles ENE, the 13.1 m patch 2½ miles ESE, and an 11.3 m patch (9 miles N); thence:
ENE of a 9.4 m patch (2½ miles NW); thence:
To the berth as convenient.

6.265

- 1 **Useful marks:**

North Herald Light-beacon (21°11'S 115°16'E) (6.227).

Conspicuous tanks on Airlie Island (21°20'S 115°10'E).

Airlie Island Light (21°20'S 115°10'E) (6.229).

Light on Chervil A oil production platform (21°19'S 115°13'E).

Services

6.266

- 1 There are no services available at the terminal.

Saladin Marine Terminal

Chart Aus 743 (see 1.16)

General information

6.267

- 1 **Position and function.** Saladin Marine Terminal (21°24'S 115°03'E) is situated 3½ miles NNE from the E extremity of Thevenard Island and is the outlet for the Saladin Oilfield. A safety zone surrounds the terminal.

Port Authority. The terminal lies within the limits of Onslow Port Authority, see 6.245.

Operator. Chevron Australia Pty Ltd, Perth, Western Australia.

Limiting conditions

6.268

- 1 **Controlling depth.** The minimum depth in the vicinity of the berth and in the approach channel is 15.6 m.

Underkeel clearance is determined by the terminal operator and can be between 1.8 and 2.8 m dependant on the swell conditions.

Density of water: 1.025 g/cm³.

- 2 **Maximum size of vessel handled.** The terminal can accept vessels up to 180 000 tons loaded displacement and a beam of 47 m.

Arrival information

6.269

- 1 **Notice of ETA** should be sent 4 days before arrival, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Anchorage is available in the vicinity of 21°23'S 114°54'E, about 2 miles NW of Saladin Fairway light-buoy, poor holding ground.

- 2 **Moorings.** An unlit mooring buoy (21°26'S 115°01'E) for the use of small craft is situated about 1¼ miles N of the E end of Thevenard Island.

Pilotage is compulsory. The pilot boards in position 21°24'S 114°53'E, as shown on the chart, about 2½ miles W of Saladin Fairway light-buoy. Mariners should not enter the buoyed channel without a pilot embarked.

- 3 **Tugs.** Two vessels are available to assist in mooring. A 3200 bhp omni-directional vessel is used with a tow line from its bow to the tanker's stern when berthing. The vessel is equipped for fire-fighting, and will stand by throughout loading. A utility vessel will run mooring lines during berthing, and will also stand by throughout loading.

- 4 **Berthing** takes place during the rising tide unless the pilot agrees otherwise. Vessels must be fitted with adequate searchlights for berthing and unberthing at night.

Ballast. There is no facility for the reception of ballast from tankers.

Terminal

6.270

- 1 A CBM, consisting of six buoys and two swamped moorings. A submarine pipeline extends SSW from the terminal to the E end of Thevenard Island.

Directions

6.271

- 1 The terminal should be approached from W from the deep water of the Indian Ocean via Saladin Marine Terminal approach channel, marked by light-buoys and shown on the chart, passing N of Thevenard Island. Saladin Fairway Light-buoy (W cardinal) (21°24'S 114°56'E) is moored 7 cables W of No 1 and No 2 Light-buoys (starboard and port hand) which mark the entrance to the approach channel. See also 6.229.

- 2 **Caution.** The SW extent of Rosily Shoals (21°20'S 114°59'E) with depths of less than 15 m lies close NW of the recommended track.

6.272

- 1 **Useful marks:**

Conspicuous tanks on Airlie Island (21°20'S 115°10'E).

Airlie Island Light (21°20'S 115°10'E) (6.229).

Lights on Saladin A and B oil production platforms (21°27'S 115°03'E).

Services

6.273

- 1 There are no services available at the terminal.

ONSLOW TO NORTH WEST CAPE

General information

Chart Aus 328 (see 1.16)

Route

6.274

- 1 From the W limit of Onslow port area NNW of Thevenard Island (21°28'S 115°00'E) the passage to North West Cape leads WSW, about 50 miles.

Topography

6.275

- 1 **Mainland coast.** The coast between Entrance Point (21°40'S 114°58'E) and Locker Point, 16 miles WSW, is low, sandy, and swampy in parts during the rainy season. Between Locker Point (21°48'S 114°43'E) and Tubridgi Point, 5 miles SW, the E entrance point to Exmouth Gulf, the coast is backed by bare sandhills rising to a height of 16 m near the latter point.

- 2 **Islands.** Serrurier Island (21°36'S 114°41'E), 6½ miles SW of Bessieres Island (6.280), is formed by sandhills partly covered with vegetation. Flat Island, 2½ miles WSW of Serrurier Island, has a flat top sparsely vegetated with its summit at its S end.

- 3 North Muiron Island (21°38'S 114°23'E) is formed of irregular sandy ridges, sparsely vegetated, the highest part being on the SW side where there are some remarkable limestone cliffs of a reddish appearance. South Muiron Island, separated from the N island by a channel about 2½ cables wide with depths of more than 7 m in the fairway, is formed of irregular sand ridges covered with coarse grass and stunted bushes. In appearance the two Muiron Islands are light in colour with an even outline.

Submarine pipeline

6.276

- 1 A submarine gas pipeline extends SSE and S from Griffin Marine Terminal (21°13'S 114°39'E) (6.212) passing E of Bessieres Island (21°32'S 114°46'E) (6.280) and to shore in the vicinity of Rocky Point (21°44'S 114°51'E)

Unexploded ordnance

6.277

- 1 An area (21°29'S 114°40'E), radius 5 cables, centred about 6 miles WNW of Bessieres Island (21°32'S 114°46'E) is dangerous with regard to anchoring, fishing or any form of submarine or seabed activity due to unexploded depth charges. For details, see *Annual Australian Notices to Mariners*.

Marine park

6.278

- 1 Vessels approaching North West Cape (21°49'S 114°10'E) (6.296) should note the existence of Ningaloo Marine Park (7.7) extending 7 miles N from the cape, the coordinates of which are best seen from the large scale national chart (Aus 744). See *Annual Australian Notices to Mariners* and *Australian Seafarers handbook AHP 20* for details.

Principal marks

6.279

- 1 **Landmark:**

North West Cape Light structure (21°49'S 114°10'E) (6.296).

Major light:

North West Cape Light – as above.

Directions*(continued from 6.230)***Thevenard Island to North West Cape****6.280**

- 1 From the vicinity of 21°22'S 114°56'E, about 6 miles NNW of the W extremity of Thevenard Island, the track leads WSW, about 35 miles, passing (with positions given from Bessieres Island Light (21°32'S 114°46'E)): NNW of a 9.2 m patch (10 miles ENE); thence:
- 2 NNW of Bessieres Island, sandy and covered with grass and a few bushes; surrounded by reef which extends nearly 1 mile N from the island. Bessieres Island Light (white GRP hut, 4 m in height) stands near the S side of the island. And: SSE of Griffin Oilfield (21°12'S 114°38'E) (6.211); thence:
- 3 NNW of Black Ledge (4 miles SW); thence: NNW of the drying reef extending 1¼ miles N from Serrurier Island (6½ miles SW) (6.275); thence: NNW of Flat Island (9 miles WSW) (6.275); thence: NNW of Peak Island (15 miles WSW); thence: NNW of Outtrim Patches (19½ miles WSW); thence:
- 4 NNW of North Muiron Island (21°38'S 114°23'E) (6.275), distant 3 miles, noting the reef which extends 5 cables from its NE extremity upon which the sea breaks heavily at times.
From the vicinity of 21°35'S 114°22'E, about 3 miles NNW of North Muiron Island, the track leads SW passing (with positions given from North West Cape (21°47'S 114°10'E)):
- 5 NNW of South Muiron Island (9 miles ENE) (6.275), noting the 6.4 m patch which lies about 1 mile W of its SW extremity; thence: NNW of North West Reef (1½ miles NNE) (6.297), the outer-most danger off North West Cape. A light (6.296) is exhibited from the cape.

6.281

- 1 **Useful marks:**
Saladin Fairway Light-buoy (21°24'S 114°56'E) (6.271).
Conspicuous tanks (21°27'S 115°01'E) near the NE extremity of Thevenard Island.
(Directions continue at 7.14 and for Exmouth Gulf at 6.297)

Side channel**Inner route****6.282**

- 1 From a position about 3½ miles N of Ashburton Island (21°36'S 114°56'E) a route for vessels of suitable draught leads initially SW passing (with positions given from Ashburton Island):
NW of Australind Shoal (1½ miles NNW); thence: Clear of a 6.7 m patch (2½ miles NW); thence:
- 2 Between Glennie Patches, the N-most patch (2¼ miles W), and Tortoise Island (4 miles W) (6.287), noting the 4.9 m patch 5 cables SSE; thence:
NW of Outer North West Patch (4 miles WSW); thence:
- 3 Between Tongue Shoals (6 miles SW) and Santo Rock (9 miles WSW), noting the 3.5 m depth which lies 1½ miles SW of Tongue Shoals.

6.283

- 1 From a position about 1 mile SE of Santo Rock the route then leads WSW passing (with positions given from Observation Island (21°44'S 114°32'E)):
Between Locker Island (12½ miles E) (6.288) and Table Island (12½ miles NE) with a flat top; thence:
- 2 NNW of Locker Reef (11 miles ENE); the depths around the reef are irregular and there is a 6 m depth 1 mile W of it; and:
SSE of the S end of Serrurier Island (10 miles NE) (6.275); thence:
- 3 NNW of Hayman Rock (8½ miles ENE); and:
SSE of Round Island (8½ miles NE); thence:
SSE of Hood Reef (6 miles NE) on which the sea breaks in a W swell; thence:
SSE of Fairway Reef (3½ miles NE); thence:
To a position E of Observation Island, distant 1¼ miles.
- 4 The route then leads SW passing:
Midway between Observation Island and Spider Reef (1¾ miles ESE); thence:
NW of Web Reef (2¼ miles SSE), noting Fly Island (4 miles S) (6.289).
When Observation Island bears 000°, distant 1¼ miles, the route leads W passing:
- 5 S of Otway Reef (4 miles W); thence:
S of Sunday Island (7 miles WNW); and:
N of Combe Reef (7½ miles WSW); the sea is reported to break on this reef in a W swell; thence:
- 6 S of the coral reef extending 8 cables from the S extremity (13½ miles W) of South Muiron Island (6.275). The outer part of this reef is submerged with strong tide rips beyond the reef. Thence:
N of North West Reef (21°46'S 114°10'E) (6.297), distant 1 mile.
- 7 **Caution.** During the falling tide it is necessary to guard against being set onto the shoal ground extending S from Observation Island.

Anchorage, minor inlets and landing**Serrurier Island anchorage****6.284**

- 1 The greater part of Serrurier Island (21°36'S 114°41'E) (6.275) is fringed by a drying reef. On the W side of the S part of the island, where there is a break in the coastal reef, there is a bay affording anchorage.
Landing is possible, in calm weather, on a beach on the E side of the island.
Tidal streams W of Serrurier Island set NNW and SSE. See also information on the chart.

Ashburton River**6.285**

- 1 **General information.** Ashburton River is of considerable length having its source amongst some hills about 220 miles inland. Its lower reaches, from about 80 miles from the mouth, drain a low flat country which is inundated for miles during wet weather.
- 2 The E mouth of Ashburton River, entered S of Entrance Point (21°40'S 114°58'E), has a narrow entrance between sandspits extending from either entrance point and there are depths of less than 5 m for about 4 cables N of this entrance. The W mouth of the river is entered 5 cables W of Parkes Reef (21°41'S 114°55'E). It is probable that the W entrance has greater depths than the E entrance and that

it is more easy of access. Advice as to existing depths should be sought locally.

Temporary anchorage can be obtained under the lee of Parkes Reef, a portion near the centre of which is awash.

Urala Creek

6.286

- 1 **General information.** A narrow drying reef fronts the coast from Locker Point (21°48'S 114°43'E) for a distance of 2½ miles SW and is separated from the coast by a boat channel. Three miles SW of Locker Point there is an entrance to Urala Creek, which has another entrance, navigable by boats, 4 miles S of Tubridgi Point (21°51'S 114°39'E).

- 2 **Caution.** In 1966 less water than charted was reported 2½ miles NNW of Locker Point. Baylis Patches and a dangerous rock lies 1 mile N of the same point.

Landings

6.287

- 1 **Tortoise Island** (21°35'S 114°52'E) is surrounded by a partially drying reef which extends up to 3 cables from its W side. There is a good landing place at the SE extremity of the island.

6.288

- 1 **Locker Island** (21°43'S 114°46'E) is surrounded by a reef which dries and a sand cay, also surrounded by reef drying 1-6 m, lies 7 cables S of the island. There is good landing at the SE extremity of the island.

6.289

- 1 **Fly Island** (21°48'S 114°33'E) is flat and sandy. A coral reef, the greater part being covered, extends 5 cables N and 2 miles SW from the island; the sea breaks on it in places. There is good landing on the SE extremity of the island.
- 2 **Caution.** A 5-1 m patch lies 2 miles W and a dangerous rock lies 2½ miles E, respectively, of the island. In the vicinity of the rock there are several shoals of less than 5 m, the positions of which can best be seen from the chart.

EXMOUTH GULF

General information

Chart Aus 328 (see 1.16)

Description

6.290

- 1 Exmouth Gulf is entered between Tubridgi Point (21°51'S 114°39'E) and North West Cape, 27 miles W. It is bordered on the W side by the peninsula of which North West Cape is the extremity, and on the E and S sides by the mainland.

The gulf has an average width of 23 miles and recedes about 40 miles S, terminating in two indentations, Giralia Bay and Gales Bay separated by Sandalwood Peninsula.

Topography

6.291

- 1 **East Side.** The E coast of the gulf rises so gently from the sea as to be almost indeterminate. Islands of mangrove trees front the coast which consists of almost level salt flats and swamp bearing a thin covering of grass and scrub extending from 7 to 8 miles inland. West of Tubridgi Point foul ground extends to a distance of 7½ miles, numerous islands, drying sandbanks and submerged rocks lie in this area. Tent Island lies, with Tent Point (22°00'S 114°31'E) its N extremity, 11 miles SW of Tubridgi Point. It is a relatively high island, which from seaward appears as a

headland. Rivoli Islands, of which Y Island (21°57'S 114°25'E) is the W-most, lie 5½ miles WNW of Tent Point. A light (grey metal pile, 4 m in height) stands on Y Island.

- 2 **West side** from North West Cape is formed by a high range of rugged red hills deeply fissured with canyons and rising from about 60 m at its N end to more than 300 m near the centre of the peninsula. Viewed from the gulf the range is almost featureless. Mount Hollister, 23 miles SSW of North West Cape, is the highest point; it is prominent only when viewed from SE.

- 3 The coast from Point Murat (21°49'S 114°11'E) to Heron Point, 27 miles S, is clear of mangroves and generally steeper than the rest of Exmouth Gulf. The town of Exmouth stands 1 mile inland, 8 miles SSW of Point Murat, but it is not clearly visible from seaward. A white dome (uncharted), in the shape of a golf ball advertising Exmouth Golf Club, stands 1½ miles NNE of Town Beach towers (21°58'S 114°08'E) and is prominent.

- 4 **South side.** The S coast is similar to the E coast, except for Sandalwood Peninsula which, on its N and NW coasts, is generally clear of mangroves. Centipede Hill, 9 miles S of the N end of Sandalwood Peninsula, is a conspicuous rocky hill.

Surveys

6.292

- 1 The coast and off-lying waters for about 9 miles S of Tubridgi Point have not been surveyed, and the waters off the N side of Y Island have not been examined. See also information on the chart.

Natural conditions

6.293

- 1 **Tidal streams** during the rising tide set ENE and NE, curving E round North West Cape and then setting into Exmouth Gulf. During the falling tide the stream sets out of the gulf, round North West Cape and thence W and SW.

The general rate of the tidal streams is from 1 to 1½ kn, and the change of direction generally corresponds with the times of high and low water by the shore. See also information on the chart.

- 2 **Climatic table.** See 1.170 and 1.179.

Pearl farming

6.294

- 1 Pearl culture farms which may be fixed or moving structures are located within Exmouth Gulf. See 1.8 and the large scale national chart for details.

Marine park

6.295

- 1 Ningaloo Marine Park, the coordinates of which are best seen from the large scale national chart (Aus 744), extends into the NW section of Exmouth Gulf. See *Australian Annual Notices to Mariners* for details.

Principal marks

6.296

- 1 **Landmark:**

North West Cape Light structure (metal framework tower, 30 m in height) (21°49'S 114°10'E), a radio tower elevation 129 m, one of a group up to an elevation of 386 m, standing 1¼ miles S of North West Cape. The radio towers are conspicuous by day and night and can be readily identified on the radar display.

Major light:

North West Cape Light – as above.

Directions*(continued from 6.13, 6.211 and 6.281)***North West Cape to Point Murat****6.297**

- 1 From a position about 5 miles N of North West Cape (21°47'S 114°10'E) the route leads initially ESE passing: NNE of North West Reef (21°46'S 114°10'E) which lies within the outer edge of a spit, with depths of less than 10 m, which extends 1¾ miles N from North West Cape. The sea generally breaks heavily on this reef. There are heavy tide-rips between the reef and the cape with fresh winds and the tidal streams are strong and somewhat irregular. Mariners should always pass outside this reef. North West Cape is a low sandy point formed by a ridge of sandhills from 12 to 18 m high. The drying coastal reef extends 5 cables N from the cape and on it is a wreck standing out of the water and appearing like a hulk at anchor; it is conspicuous from W. North West Cape Light (6.296) is exhibited on the cape. Thence:
- 2 To a position ENE of North West Cape, distant 4½ miles, noting South Muiron Island (6.275) which lies 9 miles ENE.
The passage then leads SSW passing:
ESE of Point Murat Wharf (6.305) situated on Point Murat (21°49'S 114°11'E); and:
- 3 WNW of an area of sandwaves which lie 5 miles W of Exmouth Reef (21°52'S 114°23'E), noting the patches with a least depth of 4-6 m, which lie 2½ miles NNW of the reef.

Point Murat to Learmonth**6.298**

- 1 From a position about 1½ miles E of Point Murat (21°49'S 114°11'E) the route continues SSW passing (with positions given from Learmonth Solar Observatory (22°13'S 114°06'E)):
ESE of Bundegi Reef (21°51'S 114°11'E); thence:
ESE of Town Beach noting the dangerous rock (16½ miles N) lying 5 cables offshore; thence:
- 2 WNW of Cooper Shoal (12 miles NE); thence:
ESE of a conspicuous radio tower (10¼ miles N) (height 35 m); thence:
Between a 9-8 m patch (10 miles N) and Camplin Shoal (10½ miles NNE); thence:
WNW of Bennett Shoal (8 miles NNE), distant 1 mile.
- 3 The track then leads S passing:
E of a reef with depths of less than 2 m over it (charted as dangerous rocks) (7 miles N) lying 1 mile offshore; thence:
E of Stewart Shoal (5 miles N); and:
W of Larkin Shoal (12 miles ENE); thence:
E of Wapet Shoal (2 miles NNE), distant 1 mile.

6.299

- 1 **Useful marks:**
Conspicuous tower (red and white bands) (21°53'S 114°08'E), 91 m high, marked by a red obstruction light.
Water tower (21°53'S 114°08'E).
Town Beach towers (21°58'S 114°08'E).
Fish processing factory (22°12'2S 114°05'3E).
Conspicuous tanks (22°12'8S 114°05'8E).
Learmonth Solar Observatory (22°13'2S 114°06'1E).

Port Exmouth**General information****6.300**

- 1 **Position and function.** Port Exmouth is situated on the W side of Exmouth Gulf.
Point Murat Wharf (21°49'S 114°11'E) at the entrance to the gulf, in the N of the port area, is for the import of general cargo, fuel and technical equipment.
Port limits are, as indicated on the chart, a line drawn from North West Cape to Point Lefroy (22°18'S 114°11'E).
Port Control. Officer in Charge, Prohibited Areas, Harold E Holt Naval Communications Base, Exmouth.

Limiting conditions**6.301**

- 1 **Deepest and longest berth:** Point Murat Wharf (6.305).
Density of water: 1.025 g/cm³.
Maximum size of vessel handled: up to 170 m in length, draught 10 m, at Point Murat Wharf.
- 2 **Local weather and sea state.** The N part of the W side of Exmouth Gulf is very exposed to prevailing S winds and in the vicinity of Bundegi Reef (21°51'S 114°11'E) sufficient fetch exists to allow the formation of a considerable swell. Point Murat Wharf offers no protection from S or SE winds and the low sandhills in the vicinity offer little protection from SW winds. As the prevailing winds are from a SE direction mariners berthed alongside should note that such winds very quickly produce a choppy sea and ground swell, and when the wind force is above 3 or 4 a vessel will begin to pound on to the wharf. Mariners in light-hulled vessels are cautioned not to lie alongside overnight as the sea conditions may deteriorate quickly without warning.

Arrival information**6.302**

- 1 **Port radio.** Limited VHF facilities are normally only available during working hours. Contact can be made by radio telephone on 2716 Kcs, call sign NAVCOMSTA.
Notice of ETA should be sent 24 hours in advance.
- 2 **Outer anchorages:**
One mile off Point Murat Wharf, good holding ground.
Learmonth Anchorage, 1 mile E of Wapet Shoal (22°12'S 114°07'E), in a depth of 8 m.
Anchorage can be obtained 1 mile NE of the boat harbour (21°57'S 114°08'E) in 8 m. The holding ground is reported poor in SE gales.
- 3 **Pilotage** is not compulsory. If required pilots may be obtained through the Port Authority, Fremantle. Boarding position: 1 mile NE of Point Murat Wharf.
Tugs are not available.
Regulations concerning entry. The area, indicated on the chart, surrounding Point Murat Wharf is a prohibited area. Mariners are warned not to enter this area without prior permission of the Civil Commissioner, Exmouth.
- 4 Berthing is permitted only during daylight hours.
Quarantine. Port Exmouth is a first port of entry see 1.54. The quarantine line is an arc with a radius of 5 cables centred on Point Murat. See *Australian Annual Notice to Mariners* and 1.54.

Harbour**6.303**

- 1 **General layout.** Point Murat Wharf, a pier 315 m in length with a T-head, extends ESE from the coast close SW of Point Murat.

Historic wreck of the vessel *Fairy Queen* lies 3 cables SW of the root of Point Murat Wharf. See also 1.60.

Wapet Jetty, Learmonth, is situated in the S part of the port area, 24 miles S of Point Murat. The jetty is disused and in a poor state of repair (2003).

Directions

6.304

- 1 Point Murat Wharf is approached from E of Point Murat (21°49'S 114°11'E) from the route (6.297) through Exmouth Gulf. There are no dangers in the approach to the berth.

It is recommended that vessels berth heading S 2 to 3 hours after the start of the falling tide, making use of the port anchor. The falling tide sets onto the jetty.

Alongside berths

6.305

- 1 **Point Murat Wharf** (21°49'S 114°11'E) has an alongside depth of 12 m (1989) with a deck height of 6.1 m above LW. The wharf has a berthing face of 49 m, with breasting dolphins extending the length to 106 m. The distance between the outer mooring dolphins is 320 m.

Port services

6.306

- 1 **Repairs** are not available.

Supplies: fresh water is not available, except in an emergency.

Communications. There is an airport at Learmonth.

6.307

- 1 Bay of Rest is entered between Heron Point (22°16'S 114°08'E) and Point Lefroy, 3½ miles SE. There are depths of from 5 to 7 m in the entrance but within it is shallow and for the greater part consists of drying sands. A narrow boat channel near the SE shore leads to the head of the bay.

- 2 Mariners in shallow-draught vessels can obtain anchorage N of Point Lefroy (22°18'S 114°11'E) noting Schofield Shoal, 2¾ miles NNE of the point.

Danger. Schofield Shoal lies in the approach, 2¾ miles NNE of Point Lefroy.

Anchorage

General information

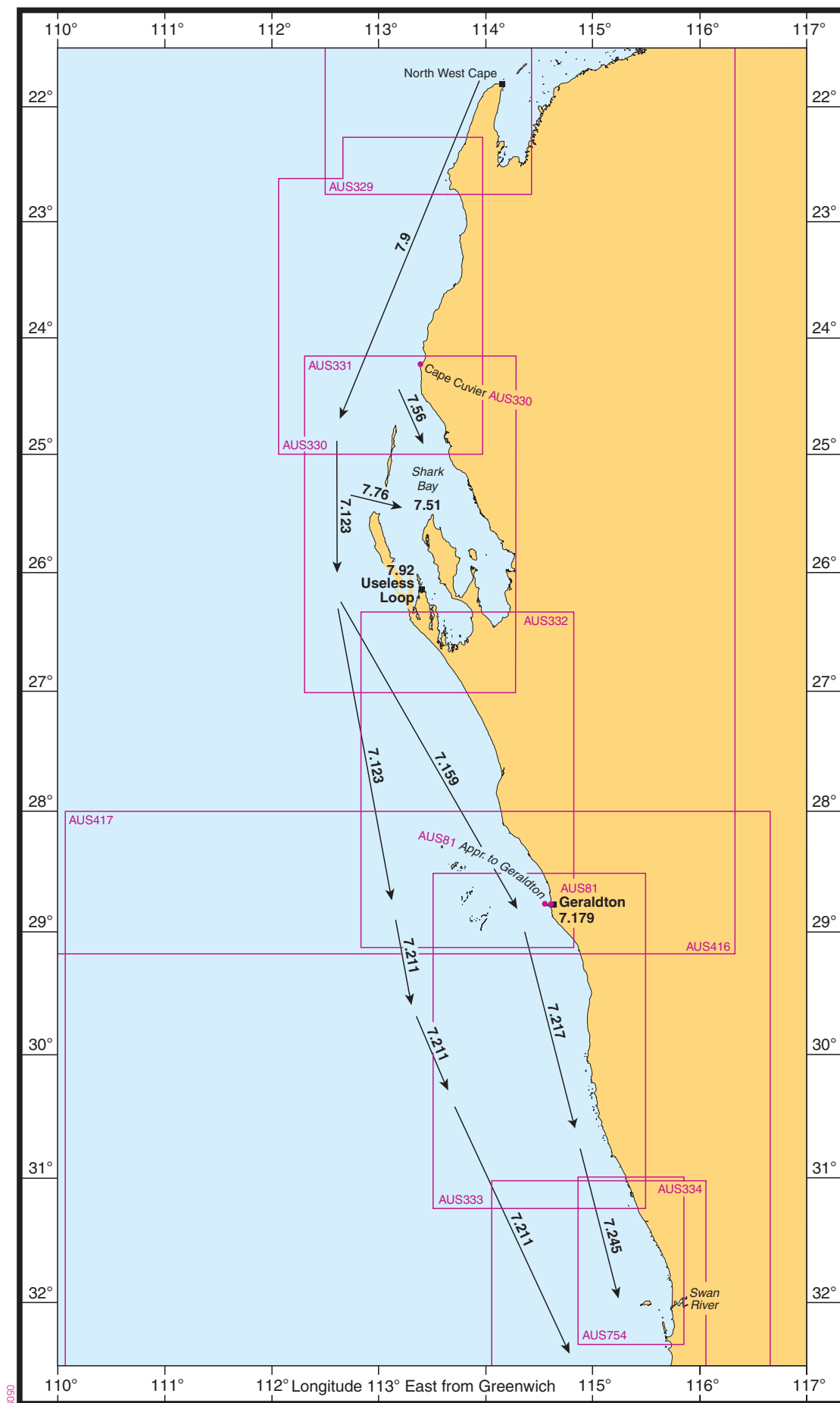
6.308

- 1 In general the holding ground in Exmouth Gulf is good, the fine brown sand having almost the consistency of mud. Anchorage becomes considerably less exposed towards the S part of the gulf, and little or no swell is experienced S of Learmonth.

NOTES



Chapter 7 - North West Cape to Swan River



CHAPTER 7

NORTH WEST CAPE TO SWAN RIVER

GENERAL INFORMATION

Charts Aus 416, Aus 417, Aus 4708

Scope of chapter**7.1**

- 1 This chapter covers the W coast of Australia from North West Cape (21°47'S 114°10'E) to the approaches to Fremantle, about 600 miles S.

Ports**7.2**

- 1 The ports of Carnarvon (24°52'S 113°39'E) (7.63), including Cape Cuvier and Useless Loop, and Geraldton (28°47'S 114°36'E) (7.179) are covered by this chapter.

Sea level**7.3**

- 1 From Geraldton to beyond Fremantle the sea level is greatly influenced by winds. The land winds, which prevail during the summer months from 0000 to about 0900 or 1000, cause the lowest levels. West and NW winds, being more prevalent during the winter months cause the highest levels.
- 2 There is an unusual rise of the water before a NW gale, and during the continuance of the gale the sea level remains from 0.9 to 1.2 m above its ordinary level. The sea level is correspondingly lowered during S winds, and LW then falls below datum, a maximum of 0.6 m below datum having been recorded. See also, non-tidal changes in sea level in *The Mariner's Handbook*.

Exercise areas**7.4**

- 1 Military exercises are conducted in:
- A circle of radius 40 miles centred on Learmonth (22°13'S 114°06'E).
 - A segment of a circle 160° to 340°, 40 to 150 miles centred on Learmonth (22°13'S 114°06'E).

The vicinity of Flat Rock (30°46'S 115°10'E).

The vicinity of Wedge Island (30°50'S 115°11'E) (7.260) and Lancelin Island (31°01'S 115°20'E) (7.261).

- 2 An area centred on 31°25'S 114°20'E

An area centred on 31°40'S 115°10'E

See 1.9, *Australian Seafarers Handbook AHP 20* for general information and *Annual Australian Notices to Mariners* for details.

Lobster Fishery**7.5**

- 1 Between November and June extensive lobster fishing takes place on the continental shelf between the parallels of 24°S and 34°S. When passage permits mariners are requested to transit outside the 200 m depth contour. For further details see 1.6.

Dangerous marine life**7.6**

- 1 Blowfish (Tetrodon) of large size, which are very poisonous, abound in Shark Bay (25°30'S 113°30'E) and, if eaten, death usually occurs after a few hours.
- Poisonous blowfish of smaller size are found near the Australian coast as far S as Cape Leeuwin (34°23'S 115°08'E).

Marine protected areas**7.7**

- 1 Ningaloo marine park centred on 22°37'S 113°32'E, Hamelin Pool marine park centred on 26°20'S 114°00'E and Shark Bay marine park centred on 26°00'S 113°00'E lie within the area covered by this chapter. For details see *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

NORTH WEST CAPE TO CAPE INSCRIPTION

General information

Chart 416

Scope of section**7.8**

- 1 The area covered by this section comprises:
- North West Cape to Geographe Channel (7.9)
 - Geographe Channel to Cape Inscription (7.44)

NORTH WEST CAPE TO
GEOGRAPHE CHANNEL**General information**

Charts Aus 329, Aus 330, Aus 416

Route**7.9**

- 1 From NW of North West Cape (21°47'S 114°10'E) the passage to Geographe Channel leads initially SW, about 17 miles, to NW of Low Point (21°58'S 113°56'E). The

passage then leads generally SSW, about 160 miles, to a position W of Point Quobba Light, off the N entrance to Geographe Channel.

Topography**7.10**

- 1 Vlamingh (Vlaming) Head (21°48'S 114°06'E), is 3 miles WSW of North West Cape, the extremity of Cape Range, a high range of rugged hills extending almost the entire length of which North West Cape is the extremity. On the seaward side the slopes of the range are steep with deep ravines. Weajuggoo Hill (Wealjugoo Hill) (22°34'S 113°43'E) is situated at the S end of the peninsula about 10 miles NNE of Point Cloates (22°43'S 113°40'E).
- 2 The coast between Cape Farquhar (23°38'S 113°37'E), 54 miles S of Point Cloates, and Red Bluff, 27 miles farther SSW, is low and sandy. About 10 miles NNE of Red Bluff there are some red cliffs fronted by rocks, the land being level. Red Bluff is level, rocky and of a dark reddish

colour, rising abruptly from the sea to a height of about 90 m, and can be readily identified on the radar display.

- 3 Cape Cuvier (24°14'S 113°23'E), situated 11 miles S of Red Bluff, is about 120 m high with light reddish cliffs, and is readily identified when seen from the N. White salt stockpiles on the cape are prominent, and a large dark coloured storage shed is conspicuous. The cape can be readily identified on the radar display.

Depths

7.11

- 1 From Vlamingh Head to Point Cloates, 60 miles SSW, the charted 200 m (100 fm) depth contour lies from 3 to 10 miles off this stretch of coast. Between Point Cloates and Point Quobba, 107 miles S, the coast recedes slightly and the distance of the charted 200 m (100 fm) depth contour from the coast increases gradually from 7 miles at Point Cloates to 45 miles at Point Quobba.

- 2 **Caution.** There are no known offshore dangers in the area between Point Cloates and Point Quobba but much of this area has not been thoroughly examined and uncharted dangers may exist, particularly in the bight between Point Maud (23°07'S 113°46'E) and Cape Farquhar, 32 miles SSW.

Currents

7.12

- 1 Currents setting towards the coast have been experienced in the neighbourhood of North West Cape (21°47'S 114°10'E).

A strong set towards the coast is experienced between Bulbarli Point (23°32'S 113°43'E) and the entrance to Geographe Channel, 70 miles SSW, before the onset of W gales.

Principal marks

7.13

- 1 **Landmark:**
North West Cape Light structure (21°49'S 114°10'E) (6.296).
Major lights:
North West Cape Light – as above.
Point Cloates Light (white hut, 2 m in height) (22°43'S 113°41'E).
- 2 Floodlights on Cape Cuvier jetty head (24°13'S 113°24'E).
Point Quobba Light (24°29'S 113°25'E) (7.59). This light is at the extreme limit of its range.

Directions

(continued from 6.13 and 6.281)

Barrier Reef

7.14

- 1 From Vlamingh Head (21°48'S 114°06'E) to Amherst Point, 105 miles SSW, the coast is fronted by Ningaloo Reef, a barrier reef from 1 to 4 miles offshore. This barrier reef should not be approached by mariners in passing vessels within a distance of 1 mile.

The barrier reef can be readily identified on the radar display.

Chart Aus 329 (see 1.16)

North West Cape to Low Point

7.15

- 1 From a position NW of North West Cape (21°47'S 114°10'E) the route leads generally SW passing (with positions given from Vlamingh Head (21°48'S 114°06'E)):

NW of Vlamingh Head (7.10); thence:

NW of Helby Bank (4 miles W); the sea has been observed to break on this bank with a heavy swell; thence:

- 2 NW of False Island Point (5½ miles SW), which appears as an island when seen from NE and SW; thence:

NW of Jurabi Point (7½ miles SW) (7.42); thence:

NW of Low Point (14 miles SW).

7.16

- 1 **Useful mark:**

Conspicuous disused lighthouse, 12 m in height, of grey concrete on Vlamingh Head (21°48'S 114°06'E).

Low Point to Point Cloates

7.17

- 1 From a position NW of Low Point (21°58'S 113°56'E), clear of the barrier reef, the route then leads generally SSW passing (with positions given from Point Cloates Light (22°43'S 113°41'E)):

WNW of a headland (8 miles N) on the N side of Norwegian Bay; thence:

WNW of Frazer Island (5 miles NW) (7.20); thence: WNW of Point Cloates.

7.18

- 1 **Useful mark:**

Conspicuous masonry tower (disused lighthouse, 14 m in height) (22°42'S 113°41'E) on the summit of Cloates Hill, 5 cables N of Point Cloates Light.

Chart Aus 330 (see 1.16)

Point Cloates to Geographe Channel

7.19

- 1 From a position WNW of Point Cloates Light (22°43'S 113°41'E), clear of the barrier reef, the track continues generally SSW passing (with positions given from Cape Cuvier (24°14'S 113°23'E)):

WNW of Black Rock (22°46'S 113°39'E) (7.24); thence:

- 2 WNW of Red Bluff (11 miles N) (7.10), noting the patches with depths of 31 and 33 m (17 and 18 fm) over them which lie 17½ and 13½ miles NNW, respectively, of Red Bluff, and about 9 miles offshore; thence:

WNW of Cape Cuvier (7.10); thence:

- 3 To a position about 14 miles W of Point Quobba Light (16 miles S) near the N entrance to Geographe Channel.

(Directions continue at 7.49 and for Geographe Channel at 7.60)

Norwegian Bay

Chart Aus 330 (See 1.16)

General information

7.20

- 1 Norwegian Bay (22°37'S 113°39'E), sheltered by the barrier reef which lies from 2 to 3 miles offshore in this vicinity, affords anchorage to mariners in vessels able to enter.

Local knowledge is required.

Topography. Frazer Island (22°39'S 113°38'E), a sandy island, lies 5 miles NNW of Point Cloates, just within the barrier reef and about 2 miles offshore.

- 2 A disused whaling station is situated in the NE corner of Norwegian Bay, 7½ miles N of Point Cloates.

Port limit is the arc of a circle, radius 12 miles, centred in position 22°35'S 113°41'E.

Historic wrecks of the vessels *Zvir* and *Fynd*, and of the vessels *Perth* and *Rapid*, lie $2\frac{3}{4}$ miles N and on the S extremity of Frazer Island, and $2\frac{1}{2}$ miles NW and 1 mile SE of Point Cloates. See 1.60.

Directions

7.21

- 1 **Entrance.** The recommended entrance through the barrier reef, situated about $6\frac{1}{2}$ miles NNW of the disused lighthouse on Point Cloates (7.18), is about 5 cables wide. The swell breaks heavily in the entrance after W winds.

Leading marks:

Front beacon (black and white triangular beacon)
($22^{\circ}37'4S$ $113^{\circ}40'0E$).

Rear beacon (black and white triangular beacon)
(1 cable ESE of the front beacon).

- 2 The alignment (117°) of the above beacons, situated on the E shore $1\frac{3}{4}$ miles S of the disused whaling station, leads through the barrier reef in a least depth of 5.2 m (charted 18 ft) passing close N of a 4 m (13 ft) patch which lies $\frac{3}{4}$ cable S of the leading line, $1\frac{1}{2}$ miles from the front leading beacon.

- 3 The line of bearing 048° of the disused whaling station then leads NE to the anchorage.

Caution. A submerged coral reef with a depth of 1.5 m (5 ft) on its outer part extends $8\frac{1}{2}$ cables from the shore in front of the leading beacons. In 1985 it was reported that the leading beacons were difficult to see and in a bad state of repair.

Anchorage

7.22

- 1 Anchorage, which was formerly used by whaling vessels, can be obtained SW of the disused whaling station in a depth of 6 m (18 ft).

Caution. Within a distance of 1 mile from the disused whaling station there are several shoals with depths of less than 1.8 m (6 ft) over them, their position can best be seen from the large scale national chart.

Point Cloates anchorage

7.23

- 1 Anchorage can be obtained by small craft with a draught not exceeding 2.5 m (8 ft) within the horn of the barrier reef E of Point Cloates. The holding ground is fairly good but there is generally a swell and there is no protection from S.

Current. In the offing a strong current has been observed setting S and obliquely towards the land and should be guarded against.

- 2 **Approach** is through Black Rock Passage, an opening in the barrier reef about 2 miles S of Point Cloates.

Depths shoal suddenly from 22 to 8.2 m (12 fm to 27 ft) in the middle of the opening, but they deepen to 14.6 m (48 ft) about $7\frac{1}{2}$ cables farther inside, and then shoal gradually towards the beach.

7.24

- 1 **Leading mark.** The line of bearing 061° of Entrance Hill ($22^{\circ}43'S$ $113^{\circ}45'E$), the highest of the coastal sandhills $4\frac{1}{2}$ miles E of Point Cloates, leads through Black Rock Passage passing SSE of Black Rock ($22^{\circ}46'S$ $113^{\circ}39'E$) on which the sea always breaks.

7.25

- 1 **Boat passage** leads inside the barrier reef from Norwegian Bay to Point Cloates and from Point Cloates Anchorage to Chabjuwardoo Bay, 15 miles SSE.

Bateman Bay

General information

7.26

- 1 Bateman Bay (Maud Landing) entered 4 miles N of Point Maud ($23^{\circ}07'S$ $113^{\circ}46'E$) affords anchorage for vessels of shallow draught but there are many coral pinnacles and shoals in the inner part. Cardabia, with an airstrip close by, stands $2\frac{1}{2}$ miles ENE of Point Maude.

Local knowledge is required.

Historic wreck, believed to be the nineteenth century trader *Emma*, lies $2\frac{3}{4}$ miles NNW of Point Maud. See 1.60.

7.27

- 1 **Barrier Reef.** The bay is approached through a break in the barrier reef nearly $2\frac{1}{2}$ miles wide. The barrier reef on either side of the opening dries in places from 0.3 to 0.6 m (1 to 2 ft) and the sea usually breaks heavily on it. The S portion, which protects the anchorage, extends about 3 miles N from a position $7\frac{1}{2}$ cables W of Point Maud.

7.28

- 1 **Topography.** Yalobia Hill ($23^{\circ}12'S$ $113^{\circ}47'E$), with a sand patch on its seaward side, lies 5 miles S of Point Maud and is the first land seen approaching from SW. Maud Hill, 8 cables E of Point Maud, will be identified as the land is approached. A radio tower ($23^{\circ}08'8S$ $113^{\circ}46'2E$), stands $1\frac{1}{2}$ miles SSE of Point Maud.

7.29

- 1 **Depths.** In the opening through the barrier reef there are depths of not less than 14.6 m (48 ft) over the greater part of it.

- 2 In the S part of Bateman Bay depths of less than 5.5 m (18 ft) extend about 5 cables offshore in the E part, and 2 miles offshore in the W part. There are a number of detached patches, with depths of less than 5.5 m (18 ft) over them, the outermost of which lies $2\frac{1}{4}$ miles N of Point Maud and has a least depth of 4.9 m (16 ft) over it. The remainder can best be seen from the large scale national chart.

7.30

- 1 **Swell.** A long, low swell, which extends through the opening and fans out, is felt at all times within the reef where it averages 0.6 m (2 ft) in height in normal weather conditions.

Tidal streams in the approach to Bateman Bay are weak and variable.

7.31

- 1 **Port limit** is a line drawn W from Point Maud for 3 miles, thence N for 9 miles, thence E to the coast.

Directions

7.32

- 1 Approach to Bateman Bay should be made from W on the parallel of the break in the barrier reef, on an E track, which leads through the entrance reefs passing (with positions given from Point Maud ($23^{\circ}07'S$ $113^{\circ}46'E$)):

N of a 4.6 m (charted 14 ft) shoal ($3\frac{1}{4}$ miles NNW) which lies off the N extremity of the barrier reef on the S side of the opening; thence:

N of a 7 m (charted 27 ft) patch ($2\frac{1}{2}$ miles N); thence to the anchorage.

Anchorage

7.33

- 1 Anchorage may be obtained, as convenient, in the S portion of the bay.

Stanley Pool

7.34

- 1 **Description.** Stanley Pool, within the barrier reef on the N side of Bateman Bay, lies about 8 miles NNE of Point Maud and affords anchorage during strong N winds.
- 2 **Entrance channel.** A 3.3 m (charted 10 ft) patch (23°02'4S 113°47'8E) lies nearly 1 mile ENE of the E extremity of the barrier reef on the N side of the entrance to Bateman Bay, on the flat which extends E from this reef. The entrance to the channel leading to Stanley Pool from Bateman Bay lies about 6 cables E of this patch. The entrance channel leads NNW, for about 1¼ miles, and then N for about the same distance, but it narrows to a width of only 1 cable between the 11 m (36 ft) depth contours in its N part.
- 3 **Anchorage** can be obtained in Stanley Pool in a depth of 13 m (42 ft). The edge of the reef is generally shown by the greenish colour of the water.

Port of Cape Cuvier

Chart Aus 330

General information

7.35

- 1 **Position and function.** The port of Cape Cuvier (24°13'S 113°24'E) lies about 40 miles NNW of Carnarvon. The port is for the export of salt only.
- Topography.** A rock 3 m (10 ft) high lies on the drying reef which extends 1 cable N from Cape Cuvier (24°14'S 113°23'E) (7.10). Reefs, on which the sea breaks, fringe the shore of the bight between Cape Cuvier and a point 8 miles N. A stranded wreck lies on the shore of this bight, 2 miles ENE of the cape.
- 2 In 2002, 9 vessels totalling 397 418 dwt used the port.
- Port limits and Port Authority.** The port is incorporated into the port of Carnarvon, for details see 7.63.
- Operator:** Dampier Salt (Operations) Pty, Lake MacLeod Division, Carnarvon.

Limiting conditions

7.36

- 1 **Density of water:** 1.025 g/cm³.
- Maximum size of vessel handled.** Vessels of 70 000 dwt call on a regular basis.
- Local weather.** Berthing may be delayed due to strong winds or heavy swell. Mariners may occasionally be required to return to anchor before completion of loading if the berth is effected by bad weather conditions.

Arrival information

7.37

- 1 **Notice of ETA** should be sent to the operators 10 days before arrival and updated at periods thereafter, for details see *Admiralty List of Radio Signals Volume 6 (4)*.
- Anchorage** can be obtained 1½ miles NNE of Cape Cuvier Jetty head (24°13'S 113°24'E) in about 27 m (15 fm), good holding.
- 2 **Pilotage** is compulsory and pilots are available from Fremantle. Pilot boards 1 mile N of Cape Cuvier Jetty head. The pilot will remain onboard for the entire loading period.
- Tugs** are available.

Regulations concerning entry. Berthing is limited to daylight hours only.

- 3 **Quarantine.** Carnarvon is a first port of entry and radio pratique may be available. For details see *Admiralty List of Radio Signals Volume 1 (2)* and 1.54.

Harbour

7.38

- 1 **General layout.** A jetty, 560 m in length, extends NNE from the bay on the N side of Cape Cuvier and carries the loader conveyor system to a shiploader at the end of the jetty. The shiploader, although in a fixed position, can be slewed so that two holds can be loaded consecutively.

Landmark:

Cape Cuvier (24°14'S 113°23'E) (7.10).

Major light:

Cape Cuvier jetty head (24°13'S 113°24'E) (7.13).

Directions for entering harbour

7.39

- 1 The berth is approached in clear water from W passing N of Cape Cuvier, or from E depending upon the prevailing weather conditions. When secured in the berth vessels should lie bow E or W.

Berth

7.40

- 1 Vessels moor to a six point mooring system and lie approximately 15 m off the shiploader. The shiploader is fixed and vessels are required to warp along the berth to load. The depth in the berth is 17.8 m.

Port services

7.41

- 1 **Repairs and supplies:** none.
- Communications,** connecting flights are available from Carnarvon to international airports.
- Harbour regulations.** Main engines are not to be immobilised whilst the vessels is in the berth and must be ready at all times.

Minor passages and anchorage

Charts Aus 329, Aus 330, (see 1.16)

Boat passages

7.42

- 1 There is a boat passage through the barrier reef 2 miles WSW of Jurabi Point (21°52'S 114°00'E). Leading beacons for this passage are situated on the shore 1½ miles SSW of Jurabi Point.
- The coast between Point Cloates (22°43'S 113°40'E) and Point Maud, 24 miles S, forms a slight bay and the barrier reef, following the curve of the coast, lies from 3 to 4 miles offshore. Within the barrier reef there is a channel for boats. There is a boat passage through a break in the barrier reef about 12 miles SSE of Point Cloates.
- 2 **Yalobia Passage.** The alignment (077¼°) of beacons (23°12'S 113°47'E) on the coast 1 mile N of Point Anderson leads through Yalobia Passage, a gap in the barrier reef.

Local knowledge is required.

Bulbarli anchorage

7.43

- 1 Bulbarli is an exposed anchorage N of Bulbarli Point (23°32'S 113°43'E), 8 miles NE of Cape Farquhar, but the surf usually makes landing impracticable here. A rough beacon (uncharted) is erected over the only landing place.
- There is a conspicuous white sandhill at Alison Point, 2 miles NNE of the beacon, and about 3 miles farther NNE

is a distinctive white sand patch which helps to identify the place.

- 2 North Reef (23°31'S 113°43'E), on which the sea breaks occasionally, lies 2 miles NW of the beacon at Bulbarli. **Local knowledge** is required.

GEOGRAPHE CHANNEL TO CAPE INSCRIPTION

General information

Chart Aus 331

Route

7.44

- 1 From W of Point Quobba (24°29'S 113°24'E), off the N entrance to Geographe Channel, the route leads generally SSW, about 60 miles, off the W sides of Bernier and Dorre Islands to NW of Cape Inscription, off the W entrance to Naturaliste Channel.

Topography

7.45

- 1 Bernier, Dorre and Dirk Hartog Islands lie between 20 miles SW and 100 miles SSW of Point Quobba and form the W side of Shark Bay (7.51).
The W side of Bernier Island, the N-most island, consists of high level perpendicular cliffs, fringed by a narrow drying reef.
- 2 Dorre Island lies immediately S of Bernier Island and is similar in appearance, but is slightly higher. The W coast of the island is, for the most part, bordered by cliffs.

SHARK BAY

GENERAL INFORMATION

Chart Aus 331 (see 1.16)

Scope of section

7.50

- 1 The area within this section comprises:
Geographe Channel and North Part of Shark Bay (7.56).
Naturaliste Channel and South West Part of Shark Bay (7.76).
South East Part of Shark Bay (7.111).

Description

7.51

- 1 Shark Bay is bounded on the E by the mainland for about 120 miles S of Point Quobba (24°29'S 113°24'E) and on the W by Bernier, Dorre and Dirk Hartog Islands, and the peninsula of Edel Land (7.124).
The bay is approached and entered from N through Geographe Channel (7.56), from W through Naturaliste Channel (7.76) and, for small craft only, from S through South Passage (7.106).
- 2 The N portion of the bay is relatively deep and suitable for most classes of vessel.
The S and larger portion of the bay is divided into two arms by Peron Peninsula. The W arm leads through Denham Sound and Freycinet Reach into Henri Freycinet Harbour, and through Denham Channel into Useless Loop. The E arm leads through Hopeless Reach to Lharidon Bight, and through Disappointment Reach to Hamelin Pool.

Depths

7.46

- 1 The W coast of Bernier Island is steep-to and depths of 50 m (27 fm) are found about 8 cables from the cliffs. The waters within 5 miles of the W side of Bernier, Dorre and Dirk Hartog Islands have not been thoroughly examined. The 100 m depth contour lies 5 to 30 miles W of them.

Charting

7.47

- 1 For information regarding charting see 7.52.

Major light

7.48

- 1 Point Quobba Light (24°29'S 113°25'E) (7.59).

Directions

(continued from 7.19)

7.49

- 1 From a position about 14 miles W of Point Quobba, near the extreme limit of the range of Point Quobba Light, the passage continues generally SSW passing:
WNW of Bernier Island; Cape Ronsard Light (24°46'S 113°10'E) (7.60) is exhibited from the N extremity of the island; thence:
- 2 WNW of Dorre Island; Cape Saint Cricq Light (25°16'S 113°05'E) (7.84) is exhibited near S extremity of the island; thence:
To a position NW of Cape Inscription (25°29'S 112°58'E) (7.77), the N extremity of Dirk Hartog Island. A light (7.83) is exhibited from the cape.
(Directions continue at 7.129 and for Naturaliste Channel at 7.83)

Carnarvon is situated in Shark Bay on the E side of the S entrance point to Gascoyne River (24°54'S 113°39'E).

Charting

7.52

- 1 **Caution.** Chart Aus 331 is not based on adequate hydrographic surveys in all areas, which include the seaward approaches to the three entrance channels, mariners are warned to proceed with caution because uncharted dangers may exist.
- 2 In 1968 it was reported that the shoals N of Cape Peron North (25°31'S 113°31'E) extend much farther N than charted, and the whole of the uncharted area E of Longitude 113°45'E is reported to be very shallow. In 1981 it was reported that Cape Peron North appeared to lie 3 to 4 cables W of its charted position.
- 3 **Fixing.** It is recommended that the fixing of a vessel's position is best done by a combined radar range and visual bearing of a prominent position.

Local knowledge

7.53

- 1 Local knowledge is advisable for Naturaliste Channel (7.76) and caution is required.

Marine and estuarine protected areas

7.54

- 1 Shark Bay contains a number of areas designated as marine or estuarine protected areas. See large scale national charts and *Australian Annual Notice to Mariners* for details.

Tidal streams**7.55**

- 1 Tidal streams enter Shark Bay by Geographe Channel and Naturaliste Channel on the ingoing tide, meeting near Uranie Bank (25°10'S 113°11'E). The maximum rate at spring tides is about 1¼ kn.

GEOGRAPHE CHANNEL AND NORTH PART OF SHARK BAY

General information

Chart Aus 331 (See 1.16)

Description**7.56**

- 1 Geographe Channel, the N entrance to Shark Bay, is about 21 miles wide between Point Quobba (24°29'S 113°24'E) on the NE side, and Koks Island, on the SW, with depths of over 18 m (60 ft) in the fairway.

Topography**7.57**

- 1 The coast on the E side between Point Quobba and Point Whitmore, the N entrance point of Gascoyne River 25 miles SSE, is mostly barren. A prominent sand patch is situated 9 miles SE of Point Quobba. Between the coastal sandhills and Lyell Range, from 6 to 11 miles inland, there is an extensive marshy plain.
- 2 Koks Island on the W side of the channel, close off Cape Ronsard (24°46'S 113°10'E), the N extremity of Bernier Island, is table-topped, terminating at each end in low cliffs, on the summit of which are several large boulders. The E side of Bernier Island is cliffy in parts, with above and below-water rocks lying close off it.

Natural conditions**7.58**

- 1 **Tidal streams.** During the rising tide the tidal stream sets about E to SE and during the falling tide it sets NW, with a rate of from 1 to 2 kn.

A strong inshore set is experienced between Point Quobba and Gascoyne River, before and after, NW gales.

It is reported that tidal streams, and the times of HW and LW, are very dependent upon weather conditions.

- 2 **Sea level.** In Gascoyne Road (7.63) strong SE winds cause the level of LW to fall up to 0.6 m below the predicted level and during strong NW winds the level of LW does not fall as low as predicted by up to 0.6 m.

Currents. It has been reported on several occasions that a strong S-going current or set towards the land is experienced at times in the approach to Geographe Channel, between Cape Cuvier and Bernier Island. This usually occurs prior to W or NW winds.

Principal marks**7.59**

- 1 **Landmark:**
Beagle Hill (24°29'S 113°25'E), a conspicuous sharp peak, 5 cables inland from Point Quobba.
- Major light:**
Point Quobba Light (white round concrete tower red cupola, 18 m in height) (24°29'S 113°25'E) on Beagle Hill.

Directions

(continued from 7.19)

Geographe Channel to Uranie Bank**7.60**

- 1 From a position about 14 miles W of Point Quobba Light the route leads SSE, giving the E shore of Geographe Channel a clearance of at least 8 miles, passing (with positions given from Cape Ronsard (24°46'S 113°10'E)): WSW of Point Quobba (21 miles NE) (7.59); thence: WSW of Fitzroy Reefs (19 miles NE) on which the sea nearly always breaks; thence:
 - 2 WSW of Darwin Reefs (18 miles NE); the sea only breaks on these reefs in heavy weather; thence: WSW of Beejaling Shoals (18 miles ENE); the sea only breaks on these shoals in heavy weather; and: ENE of Cape Ronsard noting Koks Island (7.57) which lies close off the cape. Cape Ronsard Light (white GRP hut, 4 m in height) stands on the cape. Thence:
 - 3 ENE of Wedge Point (1½ miles S) and associated dangers; thence: ENE of Wedge Rock (3 miles S) (7.61); thence: ENE of Cleft Rock (3½ miles S); thence: ENE of Low Rock (10½ miles S) which lies 4½ cables S of Red Cliff Point; and:
 - 4 WSW of Blowfish Banks (22 miles E) (7.67); thence: WSW of Babbage Island (27 miles ESE) from where a light is exhibited (7.67); and: ENE of Quoin Bluff North (18 miles S); thence: WSW of Elbow Shoal (27 miles SE). During the rising tide the stream sets directly onto this shoal; and:
ENE of Uranie Bank (24 miles S).
- (Directions continue at 7.81)*

Anchorage**Wedge Rock****7.61**

- 1 Safe anchorage can be obtained E of Wedge Rock (24°48'S 113°10'E), distant 2 miles, in a depth of 20 m (11 fm).

Disaster Cove**7.62**

- 1 Disaster Cove entered between Cape Boullanger (25°00'S 113°07'E), the N extremity of Dorre Island, and Smith Point, 1 mile SSE, is a convenient harbour.
Local knowledge is required.

Gascoyne Road and Carnarvon**General information****7.63**

- 1 **Position.** Carnarvon, the principal town of the large pastoral district of Gascoyne, is situated in Shark Bay on the E side of the S entrance point to Gascoyne River (24°54'S 113°39'E).
Gascoyne Road, off the entrance to Gascoyne River, affords anchorage to most classes of vessel.
- 2 **Function.** The port of Carnarvon also incorporates the bulk loading facilities of the ports of Cape Cuvier (24°13'S 113°24'E) (7.35) to the N, and Useless Loop (26°05'S 113°25'E) (7.92) to the S.
Babbage Island jetty (24°53'S 113°37'E) is closed to commercial shipping and Carnarvon harbour now caters only for fishing vessels and small craft.

- 3 **Port limits.** The limits of the port of Carnarvon, as shown on the chart, are enclosed by the bounds of Shark Bay and also includes the ports of Cape Cuvier (24°13'S 113°24'E) (7.35) and Useless Loop (26°05'S 113°25'E) (7.92).

Approach and entry. The port is approached direct from Shark Bay (7.51).

Port Authority. Department of Transport, PO Box 402, Fremantle, Western Australia 6160.

Limiting conditions

7.64

- 1 **Local weather.** Mariners at anchor in Gascoyne Road from December to the end of March should be prepared to put to sea on indications of bad weather.

Arrival information

7.65

- 1 **Coast radio station,** operates from Carnarvon, for details see *Admiralty List of Radio Signals Volume 1* (2).

Notice of ETA should be sent 7 days in advance and at intervals thereafter, to the Harbour Master, Carnarvon, for details see *Admiralty List of Radio Signals Volume 6* (4).

Tugs are available from Carnarvon for the port of Cape Cuvier (7.35).

Quarantine. Carnarvon is a first port of entry, radio pratique may be available, see *Admiralty List of Radio Signals Volume 1* (2) and 1.54.

Harbour

7.66

- 1 **General layout.** Babbage Island (24°53'S 113°38'E) lies between Point Whitmore and Mangrove Point. Carnarvon Jetty, a timber jetty in ruins, extends 8 cables WSW from the NW end of Babbage Island. A jetty for the use of fishing vessels lies 5 cables SE of Carnarvon Jetty.

Gascoyne Road lies off the entrance to Gascoyne River (24°52'S 113°39'E).

- 2 A fishing boat harbour, suitable only for small craft, lies close E of Mangrove Point (24°55'S 113°39'E).

Climatic table, see 1.170 and 1.180.

Landmarks:

Conspicuous dish aerial (24°52'S 113°42'E).

Radio masts (24°55'S 113°43'E), elevation 124 m (charted 405 ft), each marked by a red obstruction light.

- 3 **Major light:**

Carnarvon Aero Light (24°53'S 113°40'E) (occasional).

Directions for entering harbour

7.67

- 1 **Approach from north.** From a position about 11 miles WSW of Blowfish Banks (24°47'S 113°35'E) the line of bearing 090° of Babbage Island Light (white square wooden framework tower, 18 m in height) (24°53'S 113°38'E) exhibited from the NW end of the island leads in the approach to a position 4 miles W of the light.

7.68

- 1 **Approach from south.** From a position about midway between Uranie Bank (25°10'S 113°11'E) and Elbow Shoal (7.60) the route leads NE to a position 4 miles W of Babbage Island Light.

7.69

- 1 **Useful marks:**

Carnarvon Jetty Light (wooden platform, 5 m in height) (24°53'S 113°37'E).

Light (24°53'S 113°38'E) exhibited from the head of a small pier.

Berths

7.70

- 1 **Anchorage.** The best anchorage is off the N entrance to Gascoyne River on the line of bearing 076° of Babbage Island Light (24°53'S 113°38'E), distant 1¼ miles, in a depth of about 6 m (19 ft), sand.
- 2 There is anchorage available off the S entrance to the river on the line of bearing 108° of Mangrove Point (24°55'S 113°39'E) with Babbage Island Light bearing 016°, distant 1½ miles, in a depth of 5 m (16 ft).
- Mariners in vessels of deeper draught must anchor some distance offshore.

Port services

7.71

- 1 **Repairs:** slipway, length 115 m, with a lifting capacity of 180 tonnes, on a cradle 19 m long.

Other facilities: regional government hospital. Oily waste reception facilities are not available, but, in an emergency, road tankers are available.

Supplies: fresh provisions and stores can be supplied to passing vessels by launch.

Communications: connecting air service to international airports.

Fishing harbour

7.72

- 1 A fishing boat harbour, suitable only for small craft, is situated close E of Mangrove Point (24°55'S 113°39'E)

Approach and entry. The harbour is approached on the alignment (070¼°) of Teggs Channel Leading Lights (white piles) (24°54'·4S 113°38'·4E) passing S of No 1A Light-beacon (S cardinal) (24°54'·5S 113°37'·6E) situated 1¼ miles W of Mangrove Point. The track then continues generally ESE through Teggs Channel, marked by light-beacons and beacons, and the harbour is entered by a channel, dredged to 3 m (10 ft) (1975), branching NE off Teggs Channel, thence N on leading lights in line bearing 357½°.

Local knowledge is required.

7.73

- 1 **Gascoyne River** is navigationally unimportant. The entrance, between Point Whitmore and Mangrove Point, is divided into two channels by Babbage Island.

The N channel is barely suitable for boats at HW. The S channel is about 3 cables wide and is winding until its junction with the N channel abreast the NE extremity of Babbage Island.

Local knowledge is required and a good lookout must be kept for the many snags which obstruct the entrance.

Side channel

Uranie Bank

7.74

- 1 Uranie Bank (25°10'S 113°11'E) lies off the E side of Dorre Island and there is a narrow channel between Dorre Island and Uranie Bank.

Local knowledge is required.

Caution. In 1987 a 1·6 m (5 ft) shoal was reported to lie in the centre of this channel, 1½ miles E of White Beach (25°11'S 113°06'E).

7.75

- 1 **Anchorage.** A safe and protected anchorage is reported off White Beach.

NATURALISTE CHANNEL AND SOUTH WEST PART OF SHARK BAY

General information

Chart Aus 331 (see 1.16)

Description

7.76

- 1 Naturaliste Channel, the W entrance to Shark Bay, is about 14 miles wide between Cape Saint Cricq (25°16'S 113°05'E) to the N, and Cape Inscription to the S.

Denham Sound, the outer part of the SW part of Shark Bay, is entered between Cape Levillain (25°30'S 113°01'E), the NE extremity of Dirk Hartog Island, and Cape Peron North, 26 miles E.

Topography

7.77

- 1 Cape Inscription (25°29'S 112°58'E), the N extremity of Dirk Hartog Island, is a remarkable jagged headland, a light (7.83) stands on the cape.

- 2 The E coast of Dirk Hartog Island between Cape Levillain and (The) Quoin Bluff South, 24½ miles SSE, which forms the W part of Denham Sound, consists of red cliffs, from 6 to 18 m high, with occasional sandy beaches, and is fringed by a reef. Sandy Point (25°43'S 113°04'E), 13½ miles S of Cape Levillain, appears as a low sand covered extension of the shore line backed by scrub covered hillocks. Quoin Bluff South is a bold projection and appears as a wedge-shaped island when seen from N.

7.78

- 1 The NW coast of Peron Peninsula between Cape Peron North (25°31'S 113°31'E), its N extremity, and Cape Lesueur, 13½ miles SSW, forms the E side of the N part of Denham Sound and is faced by red sand cliffs on its S part. Cape Lesueur is a bright sandy bluff forming the W elbow of a ridge of barren sandstone cliffs.

Local knowledge

7.79

- 1 For a requirement for local knowledge, see 7.53.

Major light

7.80

- 1 Cape Peron North Light (white steel tube) (25°31'S 113°31'E).

Directions

(continued from 7.60)

Uranie Bank to Denham Channel

7.81

- 1 From a position about midway between Uranie Bank (25°10'S 113°11'E) and Elbow Shoal (7.60) the track leads generally SSW into Denham Sound passing (with positions given from Cape Peron North (25°31'S 113°31'E)):

WNW of Cape Peron Flats which extend about 12 miles N from Cape Peron North; and:

ESE of the 9.1 m (30 ft) patch (19 miles NW) at the SE extremity of Uranie Bank

- 2 ESE of a 9.6 m (31½ ft) patch (16 miles WNW), the E-most of a group of shoals, with depths of less than 11 m (36 ft) over them, which lie E and SE of Dampier Reef (25 miles WNW) (7.83); thence:

WNW of Cape Peron North; thence:

- 3 WNW of the coastal bank with irregular depths of less than 10 m (33 ft) which extends up to 6 miles offshore between Cape Peron North and Cape

Lesueur (13½ miles SSW), noting the two patches of 4.4 m (14½ ft) and 1.3 m (4½ ft) (10½ miles WSW) and the 8.5 m (28 ft) (14½ miles SW) which lie near the edge of the bank.

- 4 The track then leads generally S, passing: E of the bank with depths of less than 10 m (33 ft) extending 4 miles E from Sandy Point (27 miles SW); thence:

W of Bar Flats, which are subject to considerable change, and occupy most of the area between Cape Lesueur (13½ miles SSW) and Heirisson Flats (27 miles SW); and:

- 5 E of the coastal bank with depths of less than 10 m (33 ft) which extends 9 miles NNE from Notch Point (32 miles SW); thence:

To the pilot boarding position (26 miles SW) for Useless Loop (7.92).

7.82

- 1 **Useful mark:**

Denham Channel No 1 light-beacon (25°53'S 113°15'E) which marks the NW extremity of Heirisson Flats.

(Directions for Denham Channel and for Useless Loop are given at 7.96).

Naturaliste Channel to Denham Channel

(continued from 7.49)

7.83

- 1 From NW of Naturaliste Channel the passage leads initially SE passing (with positions given from Cape Inscription (25°29'S 112°58'E)):

NE of Cape Inscription (7.77) distant 4½ miles. Cape Inscription Light (grey concrete tower white cupola, 15 m in height) stands on the cape. And:

- 2 SW of Dampier Reef (9 miles NE) on which the sea breaks in heavy weather; there are strong overfalls over this danger with a W-going tidal stream; thence:

NE of a spit with depths of less than 10 m (33 ft) which extends 8 cables ENE from Cape Levillain (3 miles ESE), noting the patch of discoloured water which lies 1 mile N of the cape, closer to the track; thence:

- 3 NE of Levillain Shoal (4 miles ESE) on which the sea breaks at times; thence:

NE of a detached patch (7½ miles ESE) with a least depth of 8 m (26 ft); thence:

SW of a detached patch (10 miles E) with a least depth of 7.7 m (25 ft).

- 4 When Cape Peron North light bears 060°, distant 17½ miles, the track joins the Uranie Bank to Denham Channel passage (7.81) and leads S to the pilot boarding position (28 miles SSE) for Useless Loop (7.92).

7.84

- 1 **Useful mark:**

Cape Saint Cricq Light (white hut, 2 m in height) (25°16'S 113°05'E).

(Directions for Denham Channel and for Useless Loop are given at 7.96).

Anchorage

Turtle Bay

7.85

- 1 **General information.** Turtle Bay, entered between Cape Inscription (25°29'S 112°58'E) and Cape Levillain, 3 miles ESE, affords good anchorage, sheltered from all winds S of ESE and WSW, which includes the prevailing winds in this

area. The bay should, however, be avoided during the period of NW gales, from May to October.

Local knowledge is required.

- 2 **Topography.** The W shore of the bay, for about 1½ miles SSE of Cape Inscription, is backed by cliffs from 40 to 50 m high and is fronted by drying rocky ledges, about 1 cable wide.

Tidal streams at the anchorage set E on the rising tide and W on the falling tide.

7.86

- 1 **Directions.** From seaward round Cape Inscription (7.77) at a distance of about 5 cables and anchor as described below.

From E, having cleared Levillain Shoal (25°31'S 113°02'E), the line of bearing 278° of Cape Inscription leads between the spit extending from Cape Levillain and the discoloured water (7.83) N of that cape passing:

- 2 Close N of the outer edge of the 10 m (30 ft) depth contour extending ENE from Cape Levillain.

Useful mark:

Cape Inscription Light (25°29'S 112°58'E) (7.83).

7.87

- 1 **Anchorage** can be obtained on the line of bearing 278° of Cape Inscription, distant about 2 miles, in a depth of 15 m (48 ft).

Good landing, especially at HW, can be obtained on the beach.

Herald Bay

7.88

- 1 **General information.** Anchorage can be obtained in Herald Bay, on the N side of Quoin Bluff South (25°53'S 113°09'E) (7.77), about 1 mile NNW of the bluff, in a depth of 7 m (24 ft).

Local knowledge is required.

- 2 **Caution.** A 7.9m (26 ft) shoal lies ¾ miles NE of Quoin Bluff South. A 5.8 m (19 ft) shoal lies 2½ miles N of the bluff and there is a 4.8 m (16 ft) patch midway between this shoal and the head of Herald Bay.

Useful mark:

Denham Channel No 1 light-beacon (25°53'S 113°15'E).

Dirk Hartog Homestead

7.89

- 1 **General information.** Dirk Hartog Homestead is situated on a point 4 miles SSE of Notch Point (25°56'S 113°10'E). Meade Island lies off this point.

Bellefin Flats extend about 5 miles NNW from Cape Bellefin (26°01'S 113°18'E) joining Heirisson Flats, which extend N from Cape Heirisson, to a position 5 miles E of Quoin Bluff South. The channel between these spits and the coastal bank extending from Notch Point forms the N approach to Blind Strait (7.106).

7.90

- 1 **Anchorage** can be obtained with Dirk Hartog Homestead bearing 202°, distant 1½ miles, in a depth of 7 m (24 ft) or with the homestead bearing 317°, distant ¾ miles, in the same depth. Care is necessary when taking up these anchorages as the coastal bank is steep-to.

Local knowledge is required.

7.91

- 1 **Useful marks:**

Denham Channel No 1 light-beacon (25°53'S 113°15'E).

Egg Island (25°55'S 113°09'E).

Port of Useless Loop

General information

7.92

- 1 **Position and function.** Useless Loop is a shoal inlet situated 7 miles SSE of Cape Heirisson (26°01'S 113°22'E) the N extremity of Heirisson Prong. Salt pans have been established in the centre of Heirisson Prong.

The port is for the export of salt.

Port limits and Port Authority. The port is incorporated into the port of Carnarvon, for details see 7.63.

- 2 **Operator:** Shark Bay Salt Joint Ventures, Perth.

Approach and entry. The port is approached through Denham Sound and entered through Denham Channel (7.95).

Limiting conditions

7.93

- 1 **Maximum size of vessel:** length 180 m beam 28 m; normal sailing draught 9.75 m.

Abnormal water levels. Continuous strong S winds may result in abnormal tides giving levels below predictions, whilst low pressure systems in the area may result in tides considerably higher than predictions.

Arrival information

7.94

- 1 **Notice of ETA** should be sent to the operators 72 hours before arrival and at intervals thereafter, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorage. Anchorage can be obtained 1 mile N of Denham Channel No 1 light-beacon (25°53'S 113°15'E).

- 2 **Pilotage** is compulsory and pilots are available from Fremantle. Pilot boards 1 mile N of Denham Channel No 1 light-beacon (25°53'S 113°15'E).

Request for a pilot should be sent through the agent to the operator giving 72, 48 and 24 hours notice at the Useless Loop pilot station.

Tugs are not available.

- 3 **Regulations concerning entry.** Mariners should arrive with their vessels in full or good ballast condition otherwise they may be unable to berth.

Quarantine. Useless Loop, under the administration of Carnarvon, is a first port of entry, radio pratique may be available, see *Admiralty List of Radio Signals Volume 1 (2)* and 1.54.

Harbour

7.95

- 1 **General layout.** Denham Channel is a narrow passage, between Bar Flats and Heirisson Flats. A cut, about 122 m wide, which extends 9 cables SE from Denham Channel No 1 light-beacon (25°53'S 113°15'E), gives access to Denham Channel from Denham Sound.

- 2 **Berth.** A dolphin type jetty, with fixed gantry loader and conveyor belt, associated with the salt pans situated in the centre of Heirisson Prong, is situated E of Slope Island (26°05'S 113°25'E).

Directions for entering harbour

(continued from 7.82)

7.96

- 1 From a position clear of Denham Channel No 1 light-beacon (25°53'S 113°15'E), marking the SW side of the NW entrance to the cut leading to Denham Channel (7.95), the track leads generally SE through Denham Channel, marked by light-beacons, passing (with positions given from Cape Heirisson (26°01'S 113°22'E)):

- 2 Between a 9.6 m patch (31½ ft) (4 miles NNW) and No 10 light-beacon (port hand) noting the 9.4 m patch 6 cables NW; thence:
Between the 10 m contours marking the extent of Heirisson and Bar Flats; thence:
NE of Cape Heirisson; thence:
SW of a 9.4 m patch (2¾ miles E)
- 3 SW of Middle Flat; (4½ miles E) thence:
To a position 3 miles N of Slope Island (5 miles SSE).
- The track then leads S to the berth.

Caution. A shoal with a least depth of 1.6 m (5 ft) (26°06'S 113°27'E) lies 2 miles ESE of the berth and a tongue, with a least depth of 8.7 m (28½ ft), extends ¾ miles NNW from the shoal about 1 mile from the berth.

7.97

- 1 **Useful marks:**
Light (26°05'S 113°25'E) on the salt works jetty.
Aero light (26°09'S 113°25'E) exhibited from a water tower.

Berth 7.98

- 1 A dolphin type jetty, 190 m in length, runs N and S 2 cables E of Slope Island (26°05'S 113°25'E). Vessels must warp along the jetty to position the holds under the loader. The depth at the jetty is 10 m.

Port services 7.99

- 1 There are no facilities, however, see 7.71.

Freycinet Reach

General information 7.100

- 1 **Description.** Freycinet Reach, entered between Middle Bluff (25°49'S 113°28'E) and Cape Heirisson, 13½ miles SW, leads from Denham Sound into Henri Freycinet Harbour (7.105).

Local knowledge is required.

7.101

- 1 **Topography.** The E shore of Freycinet Reach between Lagoon Point (25°55'S 113°31'E) and Goulet Bluff, 20 miles SSE, is fronted by a coastal bank with depths of less than 5.0 m (16½ ft) which extends up to 4 miles offshore. Eagle Bluff (26°05'·7S 113°34'·8E), is a bold sandstone cliff, 42 m high, marked by red and white stripes; Eagle Island lies near the base of the bluff. Wilson Island (26°10'·0S 113°39'·5E) lies 6 miles farther SSE, 4 cables from the shore of Taillefer Isthmus.

- 2 The W shore of Freycinet Reach is formed by the E side of Heirisson Prong.

7.102

- 1 **Dangers.** Middle Flat (26°03'S 113°29'E) and other dangers lie between Eagle Bluff and Useless Loop, their positions can best be seen from the chart.

Boat Haven Loop 7.103

- 1 Boat Haven Loop (26°17'S 113°30'E), a narrow inlet on the W side of Cararang Peninsula, is approached through a narrow channel, with depths of from 5.7 to 7.0 m (19 to 23 ft), in the coastal bank.

- 2 **Dangers.** Lefebre Island (26°14'S 113°30'E) lies on the E side of the entrance to this channel, 2½ miles N of the N extremity of the peninsula, and a shoal, 1.2 m (4ft), lies on

the W side of the entrance, 1¼ miles NW of the island. Briggs Rocks lie on the W side of the channel 1 mile NW of the N extremity of Cararang Peninsula.

Denham 7.104

- 1 Denham situated close SE of Lagoon Point (25°55'S 113°31'E) is a small town.

Outer and inner light-beacons (port hand) lead to the entrance of the buoyed channel into Denham, and N of the shoal bank S of Denham.

Henri Freycinet Harbour

General information 7.105

- 1 **Description.** Henri Freycinet Harbour, at the head of the SW arm of Shark Bay, is entered between Goulet Bluff (26°13'S 113°41'E) and the N extremity of Cararang Peninsula, 10 miles WSW.

- 2 There are fairly regular depths of from 6.7 to 14.0 m (22 to 46 ft) in the central part of the harbour, and in some places secure anchorage might be found, but the approach is difficult, without buoyage, and the harbour seems to be of no value to shipping.

Local knowledge is required, see 7.52.

- 3 **Dangers.** Fork Flat (26°18'S 113°38'E) lies nearly in the middle of the entrance leaving a passage with depths of more than 6.2 m (20 ft) on either side. There are several other detached dangers in Henri Freycinet Harbour, the positions of which can best be seen from the chart.

Useful marks:

Radio masts (26°15'·4S 113°48'·4E) at Nanga, on the Taillefer Isthmus.

South Passage

General information 7.106

- 1 **Description.** South Passage, leading from seaward to the S part of Denham Sound (7.76), is entered between Surf Point (26°07'S 113°11'E) and Steep Point (7.131), the NW extremity of Edel Land 1½ miles SW, and continues N through Blind Strait. South Passage is obstructed by Outer and Inner Bars and should only be attempted by small craft.

Local knowledge is required, see 7.52.

7.107

- 1 **Topography.** Surf Point, on the N side of the passage, is a narrow cliffy peninsula, about 21 m high, having two rocky islets close S of it and a sandy coast on either side. About 7½ cables N of Surf Point there is a conspicuous sand patch, at a height of 107 m, and 7½ cables E of the point there is a conspicuous bare sandhill, about 60 m high. Cape Ransonnet, the S extremity of Dirk Hartog Island, lies 2¾ miles SSE of Surf Point and is a bare wedge-shaped sandstone point with two bare rocks, 2 m (7 ft) high, close off it.

- 2 Cape Bellefin (26°01'S 113°18'E) is the N extremity of Bellefin Prong, a narrow tongue of land which forms the E side of Blind Strait.

7.108

- 1 **Tidal streams** in South Passage are reported to attain a rate of 3 kn on the falling tide at springs causing heavy overfalls on Outer Bar.

Sea level. Strong S winds are reported to cause the water to fall up to 0.6 m below the predicted level.

Directions

7.109

- 1 Approaching South Passage from S, Crayfish Bay (26°21'S 113°17'E) can be mistaken for the entrance to South Passage as both openings take a SE direction and their entrance points are somewhat similar in appearance. The light on Steep Point (26°09'S 113°09'E) (7.131) should identify South Passage.

- 2 The passage leads SE, rounds Cape Ransonnet to the S, then leads N through Blind Strait, its W limits marked by light-beacons, crossing Inner Bar (26°05'S 113°16'E), which obstructs its inner end, before entering Denham Sound.

Significant features in the passage (positioned from Steep Point Light (26°09'S 113°09'E)):

- 3 Ledges which dry and foul ground nearly awash extend 1 mile S from Surf Point (2 miles NNE); except with offshore winds these ledges are usually marked by breakers.
Monkey Rock (3 m (11 ft) high) (5 cables NE), with submerged dangers around it, lies 1½ cables offshore.
- 4 Outer Bar (1 mile NE), between the reefs extending from Surf Point and those extending E from Steep Point has a least depth of 3.1 m (10 ft) over a width of about 5 cables, and is steep-to on its seaward side. There is usually a considerable scend on Outer Bar.
- 5 A channel entered about 2 miles N of Cape Bellefin (7.89), marked by light-beacons and beacons, permits passage across Bellefin Flats and Heirisson Flats (7.81) to Denham Channel.

Anchorage

7.110

- 1 Anchorage can be obtained in the fairway throughout Blind Strait in depths of from 7 to 9 m (24 to 30 ft).
In 1977 HMAS *Adroit*, displacement 146 tons, length 33 m, breadth 6 m, draught 2.2 m, had to seek shelter and used South Passage, with caution, entering on a track of 121° and obtaining good anchorage in mid-channel S of Cape Ransonnet (26°10'S 113°13'E).

SOUTH EAST PART OF SHARK BAY

General information

Chart Aus 331 (see 1.16)

Description

7.111

- 1 The SE arm of Shark Bay is entered between Cape Peron North (25°31'S 113°31'E) and a point 23 miles NE, close W of Denham Hummock.

Local knowledge is required, see 7.52.

Topography

7.112

- 1 On the E side of the SE arm, Denham Hummock, the central of three hummocks, is dominant. From the point W of Denham Hummock to Wooramel River, 43 miles SE, the coast is low, intersected by creeks, and lined with mangroves, through which the tide flows a considerable distance inland in some places. A range of sandhills, scarcely higher than the mangroves, extends along the greater part of this coast.

Caution. The waters fronting this part of the coast have not been examined, see also 7.52.

7.113

- 1 Faure Flat, on which Faure Island (25°51'S 113°53'E) lies, extends almost across the whole width of the SE part of Shark Bay. This flat connects Faure Island with Petit Point (25°57'S 113°52'E), the N extremity of a hilly peninsula which separates Hamelin Pool from Lharidon Bight.

Hopeless Reach

General information

7.114

- 1 Hopeless Reach, the N part of the SE arm of Shark Bay, has general depths of from 12.6 to 16.3 m (41 to 53½ ft) in the fairway between the coastal banks on either side.
Herald Bight, on the W side of the SE arm, is entered between Cape Peron North (25°31'S 113°31'E) and Guichenault Point, 7½ miles SSE. Herald Bluff, at the SE corner of the bight, lies close S of Guichenault Point.

7.115

- 1 **Dangers.** Cape Peron Flats extend about 12 miles N from Cape Peron North. A submerged ledge, with depths of less than 0.3 m (1 ft) over its greater part, extends 5 miles N from Herald Bluff.
- 2 **Fish research areas**, marked by light-buoys (special), are situated 4 miles NNE and 12 miles ENE, respectively, of Cape Peron North.
Pearl farms, which may be floating or fixed structures, exist in this area. They, and their associated moorings, should be avoided. The farms are generally marked by buoys and beacons which may be lit.

7.116

- 1 **Major light:**
Cape Peron North Light (25°31'S 113°31'E) (7.80).

Anchorage and harbour

7.117

- 1 **Anchorage** can be obtained:
East of Cape Peron Flats, 5 miles NE of Cape Peron North (25°31'S 113°31'E), in a depth of 17 m (54 ft).
North of Herald Bight, 3¾ miles ESE of Cape Peron North, in a depth of 13 m (42 ft).
In Herald Bight, W of the ledge extending N from Herald Bluff, in depths of about 7 m (23 ft).
- 2 **Monkey Mia Jetty** lies at the head of Red Cliff Bay (25°46'S 113°42'E). It is approached on a generally SSE heading passing between the reef extending up to 8 cables offshore along the E coast of Peron Peninsula, and the reef extending 2 miles N from Eastern Bluff (26°48'S 113°42'E), marked by light-beacons.

Disappointment Reach and Hamelin Pool

General information

7.118

- 1 Disappointment Reach, with a least charted depth of 7.3 m (24 ft) in the fairway, is the passage between the spit extending NNW from Faure Island (25°51'S 113°53'E) (7.113) and the coastal bank extending from the E shore of Shark Bay. It forms the approach to Hamelin Pool, but, 5 miles E of Faure Island, it is divided by Pelican Island Spit and Pelican Island. Herald Loop, the narrow E channel, has a depth of only 4.3 m (14 ft) at its S end across Faure Flat.
- 2 Hamelin Pool, the E part of the head of Shark Bay, has general regular depths of 7. m (23 ft) over its greater part.
Fish research area, marked by buoys (special) is situated 7 miles NNW of Faure Island (7.113).

Side channel**7.119**

- 1 A channel leads from Herald Loop to Gladstone Jetty (25°57'S 114°15'E).

Lharidon Bight**General information****7.120**

- 1 Lharidon Bight between the E side of Peron Peninsula

and the W side of the peninsula which terminates N in Petit Point (25°57'S 113°52'E) has depths of from 8-9 to 12-1 m (29 to 40 ft) in its central part. Taillefer Isthmus, which connects Peron Peninsula with the mainland, forms the head of Lharidon Bight.

- 2 **Approach.** Lharidon Bight is reached by a narrow and tortuous channel, leading S from Herald Gut, between the W side of Faure Flat (7.113) and the coastal bank extending from the E side of Peron Peninsula.

CAPE INSCRIPTION TO GERALDTON**GENERAL INFORMATION**

Chart Aus 416

Scope of section**7.121**

- 1 The area covered by this section comprises:
Cape Inscription to Houtman Abrolhos (7.123).
Houtman Abrolhos (7.133).
Geelvink Channel (7.159).
Geraldton (7.179).

Lobster fishery**7.122**

- 1 For details of lobster fishing, see 7.5.

**CAPE INSCRIPTION TO
HOUTMAN ABROLHOS****General information**

Charts Aus 416, Aus 331, Aus 332

Route**7.123**

- 1 From NW of Cape Inscription (25°29'S 112°58'E) the passage leads initially S, about 30 miles, off the W side of Dirk Hartog Island to W of Quoin Head (25°47'S 112°58'E).

The passage then divides:

- The offshore route, usually used by mariners not calling at ports N of Cape Naturaliste (33°32'S 115°00'E) (chart Aus 417), or those passing W of Houtman Abrolhos, continues generally S, about 160 miles.
- 2 The coastal route, for mariners using Geelvink Channel, leads generally SSE, about 160 miles, passing E of Houtman Abrolhos.

Topography**7.124**

- 1 The W coast of Dirk Hartog Island consists of light brown sandstone cliffs with occasional slopes and strips of whitish drift sand here and there. It is sharply indented at the base; the land behind has a barren aspect. Herald Heights (187 m (614 ft) high) (25°59'S 113°07'E) are the highest peaks on the W coast.
- 2 Between Steep Point (26°09'S 113°09'E), the NW extremity of Edel Land, and Zuytdorp Point, 17 miles SSE, the coast is high and precipitous but it has not been examined. Zuytdorp Point can be readily identified on the radar display.
- 3 The coast between Zuytdorp Point and Murchison River mouth, about 90 miles SE, consists of a range of rocky cliffs, the N part of which is known as Zuytdorp Cliffs, the heights of which can be seen from the chart. The land at

the cliff top is generally level and the coast is uniform making it difficult to identify any particular part except Mount Dorrigo (7.127), 3 miles SE of Zuytdorp Point. Womerangee Hill, 40 miles SE of the same point, is prominent.

- 4 Red Bluff (27°45'S 114°08'E), 3 miles S of the entrance to Murchison River (7.132), forms the N extremity of a range of reddish cliffs, about 60 m high, which extend 6 miles SSW to Bluff Point. The coast between Bluff Point and Shoal Point, 16 miles S, is sandy with occasional rocky points and bays.

For topography of Houtman Abrolhos see 7.134.

Historic wreck**7.125**

- 1 The historic wreck of the vessel *Zuytdorp* (27°11'S 113°56'E) lies 58 miles SE of Zuytdorp Point. See 1.60.

Local magnetic anomaly**7.126**

- 1 Local deflection of the compass was reported (1961) to occur in position 28°05'S 112°03'E, about 80 miles WNW of North Island.

Principal marks**7.127**

- 1 **Landmark:**
Mount Dorrigo (26°26'S 113°20'E).

Major light:

North Island Light (28°18'S 113°35'E) (7.141).

Other aid to navigation**7.128**

- 1 **Racon.**
Shoal Point Light (28°03'S 114°12'E) (7.131).

Directions

(continued from 7.49)

Cape Inscription to Quoin Head**7.129**

- 1 From a position about 12 miles NW of Cape Inscription Light (25°29'S 112°58'E) (7.83) the route leads generally S passing (with positions given from Quoin Head (25°47'S 112°58'E)):
- 2 W of West Point (15½ miles N), the NW extremity of Dirk Hartog Island. Heavy breakers extend for about 1 mile from the coast between this point and Cape Inscription; thence:
W of Quoin Head, a bold point.

Quoin Head to Houtman Abrolhos – offshore route**7.130**

- 1 From a position about 10 miles W of Quoin Head (25°47'S 112°58'E) the offshore route continues generally S passing:

W of a 11.4 m bank (28°06'S 113°27'E) on which the sea breaks heavily in bad weather; thence:

W of North Island, the N-most island of Houtman Abrolhos, from where a light (28°18'S 113°35'E) (7.141) is exhibited.

(Directions continue at 7.142)

Quoin Head to Houtman Abrolhos – coastal route 7.131

- 1 From a position about 10 miles W of Quoin Head (25°47'S 112°58'E) the coastal route leads generally SSE passing (with positions given from Bluff Point (27°51'S 114°06'E)):

WSW of Steep Point (26°09'S 113°09'E), a bold clifly projection, 35 m high, having a cairn of stones, 3 m high, on it. Steep Point Light (white round metal tower, 4 m in height) is exhibited 4 cables S of the point. Thence:

- 2 WSW of Zuytdorp Point (26°24'S 113°18'E) (7.124); thence:

WSW of Bluff Point; and:

ENE of an isolated coral patch with a least depth of 16.3 m over it (33 miles WSW) noting the shoaler 11.4 m bank which lies 5 miles farther WNW; thence:

- 3 WSW of Shoal Point (16 miles S) a low sandy projection. Shoal Point Light (white square brick tower, 6 m in height) is situated on a hill 3½ miles NNE of the point. And:

ENE of North Island, the N-most island of Houtman Abrolhos, from where a light (28°18'S 113°35'E) (7.141) is exhibited.

(Directions continue at 7.167)

Murchison River

General information

7.132

- 1 Gantheaume Bay, off the mouth of Murchison River (27°42'S 114°10'E), is an exposed indentation with rocky and sandy shores, backed by hills bearing a stunted vegetation. Meanarra Hill stands 3 miles E of the river entrance and is prominent.
- 2 Murchison River has a bar across the mouth, protected from the sea by a reef on which the sea generally breaks heavily. There appears to be no passage even for a boat, except at HW, but in fine weather there is a convenient landing place under the shelter of the reef.

HOUTMAN ABROLHOS

General information

Chart Aus 332 (see 1.16)

Description

7.133

- 1 Houtman Abrolhos (28°45'S 113°45'E) consists of three groups of islands and rocks, surrounded by reefs, about 30 miles offshore. They are separated from the mainland by Geelvink Channel (7.159).

Topography

7.134

- 1 **Wallabi Group** is the N-most of the three groups and comprises the three islands of North, East Wallabi and West Wallabi Islands, which are considerably higher and larger than those of the other groups, together with smaller islands and rocks, mostly connected by reefs.
- 2 North Island (28°18'S 113°36'E) lies close within the E edge of the drying reef which extends N and S from the island. The island has a flat top, covered with a coarse grass and some stunted scrub, surrounded by sandhills. A light (7.141) is exhibited from the W side of the island.
- 3 East Wallabi Island lies 10½ miles SE of North Island Light. From the base of Flag Hill (28°26'S 113°44'E), 15 m high, on the NE part of the island, a narrow tongue of land terminating in Fish Point extends 5 cables NE from where a light (7.153) is exhibited. Foul ground and rocky ledges extend 1½ miles N from the island and a reef, which dries, extends 2½ miles S, connecting East Wallabi and West Wallabi Islands.
- 4 West Wallabi Island lies 1 miles SW of East Wallabi Island; its N end is a level stony flat which terminates towards the sea in projecting banks, from 2 to 2½ m high, with clumps of bushes on them. On the S part of the island there are some sandhills, up to 15 m high, covered with thick scrub. Reefs extend up to 3 miles N from the island.
- 5 Morning and Noon Reefs, with several small islands on them, form the SE limit of Wallabi Group, they are separated from each other by Goss Passage (28°29'S 113°47'E) (7.146). On Morning Reef, a light (7.153) stands on Eastern Island, close to the reef's NE extremity while, on Noon Reef, a light (7.153) stands on Dick Island, in the reef's S part. Evening Reef is centred about 2½ miles S of the S extremity of West Wallabi Island, and is the S-most danger off the Wallabi Group.

7.135

- 1 **Easter Group.** Rat Island (28°43'S 113°47'E), the largest of the Group, lies 14 miles SSE of West Wallabi Island (7.134), and nearly in the centre of a lagoon, mostly enclosed by drying reefs; the lagoon is entered through Good Friday Bay, N of the island. The drying reefs which surround Rat Island extend up to 6 miles from the island, their positions may best be seen from the chart.
- 2 Little North Island, composed of dead coral, 1.5 m high, and surrounded by a drying reef lies about 7 miles NE of Rat Island, and is the NE-most danger off Easter Group. A relatively deep channel separates Little North Island from Eastern Islands, a group of islands on a drying reef about 1½ miles S.

7.136

- 1 **Pelsaert Group** is somewhat similar in its general features to Easter Group (7.135), the main body being triangular in shape, enclosing a lagoon with several islands in it, with the opening on its N side. Middle Island (28°55'S 113°55'E) lies in the centre of this lagoon, and Gun Island (7.139) lies 3 miles WNW. Square Island (28°54'S 113°57'E), with a reef close N of it, lies 1¼ miles ENE of Middle Island, and, owing to its position and peculiar shape, is a useful mark for entering the lagoon.
- 2 Pelsaert Island, which forms the greater part of the E side of the lagoon, is a narrow ridge of dead coral, its highest and most prominent part is a clump of mangroves, 5 m high, in the central part of the island. Mangrove Group lie on the edge of the reef extending up to 2½ miles N from the N extremity of Pelsaert Island, Post Office Island (28°52'S 113°59'E) being the most prominent. About 3 miles NNE of the same extremity lie The Coral Patches,

detached banks of white dead coral, 1 m high. From Wreck Point (28°59'S 113°58'E), the S extremity of the island, the barrier reef extends 5 cables S, and then gradually turns NW for about 11 miles, thus forming the SW barrier of the lagoon. A light (7.142) is exhibited from Wreck Point.

Depths

7.137

- 1 On the E side of Houtman Abrolhos the islands rise steeply from depths of about 45 m. On their W sides the barrier reef is steep-to off Pelsaert Group, but becomes increasing less so farther N, off Easter Group and Wallabi Group.

Surveys

7.138

- 1 Waters in and around Wallabi, Easter and Pelsaert Groups have not been examined in detail, less water than charted may exist. See information on the large scale national chart.

History

7.139

- 1 Gun Island (28°53'S 113°51'E) in Pelsaert Group was so named from a small brass 4-pounder having been found on it by Captain Wickham in 1840, together with other articles of Dutch manufacture, probably left there by the crew of the *Zeewyk* in 1727.

7.140

- 1 **Historic wrecks** of the vessels *Batavia* and *Hadda* lie on the S and NW extremities of Morning Reef.

The historic wrecks of the vessels *Marten* and *Ben Ledi* lie on the SE side of Pelsaert Island, about 3 miles N from Wreck Point, whilst the historic wrecks of the vessels *Windsor*, *Ocean Queen* and *Zeewyk* lie on the barrier reef extending NW from the S extremity of the island, 1½, 3½ and 9 miles, respectively, from Wreck Point. See also 1.60.

Major light

7.141

- 1 North Island Light (white hut, 4 m in height) (28°18'S 113°35'E) on the N-most island of Houtman Abrolhos.

Directions

(continued from 7.130)

Offshore route – North Island to Pelsaert Island

7.142

- 1 From a position W of North Island Light (7.141) the offshore route leads SSE passing (with positions given from North Island Light):

WSW of West Wallabi Island (10½ miles SSE) (7.134) and associated dangers, noting the 4.3 m patch which lies 4 miles WNW of Pelican Point, the NW extremity of the island; thence:

WSW of Evening Reef (15 miles SSE) which always breaks; thence:

- 2 WSW of the barrier reef extending up to 5 miles W from Rat Island (27 miles SSE) (7.135); thence: WSW of the barrier reef of Pelsaert Group (7.136) extending up to 11 miles NW from Wreck Point (28°59'S 113°58'E). Pelsaert Island Light (stainless steel column, 20 m in height) (28°59'S 113°58'E) stands on Wreck Point.

(Directions continue at 7.215)

Side channels

Chart Aus 332 (see 1.16)

South Passage

7.143

- 1 **General information.** The channel between North Island (28°18'S 113°36'E) and the two Wallabi Islands, 10 miles SE, contains many dangers, and is incompletely surveyed. South Passage, on the N side of this channel, leads between the barrier reef extending S from North Island and the dangerous rock lying 4¼ miles S of North Island Light.

Local knowledge is required.

Middle Channel

7.144

- 1 **General information.** Middle Channel, which separates Wallabi Group from Easter Group has a least width of 6 miles between Evening Reef (28°32'S 113°41'E) and the dangers NW of Easter Group.

Depths. Middle Channel has general depths of from 40 to 60 m in the fairway. Broken ground, on which a sounding of 23.5 m was obtained, lies 4 miles ESE of Evening Reef and it is considered that significantly less water is unlikely.

7.145

- 1 **Directions.** From W the passage through Middle Channel leads ENE passing (with positions given from Rat Island (28°43'S 113°47'E)):

NNW of a drying reef (5 miles NW), which always breaks, lying on the outer edge of the reef and foul ground extending NW from Rat Island, noting the patches of broken ground, with depths of less than 10 m over them, which lie up to 3 miles WSW of the drying reef; thence:

- 2 SSE of Evening Reef (11½ miles NNW); thence: SSE of the 10 m depth contour (11 miles NNW) extending up to 3 miles SW of Dick Island (13 miles N) the S-most island on Noon Reef; thence:

- 3 SSE of Morning Reef (13½ miles N) and associated dangers; and:

NNW of Little North Island (7 miles NE).

7.146

- 1 **Goss Passage** (28°29'S 113°47'E), a channel with a clear passage from 3 to 5 cables wide, with depths of from 35 to 42 m in the fairway, separates Morning Reef from Noon Reef. Broken ground extending 6 cables SW from the S extremity of Morning Reef constricts the width of the channel to 3 cables.

Local knowledge is required.

Zeewyk Channel

7.147

- 1 **General information.** Zeewyk Channel (Zeewijk Channel) separates Easter Group from Pelsaert Group and is about 4 miles wide in its narrowest part between the S end of the barrier reef surrounding Easter Group and the NW extremity of the barrier reef of Pelsaert Group.

Depths in the fairway are from 40 to 60 m.

7.148

- 1 **Directions.** From W the passage through Zeewyk Channel leads generally ENE passing (with positions given from Rat Island (28°43'S 113°47'E)):

Between the S end of the 10 m depth contour (5 miles S) extending S from Easter Group and the N end of the 10 m depth contour (7 miles SSE) extending N from Pelsaert Group; thence:

- 2 SSE of the spit extending 5 cables SE from Wooded Island (2 miles SE); thence:
SSE of Leo Island (4 miles ENE), the S-most Eastern Island and from where a light is exhibited; and:
NNW of Gee Bank (10 miles SE), noting the 11.1 m patch, 2 miles farther E; thence:
SSE of Dart Shoal (6 miles ENE); thence:
3 NNW of Hummock Island (14½ miles ESE) from which a light (white steel tube) is exhibited; thence:
Clear of Snapper Bank (11 miles E) (7.167) noting the 10.3 and 15.6 m depths and the 8.9 m patch which lie 5 miles ESE, and 7 miles SE and E, respectively, of the bank.

7.149

- 1 **Eastern Passage** (28°40'S 113°50'E), a side channel, separates Eastern Islands from the barrier reef of Easter Group, and is 8 cables wide.

Local knowledge is required. See 7.138.

7.150

- 1 The side channel between Hummock Island (28°48'S 114°02'E) and The Coral Patches (7.136), 3 miles SSW, has a least charted depth of 13.6 m in the fairway. King Reef, 2¼ miles SSE of Hummock Island, on which the sea seldom breaks, and the broken ground extending 9 cables ENE of The Coral Patches restrict the width of the channel to about 2 miles.

Local knowledge is required. See 7.138.

Wooded Island Passage**7.151**

- 1 Wooded Island Passage, a narrow channel close SW of Wooded Island (28°45'S 113°48'E), has been used by sailing vessels to enter Good Friday Bay from S with favourable winds. A spit, plainly marked by discolouration, extends S from the S end of Wooded Island.

Local knowledge is required. See 7.138.

Anchorage**General information****7.152**

- 1 The anchorages in Houtman Abrolhos are well sheltered from the sea but exposed to the full force of the wind as none of the islands are sufficiently elevated to give shelter. The water, however, is quite smooth between the reefs.

For anchorages on the E side of Houtman Abrolhos see 7.170.

Recruit Bay**7.153**

- 1 Recruit Bay, E of East Wallabi Island, is entered between Fish Point (28°26'S 113°45'E) (7.134) and Shelter Reef, 1¼ miles S, and affords good anchorage about 9 cables S of Flag Hill. Local knowledge is required.

Caution. A patch of 2.4 m, marked by a light-buoy (N cardinal) lies 1 mile S of Fish Point (7.134). In the approaches to the anchorage, there are other shoal patches, the positions of which can best be seen from the large scale national chart. See also 7.138.

- 2 **Offshore dangers.** North East Reef (28°25'S 113°49'E) (7.167) with Acute Bank and associated dangers (7.167), 2 miles farther N, lie in the approach to Recruit Bay.

Useful marks:

Fish Point Light (pole) (28°25'.7S 113°44'.6E).
Dick Island Light (E cardinal) (28°29'.9S 113°46'.0E).
Eastern Island Light (pole) (28°27'.9S 113°48'.8E).

Good Friday Bay**7.154**

- 1 Good Friday Bay lying N of Rat Island (28°43'S 113°47'E) is the N entrance to the lagoon of Easter Group, and affords secure anchorage. The bay, including its entrance from N, is bordered on both side by reefs, the positions of which can best be seen from the large scale national chart.

Local knowledge is required.

7.155

- 1 **Directions.** A vessel entering Good Friday Bay should be conned from as high a position as possible, and with the sun astern, the best conditions for seeing the various coral patches.

- 2 From Middle Channel the line of bearing 166° of the E side of Rat Island leads between the drying reefs on both sides of the entrance, noting the 5.5 m patch, steep-to, which lies 4 miles N of the island, to the E of the track.

When White Bank, a drying sandbank 5 cables N of the NW extremity of Rat Island, bears 290° the track then leads SE passing:

- 3 Between the reef extending from the N side of Rat Island and the drying patch 3 cables E of White Bank; thence:

To anchorage.

Caution. The passage between the reef off Rat Island and the drying patch is only 1½ cables wide.

7.156

- 1 **Anchorage**, as indicated on the large scale national chart, can be obtained 4 cables NE of the NE extremity of Rat Island in 20 m. There are several patches in the vicinity of the anchorage, their positions can best be seen from the chart.

Berth. There is a jetty on the NE side of Rat Island.

Pelsaert Lagoon**7.157**

- 1 The entrance to Pelsaert Lagoon (28°52'S 113°56'E) in the vicinity of Square and Mangrove Islands (7.136) appears to afford anchorage to small coasting vessels in depths of about 27 m.

Local knowledge is required, see also 7.138.

7.158

- 1 **Offshore dangers.** Fantome Shoal (28°51'S 113°56'E), with a depth of 6.8 m over it, with Gee Bank and associated dangers (7.148), 2 miles farther NNE, lie in the approach.

GEELVINK CHANNEL**General information**

Chart Aus 332 (see 1.16)

Description**7.159**

- 1 Geelvink Channel, between Houtman Abrolhos (28°45'S 113°45'E) and the mainland, is about 30 miles wide, and is the normal route for mariners bound to and from Fremantle from N.

Topography**7.160**

- 1 The coast between Shoal Point (28°07'S 114°10'E) and Point Moore, 45 miles SSE, forms the E side of Geelvink Channel.

For topography of Houtman Abrolhos see 7.134.

Depths**7.161**

- 1 There are general depths of from 19 to 50 m in the fairway of Geelvink Channel.

Unsurveyed areas**7.162**

- 1 No hydrographic survey has been conducted in the coastal areas, indicated on the chart, NW and SE of Port Gregory (28°11'S 114°14'E). Mariners without local knowledge should not navigate inshore of the 30 m depth contour in this area. See also information on the chart.

Marine farm**7.163**

- 1 Shellfish beds centred on 28°28'·6S 114°10'·5E, as shown on the chart, lie near the middle of Geelvink Channel. Seabed activities are prohibited in this area.

Principal marks**7.164**

- 1 **Landmarks:**

Mount Victoria and Mount Albert (28°11'S 114°21'E), the latter distinguished by a conspicuous cone, two remarkable conical peaks.

Kings Table Hill (28°28'S 114°37'E), conspicuous.

7.165

- 1 **Major lights:**

North Island Light (28°18'S 113°35'E) (7.141). Mariners in the centre of Geelvink Channel are outside the range of this light.

Point Moore Light (white conical metal tower, red bands, 35 m in height) (28°47'S 114°35'E).

Geraldton Aero Light (control tower) (28°47'S 114°41'E).

Other aids to navigation**7.166**

- 1 **Racons.**

Shoal Point Light (28°03'S 114°12'E) (7.131).

Geraldton Outer Roads Fairway Light-buoy (28°46'S 114°32'E).

Directions

(continued from 7.131)

Shoal Point to Point Moore**7.167**

- 1 From a position about midway between Shoal Point (28°07'S 114°10'E) and North Island the passage through Geelvink Channel leads generally SE passing (with positions given from North Island Light):

NE of Acute Bank (12 miles ESE), the outer-most danger NE of Wallabi Group (7.134), noting Beagle Knoll and Assail Bank which lie 3 and 6 miles WNW, respectively, of Acute Bank; and:

- 2 SW of a 12 m patch (27 miles ENE) lying 7 miles SW of Shoal Point, noting the 16·4 m patch which lies 3½ miles farther SE. Tide rips form W of the 30 m depth contour in this area, as shown on the chart. Thence:

NE of North East Reef (14 miles ESE), which often breaks, lying 2½ miles N of Eastern Island, the E-most island of Wallabi Group; thence:

- 3 NE of Little North Island (25 miles SE) the outer-most danger NE of Easter Group (7.135); thence:

NE of an 8·9 m shoal (28°41'S 114°08'E) which lies 7 miles E of Snapper Bank; and:

Clear of an isolated coral patch (28°34'S 114°15'E) with a least depth of 16·5 m over it; thence:

- 4 NE of a 9·4 m shoal (28°45'S 114°10'E) which lies 2½ miles NE of Mid Reef, nearly awash; thence: SW of Point Moore (28°47'S 114°35'E).

7.168

- 1 **Useful marks:**

Television mast (28°41'S 114°41'E) (7.198).

Hummock Island Light (28°48'S 114°02'E) (7.148).

This light is outside the range of mariners in the centre of Geelvink Channel.

(Directions continue at 7.224 and for Geraldton at 7.201)

Side channels**Houtman Abrolhos****7.169**

- 1 South Passage (28°21'S 113°36'E), Middle and Zeewyik Channels lead between Houtman Abrolhos, for details see 7.143.

Anchorage

Chart Aus 332 (see 1.16)

North Island**7.170**

- 1 Safe anchorage can be found off the E coast of North Island (28°18'S 113°36'E) outside the 20 m depth contour.

Recommended berth lies 2½ miles ENE of North Island Light (7.141) in 37 m, sand and shell.

Batavia Road**7.171**

- 1 Batavia Road (28°58'S 113°58'E), a slight curve in the E coast of the S part of Pelsaert Island, affords temporary anchorage sheltered from winds between SSE, through W to about NE, in depths of from 22 to 24 m.

Local knowledge is required.

Caution. Depths of 6·7 and 3·4 m lie 1 mile, and 5 cables N, respectively, of Wreck Point (28°59'S 113°58'E) on the N and S sides of Batavia Road.

Port Gregory**7.172**

- 1 **Description.** Port Gregory is formed between the coast SE of Hillock Point (28°11'S 114°14'E), situated 5½ miles SE of Shoal Point, and a ledge of flat-topped reef running parallel with this stretch of coast at an average distance of 2 cables, and affords safe anchorage for vessels with a draught of less than 4 m. However, the confined space at the anchorage does not afford sufficient room for swinging at single anchor, and mariners must moor.

- 2 The main ledge of reef which forms the seaward side of Port Gregory extends ESE, and is about 1 m high and breaks heavily. The S end of this ledge curves towards the shore and joins the land about 2 miles SE of Hillock Point. Two detached ledges, North Rock and Flat Rock, lie within 5½ cables WNW of the NW extremity of the main ledge.

Local knowledge is required, see also 7.162.

7.173

- 1 **Topography.** Hutt Lagoon, situated within Shoal Point and Hillock Point, 5½ miles SE, is only separated from the sea by a narrow strip of bare sand hillocks. Five cables SE of Shoal Point the sea washes over the low sandy beach into the lagoon with heavy W gales. On the E side of Hutt Lagoon there is a range of grassy hills attaining a height of 129 m at the S end.

- 2 The position of Port Gregory can be identified by a distinctive bare white sand patch situated about 5 cables N of Hillock Point, and visible from a distance of about 12 miles.

7.174

- 1 **Historic wreck.** A historic wreck lies 2 cables W of Hillock Point. See 1.60.

7.175

- 1 **Offshore danger.** Archdeacon Ledge (28°14'S 114°16'E), on which the sea seldom breaks, lies 3 miles SE of Hillock Point and 1 mile offshore. See also 7.162.

7.176

- 1 **Currents.** A current generally sets N through the passages, and at times may attain a rate of 3 kn. During the winter, with a succession of NW gales, the current runs in the opposite direction.

In the offing the current generally sets NW, with a maximum rate of 2 kn during the greater portion of the year. When N and NW winds prevail it sets in the opposite direction, though not so strong, but the tendency is to set the mariner towards the coast.

Directions

7.177

- 1 **Hero Passage,** is a clear channel about 1½ cables wide with a least depth of 4.2 m in the fairway between North Rock and Flat Rock.

Within the entrance the channel leads ESE passing N of Flat Rock and contracts to a width of about ½ cable at its narrowest part.

- 2 **Leander Passage,** the N entrance into Port Gregory, is approached between North Rock and a 4.2 m patch 9 cables NW of Hillock Point. The least depth in Leander Passage is 5.5 m.

Gold Digger Passage, between Flat Rock and the main ledge, is only suitable for boats.

Anchorage

7.178

- 1 A bank of sand and weed extends from 1 to 2 cables from the inner side of the main ledge of reef protecting Port Gregory, reducing the width of the space available for anchorage, with depths of over 4 m, to barely 1 cable.

- 2 Anchorage can be obtained about 1 cable ESE of Hillock Point, with one anchor on the shoal bank extending towards the coast from the ledge, and the other on the beach.

Landing A jetty, suitable for boats, is situated 6 cables SE of Hillock Point.

GERALDTON

General information

Chart Aus 332, Aus 81 (see 1.16)

Position and function

7.179

- 1 Geraldton (28°47'S 114°36'E) is situated in the SE corner of Champion Bay. The port serves the N wheatbelt for the export of grain, other agricultural products and livestock. Mineral sand, iron ore and talc, in bulk, are also exported. The port is also a supply centre for oil platforms off W Australia.

Topography

7.180

- 1 The locality of Champion Bay can be identified, by the mountains of Moresby Flat Topped Range (Moresby

Range), which has a flat-topped peak at its S extremity with a gap between it and Mount Fairfax (28°45'S 114°42'E). Wizard Peak (7.198) is situated 7 miles SE of Mount Fairfax, with comparatively low country between.

Point Moore (28°47'S 114°35'E), the S entrance point to Champion Bay, is a low sandy projection.

Port limits

7.181

- 1 Port limits extend from Point Moore Light (28°47'S 114°35'E) W to the meridian of 114°30'E, thence N to the coast, 2¾ miles NW of Woolawar Gully (28°30'S 114°32'E).

Approach and entry

7.182

- 1 The port is approached from seaward from Outer Roads Fairway Light-buoy (28°46'S 114°32'E) with Bluff Point Leading Lights (28°45'S 114°37'E) bearing 071½°, through a cleared channel, and the harbour entered on port leading lights bearing 180°. An alternative approach from NW for vessels with a maximum draught of 7.5 m is from a fairway buoy (28°42'S 114°33'E) with Bluff Point Leading Lights bearing 128°.

Traffic

7.183

- 1 In 2003, 234 vessels visited the port which loaded 2 495 684 tonnes.

Port Authority

7.184

- 1 Geraldton Port Authority, PO Box 1856, Geraldton 6531, Western Australia.

Website: www.gerport.wa.gov.au

E-Mail: portauthority@wn.com.au

Limiting conditions

Controlling depths

7.185

- 1 The entrance channel is maintained at a depth reducing from 14.2 m at the outer end to 12.8 m at the inner end. The controlling depth within the harbour is 12.4 m.

Maximum permitted draughts

7.186

- 1 The maximum permitted draughts are 11.5 m plus tide to a maximum of 12.8 m.

These draughts are subject to conditions of swell, and sea level when the latter is subject to meteorological conditions, see 7.3.

Mariners wishing to load to maximum draught should obtain permission from the Harbour Authority. A dynamic under-keel clearance programme is available for deep-draught vessels.

Density of water

7.187

- 1 Density: 1.023 to 1.025 g/cm³.

Maximum size of vessel handled

7.188

- 1 The *National Prestige* 71 000 dwt used the port in 2000.

Local weather and sea state

7.189

- 1 **Northerly gales** blow with some strength between May and November. The wind, as a rule, hauls more quickly SW than in gales experienced farther S. The gales are most

severe with the wind from WSW. With a falling barometer, accompanied by an unusual rise in the sea level, a NW gale may be expected. See also 7.3.

- 2 **Swells** Mariners in deep-draught vessels are advised to ensure that the swell is not excessive before entering the channel, and, if it is, not to enter the outer channel. At times swells of up to 6 m have been reported in the outer approaches. See also 7.3.

Arrival information

Port radio

7.190

- 1 The Telstra seaphone network (VHF) operates from Geraldton. The port radio is monitored during normal working hours and 1 hour prior to pilot boarding time. For details see *Admiralty List of Radio Signals Volume 1 (2) and Volume 6 (4)*.

Notice of ETA

7.191

- 1 Notice of ETA should be sent 48 hours before arrival and at intervals thereafter: for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages

7.192

- 1 Designated anchorages, each with a swinging radius of 5 cables, have been established in Champion Bay, as follows:

S1 (28°47'0S 114°32'2E)	N6 (28°42'7S 114°31'6E)
N1 (28°44'6S 114°32'1E)	N7 (28°40'9S 114°33'3E)
N2 (28°44'6S 114°31'0E)	N8 (28°40'9S 114°32'1E)
N3 (28°43'7S 114°32'5E)	N9 (28°39'9S 114°33'6E)
N4 (28°43'7S 114°31'3E)	N10 (28°39'9S 114°32'4E)
N5 (28°42'7S 114°32'7E)	QN (28°42'5S 114°35'6E)

Caution. A wreck with a depth over it of 9.6 m, and marked by a light-buoy (isolated danger), lies close E of N3 anchorage.

Pilotage and tugs

7.193

- 1 **Pilotage** is compulsory for all vessels over 35 m and those over 150 gt, except for those vessels exempt by law. Pilots board in the following positions:

28°45'5S 114°31'0E – Position A (primary)
 28°42'S 114°32'E – Position B
 28°47'S 114°31'E – Position C

Pilotage may be deferred when swell height exceeds 3 m or wind speed exceeds 30 kn.

Tugs are available.

Regulations concerning entry

7.194

- 1 **Tankers** are berthed only during daylight hours.

Quarantine

7.195

- 1 Geraldton is a first port of entry, radio pratique may be available. See *Admiralty List of Radio Signals Volume 1 (2) and 1.54*.

Harbour

General layout

7.196

- 1 **Alongside berths.** Geraldton Harbour, in the S part of Champion Bay, is protected on its N and W sides by a breakwater, and on its NE side by a detached breakwater. The wharf, a land backed concrete structure, extends W then NNE from the S side of the harbour from the vicinity of the front harbour leading light. There is considerable development being undertaken within the harbour (2004).

- 2 **Channel.** A dredged channel 2.8 miles long and 180 m wide, 14.2 m deep at the outer end and 12.8 m at the inner end, is marked by leading lights and a combination of ten light-beacons and light-buoys each side. It leads through the bank extending N of Outer Knoll into Champion Bay and thence to the harbour.

- 3 **Fishing boat harbour** is situated on the W side of Geraldton Harbour.

Batavia Coast Boat Harbour is located 5 cables NE of the main harbour.

Historic wrecks lie 5 cables N of the mouth of Chapman River (28°44'S 114°37'E) and 1 mile NNW of Point Moore, the latter wreck is the vessel *Mayhill*. See 1.60.

Natural conditions

7.197

- 1 **Currents**, in the approach to Geraldton, during the summer months generally set N, and during the winter S.

Swell. The ocean swell being generally from W has a tendency to set a vessel towards the coast. See also 7.189.

Climatic table: see 1.170 and 1.181.

Principal marks

7.198

- 1 **Landmarks:**

Conspicuous television mast (28°41'S 114°41'E) on Moresby Flat Topped Range (7.180).

Conspicuous radio tower (28°44'4S 114°37'2E).

Mount Scott (28°46'6S 114°36'9E).

Conspicuous rectangular silo (28°46'7S 114°35'9E), 58 m in height.

Wizard Peak (28°49'S 114°47'E) a conspicuous cone.

Conspicuous water tower (28°49'S 114°38'E).

7.199

- 1 **Major lights:**

Point Moore Light (28°47'0S 114°34'7E) (7.165).

Geraldton Aero Light (28°47'S 114°41'E) (7.165).

Other aid to navigation

7.200

- 1 **Racon:**

Geraldton Outer Roads Fairway Light-buoy (28°46'S 114°32'E).

Directions for entering harbour

(continued from 7.168)

Approach from north

7.201

- 1 There are depths of less than 10 m on either side of the maintained channel (7.196). With a W gale, or swell, the sea breaks nearly all over these banks.

The track leads generally S passing W of the shoals and banks N of the maintained channel in depths greater than 37 m until Bluff Point Leading Lights (28°45'S 114°37'E) (7.203) are aligned (071½°).

Approach from south**7.202**

- 1 Keep Point Moore Light bearing more than 020° until Wizard Peak bears 080°.

The track then leads generally N passing W of Point Moore Light, distant at least 3 miles, noting Point Moore Reefs, on which the sea generally breaks, lying both N and S of the drying ledges off the point, and the shoals and banks S of the maintained channel (7.196).

- 2 **At night** the track leads in depths greater than 37 m until Point Moore Light bears more than 040°.

The track then leads generally N passing W of Point Moore Light, distant at least 3 miles.

Main approach channel**7.203**

- 1 **Bluff Point Leading Lights:**

Front sea-beacon (white pole, on metal framework tower, 8 m in height) (28°44'8S 114°36'5E).

Common Rear beacon (white pole 17 m in height) (6½ cables ENE of the front light).

- 2 The alignment (071½°) of these lights leads through the outer part of the maintained channel between the N and S portions of the banks extending N of Point Moore passing (with positions given from the front light):

Clear of Fairway Light-buoy (safe water; racon) (28°46'S 114°33'E); thence:

- 3 Between No 1 and No 2 Light-beacons (starboard and port hand) (2¼ mile WSW), which mark the S and N sides of the channel, to a position between No 9 and No 10 Light-beacons.

In winter a S set is experienced until Outer Knoll is reached, and is often quite strong. In summer the set is N but weaker.

7.204

- 1 The track then leads E, SE and S between light-beacons marking the port and starboard sides of the channel to midway between No 17 and No 18 Light-beacons (starboard and port hand) (1 mile SSW).

Harbour leading lights:

Front light (orange triangle, point up, on metal column) (28°46'6S 114°36'0E).

- 2 Rear light (orange triangle, point down, on framework tower) (1 cable S of the front light).

The alignment (180°) of these lights leads in mid-channel between light-beacons and between the W breakwater head and the E detached breakwater situated 3 cables N of the front light.

Alternate channel**7.205****Leading Lights**

Front sea-beacon (28°46'8S 114°36'0E)

Common rear beacon, see 2.230.

Passing clear of the fairway Light-buoy (28°42'S 114°33'E), the alignment (128°) of these lights leads through a channel for vessels with a maximum draught of 7.5 m. The NW and SE ends of the channel are marked by light-buoys (lateral).

Basins and berths**Champion Bay anchorage****7.206**

- 1 The anchorage, shown as SB on the chart, in Champion Bay (28°45'S 114°36'E) is protected on its S and W sides by Point Moore and the reefs extending from it, and is well sheltered from all winds except those between NW, through N, to N by E. The bank on both sides of the outer cleared channel, affords some protection from NW gales. Mariners in vessels with good ground tackle and a long scope of cable have ridden out heavy gales in this bay.

- 2 **Depths** in the anchorage are from 7 to 11 m.

Caution. A spoil ground, in the E part of the bay, lies centred 6 cables W of Bluff Point (28°45'S 114°37'E), and a shoal, with a least depth of 5.4 m, lies 9 cables SW of the same point.

Alongside berths**7.207**

- 1 **Geraldton Wharf** (28°47'S 114°36'E) is divided into six berths numbered 1 to 4 from E, with Nos 5 and 6 Berths running in a NNE direction from the W end of No 4 Berth to West Breakwater. Longest berth: No 4 Berth, 281 m in length. Maximum depth alongside is 13.4 m.

Port services**7.208**

- 1 **Repairs.** Boat lift for vessels up to 21 m LOA, 6.9 m beam and 80 tonnes. Engineering and general ship repair facilities are available.

Other facilities. Deratting certificates can be issued. Hospitals are available in the area. Oily waste disposal facilities are available for small quantities using road tankers.

- 2 **Supplies:** marine diesel (light) available by pipeline at No 2 berth, by road tanker at other berths. Fresh water is available at each berth. Provisions are plentiful.

Communications. Local airport 11 km from the port, with connecting flights to Perth International Airport, 350 km distant.

GERALDTON TO SWAN RIVER**GENERAL INFORMATION**

Chart Aus 417

Scope of section**7.209**

- 1 The area covered by this section comprises:
Offshore Route (7.211).
Geraldton to Island Point (7.217).
Island Point to Swan River (7.245).

Hazards**7.210**

- 1 **Lobster fishery.** For details of lobster fishing, see 7.5.
Breakers. In moderate swell breakers form in depths of less than 6 m.

Exercise Areas. Military exercises are conducted in areas within this section. See 7.4, 1.9 and *Australian Annual Notices to Mariners*.

OFFSHORE ROUTE

General information

Charts Aus 417, Aus 333, Aus 334

Route**7.211**

- 1 From WSW of Houtman Abrolhos (28°45'S 113°45'E) the offshore route to the approaches to Fremantle leads SSE, about 190 miles.

Local magnetic anomaly**7.212**

- 1 A local magnetic anomaly was reported (1964) to exist about 50 miles offshore on the parallel of 31°00'S.

Major lights**7.213**

- 1 Guilderton Light (31°20'S 115°29'E) (7.252).
Rottneest Light (32°01'S 115°30'E) (8.43).

Other aid to navigation**7.214**

- 1 **Racon:**
Fremantle Fairway Landfall Light-buoy (31°57'S 115°39'E), for details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 7.142)

Houtman Abrolhos to Swan River**7.215**

- 1 **Thick weather** see 7.254.
From a position WSW of Pelsaert Island Light (28°59'S 113°58'E) the passage leads SSE passing:
WSW of Turtle Dove Shoal (29°21'S 114°11'E), noting Clio Bank which lies 4 miles NNE. The shoal can be seen easily on sunny days with clear water. Breakers, 12 m in height, have been observed over the shoal, and blind rollers higher than this have been seen on its edge. Thence:
2 WSW of Pelsaert Bank with a least depth of 33 m (29°28'S 114°16'E) noting a 29.6 m depth which lies 15 miles farther SSE; thence:
WSW of Direction Bank (31°36'S 115°16'E) (7.256).
The passage then leads SE passing:
SW of a 22 m patch (31°46'S 115°22'E) at the S end of Direction Bank to a position N of Rottneest Light and NW of Buckland Hill Directional Light (32°01'S 115°46'E) (8.43).

7.216

- 1 **Useful marks:**
Hillarys Boat Harbour breakwater light (31°50'S 115°44').
Bathurst Point Light (31°59'S 115°32'E) (8.48).
Woodman Light (32°08'S 115°46'E) (8.43).
Cape Vlamingh Light (32°01'S 115°27'E).
(Directions continue at 8.45)

GERALDTON TO ISLAND POINT

General information

Chart Aus 333 (see 1.16)

Route**7.217**

- 1 From Geraldton the coastal route to Island Point (30°19'S 115°01'E) leads generally SSE, about 90 miles.

Topography**7.218**

- 1 From Cape Burney (28°52'S 114°38'E), 6 miles SSE of Point Moore, to Leander Point, 29 miles SSE, the coast consists of sandhills varying from 52 to 90 m high. About 15 miles N of Leander Point, and a few miles inland, there are several scattered table-topped hills reaching a height of 245 m.
2 The locality of Jurien Bay (30°16'S 115°01'E) (7.233) can be identified by Gairdner Range (7.222) situated 10 miles NE of North Head (30°14'S 115°00'E).

Local knowledge**7.219**

- 1 From Point Moore (28°47'S 114°35'E) to Jurien Bay, 90 miles SSE, the coast is fronted by reefs, and, in places, off-lying reefs are charted up to 7 miles offshore.
Between Point Moore and Beagle Islands, 63 miles SSE, shoal investigations inside the 30 m depth contour are incomplete, and less water may exist. Mariners should not enter this area without local knowledge.

Historic wreck**7.220**

- 1 The historic wreck of the vessel *Cambewarra* (30°13'S 114°50'E) lies 9 miles WNW of North Head, see 1.60.

Local magnetic anomaly**7.221**

- 1 A local magnetic anomaly was reported (1934) 8 miles WNW of Escape Island (30°20'S 114°59'E).

Principal marks**7.222**

- 1 **Landmarks:**
Mount Peron (30°07'S 115°09'E), a conspicuous table-topped hill on Gairdner Range.
Mount Lesueur (30°11'S 115°12'E), a conspicuous table-topped hill on Gairdner Range.

7.223

- 1 **Major lights:**
Point Moore Light (28°47'S 114°35'E) (7.165).
Geraldton Aero Light (28°47'S 114°41'E) (7.165).
Port Denison Main Passage rear Leading Light (beacon, red rectangular daymark) (29°16'S 114°56'E).
Freshwater Point Light (29°36'S 114°58'E).
Leeman rear Leading Light (beacon) (29°57'S 114°59'E).

Directions

(continued from 7.168)

Point Moore to Escape Island**7.224**

- 1 From a position SW of Point Moore Light (28°47'S 114°35'E) the passage leads generally SSE passing (with positions given from Leander Point (29°17'S 114°55'E)):
WSW of African Reef (24 miles NW); the sea breaks over this reef in moderate to heavy swell; thence:

ENE of Clio Bank (29°17'S 114°13'E), noting Turtle Dove Shoal (7.215) which lies 4 miles SSW of the bank; thence:

- 2 ENE of Pelsaert Bank (29°28'S 114°16'E) (7.215); and:
WSW of Leander Reef (9 miles SW); the sea generally breaks over this reef; thence:
WSW of Beagle Islands (29°48'S 114°53'E); a reef which breaks heavily lies up to 2 miles NW of the islands.

3 Useful marks:

Water tower (28°49'S 114°38'E) (7.198) at Geraldton.
Wizard Peak (28°49'S 114°47'E) (7.198).

7.225

- 1 The passage continues generally SSE passing (with positions given from Green Head (30°05'S 114°58'E)):
WSW of Corner Break (5½ miles NW); thence:
WSW of Apex Reef (3 miles NW) which breaks heavily; thence:
WSW of a 4-1 m patch (2½ miles W) which breaks during a moderate swell; thence:
- 2 WSW of Fisherman Islands (4 miles SSW); thence:
WSW of North Head (10 miles S); thence:
WSW of Seaward Ledge (3 m high) (13 miles S), the W-most danger off Jurien Bay, noting the ledge drying 0.8 m (charted as drying rock) (7.234) and The Boomer, a dangerous rock, which lie 1 mile N and 1½ miles S, respectively, of Seaward Ledge; thence:
- 3 WSW of Escape Island (30°20'S 114°59'E) which lies 2 miles WSW of Island Point. Escape Island Light (stainless steel framework tower, 24 m in height) is exhibited near the centre of the island.

Useful marks:

Peak (50 m) (29°14'S 114°55'E) (7.226).
Sand patch (29°18'S 114°56'E) (7.226) standing 1½ miles SE of Leander Point.
Water tower (29°57'S 114°59'E) (7.241) at Leeman.
(Directions continue at 7.254)

Port Denison

Chart Aus 333 (see 1.16)

General information

7.226

- 1 **Description.** Port Denison is a small fishing boat harbour, enclosed by breakwaters, situated N of Leander Point (29°17'S 114°55'E). The harbour provides sheltered moorings for the local cray fishing fleet.

Topography. Leander Point is low and rocky with an elevation of 10 m, a conspicuous sand patch, 38 m high, lies 1½ miles SE of the point. Irwin River, entered 1¼ miles NNE of Leander Point, is about 35 miles in length, but its mouth is generally closed. A conspicuous peak (50 m high) (29°14'S 114°55'E) stands 1 mile N of the mouth of Irwin River.

- 2 **Port limit** is the arc of a circle, radius 7½ cables, with its centre near Leander Point.

Approach and entry. The port is approached through Main Passage (29°17'S 114°52'E) and entered on Leander Point Leading Lights.

Limiting conditions

7.227

- 1 **Depths** in the harbour are from 5.8 m in the entrance to 2 m in mid-harbour.

Sea level rises and falls considerably with onshore winds and offshore winds, see 7.3.

Maximum size of vessel handled: up to 25 m in length.

Breakers form on the leading line during heavy swell, see 7.210

Directions for entering harbour

7.228

1 Approaches:

From N keep 10 miles offshore in depths of not less than 30 m.

From S pass well clear W of Leander Reef (29°24'S 114°49'E) (7.224).

7.229

- 1 **Main Passage**, between the S limit of North Bank (29°16'S 114°52'E) and the N extremity of Irwin Reef, is about 1¼ miles wide with depths of from 11 to 14 m in the fairway, except for a small 9.2 m patch, on which there are breakers in a heavy swell, lying nearly in mid-channel 2¼ miles W of Leander Point.

Leading lights:

- 2 Front light (beacon, red rectangular daymark) (29°16'S 114°55'E).

Rear light (7.223) (969 m ENE of the front light).

The alignment (072°) of the above leading lights, situated on the E side of the bay, leads through Main Passage passing (with positions given from Leander Point (29°17'S 114°55'E)):

NNW of Irwin Reef (2¾ miles WSW) on which the sea usually breaks; thence:

- 3 SSE of the S extremity of North Bank (2 miles WNW), noting the 9.2 m shoal patch (2¼ miles W), mentioned above, close N of the leading line. The sea breaks on portions of this bank and on Pearse Break (3¾ miles NW), especially during a heavy swell. Thence:
NNW of Leander Point, noting depths of less than 5 m which extend 1 cable beyond Leander Point Reef.

7.230

1 Entrance – Leander Point Leading Lights:

Front light (beacon, triangular topmark, point up) (29°17'S 114°55'E).

Rear light (obelisk, rectangular topmark) (60 m S of the front light).

The alignment (176°) of the above leading lights leads between the breakwaters into the harbour.

A light is exhibited from the head of each breakwater.

Anchorage

7.231

- 1 Anchorage, as indicated on the chart, may be obtained 1¼ miles SW of Leander Point in 15 m, good holding.

Anchorage may also be found NE of the harbour entrance, in Arurine Bay, but it is unsafe in winter or with strong winds from NW or W. The holding ground is rocky and cannot be depended upon.

Caution. A 5.2 m patch lies 5½ cables N of Leander Point.

Facilities

7.232

- 1 There are two small jetties within the harbour; fuel is available at the Service Jetty.

The town of Dongara is situated on the N bank of Irwin River.

Jurien Bay

General information

7.233

- 1 **Description.** Jurien Bay, entered between North Head (30°14'S 115°00'E) and Island Point, 5¼ miles SSE, is protected on its S and SW sides by several islands and reefs which extend up to 4 miles offshore. The bay is open to the NW.

- 2 A bar of sand extends E from Favorite Island (14 m high) (30°17'S 115°00'E) to the mainland, and divides the outer from the inner anchorage.

There is a good boat passage between Island Point and Boullanger Island, and between the reefs S.

Local knowledge is essential for entering the inner anchorage.

- 3 **Topography.** Boullanger Island lies 7 cables W of Island Point, with Whitlock Island, to which it is joined at LW, 2½ cables farther SW. Tern Island lies near the N end of the drying ledge extending 3 cables N from the latter island, with Osprey Island 2½ cables farther NE.

- 4 **Marine Protected Area.** Jurien Bay lies within a Marine Protected Area, see *Annual Australian Notices to Mariners* and *Australain Seafarers Handbook AHP 20*.

Historic wreck of the vessel *Lubra* lies on Boiler Reef (30°18'S 115°00'E), see 1.60.

Breakers form on the leading line during heavy swell, see 7.210.

Directions

7.234

- 1 **Leading lights:**

Front light (orange triangle, point up, on white round tower) (30°17'S 115°03'E).

Rear light (orange triangle, point down, on white round tower) (483 m ESE of the front light).

The alignment (111½°) of the above leading lights, situated 3½ miles SE of North Head, leads in the approach to the bay passing (with positions given from North Head):

- 2 SSW of Sandland Island (1½ miles NNW), noting the dangers extending up to 1 mile S, and 1¼ miles NW from the island; thence:

NNE of North Tail (1¾ miles SW) at the N extremity of a spit extending 8 cables N from a rocky ledge drying 0.8 m (2½ miles SSW). The sea breaks on this spit with a heavy swell; thence:

- 3 Between the 6.4 m depth, which lies 1¼ miles S of North Head, and a depth of 6 m (1¾ miles S); thence:

Between rocky patches with depths of less than 10 m over them. The shoalest to the N of the leading line being two 4.5 m patches (1¼ and 1¾ miles SSE), and on the S side the 5.7 m depth at the edge of the spit extending 1 mile N from Favorite Island (3 miles SSE).

- 4 The line of bearing 175° of Island Point (30°19'S 115°01'E) then leads towards the outer anchorage.

Mariners in vessels of shallow draught can proceed farther E, noting the rocky shoal, with a least depth of 2.8 m, which lies 1¼ miles NW of the front leading light.

7.235

- 1 **Useful marks:**

Escape Island Light (30°20'S 114°59'E) (7.225).

Harper Reef Light-beacon (port hand) (30°18'0S 115°00'2E).

Boiler Reef Light-beacon (starboard hand) (30°18'1S 114°59'6E).

Anchorage

7.236

- 1 **Outer anchorage.** Anchorage can be obtained in depths of from 9 to 11 m.

Recommended berth, indicated on the large scale national chart, lies 7½ cables NE of Favorite Island (30°17'S 115°00'E) in a depth of 9 m.

7.237

- 1 **Inner anchorage.** The inner anchorage, within the sandbar between Favorite Island and the mainland, has a depth of from 7 to 12 m, but depths across the bar are not more than 3.6 m. Coasting vessels generally anchor in this inner anchorage.

- 2 **Approach.** The alignment (130°) of leading lights situated on the SW corner of Jurien Boat Harbour (30°17'S 115°02'E) leads from the outer anchorage over the sand bar, in a least depth of 3.6 m, into the inner anchorage passing SW of Channel Rocks situated 6 cables NW of the front light.

- 3 **Recommended berths.** Anchorage, indicated on the large scale national chart, can be obtained on the line of bearing 280° of the S extremity of Favorite Island, with Island Point bearing 200°, in a depth of 10 to 11 m; also on the line of bearing 300° of the S extremity of Favorite Island with Island Point bearing 213°, in depths of 8 to 9 m.

Caution. Wire Reef lies on the S part of the inner anchorage, 1¼ miles NNE of Island Point.

Harbour

7.238

- 1 **Jurien Boat Harbour,** protected by two breakwaters, is situated on the E side of the bay 1½ miles S of Middle Head (30°16'S 115°02'E). A light stands on the head of each breakwater.

Harbours

General information

7.239

- 1 **Broken ground.** An extensive area of broken ground exists within the 20 m depth contour S of Freshwater Point (29°36'S 114°58'E). Within this area reefs, with less than 2 m of water over them, are usually marked by breakers in normal weather conditions, however, numerous other dangerous reefs are not easily identified.

Local knowledge is essential for mariners navigating in this area. See also 7.219.

7.240

- 1 **Reefs.** Between Coolimba (29°52'S 114°59'E) and North Head, 22 miles S, numerous limestone reefs, with depths of less than 1 m over them, extend up to 3 miles offshore.

Breakers form on the leading lines during heavy swell, see 7.210.

Leeman

7.241

- 1 **Leeman Leading Lights:**

Front light (beacon) (29°57'S 114°59'E).

Rear light (7.223) (742 m ESE of the front light).

- 2 The alignment (116°) of the above leading lights leads through the reefs from seaward passing between Snag Island and Drummond Rock situated 4 cables N, and 3 cables SW, respectively, of the front leading light. A light-beacon (starboard hand) is moored 7½ cables WNW of the front leading light.

A conspicuous water tower stands 4 cables SSE of the front leading light.

Green Head Anchorage

7.242

- 1 **General information.** Green Head Anchorage, which is well protected, is situated in Anchorage Bay, about 1 mile N of Green Head (30°05'S 114°58'E), a round grassy-topped hillock. The approach to the anchorage, with a least depth of 3.1 m, is marked by two pairs of leading lights.

7.243

- 1 **Outer leading lights:**

Front light (white metal column, white rectangular daymark) (30°05'S 114°58'E).

Rear light (as above) (180 m ESE of the front light).

The alignment (105½°) of the above leading lights, situated on Green Head, leads in the approach passing (with positions given from the above leading lights):

- 2 Between Apex Reef (¾ miles NW) and the 4.1 m patch (3 miles W) (7.225); thence:

SSW of a rock awash (1 mile WNW) distant 1½ cables.

Inner leading lights. The alignment (007¼°) of inner leading lights (as above) situated close E of Point Louise (1½ miles NNW of Green Head) then leads towards the anchorage.

- 3 Vessels continuing to the jetty should note the drying reef (9 cables NNW) which lies close E of the leading line.

The alignment (131°) of the leading lights situated 6 cables N of Green Head leads towards the jetty.

Useful mark. Light (black and yellow pile, N cardinal top mark) (30°03'8S 114°57'8E).

7.244

- 1 **Berth:** jetty, with least depth of 1 m in its approach.
Supplies: fuel; water; provisions.

ISLAND POINT TO SWAN RIVER

General information

Charts Aus 333, Aus 334, Aus 754

Route

7.245

- 1 From Island Point (30°19'S 115°01'E) the coastal route to the approaches to Fremantle continues SSE, about 100 miles.

Topography

7.246

- 1 The coast between Island Point and a point about 31 miles SSE, off which Wedge Island lies, is fronted by several above-water rocks and numerous reefs which extend up to 4 miles offshore. The mouth of Hill River, 4 miles SSE of Island Point, is generally closed and 2½ miles SE of the mouth there is a conspicuous bare sand patch (57 m high) with a dome-shaped top.
- 2 Cervantes Islands (30°32'S 115°03'E) (7.259) lie close off Thirsty Point. Cervantes, in the vicinity of which there are numerous water towers, is situated close NE of Thirsty Point. East of Cervantes Islands the land rises suddenly, and about 2 miles inland, SE of these islands, there is a long range of sandhills with two remarkable dark bushy summits, North and South Hummocks, near the S end. A conspicuous sandpatch lies 1 mile NNE of North Hummock.
- 3 From abreast Wedge Island (30°50'S 115°11'E) an extensive tract of bare sand stretches along the coast for about 6 miles, extending about 3 miles inland to a sand ridge lying nearly parallel with the coast, and attaining a

height of 139 m. There are several conspicuous sand patches in this locality.

Historic wrecks

7.247

- 1 A number of historic wrecks lie within this coastal area, as shown on the charts. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Exercise area

7.248

- 1 A tower from which fixed red obstruction lights are occasionally exhibited stands on the mainland 2 miles ESE of Wedge Island (30°50'S 115°11'E). Numerous beacons and towers, some of which carry red obstruction lights, stand up to 2 miles inshore within a military exercise area in the vicinity of Wedge Island. See 1.9, *Australian Seafarers Handbook AHP 20* for general information and *Annual Australian Notices to Mariners* for details.
- 2 **Anchorage** is prohibited during military exercises except for a small craft anchorage, 1 mile in radius, centred on the S point of Wedge Island.

Unexploded ordnance

7.249

- 1 Two areas, each radius 2.5 cables, centred in positions 31°45'S 115°13'E and 31°48'S 115°14'E, about 20 miles NW of Rottnest Island, are dangerous with regard to anchoring, fishing or any form of submarine or seabed activity due to unexploded depth charges. See *Annual Australian Notices to Mariners* for details.

Vessel Traffic System

7.250

- 1 A VTS operates for vessels proceeding to Fremantle (8.6) or anchorage in Gage Roads (8.26). For details see *Admiralty List of Radio Signals Volume 6(4)*.

Submarine cables

7.251

- 1 The submarine cables from Singapore and Indonesia land 5 cables NNE and 7½ miles S of Mullaloo Point (31°48'S 115°44'E).
Prohibited anchorage area exists 500 m on either side of the cables.

Principal marks

7.252

- 1 **Landmark:**
Manakoorra Sand Patch (31°09'S 115°23'E).
- Major lights:**
Guilderton Light (red brick tower white lantern, 30 m in height) (31°20'S 115°29'E).
Rottnest Light (32°01'S 115°30'E) (8.43).

Other aid to navigation

7.253

- 1 **Racon.**
Fremantle Fairway Landfall Light-buoy (31°57'S 115°39'E); for details see *Admiralty List of Radio Signals Volume 2*.

Directions

(continued from 7.225)

Island Point to Swan River

7.254

- 1 **Thick weather.** The coast from Jurien Bay (30°16'S 115°01'E) to Swan River, 110 miles SSE, is fronted by rocks and reefs for up to 4 miles offshore, with the charted

200 m depth contour between 20 to 30 miles off the coast. There are depths of 30 m close outside the coastal dangers, and, in thick weather, mariners should not approach the coast to a depth of less than 50 m if uncertain of their position.

Island Point to Wedge Island

7.255

- 1 From a position WSW of Escape Island Light (30°20'S 114°59'E) the passage continues SSE passing (with positions given from Thirsty Point (30°31'S 115°03'E)):
 - WSW of The Coffins (7 miles NW); thence:
 - WSW of Outer Rocks (5 miles NW); thence:
 - WSW of Big Wave Reef (2 miles WSW); thence:
- 2 WSW of South Break (2¼ miles SW) which lies 1 mile SW of Cervantes Islands, noting Island Reef which extends 1 mile S of the same islands; thence:
 - WSW of Outer Seven Foot Rock (2 m high) (4½ miles S); thence:
 - WSW of The Boomers (6½ miles S); thence:
- 3 WSW of Big Break (8 miles S); thence:
 - WSW of Purser Reef, with a least depth of 2.7 m over it (9½ miles S); thence:
 - WSW of Green Islands (10½ miles SSE), two in number; thence:
 - WSW of Red Rock (2.5 m high) (11¾ miles SSE), noting Gazeley Reef which lies 5 cables S of the rock; thence:
- 4 WSW of Wedge Island (20 miles SSE), noting the chain of reefs and broken ground extending up to 5½ miles NNW from the island.

Wedge Island to Swan River

7.256

- 1 From WSW of Wedge Island (30°50'S 115°11'E) the passage to the approaches to Fremantle continues SSE, about 60 miles. The direct route leads slowly away from the coastal shoals and the charts indicate that all known dangers are avoided by keeping outside the 30 m coastal depth contour passing:
 - Clear of a dangerous wreck (31°10'S 115°12'E); thence:
- 2 Clear ENE of Direction Bank, about 75 miles in length lying parallel to the coast with depths of from 19 to 29 m over it, with its shoalest part (19.4 m) (31°36'S 115°16'E) lying 17 miles WSW of Wreck Point, noting the depth of 22 m which lies at the SE extremity of the bank, 11 miles farther SSE; thence:
- 3 To a position N of Rottneest Light and NW of Buckland Hill Directional Light (32°01'S 115°46'E) (8.43).

7.257

- 1 **Useful marks:**
 - Water tower (31 m) (31°02'S 115°20'E) (7.261).
 - Water tower (37 m) (31°07'S 115°22'E) (7.264) with a second water tower (42 m) 7 cables NNE.
 - Water tower (31°33'S 115°38'E) with water tanks 7 cables SE.
- 2 Conspicuous hill (51 m) (31°34'S 115°38'E).
 - Water tower (62 m) (31°40'S 115°42'E) with a second water tower (36 m) 4 miles SSE.
 - Hillarys Boat Harbour Breakwater Light (31°50'S 115°44'E).
 - Bathurst Point Light (31°59'S 115°32'E) (8.48).
 - Woodman Light (32°08'S 115°46'E) (8.43).

(Directions continue at 8.45)

Anchorage and landings

Chart Aus 333 (see 1.16)

General information

7.258

- 1 **Breakers** form on the leading lines during heavy swell, see 7.210.

Cervantes Islands

7.259

- 1 **General information.** Cervantes Islands (30°32'S 115°03'E) lie close off Thirsty Point, a low scrubby point. The S and smaller island is 8 m high, the N island is lower and numerous submerged rocks and ledges lie off its N extremity.

Ronsard Bay Leading lights:

- Front light (orange triangle, point up) (30°29'S 115°04'E).
- 2 Rear light (framework tower square orange topmark) (352 m ENE of the front light).

The alignment (067°) of these lights situated at the head of Ronsard Bay, 2 miles NNE of Thirsty Point, leads through the coastal reefs, in a least depth of 3 m, until 1¼ miles from the front light.

Landing. Boats may land in Ronsard Bay in moderate weather.

Wedge Island

7.260

- 1 **General information.** Wedge Island (30°50'S 115°11'E) lies close off a prominent sandy point and is perpendicular on its S side, but slopes gradually N. For details of a military exercise area and small craft anchorage, see 7.248.

Landing can be made on the NE side of the island in fine weather.

Charts Aus 333, Aus 754

Lancelin Island

7.261

- 1 **General information.** The coast between Wedge Island (30°50'S 115°11'E) and Lancelin Island (17 m high) lying 12½ miles farther SSE, is fronted by rocks and ledges, many of which are awash. The outer reefs do not appear to extend more than 1¼ miles offshore. Edwards Island lies 1½ miles S of Lancelin Island, and 1½ cables offshore. A conspicuous water tower stands near the coast 3 cables NE of Edwards Island.

7.262

- 1 **Leading lights:**
 - Front light (beacon, triangular daymark, point up) (31°00'S 115°19'E).
 - Rear light (beacon, triangular daymark, point down) (75 m ENE of the front light).

The alignment (075½°) of the above leading lights, situated on the mainland NE of Lancelin Island, leads through the coastal reefs to the anchorage.

7.263

- 1 **Facilities.** There are several small jetties at Lancelin, 6 cables SE of Lancelin Island.
- Landing** may be obtained on a small sandy beach on the E side of Lancelin Island.

Chart Aus 754

Ledge Point anchorage

7.264

- 1 Ledge Point Leading Lights (metal columns, orange daymarks) (31°07'S 115°23'E). The alignment (059½°) of the above leading lights situated 4½ cables SE of Ledge

Point leads through a gap in the coastal reefs to an anchorage.

Conspicuous water towers stand 6½ cables NE and 3 cables ESE of Ledge Point.

Seabird

7.265

- 1 **General information.** Cape Leschenault (31°18'S 115°27'E) appears as a dark bluff when seen from S. The town of Seabird stands about 1½ miles NNW of the cape.

The mouth of Moore River, 4 miles SSE of Cape Leschenault, is closed by a sand bar and the town of Guilderton is situated on the N side of the river entrance. Guilderton Light (7.252) is exhibited on the coast 3 miles SSE of the cape.

7.266

- 1 **Seabird Leading Lights:**

Front light (metal column, rectangular orange daymark) (31°18'S 115°27'E).

Rear light (as above) (7 cables NE of the front light).

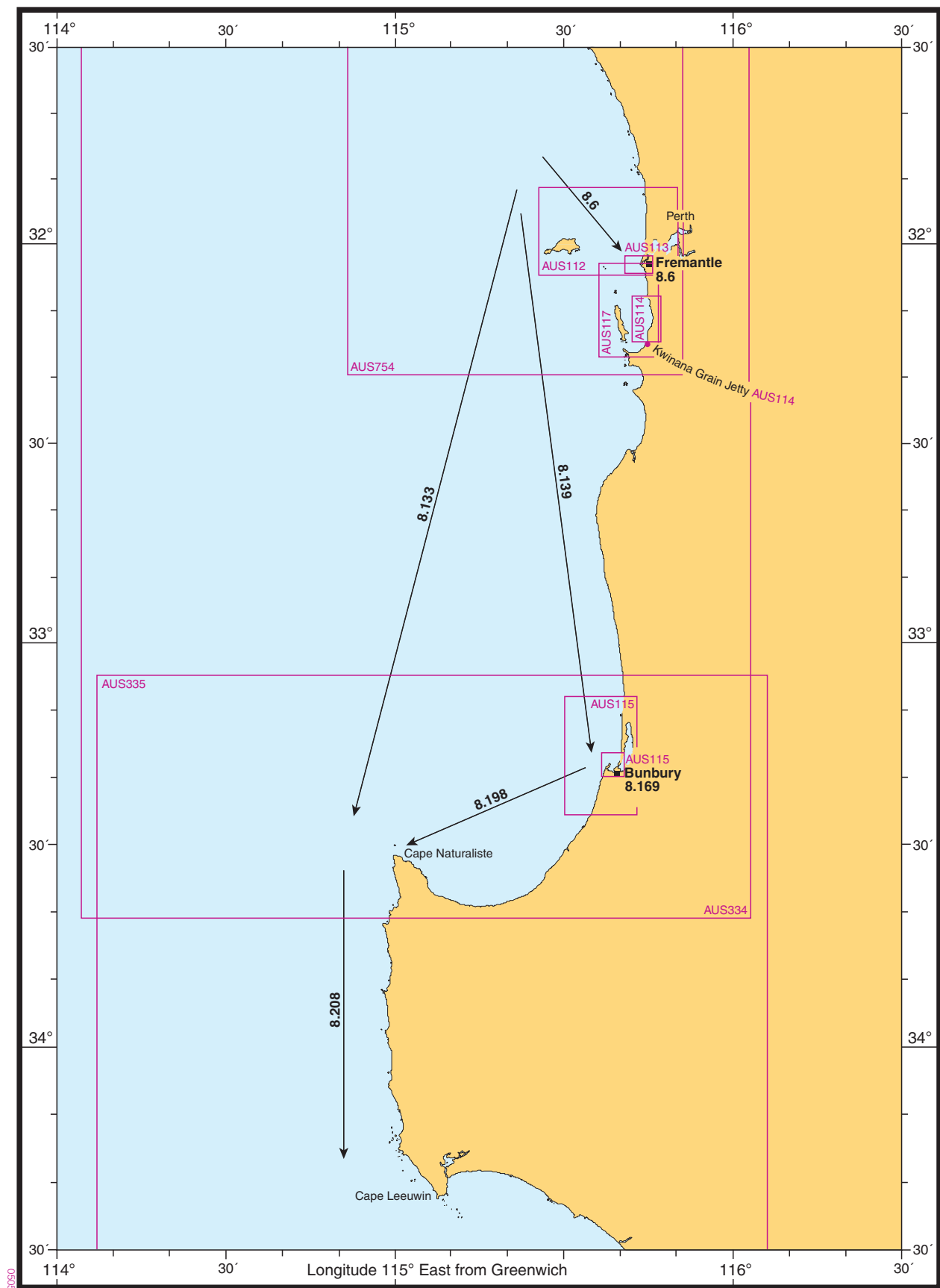
- 2 The alignment (035°) of the above leading lights, situated on Cape Leschenault, leads between Leschenault and Ville de Rouen Reefs, 3 miles W and 3½ miles SSW, respectively, of the front leading light, passing SE of One Mile Reefs which lie 1 mile W of Cape Leschenault. The sea only breaks on Leschenault Reef in a heavy swell.

Common rear light (rectangular topmark) (31°46'S 115°44'E).

Front lights (as above) (310 m W and 340 m SW of the rear light).



Chapter 8 - Swan River to Cape Leeuwin



CHAPTER 8

SWAN RIVER TO CAPE LEEUWIN

GENERAL INFORMATION

Chart Aus 417

Scope of chapter**8.1**

- 1 This chapter covers the W coast of Australia between Swan River (32°00'S 115°50'E) and Cape Leeuwin, about 140 miles SSW, including the ports of Fremantle (8.6) and Bunbury (8.169).

Current**8.2**

- 1 Leeuwin Current is most predominant during May to August with a surface current generally less than 1 kn. It has an average width of 30 miles and extends to a depth of approximately 200 m, carrying warm, low salinity water from the North West Shelf area along the continental slope to Cape Leeuwin, and then E into the Great Australian Bight (chart 4709). For details of local currents off Cape

Leeuwin, see 8.211 and for general information on currents see 1.125

Exercise area**8.3**

- 1 A military exercise area lies W of Rottnest Island (32°00'S 115°30'E), see 1.9, *Australian Seafarers Handbook AHP 20* for general information and *Annual Australian Notices to Mariners* for details.

Lobster Fishery**8.4**

- 1 Between November and June extensive lobster fishing takes place on the continental shelf between the parallels of 24°S and 34°S. When passage permits mariners are requested to transit outside the 200 m depth contour. For further details see 1.6.

FREMANTLE AND APPROACHES

GENERAL INFORMATION

Aus 754

Scope of section**8.5**

- 1 The area covered by this section comprises;
Fremantle (8.6)
Owen Anchorage (8.71)
Cockburn Sound (8.89)

FREMANTLE

General information

Charts Aus 112, Aus 113, Aus 117, Aus 754

Position and function**8.6**

- 1 Fremantle (32°03'S 115°44'E) is the principal commercial port of Western Australia and is situated adjacent to the mouth of Swan River.

The port comprises Inner Harbour, within the estuary of Swan River, and an outer harbour with three open roadsteads; Gage Roads, Owen Anchorage, and Cockburn Sound.

Topography**8.7**

- 1 **Rottnest Island** (32°00'S 115°30'E) (8.145) lies about 10 miles WNW of the entrance to Fremantle Inner Harbour and is a good mark when approaching the port. The island can be readily identified on the radar display when approaching from NW.

Coast north of Fremantle. The coast extending about 10 miles S from Trigg Island (31°53'S 115°45'E) to the entrance to Fremantle Inner Harbour is generally low and sandy.

Port limits**8.8**

- 1 The port limits are shown on the chart and include the NW approaches, Gage Roads and most of Cockburn Sound. Outside the port limits is a section of inshore water S of South Mole to Woodman Point including Fish Rocks.

Approach**8.9**

- 1 **Main approach.** Approach to the port of Fremantle is N of Rottnest Island through Gage Roads, which from sea, is open and readily accessible for mariners in all weathers. The entrance to the roads, between Rottnest Island and the offlying shoals fronting the mainland NE, is about 8 miles wide.

South Passage (32°02'S 115°34'E) (8.149), closed to commercial shipping, leads into Gage Roads passing S of Rottnest Island. See also 8.32 for requirement for local knowledge.

Entry**8.10**

- 1 Fremantle Inner Harbour is entered from Gage Roads via a short dredged entrance channel which is protected by two rubble breakwaters, North Mole and South Mole. Vessels should avoid crossing the entrance channel; where it is unavoidable the shortest route should be used and within the speed limit of 8 kn.

Owen Anchorage and Cockburn Sound are entered from Gage Roads through Success Bank Channel (32°05'S 115°41'E) and Parmelia Bank Channel (32°07'S 115°42'E).

Traffic**8.11**

- 1 In 2002 the port was used by 1859 vessels totalling 61 264 995 dwt.

Port authority**8.12**

- 1 Fremantle Port Authority, 1 Cliff Street (PO Box 95), Fremantle, Western Australia 6160.
Website: www.fremantleports.com.au
E-Mail: mail@fremantleports.com.au

Limiting conditions**Controlling depths – Gage Roads****8.13**

- 1 **East Channel:** (8.45) The maximum authorised draught in the East Channel is 11 m and the least charted depth is 13.1 m, about 3½ miles NW of Buckland Hill Directional Light (32°01'S 115°46'E) (8.43).
West Channel: (8.46) The maximum authorised draught in the West Channel is 9 m and the least charted depth is 11.4 m, about 4¾ miles NW of Buckland Hill Directional Light (32°01'S 115°46'E) (8.43).
- 2 **Least charted depth** in the compulsory pilotage Deep-Water Channel (8.45), is 15.1 m, about 4 miles WNW of Buckland Hill Directional Light (32°01'S 115°46'E) (8.43).

Controlling depths – Outer harbour**8.14**

- 1 **Maintained depths.** Success Bank Channel (32°05'S 115°41'E) (8.37) and Parmelia Bank Channel (32°07'S 115°42'E) (8.37), which lead S through outer harbour to Cockburn Sound, are maintained at 14.8 m.
For controlling depths of channels in Cockburn Sound, see 8.95.

8.15

- 1 **South Passage** (32°02'S 115°34'E) (8.149), the least depth on the leading line is 7.9 m, but, due to swell in this vicinity, passage is restricted to non-commercial vessels with a maximum draught of 5.0 m. See also 8.32 for requirement for local knowledge and caution.

Controlling depths – Fremantle Inner Harbour**8.16**

- 1 **Depths** in Inner Harbour (32°03'S 115°44'E) are maintained at from 11 to 13 m, except for a small area in the NE corner of Inner Harbour, indicated on the chart, where silting occurs.

Navigation restrictions**8.17**

- 1 Vessels in ballast, during adverse wind conditions, may be subject to a minimum draught restriction based on their dwt.
Tankers with LOA 250 m and greater than 40 m beam, in ballast condition, may be limited to daylight passage in Success/Parmelia Channels.
- 2 Tankers with a beam greater than 40 m and loaded, may be subject to a draught limitation in Success/Parmelia Channels.

Deepest and longest berths**8.18**

- 1 **Fremantle Inner Harbour.** The deepest and longest berths are at North Quay (8.58) and Victoria Quay (8.59).
Outer Harbour. The deepest and longest berths in outer harbour are all situated in Cockburn Sound and are specialist berths as follows:
Alcoa Jetty (32°11'S 115°46'E) (8.113).
- 2 Kwinana Bulk Terminal Jetties (32°12'S 115°45'E) (8.113).

Oil Refinery Jetty (32°14'S 115°45'E) (8.113).
Kwinana Bulk Jetty (32°14'S 115°45'E) (8.113).
Kwinana Grain Jetty (32°15'S 115°44'E) (8.113).

Mean sea level**8.19**

- 1 MSL is lowered during the summer months, when breezes off the land are general, and raised during winter months, when N to W winds are frequent. Prior to, and during winter gales, the water may rise to 1.5 m, and on rare occasions to 1.8 m, above chart datum.

Density of water**8.20**

- 1 Density: 1.025 g/cm³, generally at all tides.

Maximum size of vessels handled**8.21**

- 1 A container vessel of 50 462 grt and 289 m in length, has used Inner Harbour; a passenger vessel of 67 139 grt, with a length of 293.53 m, and a draught 9.95 m has berthed at Victoria Quay.

Local weather and sea state**8.22**

- 1 **Gales.** The barometer is a good indicator of the weather, as a general rule rising with S and falling with N winds. It invariably gives several hours notice of the approach of bad weather.
- 2 During the winter months gales generally commence from N and rapidly shift W with a falling barometer. When the wind shifts to NW with the barometer still falling the wind will be approaching its maximum and may reach gale force. When the wind shifts to W, or WSW, it generally increases. As the wind shifts S, with a rising barometer and the weather moderating, as it generally does, it continues to back returning to the NE quarter.
- 3 Should the wind after backing SW, veer to W or NW, the gale is not over, but will probably blow harder than before, the barometer keeping below 1016 hPa.
Swell. During winter months heavy swells are experienced in the approaches to Gage Roads.

Arrival information**Vessel Traffic Service****8.23**

- 1 Orders concerning shipping movements, allocation of berths and related matters are passed to mariners through the signal station on the Port Authority Office (32°03'S 115°44'E) (8.43).
The signal station is manned continuously and is equipped with Automatic Radar Plotting Aid (ARPA) and all modern navigational aids. Automatic equipment records wind speed and direction, barometric pressure and water level variations in the port.

- 2 **Inwards reporting line,** shown on the chart, is the arc of a circle 15 miles radius, centred on the Fairway Landfall Buoy (8.27) and covering the N and W approaches to Fremantle.

Inbound vessels are to contact Port of Fremantle when crossing this line, reporting their pilotage requirement and pilot boarding position (see 8.49).

Port radio**8.24**

- 1 A port radio operates from the signal station at Fremantle and also from HMAS *Stirling* (Fleet Base West) at Garden Island. For details see *Admiralty List of Radio Signals Volume 6* (4).

Notice of ETA

8.25

- 1 Notice of ETA at the Fairway Landfall Light-buoy (31°57'S 115°39'E) 48 hours before arrival and confirmed at intervals thereafter. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages – Gage Roads

8.26

- 1 **Anchorage** can be obtained in Fremantle outer harbour in Gage Roads. For details of anchorages in Owen Anchorage and Cockburn Sound see 8.84 and 8.95.
- 2 **Description.** Gage Roads, in the approach to Swan River and Fremantle Inner Harbour, are protected from W and S by Rottnest Island (32°00'S 115°30'E) and the reefs and shoals between it and Garden Island, 10 miles SE, as well as by Success Bank (32°05'S 115°41'E). The roads afford anchorage to all classes of vessel, and there is room for a considerable number of vessels, but they are open to N and NW winds.

Waiting anchorages

8.27

- 1 Vessels awaiting a pilot with a draught of 11 m or more should anchor W of Fairway Landfall Light-buoy (31°57'S 115°39'E). The holding ground is firm sand and shell.
Vessels of less than 11 m draught, and expecting a pilot on the same day as arrival, may anchor in Gage Roads in the vicinity of Hall Bank Light-beacon (32°02'S 115°43'E). The holding ground is fine sand.
- 2 Vessels of less than 11 m draught, not expecting a pilot on the same day as arrival, should anchor in Gage Roads, as directed by the signal station, W of the W limit of the prohibited anchorage area (8.30), shown on the chart, extending 2¼ miles W from the entrance to Inner Harbour (32°03'S 115°44'E).
- 3 Vessels of less than 11 m draught may, with permission of the Harbour Master, anchor S of a line between South Mole (32°03'S 115°44'E) and the N entrance to Success Bank Channel, 2½ miles WSW, in sand and mud. In winter, anchorage in this area is preferred in the red sector of Woodman Light (32°08'S 115°46'E) (8.43) which shows red between the bearings of 132° to 145°.
- 4 Within Gage Roads, designated anchorages N1–N6 and A–I are shown on the chart.
Spoil ground, indicated on chart Aus 113, lies on the S side of the above anchorage, situated 5 cables S of the head of North Mole.

Beagle Road

8.28

- 1 **Anchorage** for small coasting vessels may be found in Beagle Road (32°01'S 115°34'E) (8.153) on the E side of Rottnest Island.

Explosive anchorage

8.29

- 1 Mariners in vessels with explosives onboard should anchor not less than 5 cables from any other vessel, unless otherwise directed by the Harbour Master. The appropriate signal as given in *The International Code of Signals* should be shown.

Prohibited anchorage

8.30

- 1 Anchoring is prohibited, as indicated on the chart, in the vicinity of East and West Channels and an area within

2¼ miles W of the entrance to Inner Harbour (32°03'S 115°44'E).

Disused submarine cables, as indicated on the chart, exist in the area NW of the coast near Buckland Hill (32°01'S 115°46'E) and across Gage Roads from Rottnest Island, in the vicinity of Bickley Bay (32°00'S 115°33'E), to the mainland W of Buckland Hill.

Pilotage and tugs

8.31

- 1 **Pilotage** from the Outer Pilot Boarding Ground is compulsory only for vessels with a draft of 11 m and above, or for vessels that do not have the appropriate charts for the approaches to Fremantle. All other vessels should proceed direct to the Inner Pilot Boarding Ground.
Pilotage is compulsory from the Inner Pilot Boarding Ground for all non-exempt vessels.
- 2 Pilotage is compulsory for vessels over 150 grt. Pilots board in the following positions:
31°55'·5S 115°36'·0E for vessels of 11 m draught and over (Outer Pilot Boarding Ground)
32°02'·0S 115°41'·5E for vessels of less than 11 m draught (Inner Pilot Boarding Ground)
Tugs are available throughout the port.

Local knowledge

8.32

- 1 **South passage.** Local knowledge is required for South Passage (32°02'S 115°34'E) (8.149).
Caution. This channel is closed to commercial shipping and should only be used by pleasure craft with a draught of 5 m or less, but it is not recommended and mariners are advised not to attempt the passage because of the swell conditions that can occur.

Traffic regulations

8.33

- 1 **Speed limit.** There is a speed limit of 8 kn in the entrance channel and inner harbour.
Restricted area. A restricted area, indicated on the chart, fronts the E coast of Cockburn Sound in the vicinity of James Point (32°13'S 115°45'E), for details see 8.97.
Unauthorised vessels and boats are not permitted within an area radius 2 cables centred on Jervoise Bay ship lifter support jetty (32°09'S 115°46'E).
- 2 **Naval waters.** An area embracing all sides of Garden Island (32°12'S 115°41'E) in Cockburn Sound, as indicated on the chart, has been declared Naval Waters, for details see 8.114.

Regulations concerning entry

8.34

- 1 **Dangerous cargoes.** All vessels with explosives, flammable liquids and other dangerous cargoes onboard shall communicate such information when notice of ETA is given. See *Admiralty List of Radio Signals, Volume 6 (4)*.
Low flash point cargoes. No night movements are allowed for vessels with low flash point cargoes, or for vessel which have not been certified gas-free.

Marine protected area

8.35

- 1 A marine protected area, as shown on the chart, is established in the waters surrounding Rottnest Island (8.145).

Quarantine

8.36

- 1 Fremantle is a first port of entry, see 1.54. and *Admiralty List of Radio Signals Volume 1 (2)*.

Radio pratique is available to all vessels except livestock carriers.

Radio pratique may be applied for by livestock carriers, however, they will be boarded and inspected by a Quarantine Officer before the vessel is allowed to berth. For details see *Admiralty List of Radio Signals Volume 1* (2).

- 2 The Quarantine Officer boards vessels in Gage Roads unless he specifically directs that the examination shall take place within Inner Harbour.

Tankers and bulk carriers proceeding to berths in Cockburn Sound, and holding certificates of pratique, will be boarded by medical, quarantine and customs officers on arrival alongside their berth.

- 3 The quarantine line is defined as a line drawn from the seaward end of North Mole to the centre of Mewstone (32°05'S 115°39'E).

Harbour

General layout 8.37

- 1 **Fremantle Inner Harbour** (32°03'S 115°44'E) is an artificial harbour constructed within the estuary of Swan River, and handles mainly Ro-Ro, container, general cargo and passenger traffic.
- 2 **Outer harbour** is comprised of Gage Roads (8.26), Owen Anchorage (8.71) and Cockburn Sound (8.89). The three roadsteads provided spacious anchorages, mostly sheltered from seaward by Rottnest Island (32°00'S 115°30'E) and Garden Island, 10 miles SE, and the chain of reefs between and seaward of these islands, extending for nearly 20 miles from Rottnest Island to about 5 miles SSW of Cape Peron (32°16'S 115°41'E).
- 3 Gage Roads is accessible at all times to all classes of vessel, the other two are only available to mariners in deep-draught vessels which can navigate Success Bank and Parmelia Bank Channels.

Berths in the outer harbour, in Cockburn Sound, are mainly for specialised cargoes.

- 4 **Success Bank Channel** (32°05'S 115°41'E), 152 m wide, leads S from Gage Roads across Success Bank (8.71) to Owen Anchorage. Light-buoys mark the entrance to the channel at either end, and pairs of light-beacons mark the edges of the channel throughout its 2 mile length. The centre line of the channel is marked by leading lights.
- 5 **Parmelia Bank Channel** (32°07'S 115°42'E), 152 m wide, leads S from Owen Anchorage, across Parmelia Bank (8.71) to Cockburn Sound. It is in line with, and forms a continuation of Success Bank Channel. It is marked, similarly to Success Bank Channel, by light-buoys, light beacons, and leading lights.

Main berthing areas 8.38

For details of channels inside Cockburn Sound, see 8.99.

- 1 Fremantle Inner Harbour contains 18 berths, all of which are land backed, and are situated on both sides of the harbour.
North Quay (8.58), on the N side of the harbour, has 11 deep water berths, with a continuous run of quay and is equipped to handle containers.
- 2 Victoria Quay (8.59), on the S side of the harbour, with a continuous run of quay has 9 berths, A to J, and is equipped to handle general cargo and passenger traffic.

Exercise areas

8.39

- 1 Mariners are warned that military exercise areas exist in the vicinity of North Rock (31°58'S 115°44'E) and W of Rottnest Island, see 1.9, *Australian Seafarers Handbook AHP 20* for general information and *Annual Australian Notices to Mariners* for details.

Historic wrecks

8.40

- 1 The site of an historic wreck is protected from unauthorised interference, for details see 1.60.

Historic wrecks of the following vessels, the positions of which can be seen on the chart, lie within the port of Fremantle and are situated with reference to the following salient points.

- 2 **Gage Roads** (with positions given from North Mole head (32°03'S 115°43'E)):
 - Elizabeth* (2¾ miles NNE).
 - Priestman* (7 cables ESE) (chart Aus 113).
 - (With positions given from the largest Straggler Rock (12 m) (32°04'S 115°38'E)):
 - Ulidia* (8 cables NNW).
 - Unknown name (5¾ cables NNW)
- 3 *Zedora* (3½ cables W).
- Lancier* (5 cables S).
- Owen Anchorage** (with positions given from Woodman Point (32°08'S 115°45'E)):
 - James* and *Diana* (2½ miles NNE).
 - Omeo* (2 miles NNE).
 - James Matthews* (close NW).
- 4 **Cockburn Sound** (with positions given from Carnac Island (32°07'S 115°40'E)):
 - Sepia* (1¼ miles WSW).
 - (With positions given from John Point (32°16'S 115°41'E)):
 - Contest* (uncharted) (1½ miles ESE).
- 5 (With positions given from Parkin Point (32°15'S 115°42'E)):
 - Dato* (3 cables NNW).
 - Day Dawn* (1 cable N).

Measured distance

8.41

- 1 A measured distance lies off the E side of Garden Island (32°12'S 115°41'E), in Cockburn Sound, for details see 8.100.

Natural conditions

8.42

- 1 **Tides.** The tide is normally diurnal, but for several days when the moon is near the Equator, smaller semi-diurnal tides occur. The largest tides coincide with the moon's maximum declination and the range seldom exceeds 1 m.

Tidal streams. The N-going stream runs for about 10 hours and the S-going stream for about 14 hours, the rate is usually small, but may be as much as 2 kn in unsettled weather in the winter months.

- 2 **Inner harbour flow.** Swan River outflow is concentrated principally in the upper 4 m of the water column and tidal underflow can be substantially different from surface river flow.

The circulation path appears to be strongest off No 10 berth and Berth E. The mid-harbour crossover is indistinct and may be variable. Flow rates are generally less than 1 kn, however, rates of 3 kn may be experienced.

- 3 **Local magnetic anomaly.** The area around Rottnest Island (32°00'S 115°30'E) is anomalous. In 1949 a local magnetic anomaly, which increased the normal magnetic variation by 6°, was reported to occur, on a W heading, 2 miles off Rottnest Island in position 31°57'S 115°31'E. The anomaly continued while the island was rounded to the W, and ceased at a range of 6 miles from the island.

Climatic tables. For climatic information for Perth and Fremantle, see 1.170 and 1.182.

Principal marks

8.43

1 Landmarks:

Conspicuous building (227 m) (31°57'S 115°51'E) visible from about 35 miles.

Signal station on top of the Port Authority Office (32°03'3S 115°44'4E) floodlit when no signals exhibited. Clearly visible to all ships in the port and commanding an overall view of the inner and outer harbours.

2 Major lights:

Rottnest Light (white masonry tower and lantern, gold cupola, 38 m in height) (32°00'5S 115°30'1E).

Buckland Hill Directional Light (white house, 10 m in height) (32°01'1S 115°45'6E) shown throughout 24 hours. Only visible to mariners approaching from NW.

- 3 Woodman Light (grey round stone tower, 13 m in height) (32°07'9S 115°46'2E). Visible only over certain arcs, which can best be seen from the chart.

Garden Island Light (32°12'9S 115°40'2E).

Other aids to navigation

8.44

1 Racon.

Fairway Landfall Light-buoy (31°57'3S 115°38'8E)
For details see *Admiralty List of Radio Signals Volume 2*.

Radar. The signal station on top of the Port Authority Office is equipped with radar, range 48 miles.

Directions for approaches

(continued from 7.216 and 7.256)

Gage Roads – approach from north-west by East Channel

8.45

- 1 From the vicinity of 31°52'S 115°30'E, about 9 miles N of Rottnest Light (8.43), the line of bearing 125° of Buckland Hill Directional Light (32°01'S 115°46'E) (8.43), which shows white between the bearings of 124¾° to 125¾°, leads in the approach passing:

NE of Roe Reef (31°58'S 115°32'E) (8.48); thence:
NE of Kingston Reefs (31°59'S 115°34'E) (8.49);
thence:

- 2 NE of Fairway Landfall Light-buoy (safe water) (31°57'S 115°39'E) to join the two-way East Channel deep-water route, continuing along the same line of bearing, noting the two 14.8 m patches (31°58'2S 115°40'4E) (31°58'0S 115°41'1E) and the 8.9 m shoal patch (31°56'8S 115°40'9E) which lies 1 mile NE of the deep-water route; thence:

- 3 NE of No 1 Light-buoy (starboard hand) (31°58'7S 115°41'5E), noting the light-buoys (special) close NW and SW.

The route, authorised for a draught of 11 m, then leads generally S over a 13.1 m patch (31°59'3S 115°42'0E), the

least charted depth (8.13) of East Channel and passing W of Hall Bank Light-beacon (port hand) (32°01'8S 115°42'7E) to the inner pilot boarding position (8.31) in Gage Roads.

- 4 For vessels with a draught greater than 11 m, the Deep-Water Channel leads generally S passing between the 15 m contours through the compulsory pilotage area shown on the chart and marked by light-buoys (lateral), thence passing W of Hall Bank Light-beacon (port hand) (32°02'0S 115°42'7E) to the inner pilot boarding position (8.31) in Gage Roads.

Gage Roads – approach from north-west by West Channel

8.46

- 1 From the vicinity of 31°52'S 115°30'E, about 9 miles N of Rottnest Light (8.43), the route leads SE for about 8 miles to join West Channel 1 mile W of Fairway Landfall Light-buoy (safe water) (31°57'S 115°39'E). West Channel is a recommended track and runs generally SE for 4¾ miles to pass between a 9.8 m patch (32°00'6S 115°39'9E) and No 3 Light-bouy (starboard hand) (32°00'S 115°41'E) which marks the end of the East Channel compulsory pilotage area shown on the chart.

- 2 The route then leads generally S passing W of Hall Bank Light-beacon (port hand) (32°01'8S 115°42'7E) to the inner pilot boarding position (8.31) in Gage Roads.

Caution. Mariners should consider avoiding passage through West Channel during periods when the approaches to Fremantle are affected by heavy swell.

Gage Roads – approach from west of Rottnest Island

8.47

- 1 **Irregular depths.** For details of irregular depths off Rottnest Island, see 8.141.

8.48

- 1 From a position about 5 miles NW of Cape Vlamingh (32°02'S 115°27'E) (8.143), on the edge of the 50 m depth contour, the route leads ENE along the N coast of Rottnest Island, at a distance of about 4 miles, passing (with positions given from Rottnest Light (32°01'S 115°30'E)):

- 2 NNW of Horse Shoe Reefs (2½ miles WNW). Several patches of less than 20 m lie N of Horse Shoe Reefs, about 2 miles offshore; during heavy N and W gales there is a confused and dangerous sea on these patches. Noting also a 28.9 m patch (5½ miles WNW) the outermost patch of less than 30 m charted NNW of Cape Vlamingh. Cape Vlamingh Light (32°02'S 115°27'E) (8.143) stands on the cape. Thence:

- 3 NNW of North Point Reef (2 miles N) on which the sea breaks in bad weather; thence:

NNW of Roe Reef (2¾ miles NE) (8.147), the N-most danger off Bathurst Point, noting that depths of less than 20 m lie up to 1½ miles N of the reef. Bathurst Point Light (white stone tower and lantern with gold cupola, 19 m in height) (31°59'S 115°32'E) is exhibited from the point.

- 4 The track continues ENE to join the NW East Channel approach route (8.45) on the line of bearing 125° of Buckland Hill Directional Light (32°01'S 115°46'E).

8.49

- 1 **Alternative route.** By day mariners in vessels of less than 11 m draught may take an alternative route from a position NNW of Roe Reef leading ESE passing (with positions given from Rottnest Light):

NNE of Kingston Reefs (3 miles ENE), noting Kingston Spit on the NE extremity of the reefs.

These dangers are marked by a light-buoy (N cardinal) (3½ miles ENE).

- 2 This route then joins the NW West Channel approach route (8.46) in the vicinity of Fairway Landfall Light-buoy (safe water) (31°57'S 115°39'E).

Useful marks

8.50

- 1 Conspicuous water tank (45 m) (31°51'·2S 115°45'·2E).
Conspicuous radio mast (178 m) (31°51'·4S 115°49'·1E).
Conspicuous pine trees (31°51'·6S 115°45'·1E).
Conspicuous water tower (82 m) (31°52'·9S 115°46'·5E).
- 2 Conspicuous building (73 m) (31°53'·6S 115°45'·4E) near the shore at Scarborough.
Conspicuous water tower (100 m) (31°56'·1S 115°46'·1E) 5 cables NW of Reabold Hill.
Conspicuous white obelisk (71 m) (32°01'·1S 115°45'·6E) on Buckland Hill.
Conspicuous building (32°02'·7S 115°45'·2E) on Cantonment Hill.
- 3 War Memorial (32°03'·2S 115°45'·3E), 62 m in height, on Church Hill.
North Mole Head Light (32°03'·3S 115°43'·4E) (8.51).
South Mole Head Light (32°03'·4S 115°43'·9E) (8.54).
Success and Parmelia Bank Channel Leading Lights (32°09'S 115°42'E) (8.52).

(Directions continue for Fremantle Inner Harbour at 8.55)

Gage Roads to Cockburn Sound – Success and Parmelia Bank Channels

8.51

- 1 From a position W of Hall Bank Light-beacon (port hand) (32°01'·8S 115°42'·7E), in the vicinity of the inner pilot boarding position, the route leads generally S passing:
W of North Mole. North Mole Head Light (red round metal tower white cupola, 9 m in height) (32°03'·3S 115°43'·4E) is exhibited from the head of the mole. And:
E of a shoal marked by an isolated danger buoy (2½ miles W of North Mole Head Light).

Success Bank Channel

8.52

- 1 **Success and Parmelia Bank Channel Leading Lights:**
Front Light (white round metal tower orange band, 12 m in height) (32°08'·8S 115°42'·3E).
Rear Light (white round metal tower orange bands, 21 m in height) (5 cables S of the front light).
From position W of North Mole Head Light (32°03'S 115°43'E) the alignment (169¼°) of Success and Parmelia Bank Channel Leading Lights, leads through Success Bank Channel passing:
- 2 Between Light-buoy A and No 1 Light-buoy (port and starboard hand) (32°03'·8S 115°41'·2E); thence:
Between lettered and numbered light-beacons (port and starboard hand) marking the E and W sides of the dredged channel; thence:
Between Light-buoy G and No 7 Light-buoy (special and starboard hand) (32°06'·2S 115°41'·7E) marking the S exit to Success Bank Channel.
(Directions for Owen Anchorage continue at 8.80)

Parmelia Bank Channel

8.53

- 1 From a position at the S end (32°06'·2S 115°41'·7E) of Success Bank Channel the track continues on the alignment (169¼°) of Success and Parmelia Bank Leading Lights passing (with positions given from No 1 Light):
Between Light-buoy H and No 8 Light-buoy (port and starboard hand) (2 miles N) marking the N entrance to Parmelia Bank Channel; thence:
- 2 Between lettered and numbered light-beacons (port and starboard hand) marking the E and W sides of the dredged channel; thence:
Between Light-buoy M and No 12 Light-buoy (port and starboard hand) (5 cables N) marking the S end of Parmelia Bank Channel; thence:
Clear of No 1 and No 2 Leading Lights into Cockburn Sound.
- 3 Mariners S-bound through Parmelia Bank Channel should pass W of No 1 and No 2 Leading Lights and N-bound, E of the leading lights.

Useful marks

8.54

- 1 Mewstone (32°05'·2S 115°39'·4E) (8.73).
Carnac Island (32°07'·3S 115°39'·7E) (8.73).
South Mole Head Light (green round metal tower white cupola, 9 m in height) (32°03'·4S 115°43'·9E).
Colpoys Point Light (32°13'·7S 115°41'·9E) (8.115).
(Directions for Cockburn Sound continue at 8.104).

Directions for entering harbour

(continued from 8.50)

Fremantle Inner Harbour

8.55

- 1 From a position in Gage Roads W of Hall Bank Light-beacon (port hand) (32°01'·8S 115°42'·7E), in the vicinity of the inner pilot boarding position, the route leads generally S passing:
W of North Mole. North Mole Head Light (32°03'·3S 115°43'·4E) (8.51) stands on the head of the mole.

8.56

- 1 **Inner Harbour Leading Lights:**
Front light (orange daymark on mast) (32°03'·3S 115°44'·4E).
Rear light (as above) (1 cable E of the front light).
The alignment (082¾°) of these lights then leads between light-buoys and light-beacons (port and starboard hand) marking the N and S limits of the approach channel to Inner Harbour passing (with positions given from North Mole Head Light):
- 2 Between Light-buoy A and No 1 Light-buoy (port and starboard hand) (4 cables WSW) which mark the outer limits of the approach channel; thence:
S of North Mole; and:
N of Beagle Rocks and associated dangers (4 cables SSE) marked by a light-beacon (isolated danger); thence:
- 3 N of South Mole. South Mole Head Light (4 cables ESE) (8.54) is exhibited from the head of the mole. Thence:
S of a light-buoy (special), close E of light-beacon "C", marking an obstruction, thence:
To the required berth.

8.57

- 1 **Transit lights**, the positions and alignments of which can best be seen from the chart, are situated on North

Quay and Victoria Quay to indicate distances from the 11 m dredged area in the NE part of Inner Harbour.

Berths

Alongside berths

8.58

- 1 **North Quay** (32°02'7S 115°44'5E) has continuous quayside 2602 m long with 11 berths. The maximum depth alongside, 13 m, is available at berths No 4 to No 9.

Berths No 4 to No 10 are container terminals. Total length of berths No 11 and No 12 is 429 m with a 10 m wide articulated stern ramp at the E side.

Berths No 1 to No 2 and No 11 to No 12 are common usage berths.

8.59

- 1 **Victoria Quay** (32°03'0S 115°44'6E) has continuous quayside 1289 m long with 7 berths. The maximum depth alongside, 11 m, is available at berths F and G, which is the passenger terminal. Berths A and B are no longer available to shipping.

Berths C to H are common user berths, C and D being available for limited lay-up and berths E to H for general cargo including livestock and car carriers.

- 2 **Caution.** Depths alongside all berths are subject to siltation and the Harbour Master should be consulted to confirm depths at particular berths.

Rous Head Harbour, a commercial boat harbour and industrial park, is situated on reclaimed land W of Rous Head (32°03'S 115°44'E).

Depths in the entrance, and in the S part of the harbour, are maintained at 6 m.

Entry to the harbour is from the S side of North Mole.

Port services

Repairs

8.60

- 1 General repairs of all kinds can be effected at Inner Harbour and Cockburn Sound. Slipways are available in Inner Harbour.

Marine support facility: The Australian Marine Complex, is available in Jervoise Bay Southern Harbour (32°09'S 115°46'E), consisting of: berths; ship services; mechanical lift dock, platform 123 m length, 25 m breadth, lifting capacity 8065 tonnes for vessels up to 148 m length, 24.5 m breadth, 8 m draught and 14 000 dwt.

Other facilities

8.61

- 1 **Deratting** can be carried out. Deratting and Deratting exemption certificates can be issued.

Hospital facilities: available.

Oily waste reception facilities are available. Private contractors operating road tankers, with limited capacity, are available and there are some facilities available to tankers at Kwinana jetties.

Supplies

8.62

- 1 **Fuel:** furnace fuel oil and marine diesel oil, heavy and light, are available at berths in Fremantle Inner Harbour and in Cockburn Sound, at Kwinana Oil Refinery Jetty, Kwinana Bulk Jetty and Kwinana Bulk Terminal Jetties.

Lighter: available to supply fuel to vessels berthed in Fremantle outer harbour.

Fresh water: available at all berths in Fremantle inner and outer harbours.

Provisions are plentiful.

Communications

8.63

- 1 An international airport is situated at Perth, 20 km by road from Inner Harbour.

Swan River

General information

8.64

- 1 Perth, the capital of Western Australia, stands on both banks of Swan River about 11 miles up river from Fremantle. Between Fremantle and Perth the river winds considerably in its course and the channel is marked by lights and beacons.

Depths in the channel are from 2 to 15 m and vessels of 1.5 m draught can ascend to the wharves at Perth.

Local knowledge is required.

8.65

- 1 **Bridges.** Swan River entrance, at the head of Inner Harbour, is spanned by a railway bridge and Fremantle Bridge, a road bridge. Both bridges have navigable arches and small craft can pass beneath them.

Stirling Bridge is situated 3 cables above Fremantle Bridge, the navigable channel under this bridge is marked by a light on each side of the bridge.

Minimum vertical clearance under the bridges is 7.1 m under Fremantle Bridge.

Harbours south of Fremantle Inner Harbour

General information

8.66

- 1 Fishing Boat Harbour, Challenger Harbour and Success Boat Harbour (32°04'S 115°44'E), three small craft harbours, are situated S of South Mole with their entrance about 6 cables S of Arthur Head.

8.67

- 1 **Fishing Boat Harbour** is enclosed by two breakwaters with an entrance ½ cable wide between their heads. A light stands on the head of the S breakwater.

General depths within the harbour are from 2.6 to 4.7 m, but near the shore on the E side there is an area with depths of from 6.6 to 8.8 m. An isolated danger spar buoy, with topmark, is moored 1¾ cables E of the control tower on the W breakwater.

8.68

- 1 **Success Boat Harbour** is situated immediately S of Fishing Boat Harbour and is enclosed by a curving breakwater about 6 cables in length, the entrance faces NW. A light-beacon (starboard hand) is situated close off the head of this breakwater.

8.69

- 1 **Challenger Harbour** is situated on the W side of the W breakwater of Fishing Boat Harbour, and is enclosed by a breakwater, the entrance faces SE. A light is exhibited from the head of the W breakwater, and a light-beacon (S cardinal) is situated close off the head of Fishing Boat Harbour W breakwater.

8.70

- 1 **Approach.** Minden Reefs lie 8 cables WSW of the entrance to Fishing Boat Harbour, and two light-beacons (special), for traffic separation purposes, are situated 1¼ and 2¼ cables SW of the same point.

OWEN ANCHORAGE

General information

Chart Aus 117

Position and function

8.71

- 1 Owen Anchorage, W of the coast between Catherine Point (32°05'S 115°45'E) and Woodman Point, 3 miles S, lies between Success Bank on the N, and Parmelia Bank on the S. It is protected on the W by the reefs which extend S from Straggler Rocks (32°04'S 115°38'E).

Success Bank, with depths of less than 5 m, extends 5½ miles W from Catherine Point, the bank is composed of sand and weed with rocky patches, and the depths on it vary from time to time.

- 2 **Parmelia Bank**, with depths of less than 5 m, extends W from Woodman Point (32°08'S 115°45'E) and separates Owen Anchorage from Cockburn Sound. Shoal areas, with depths of less than 2 m over them, and on which the sea breaks heavily with a W swell, lie on the bank 1½ and 2¼ miles WNW of Woodman Point.

- 3 The NE part of Owen Anchorage, known as Beagle Anchorage, affords good shelter for small vessels of light draught in comparatively smooth water, even during the winter months.

Topography

8.72

- 1 **East side.** The coast between Catherine Point and Woodman Point is low and sandy, backed by a ridge of scrubby limestone hillocks, 30 to 50 m high. Several prominent wind-motors stand on these hillocks, 8 cables SE of Catherine Point. Woodman Point is low, but it can be identified by the buildings of the quarantine station on it. Woodman Light (8.43) is situated on a hill about 1 mile E of the point.

- 2 A number of prominent chimneys stand close to the shore forming the E side of Owen and Beagle Anchorages, their positions can best be seen from the chart.

8.73

- 1 **West side.** Mewstone (32°05'S 115°39'E), a round bare rock, lies S of the W end of Success Bank, and 1½ miles SE of the highest (12 m) Straggler Rock. Straggler Reefs, with numerous rocky ledges, some of which dry, extend, with depths of less than 5 m, 1½ miles NNW, 5 cables E, and 5 cables S from Straggler Rocks (32°04'S 115°38'E). From the S end of Straggler Reefs, the reefs are nearly continuous as far as the N end of Garden Island, about 5 miles SSE.

- 2 Carnac Island (32°07'S 115°40'E) situated near the W end of Parmelia Bank, has a bare white top, its N and W sides are cliffy, and its E side slopes gradually to a sandy beach. A large bare sand patch extends across the SE end. A beacon stands close off the E side of the island, 1 cable E of its summit. Flat Rock, with perpendicular sides and a level top, lies 1 cable S of Carnac Island.

- 3 West of Carnac Island submerged reefs and foul ground extend 5 cables, almost connecting it with the reefs W of it extending S from Straggler Rocks.

Approach and entry

8.74

- 1 From N, Owen Anchorage is approached through Gage Roads and entered by Success Bank Channel (8.52).

From S, the anchorage is approached from Cockburn Sound and entered by Parmelia Bank Channel (8.53).

For controlling depth in Success and Parmelia Bank Channels, see (8.14).

For small craft channels see 8.87.

Limiting conditions

Charted depths

8.75

- 1 Depths in the W part of Owen Anchorage are from 12 to 15 m, but there are several shallow patches in the anchorage, the positions of which are best seen from the chart.

Deepest and longest berth

8.76

- 1 The deepest and longest berth in Owen Anchorage is a jetty (32°08'S 115°45'E) previously used for explosives. There are currently (2004) no port facilities in Owen Anchorage.

Local weather

8.77

- 1 The SE part of Owen Anchorage, under Woodman Point (32°08'S 115°45'E), is preferable during the summer months, when strong winds prevail from S and W.

Harbour

General layout

8.78

- 1 **Main berthing area.** Jetty (32°08'S 115°45'E), previously used for the handling of explosives, is situated in the SE corner of Owen Anchorage. In 1988 the jetty was reported to be no longer in use.

Anchorage berths can be obtained in Beagle Anchorage (8.84) and close N of Woodman Point jetty (8.85).

Principal marks

8.79

- 1 **Landmark:**

Signal station (32°03'·3S 115°44'·4E) (8.43).

Major lights:

Woodman Light (32°07'·9S 115°46'·1E) (8.43), visible only over certain arcs, which can best be seen from the chart.

Garden Island Light (32°12'·9S 115°40'·4E).

Directions

(continued from 8.52)

Success Bank Channel to Beagle Anchorage

8.80

- 1 From a position at the S end (32°06'S 115°42'E) of Success Bank Channel the track leads E along the S side of Success Bank passing (with positions given from Woodman Light (32°08'S 115°46'E)):

S of Elbow Rock with a depth of 5·1 m over it (2¾ miles NW); thence:

- 2 S of Middle Ground (2½ miles NW), noting Elbow Rock 5·1 m, 3 cables W.

The track then leads NNE to Beagle Anchorage (8.84).

8.81

- 1 **Useful mark:**

Beacon (N cardinal) marking the N side of Fish Rocks (32°05'·2S 115°43'·8E).

Success Bank Channel to Woodman Point Anchorage

8.82

- 1 From a position at the S end (32°06'S 115°42'E) of Success Bank Channel the line of bearing 122° of the

obelisk (32°09'S 115°46'E) (8.106) leads NE of Parmelia Bank passing (with positions given from Woodman Light (32°08'S 115°46'E)):

Clear of the spar buoy (special) (3 miles WNW); thence:

Between the 5 m depth contour and a 3.9 m shoal patch (2 miles WNW).

- 2 The line of bearing 103° of Woodman Light (8.43) then leads towards the anchorage passing:

Between a set of mooring buoys and a 2.7 m shoal patch (1¼ miles WNW); thence;

To the anchorage off Woodman Point jetty.

Useful marks

8.83

- 1 Success and Parmelia Bank Leading Lights (32°09'S 115°42'E) (8.52) are visible 10° on either side of the leading line, from other directions lights are visible from each structure as an aid to navigation. North Mole Head Light (32°03'3S 115°43'4E) (8.51). South Mole Head Light (32°03'4S 115°43'9E) (8.54). Colpoys Point Light (32°13'7S 115°41'9E) (8.115).

Anchorage

Beagle Anchorage

8.84

- 1 **General information.** Beagle Anchorage (32°06'S 115°45'E) in the NE part of Owen Anchorage affords good shelter for small vessels of light draught. **Deepest berth.** The deepest position with the best holding ground is about 2 cables N of Middle Ground (32°06'S 115°44'E), in depths of from 10 to 12 m, mud. This berth offers a limited swinging circle.
- 2 A shallower berth, with fair holding ground, may be found NE of Middle Ground in a depth of 7 m, sand. **Caution.** Empress Rock (32°06'S 115°45'E) and a 4.8 m patch, 5 cables W of the rock, lie in Beagle Anchorage.

Woodman Point anchorage

8.85

- 1 **General information.** Anchorage can be obtained 4 cables NNE of the jetty on Woodman Point (32°08'S 115°45'E) in a depth of about 10 m. **Mooring buoys** are situated 2 cables N and 4 cables NW of the jetty head.

Port services

8.86

- 1 For details of port services, see 8.60.

Side channels

Straggler Channel

8.87

- 1 **General information.** Straggler Channel (32°04'S 115°39'E) lies between the SE end of Straggler Reefs (8.73) and the W end of Success Bank. **Local knowledge** is required.

Hugel and Lambert Passages

8.88

- 1 **General information.** A line of reefs extends S from the S end of Straggler Reefs as far as the N end of Garden

Island. Hugel Passage and Lambert Passage, 8 cables and 2 miles S of Straggler Rocks (32°04'S 115°38'E), are channels through these reefs leading into Owen Anchorage.

Local knowledge is required.

Caution. Passage Rock (32°06'S 115°39'E) lies in the middle of Lambert Passage, 2½ cables N of The Roarers.

COCKBURN SOUND

General information

Charts Aus 117, Aus 114

Position and function

8.89

- 1 Cockburn Sound is formed between Garden Island (32°12'S 115°41'E) and the mainland and is sheltered from N by Parmelia Bank. The sound affords secure anchorage nearly throughout in depths of from 10 to 22 m, well protected from all winds, especially on the W side near Garden Island. A Naval base, *HMAS Stirling*, is situated at the SE end of Garden Island.
- 2 **Specialist berths**, mainly for bulk carriers and tankers, are situated in the SE part of Cockburn Sound. **Marine support facility** (32°09'S 115°46'E) (8.60) is in operation in Jervoise Bay.

Topography

8.90

- 1 **East side.** Between Woodman Point (32°08'S 115°45'E) and James Point, 5 miles S, the coast forms a bight in the N part of which is Jervoise Bay. Mount Brown (32°11'S 115°47'E) stands 5 cables inland midway between Woodman and James Points and, with an elevation of 66 m, is the highest point of the coastal ridge which latter continues S varying from 40 to 60 m in height, thickly wooded.
- 2 Numerous chimneys, both conspicuous and prominent, are situated on the E side of Cockburn Sound, their positions can best be seen from the chart.

8.91

- 1 **South side.** Cape Peron (32°16'S 115°41'E) is a prominent headland with a conical summit, it is joined to the mainland by a low narrow sandy neck giving the appearance of an island when viewed from a distance. A causeway, carrying a road, links Parkin Point (32°15'S 115°42'E), the SE end of Garden Island, with the mainland, 1¾ miles S. The shallows bordering Southern Flats, 2 miles NE of Cape Peron, are utilised for mussel cultivation (see chart). All vessels should navigate with caution in the area.

8.92

- 1 **West side.** Garden Island, which forms the W side of Cockburn Sound, lies 1 mile N of John Point (32°16'S 115°41'E), the N extremity of Cape Peron. Entrance Point (32°09'S 115°40'E), the NW extremity of Garden Island, lies 5 cables W of Beacon Head; the coast between is cliffy and fronted by rocks in the centre. North West Spit, with many ledges on it, some of which dry, extends 6 cables NW from Entrance Point.

Approach and entry

8.93

- 1 Cockburn Sound is approached through Gage Roads, and entered from N through Success and Parmelia Bank Channels (8.52 and 8.53). For small craft channels see 8.122.

Limiting conditions

Controlling depths

8.94

- 1 For controlling depth in Success Bank and Parmelia Bank Channels, the entrance channels to Cockburn Sound, see 8.14.

8.95

- 1 **Channels within Cockburn Sound:**

Woodman and Jervoise : least depth 9.5 m.
 Stirling Channel (32°12'S 115°45'E) (8.99) has a maintained depth of 11.8 m.
 Calista Channel (32°12'S 115°46'E) (8.99) has a maintained depth of 11.7 m.
 Medina Channel (32°10'S 115°46'E) (8.99) has a maintained depth of 10.1 m.

Arrival information

Outer anchorages

8.96

- 1 **Mangles Bay** (32°16'S 115°43'E), the S part of Cockburn Sound, is entered between a point 1½ miles S of James Point (32°13'S 115°45'E) and John Point, ¾ miles WSW. The bay is protected from W by Cape Peron (32°16'S 115°41'E) (8.91) and the causeway linking the SE end of Garden Island to the mainland.
- 2 **Recommended berth.** The best anchorage in Mangles Bay is in position 095°, distant 2 miles from John Point (32°16'S 115°41'E), in depths of about 18 m.

Traffic regulations

8.97

- 1 **Restricted areas**, indicated on the chart, front the E coast of Cockburn Sound in the vicinity of James Point (32°13'S 115°45'E) between the parallels of 32°11'S to 32°15'S and also within a 2 cable radius of the shiplift facility in the marine support facility of Jervoise Bay Southern Harbour (32°09'S 115°46'E). Unauthorised vessels and boats are not permitted inside these areas.
- 2 **Prohibited entry.** Entry is prohibited to a fish farm (mussel beds), marked by buoys (special), located 5 cables ENE of Beacon Head (8.92).

Naval waters, for details see 8.114.

Harbour

General layout

8.98

- 1 The main terminals are open and are located on the SE side of Cockburn Sound, N and S of James Point (32°13'S 115°45'E). *HMAS Stirling*, is located in Careening Bay (32°14'S 115°41'E).
- 2 Jervoise Bay Northern Harbour is enclosed by two breakwaters extending from the N and E coasts of the bay. A detached breakwater, 6½ cables in length and running generally N/S, lies about 4 cables offshore and forms the seaward boundary of Southern Harbour within which is a marine support facility (8.60)

Approach channels

8.99

- 1 **Woodman Channel** (8.105), marked at its entrance by light-beacons, leads through the ridge (8.104) which extends S from Woodman Spit (32°08'S 115°44'E) to James Point, and is the main approach to Jervoise Bay. Woodman Directional Light (8.43) marks the centre line of the

channel, which has a width of 120 m between the light-beacons marking its entrance.

- 2 **Stirling Channel** (32°12'S 115°45'E), the main approach to Kwinana Bulk Terminal jetties and Alcoa Jetty, has a navigable width of 122 m and is marked by light-beacons and a light-buoy. The centre line of the channel is marked by leading lights.

Calista Channel leading NNE from Stirling Channel to Alcoa Jetty has a navigable width of 152 m and is marked by light beacons, the centre line of the channel is marked by leading lights.

- 3 **Medina Channel** a continuation NNW of Calista Channel, leads to Jervoise Channel and is the entrance channel to Jervoise Bay Southern Harbour.

Jervoise Channel extends NNW for about 1½ miles from the end of Medina Channel and terminates in Jervoise Bay.

- 4 Jervoise/Medina Channel Directional Light, situated on Woodman Point, marks the centre line of Medina and Jervoise channels.

Measured distance

8.100

- 1 A measured distance, in one section between two pairs of beacons, lies off the E side of Garden Island in the vicinity of Cliff Point (32°11'S 115°41'E).

North limit marks:

Two beacons (white and yellow with diamond shaped topmarks) (32°11'S 115°40'5E).

- 2 **South limit marks:**

Two beacons (as above) (1½ miles S of the N beacons).

Distance, 2682 m.

Running track, 349¾°.

Sea and swell

8.101

- 1 Although protected from NW, a heavy swell rolls into Jervoise Bay through Challenger Passage (32°08'S 115°38'E) (8.123) and North Channel, 7½ cables S; during W gales, and with SW winds, a short, heavy sea sets in.

Principal marks

8.102

- 1 **Landmarks:**

Signal station (32°03'3S 115°44'4E) (8.43).

Conspicuous flare chimneys (73 m) (32°13'2S 115°45'8E) visible by day and night.

Conspicuous grain silos (32°15'6S 115°45'0E) near the root of Kwinana Grain Jetty.

Radio tower (32°17'S 115°45'E) (chart Aus 754) standing 1¼ miles SE of the head of Mangles Bay.

8.103

- 1 **Major lights:**

Woodman Light (32°07'9S 115°46'1E) (8.43) visible only over certain arcs which can best be seen from the chart.

Garden Island Light (32°12'9S 115°40'4E).

Directions for entering harbour

(continued from 8.54)

Parmelia Bank to Pinnacle Rock

8.104

- 1 From a position S of Success and Parmelia Bank Channel Leading Lights (32°09'S 115°42'E) (8.52) the alignment (349¼°), astern, of these leading lights leads to the S part of Cockburn Sound passing:

E of Garden Island (32°12'S 115°41'E) and associated dangers; and:

- 2 W of a ridge with isolated shallow patches on it which extends S from Woodman Spit (32°08'S 115°44'E) to James Point, 5 miles S, parallel to the coast and about 1½ miles from it; thence:
To a position WSW of Pinnacle Rock (32°11'4S 115°44'7E).

Parmelia Bank to Jervoise Bay

8.105

- 1 From a position S of Success and Parmelia Bank Channel Leading Lights (32°09'S 115°42'E) the line of bearing 051½° of Woodman Directional Light, which shows white between the bearings of 051° to 052° and is exhibited from the same structure as Woodman Light (32°08'S 115°46'E) (8.43), leads through Woodman Channel passing (with positions given from Woodman Light):
- 2 Between Light-beacon A and No 1 Light-beacon (port and starboard hand) (2¼ miles SW) marking the entrance to Woodman Channel; thence:
Between Woodman Point (1¼ miles W) and Jervoise Bank (1¾ miles SW). Jervoise Bank Light-beacon (N cardinal) stands 2½ cables N of the bank.
Thence:
To Jervoise Bay.

8.106

- 1 **Useful marks:**
White obelisk (32°08'7S 115°46'1E), 8 m in height, standing on a ridge, 34 m high, 1½ miles ESE of Woodman Point.
Success and Parmelia Bank Leading Lights (32°09'S 115°42'E) (8.52) are visible 10° on either side of the leading line, from other directions lights are visible from each structure as an aid to navigation.

Pinnacle Rock to Stirling and Calista Channels

8.107

- 1 **Stirling Channel Leading Lights:**
Front light (tower, 28 m in height) (32°12'6S 115°45'9E) on the N jetty of the Kwinana Bulk Terminal near its centre.
Rear light (420 m ESE of the front light).
- 2 From a position WSW of Pinnacle Rock (32°11'4S 115°44'7E) the near alignment (105¾°) of these leading lights leads through Stirling Channel (8.99) passing (with positions given from the front leading light):
Between Light-beacon A and No 1 Light-beacon (port and starboard hand) (1¼ miles WNW) marking the entrance to Stirling Channel; thence:
- 3 Between Light-beacon B (port hand) and No 2A Light-buoy (starboard hand) (8 cables WNW); thence:
NNE of No 2 Light-buoy (starboard hand) (7 cables WNW); thence:
SSW of Ridge Light-beacon C (port hand) (6 cables WNW) which marks the N side of the dredged area between Stirling and Calista Channels; thence:
- 4 SSW of No 3 Light-beacon (starboard hand) (4 cables NW) to the requisite berth.

Useful marks:

North Jetty Head Light (32°12'5S 115°45'8E).
South Jetty Head Light (32°12'7S 115°45'6E).
Stirling Channel Directional Light (32°12'6S 115°46'1E).

8.108

Calista Channel Leading Lights:

- 1 Front light (round tower, 8 m in height) (32°10'5S 115°46'3E) on the hillside on the E coast of Cockburn Sound.
Rear light (round tower, 7 m in height) (490 m NNE of the front light).
- 2 The alignment (020½°) of these lights leads through Calista Channel (8.99) from the junction of Stirling Channel and the S end of Calista Channel passing between light-beacons (port and starboard hand), marking the W and E sides of the channel, to the deep water off Alcoa Jetty.
- 3 **Useful marks:**
Two pairs of lights (32°11'9S 115°46'1E) marking the seaward ends of two water intakes.
Alcoa Jetty Light (32°11'4S 115°46'1E).

Medina and Jervoise Channels

8.109

- 1 From a position N of Alcoa Jetty, the line of bearing 342½° of Jervoise/Medina Channel Directional Light (32°08'0S 115°44'8E), which shows white between the bearings 342° to 343°, leads through Medina and Jervoise Channels (with positions given from Woodman Light (32°08'S 115°46'E)):
Between Light-beacon A and No 1 Light-beacon (port and starboard hand) (3 miles S); thence;
Between Light-beacon B and No 2 Light-beacon (port and starboard hand) (2½ miles SSW); thence;
- 2 ENE of C Light-beacon (2¼ miles SSW); thence;
WSW of the detached breakwater of Jervoise Bay Southern Harbour, its extremities marked by light-beacons (cardinal) (1¼ to 2 miles SSW); thence
To Jervoise Bay.

Medina Channel to Jervoise Bay Southern Harbour

8.110

- 1 **Jervoise Bay Entrance Channel Leading Lights:**
Front light (red square on red beacon) (32°09'0S 115°45'7E).
Rear light (beacon) (1 cable N of front light).
From a position 2 cables NNW of No 2 Light-beacon the alignment (000½°) of these lights leads for about 4 cables to the harbour entrance.

Pinnacle Rock to Kwinana

8.111

- 1 **Kwinana Refinery clearing line:**
Front light (column) (32°13'8S 115°45'2E).
Rear light (grey metal framework tower) (690 m SE of the front light).
From a position WSW of Pinnacle Rock (32°11'4S 115°44'7E) the track leads SE remaining SW of the alignment (133¾°) of the above lights towards the specialist berths in the vicinity of Kwinana passing:
- 2 Clear of a light-buoy (special) 8 cables W of James Point (32°13'S 115°45'E); thence:
SW of a light-beacon (W cardinal) which marks the edge of the coastal bank extending 4 cables W from James Point (32°13'S 115°45'E); thence:
To the requisite berth.

8.112

- 1 **Useful marks:**
Two lights (32°13'7S 115°45'2E) marking the seaward end of a water intake pipe close N of Kwinana Oil Refinery Jetty.
Lights at the N and S end of Kwinana Bulk Jetty (32°14'5S 115°45'2).

- 2 Lights at the N and S end of Kwinana Grain Jetty (32°15'3S 115°44'5E).
Southern Flats light-beacon (E cardinal) (32°15'2S 115°43'3E) marking the E side of Southern Flats (8.127).
Colpoys Point Light (32°13'7S 115°41'9E) (8.115).

Berths

Alongside berths

8.113

- 1 **Marine support facility** (32°09'S 115°46'E) (8.60) consisting of a mechanical lift dock, berths and ship services is situated in Jervoise Bay Southern Harbour on the S side of Jervoise Bay breakwater.
- 2 **Alcoa Jetty** (32°11'5S 115°46'2E) for loading refined alumina and for the discharge of bulk caustic soda is 244 m long with a maximum depth alongside of 11.6 m and can accommodate vessels up to 200 m in length, 30 m beam and 10.97 m draught.
Vessels berth bows W, loading vessels N side and discharging vessels S side.
- 3 **Kwinana Bulk Terminal Jetties** (32°12'7S 115°45'7E); two jetties, with a maximum length of 268 m and depth alongside of 12.3 m at the S jetty, which can accommodate vessels up to 244 m in length.
Oil Refinery Jetty (32°14'0S 115°45'2E); three T-headed berths each 71 m long with mooring dolphins. Each berth has an alongside depth of 14.7 m. Berth Nos 1 and 2 can accommodate tankers of 229 m, Berth No 3 274 m.
- 4 **Kwinana Bulk Jetty** (32°14'5S 115°45'2E) for handling bulk minerals, fertilisers and petroleum cargoes has two berths with a total length of 480 m and a depth alongside of 13.4 m and can accommodate vessels up to 244 m in length.
Kwinana Grain Jetty (32°15'3S 115°44'5E) is 291 m long with a depth alongside of 16.8 m.

Naval Waters

General information

8.114

- 1 **Regulations.** An area embracing Garden Island and within 1 cable on either side of the causeway (8.91), as shown on the chart, has been declared Naval Waters. For the Control of Naval Waters Regulations, see Appendix I.

Careening Bay

8.115

- 1 **General information.** Careening Bay, on the SE side of Garden Island, is entered between Parkin Point (32°15'S 115°42'E) and Colpoys Point, 1 mile NNE, and provides berths and facilities for naval vessels. HMAS *Stirling* is located on the N side of the bay.
- 2 An angled breakwater, with re-claimed land behind it, extends 2 cables NE from Colpoys Point. Colpoys Point Light (32°13'7S 115°41'9E) is exhibited from the head of this breakwater.
Depths in the bay are in excess of 10 m outside the rocks and sandbanks which front the W shore.
Prohibited anchorage. Anchorage is prohibited in an area, shown on the chart, 2 cables SE of Colpoys Point.

8.116

1 Facilities:

- Wharves**, with depths of from 9 to 14 m alongside, situated in the N part of the bay, W of Colpoys Point.
Small boat harbour, protected by an angled breakwater, in the NW part of the bay.
- 2 **Mooring buoys:** The two situated in NW approaches, 2½ cables NE and SE of Colpoys Point respectively, both exhibit lights. A third mooring buoy, 2 cables S of the light (8.174) at the head of the small boat harbour breakwater, is also lit. A dolphin, ¾ cable W of this buoy marks the edge of the coastal bank which extends towards the buoy at this point.

8.117

1 Useful marks:

- Lights at the SE ends of the wharves and at the head of the boat harbour breakwater.

Sulphur Bay

8.118

- 1 **General information.** Sulphur Bay is entered between Cliff Point (32°11'S 115°41'E) and Dance Head, 1 mile N, and provides sheltered anchorage from the prevailing winds.
Recommended anchorage. The best berth lies NE or SE of Sulphur Rock (32°11'S 115°41'E) in depths of 16 m, clay.
Caution. It is reported that vessels are liable to drag in strong winds.
- 2 **Alongside berth.** Armament Jetty (32°10'6S 115°40'7E) extends about 2 cables ESE from the coast 2 cables S of Dance Head; a dolphin is situated 2¼ cables WSW of Armament Jetty head.
Depths. An area, indicated on the chart, dredged to 10.3 m (1977), lies S of the W end of Armament Jetty. The inshore limit is marked by a beacon 1¼ cables WSW of the jetty head.
- 3 **Useful marks:**
Monument (32°11'3S 115°40'5E) on Cliff Point.
Armament Jetty Light (32°10'6S 115°40'7E).

Port services

8.119

- 1 For details of port services, see 8.60.

Minor bays

Jervoise Bay

8.120

- 1 **Northern Harbour** (32°08'7S 115°45'7E), enclosed by breakwaters, is situated in the NE part of Jervoise Bay. Lights are exhibited from the breakwater heads.
Caution. An obstruction exists within the harbour, 1¾ cables ENE of the entrance.

Mangles Bay

8.121

- 1 **Jetties** (32°17'S 115°43'E) for small craft are situated along the S shore of Mangles Bay.

Side channels

General information

8.122

- 1 Between Carnac Island (32°07'S 115°40'E) and the N end of Garden Island, 2 miles S, there are many dangers.

Except for Challenger Passage (8.123) a small craft channel, there are no marked channels through these dangers.

Challenger Passage

8.123

- 1 **General information.** Challenger Passage (32°08'S 115°38'E), a small craft channel for vessels with a draught of less than 3 m, leads from the clear channel within Five Fathom Bank (32°09'S 115°36'E) (8.157) into Cockburn Sound, N of Garden Island.

Caution should be observed in adverse weather conditions and heavy swell as numerous pinnacles abound in the area.

- 2 **Current.** During SW winds a strong current sets NE across Challenger Passage between Middle Ground (32°08'S 115°39'E) and Sea Reef, 5 cables SW. During NW or N winds the current sets S.

8.124

- 1 **Directions.** Challenger Passage Leading Lights:
Front light (beacon, steel pile, concrete platform, 6 m in height) (32°08'7S 115°39'9E).
Rear light (as above, 9 m in height) (400 m ESE of the front light).
- 2 From a position about 2 miles NW of Entrance Point (32°09'S 115°40'E) the alignment (109½°) of these lights leads through Challenger Passage passing (with positions given from the front light):
Between two light-buoys (port and starboard hand) moored close N of Challenger Rock (1 mile WNW); thence:
Between a 4.2 m patch (9 cables WNW) and Sea Reef (9 cables W); thence:
Between Flat Ledge (7 cables WNW) at the S extremity of Middle Ground and Stag Rocks (6 cables WNW); thence:
Between Three Fathom Bank (3 cables NW) and Channel Rock (4 cables WSW); thence:
Clear of Challenger Passage Leading Lights and the 4.6 m patch (reported 1993) lying 1 cable N of the lights.

8.125

- 1 The alignment (289½°) astern, of Challenger Passage Leading Lights – as above, then leads into Cockburn Sound passing (with positions given from Beacon Head (32°09'S 115°40'E):
Between Inside Rock (8 cables NNE) and Beacon Head.
- 2 The track then leads E passing:
N of North East Spit; an obstruction, the outer limit of which is marked by a dolphin (5 cables ENE), extends 7 cables NNE from the coast across North East Spit. Mussel beds (8.97), shown on the chart,

marked by light-buoys (special) surrounds the dolphin.

North Channel

8.126

- 1 North Channel, 1 mile NW of Garden Island, is entered between Sea Reef (32°09'S 115°39'E) and North West Spit, 2 cables SSE.

The rocks in North Channel are remarkable sand-stone pinnacles. Although soundings give little or no indication of the approach of these dangers the bright yellow pinnacle rocks can readily be discerned in smooth water and with clear sky.

Caution. North Channel is not recommended.

South Channel

8.127

- 1 **General information.** South Channel, leading to Cockburn Sound from seaward, lies between the S end of Garden Island and John Point (32°16'S 115°41'E). It is barred by Southern Flats and obstructed by a causeway linking the SE end of Garden Island to the mainland. There are two gaps in the causeway, each spanned by a bridge.

Local knowledge is required.

- 2 **Minstrel Channel**, about 40 m wide, has been dredged across Southern Flats under the N bridge of the causeway. In bad weather the channel is subject to a heavy swell but, in fine weather, it can be used by mariners in small craft.

Controlling depths and height. Least depth, 2.7 m (1989), vertical clearance under the N bridge 12.2 m. The channel is subject to siltation and storm erosion effects. See information on the chart.

8.128

- 1 **Directions.** Approach to Minstrel Channel from the W leads (with positions given from Collie Head (32°15'S 115°41'E)):

Between the foul ground and drying patches extending up to 2½ cables S of South West Point (5 cables W), the SW extremity of Garden Island, and John Ledge (6 cables SSW) which lies at the N extremity of drying ledges which extend 6½ cables N from John Point. A light-beacon (N cardinal) marks the outer limit of the latter. Thence:

- 2 Through Minstrel Channel.

Caution. Patches, which dry up to 0.7 m and are marked on their S side by a light-beacon (port hand) and Collie Ledge, lie close N and S of the W entrance to Minstrel Channel, 2½ cables SE and 3½ cables SSE, respectively, of Collie Head.

Useful mark:

- 3 Light-beacon (N cardinal) (32°14'5S 115°42'5E) at the N entrance to Minstrel Channel.

ROTTNEST ISLAND TO CAPE LEEUWIN

GENERAL INFORMATION

Chart Aus 417

Scope of Section

8.129

- 1 The area covered by this section comprises:
Rottnest Island to Cape Naturaliste – Offshore Route (8.133).
Rottnest Island to Bunbury (8.139).

Bunbury and Approaches (8.169).

Bunbury to Cape Naturaliste (8.198).

Cape Naturaliste to Cape Leeuwin (8.208).

Exercise area

8.130

- 1 A military exercise area lies W of Rottnest Island (32°00'S 115°30'E), see 1.9, *Australian Seafarers*

Handbook AHP 20 for general information and *Annual Australian Notices to Mariners* for details.

Lobster fishery

8.131

- 1 Between November and June extensive lobster fishing takes place on the continental shelf between the parallels of 24°S and 34°S. When passage permits mariners are requested to transit outside the 200 m depth contour. For further details see 1.6.

Local magnetic anomaly

8.132

- 1 A local magnetic anomaly was reported in 1921 between Fremantle and Cape Naturaliste (33°32'S 115°00'E). Normal magnetic variation was not regained until Cape Leeuwin (34°23'S 115°08'E) was passed.

ROTTNEST ISLAND TO CAPE NATURALISTE – OFFSHORE ROUTE

General information

Chart Aus 334

Route

8.133

- 1 From Rottnest Island (32°00'S 115°30'E) the offshore route to Cape Naturaliste leads SSW, about 95 miles.

Topography

8.134

- 1 For topography of Rottnest Island and Cape Naturaliste, see 8.146 and 8.199.

Irregular depths

8.135

- 1 For details of irregular depths off Rottnest Island, see 8.141.

Fish aggregating devices

8.136

- 1 Between November and June lighted fish aggregating devices are deployed at charted sites (see charts Aus 334 and Aus 754). Mariners are requested not to navigate through the areas during this period.

Major lights

8.137

- 1 Rottnest Light (32°01'S 115°30'E) (8.43).
Cape Naturaliste Light (33°32'S 115°01'E) (8.201).

Directions

(continued from 7.257)

Rottnest Island to Cape Naturaliste

8.138

- 1 From a position about 5 miles NW of Cape Vlamingh (32°02'S 115°27'E), on the edge of the 50 m depth contour, the offshore route leads SSW, keeping outside the 50 m depth contour, passing:
 - WNW of Cape Vlamingh (32°02'S 115°27'E) (8.143) from where a light is exhibited; thence:
- 2 WNW of a 20.8 m shoal (32°19'S 115°22'E), noting the depth of 27.6 m which lies 7 miles SSW; thence:
WNW of Naturaliste Reefs (33°15'S 115°02'E); soundings give little warning and the sea does not always break over these reefs; thence:

WNW of a shoal (33°19'S 114°59'E) with a depth of 19.1 m over it; thence:

- 3 WNW of a shoal (33°26'S 114°51'E) with a depth of 26.5 m over it which lies 10 miles WNW of Cape Naturaliste, noting the shoal of 29.5 m which lies 2 miles WSW of the shallower shoal, closer to the track.

(Directions continue at 8.213)

ROTTNEST ISLAND TO BUNBURY

General information

Charts Aus 754, Aus 334

Route

8.139

- 1 From Rottnest Island (32°00'S 115°30'E) the passage to Bunbury, passing E of Naturaliste Reefs (33°15'S 115°02'E), leads S, about 80 miles.

Topography

8.140

- 1 For topography of Rottnest Island, see 8.146.
The coast from Cape Bouvard (32°41'S 115°36'E) for 38 miles S to Point Casuarina (33°19'S 115°38'E), the W entrance point of Koombana Bay, consists of a narrow grassy-topped ridge, up to 52 m high in places, for 25 miles S of the cape. Thence, for 3 or 4 miles, the hills are about 20 m high, rising gradually S towards Koombana Bay.

Irregular depths

8.141

- 1 Depths of 30 m will be found within 5 cables of the dangers off Cape Vlamingh (32°02'S 115°27'E), the W extremity of Rottnest Island. By night or in thick weather, if uncertain of the position, Rottnest Island should not be approached on its NW or SW sides to a depth of less than 50 m, or on the N side of the island to a depth of less than 30 m.

Major lights

8.142

- 1 Rottnest Light (32°01'S 115°30'E) (8.43).
Garden Island Light (32°13'S 115°40'E).
Halls Head Light (32°32'S 115°42'E) (8.167).
White Hill Light (metal tube, 3 m in height) (32°41'S 115°37'E).
Point Casuarina Light (33°19'S 115°38'E) (8.188).

Directions

(continued from 7.257)

8.143

- 1 From a position about 5 miles NW of Cape Vlamingh, on the edge of the 50 m depth contour, the route leads S, keeping outside of the 30 m depth contour, passing:
 - W of Cape Vlamingh, noting that underwater rocks extend up to 5 cables from the cape. Cape Vlamingh Light (metal mast on bunker, 6 m in height) is exhibited on the cape. Thence:
- 2 W of a 26.3 m patch (32°05'S 115°28'E) which lies 6 miles W of the N end of Five Fathom Bank (8.157); thence:
Clear of a 20.8 m shoal (32°19'S 115°22'E), noting the depth of 27.6 m which lies 7 miles SSW; thence:
W of Coventry Reef (32°20'S 115°38'E) (8.158) lying near the S end of Five Fathom Bank; thence:

- 3 W of Cape Bouvard (32°41'S 115°36'E) noting the shoals, with depths of less than 10 m over them, which extend N from a position 3 miles NNW of Cape Bouvard to Coventry Reef, and form a continuation S of Five Fathom Bank. Bouvard Reefs extend up to 22 miles S from Cape Bouvard, and up to 3 miles offshore. The sea only breaks on these reefs during a heavy swell. Thence:
- 4 E of Naturaliste Reefs (33°15'S 115°02'E) (8.138) to a position about 13 miles WNW of Point Casuarina Light (33°19'S 115°38'E) (8.188).

8.144**1 Useful mark:**

Conspicuous sandpatch (32°13'S 115°40'E) on Garden Island.

(Directions continue at 8.202 and for Bunbury at 8.189)

Rottnest Island

Chart Aus 112

General information**8.145**

- 1 **Description.** Rottnest Island (32°00'S 115°30'E) lies about 10 miles WNW of the entrance to Fremantle Inner Harbour and is a good mark when approaching the port.

8.146

- 1 **Topography.** Rottnest Light (32°01'S 115°30'E) (8.43) is situated about the middle of the island and prominent wind-motors are situated on Forbes Hill, about 1 mile ENE of the light.

- 2 **South side.** From Cape Vlamingh (32°02'S 115°27'E), the W extremity of Rottnest Island, to Parker Point, 4 miles E, the coast is fronted by a reef and by numerous rocks extending to the edge of the 10 m depth contour. Parker Point is a round bare headland connected with the coast by a low narrow ledge of rock, and when seen from E or W, appears to be detached. Dyer Island (32°01'S 115°33'E), a rocky mass, is the S-most and largest island off Bickley Point, 5 cables N.

8.147

- 1 **Unexploded ordnance.** An area on the N side of Rottnest Island close N of Roe Reef (31°58'S 115°32'E) is dangerous with regard to anchoring, fishing or any form of submarine or seabed activity due to unexploded depth charges. See *Annual Australian Notices to Mariners* for details.

8.148

- 1 **Historic wrecks** of the following vessels, the positions of which can be seen on the chart, are situated in the vicinity of Rottnest Island and lie (with positions given from Cape Vlamingh (32°02'S 115°27'E)):

Mira Flores (1½ miles NE).

City of York (2½ miles NE).

- 2 (With positions given from Phillip Point (32°00'S 115°33'E)):

Macedon, Janet and *Denton Holme* (1 mile N).

Gem (uncharted) (6 cables N).

Uribes (N side).

Lady Elizabeth and *Raven* (1¼ miles SSW).

See also 1.60.

8.149

- 1 **South Passage.** South Passage (32°02'S 115°34'E), closed to commercial shipping, leads into Gage Roads S of Rottnest Island. See caution at 8.32.

Controlling depth. For details of controlling depth in South Passage, see 8.15.

Marine protected area, as shown on the chart, is established in the waters surrounding Rottnest Island.

Local knowledge is required, see 8.32.

8.150

- 1 **Swell.** Duffield Ridge (32°02'S 115°28'E), a narrow ledge of rock on which the sea breaks in heavy weather, lies 1 mile SE of Cape Vlamingh, the W extremity of Rottnest Island, and 7½ cables offshore. Rottnest Island should not be approached nearer than 1 mile as the whole S coast is foul and a heavy ground swell sets directly on to it, especially W of Parker Point (32°02'S 115°32'E) (8.146).

Directions**8.151**

- 1 **South Passage Leading Lights:**

Front light (white structure, orange bands) (32°01'3S 115°37'0E).

Rear light (as above) (5 cables ENE from the front light).

- 2 From a position 1 mile SSE of Dyer Island (32°01'S 115°33'E) (8.146) the alignment (076°) of the leading lights leads through South Passage passing (with positions given from Dyer Island):

NNW of a 7.5 m rocky patch (1½ miles SE), noting the 6.9 m patch which lies close SW; thence:

- 3 SSE of Jackson Rock (1¼ miles ESE) which lies 3 cables S of Middle Bank; thence:

Between Nineteen Foot Rock (2½ miles E) and a 4.8 m rocky patch (2¾ miles ESE); thence:

NNW of Champion Rock (3 miles ESE); thence:

Clear of South Passage Leading Lights (3½ miles E).

8.152

- 1 **Useful marks:**

South Passage Leading Lights (32°01'S 115°37'E) (8.151) are visible for 10° either side of the leading line, from other directions lights are visible from each structure as an aid to navigation.

Beagle Road**8.153**

- 1 **Anchorage** may be obtained by mariners in small coasting vessels in Beagle Road (32°01'S 115°34'E), 5 cables off the coast, on the E side of Rottnest Island between Bickley Point and Phillip Point, avoiding the disused cable area (8.30). The anchorage affords shelter from the usual gales from between SW and NW, which occur between the months of May and October.

Heavy swell sets into Beagle Road with strong SW winds and mariners sheltering there during a NW gale should be prepared to weigh when the wind shifts to WSW.

- 2 **Dangers.** On the N side of the road a narrow ledge of rock, which dries, extends 2 cables E from Phillip Point (32°00'S 115°33'E); a beacon (port hand) marks the extremity of this ledge. Foul ground extends 3 cables SE from Phillip Rock, 2 cables NNE of the point, and almost connects with the drying ledge extending E from Phillip Point. Phillip Rock Light (red beacon, 2 m in height) (32°00'0S 115°33'6E) stands on the summit of the rock and a beacon (starboard hand) is situated near the middle of the foul ground extending SE from Phillip Rock.

- 3 On the SW side of the road Twin Rocks, which dry, lie 4 cables S of Phillip Point, a 2.9 m shoal lies 4 cables SSE of the rocks.

Middle Bank (32°01'S 115°35'E) lies on the SE side of the road.

8.154**1 Clearing marks in the approach:**

The alignment (287½°) of Kingston Reefs Light (black triangle point up on metal framework tower) (31°59'7S 115°33'4E) with Bathurst Point Light (1 mile WNW) (8.48) clears N of Pilot Reef (32°00'S 115°35'E) and S of a 4.2 m rocky patch on Kingston Spit (31°59'S 115°35'E) (8.49).

2 Useful marks:

Wallace Island (32°01'S 115°33'E), a grey rugged rock.

Minor bays**8.155**

1 Parakeet and Geordie Bays. Between North Point (31°59'S 115°31'E) and Bathurst Point, 1½ miles E, the coast of Rottneest Island is indented by three shoal bays. Parakeet Bay and Geordie Bay, the two W-most, are entered between North Point and Point Clune, 5 cables E.

2 Leading marks. The alignment (240½°) of beacons (31°59'4S 115°30'7E) standing on the SW side of Parakeet Bay and on Armstrong Hill, 4 cables WSW, leads in the approach to the above two bays.

3 Caution. A dangerous rock, marked by a beacon (port hand), stands very close SE of the leading line 1½ cables NW of Point Clune and a buoy (N cardinal), marking foul ground close NW of the leading line, is moored 3 cables NNW of the same point. A depth of 3.9 m lies 3 cables NNW of Point Clune.

Useful mark:

Duck Rock Light-beacon (N cardinal) (31°59'3S 115°32'5E).

8.156

1 Thomson Bay (32°00'S 115°33'E), a shallow indentation on the NE coast of Rottneest Island fronted with rocks and submerged reefs, is entered between Bathurst Point and Phillip Point, 1¼ miles SE.

Local knowledge is required.

2 Leading lights, the positions and alignments of which can best be seen from the chart, lead into the bay from E passing between Transit Rocks (31°59'5S 115°33'3E) and Phillip Rock, 5 cables SSE. A light (8.153) is exhibited from Phillip Rock.

Clearing marks, for details see 8.154.

Berths: two jetties suitable for small craft.

Five Fathom Bank

Charts Aus 117, Aus 754, Aus 334 (see 1.16)

General information**8.157**

1 Description. Five Fathom Bank extends S from a position about 4 miles SE of Parker Point (32°02'S 115°32'E), the S extremity of Rottneest Island, to S of Coventry Reef (32°20'S 115°38'E). Although named Five Fathom Bank it is a rocky ridge with patches on it, in places with depths 5 m or less. The N-most shoal on the bank has a depth of 5.1 m and lies 2½ miles W of the highest Straggler Rock (12 m) (32°04'S 115°38'E).

2 Depths. From the 20 m depth contour on the W side of Five Fathom Bank the depths increase rapidly to 30 m. The E side is steep-to, with a clear channel, about 2 miles wide, between it and the islands and reefs E.

Passages over Five Fathom Bank.**8.158**

1 Mariners in a vessel with a draught of more than 3.7 m should not cross Five Fathom Bank N of Casuarina Shoal (32°09'S 115°36'E).

Leading marks. The alignment (083°) of the following marks leads from seaward over Five Fathom Bank passing between Casuarina Shoal (32°09'S 115°36'E) and Hawley Shoal (1 mile farther S), in a least charted depth of 8.5 m on the marks, and is the best known passage:

2 Entrance Rocks (32°09'4S 115°39'5E) off Entrance Point.

Obelisk (5¾ miles E of the front mark) (8.106).

Leading lights. There is a passage between Coventry Reef (32°20'S 115°38'E) which usually breaks and a wreck (3.2 m) (3 miles N) for which Warnbro Sound Leading Lights (32°21'S 115°42'E) (8.165) may be a useful guide.

3 Small craft with a draught of less than 3 m may cross Five Fathom Bank between Casuarina Shoal (32°09'S 115°36'E) and Seaward Reef, 2 miles N, and enter Cockburn Sound through Challenger Passage (32°08'S 115°38'E) (8.123).

The passage within Five Fathom Bank and Coventry Reef can be entered from S.

Local knowledge is required.

Warnbro Sound

Charts Aus 754, Aus 334 (see 1.16)

General information**8.159**

1 Description. Warnbro Sound is entered between Mersey Point (32°18'S 115°42'E) and Becher Point, 4 miles S. It is protected from W by a chain of islands, rocks and reefs, with narrow passages between, which extend right across its entrance. The sound is used for mussel culture.

Port Kennedy, the S part of Warnbro Sound, affords secure anchorage.

8.160

1 Topography. Penguin Island (32°18'S 115°41'E) lies on the edge of North Sands, W of Mersey Point with which it is connected by a ledge which dries in places. The N and S coasts of the sound are low. The E coast is backed by sand hillocks about 21 m high, E of these hillocks there is a wooded range, the highest point being Tamworth Hill (32°19'S 115°48'E).

2 Passage Rock (32°20'S 115°41'E), 6 m in height, at the S extremity of North Sands, rises abruptly from the middle of a ledge which dries.

8.161

1 Historic wrecks of the following vessels, the positions of which can be seen on the large scale national charts, are situated in the vicinity of Warnbro Sound and lie, with reference to Penguin Island (32°18'S 115°41'E):

Belle of Bunbury (close S).

Carlisle Castle (¾ miles WSW).

Chalmers, Star and the wooden brig *Robertina* (¾ miles S).

James Service (9 miles S).

2 The uncharted historic wrecks of the vessels *Highland Forest* and *Hero of the Nile* also lie in Warnbro Sound, 2½ miles WSW and 1 mile SSE, respectively, of Becher Point. See 1.60.

8.162

1 Least charted depth is 4.2 m on the leading line, 3 cables W of Passage Rock.

Breakers. During moderate swell, seas may break over depths of about 6 m. During extremely heavy swell, seas may break on the leading line.

8.163

- 1 **Sea level** rises during winter gales, from N and W, considerably above normal level. Land winds, prevalent mostly in November, December and January, cause very low levels, especially between the hours of 0400 and 1100.

Flow towards Murray Reefs, which extend S from The Sisters (32°21'S 115°41'E) to James Service Reef, 6 miles SSW, is strong, especially during W gales.

Directions

8.164

- 1 **Caution.** The N to S reefs along the alignment of Murray Reefs and Penguin Island are inadequately surveyed. Mariners are advised to enter Warnbro Sound along the leading line.

8.165

- 1 **Warnbro Sound Leading Lights:**

Front light (round tower, 6 m in height, with a triangular topmark point up) (32°20'·5S 115°42'·1E).

Rear light (round tower, 10 m in height, with a triangular topmark, point down) (90 m ESE of the front light).

- 2 From a position WNW of the front leading light the alignment (123¼°) of these lights leads into Warnbro Sound passing (with positions given from the front light):

SSW of Copeland Ledge (1¼ miles NW); thence: Between Passage Rock (9 cables NW) (8.160) and Channel Reef (7 cables WNW), noting the rocks awash 3 cables W of Channel Reef; thence:

- 3 SSW of Warnbro Sound Entrance Light (round tower, 9 m in height, with a red square topmark) (5 cables NW); thence:

Clear of Warnbro Sound Leading Lights; thence:

NNE of Tongue Sand (1 cable S) the outer part of South Sands; thence:

NNE of the mussel culture farm, marked by light-buoys, (9 cables SE); thence:

To anchorage as convenient.

Anchorage

8.166

- 1 **Secure anchorage** can be found in Port Kennedy about 1¼ mile NE of Becher Point (32°22'S 115°43'E) in depths of from 13 to 16 m, sand and mud.

Fish haven, with a least depth of 14·2 m, lies 5 cables N of the recommended anchorage.

Mandurah Estuary

Chart Aus 334 (see 1.16)

General Information

8.167

- 1 **Description.** Mandurah Estuary is entered about 5 cables E of Robert Point (32°31'S 115°42'E) which is low and sandy. A bank, with depths of less than 5 m over which the sea breaks, extends 3 cables NNE from the point, marked by a light beacon (N cardinal) standing 1 cable farther NNE.

Two miles within the estuary opens out into Peel Inlet and Harvey Estuary, which continues S about 14 miles.

- 2 Dawseville Channel, 5½ miles SW of Robert Point and marked by light-beacons at either end, connects Peel Inlet and Harvey Estuary to the sea. The channel is bridged by the Old Coast Road.

Lights are exhibited at each side of the entrance and the fairway within Mandurah Estuary is marked by light-beacons and beacons.

- 3 **Depths** over the entrance sand bar vary accordingly to the weather, and at times the mouth is closed altogether.

Landmark:

Halls Head Lighthouse (conspicuous water tower) (32°31'·7S 115°41'·9E) situated 4½ cables S of Robert Point.

Major light:

Halls Head Light – as above.

8.168

- 1 **Harbour.** Mandurah Ocean Marina is situated within an inlet opening E of the estuary, 3 cables inside the entrance.

Facilities. There are several small jetties on both sides of the estuary.

BUNBURY AND APPROACHES

General information

Charts Aus 115, Aus 334

Position and function

8.169

- 1 The port of Bunbury (33°19'S 115°39'E) is situated in the S part of Koombana Bay, and is the principal port of the SW district of Western Australia.

Topography

8.170

- 1 Koombana Bay is entered between Point Casuarina (33°19'S 115°38'E), which is composed of sandhills covered with low scrubby vegetation gradually rising to a height of 40 m, and the coast, 2 miles NE.

Port limits

8.171

- 1 Port limits are defined, as shown on the chart, extend some 3 miles N and NW from Point Casuarina Light (33°19'S 115°38'E); thence E to the coast.

Approach and entry

8.172

- 1 Bunbury is approached from N by the coastal route from Rottneest Island (32°00'S 115°30'E), from W by the offshore route passing N of Naturaliste Reefs (33°15'S 115°02'E) or from SW by the coastal route from Cape Naturaliste (33°32'S 115°00'E) through Geographe Bay.

The port is entered by a dredged channel through Koombana Bay.

Traffic

8.173

- 1 In 2002, 348 vessels totalling 16 473 502 dwt used the port.

Port Authority

8.174

- 1 Bunbury Port Authority, PO Box 4, Bunbury 6231, Western Australia. Website: www.byport.com.au

Limiting conditions

Controlling depths

8.175

- 1 **Dredged channel** to the inner harbour is maintained at a least depth of 12·2 m; maintained depth in the approach to Bunbury Mole berths (8.194) is 9·1 m.

Deepest and longest berths

8.176

- 1 The deepest and longest berths are situated in the inner harbour basin (8.195).

Density of water**8.177**

- 1 Density: outer harbour 1.024 to 1.025 g/cm³; inner harbour 1.023 to 1.026 g/cm³.

Maximum size of vessel handled**8.178**

- 1 **Inner harbour:** bulk carrier of 32 340 grt, 225 m in length.

Official limit:

Outer harbour maximum length 220 m, maximum draught 8.8 m, subject to a slight increase at the Harbour Master's discretion.

Inner harbour maximum length 244 m, maximum draught 11.6 m.

Arrival information**Notice of ETA****8.179**

- 1 Notice of ETA should be sent 24 and 4 hours before arrival, for details see *Admiralty List of Radio Signals Volume 6* (4).

Outer anchorage**8.180**

- 1 Anchorage may be obtained, as shown on the chart, in an area centred on position 33°16'2S 115°35'8E. The holding ground is good but unprotected during bad weather. The alignment (089½°) of a pair of lights situated on the coast 3½ miles E of the anchorage may prove useful.

Pilotage and tugs**8.181**

- 1 **Pilotage** is compulsory except for those vessels exempt by law. Pilot boards all vessels in position (33°16'5S 115°36'8E).

Pilot boat: White hull, orange wheelhouse, three distinctive blue stripes and number 104 on hull; name *Leschenault*. Stand by pilot vessel *Koombana* in similar colours.

Tugs are available.

Traffic regulation**8.182**

Speed limit. There is a speed limit of 8 kn in Koombana Bay (8.243) and the inner harbour.

Regulations concerning entry**8.183**

- 1 **Berthing** at night is at the discretion of the Harbour Master.

Quarantine**8.184**

- 1 Bunbury is a first port of entry, see 1.54 for general quarantine regulations.

Radio pratique is not available.

Harbour**General layout of harbour****8.185**

- 1 The port is divided into an outer and inner harbour.

Outer harbour. The W side of the outer harbour is formed by a mole and breakwater, about 1 mile in length, which extends generally NE from Point Casuarina (33°19'S 115°38'E). There are berths on the inner side of the mole.

The E side of the outer harbour is formed by a disused timber jetty, the NE end of which is lit.

- 2 **The inner harbour** is approached through a dredged channel, marked by leading lights and light-beacons, to a basin, S of the power station, in the SE part of the port.

Flow**8.186**

- 1 A strong set is experienced, generally towards the breakwater, more especially during the winter months, mariners should keep W of the pilot boarding ground when approaching the port.

Principal marks**8.187**

- 1 **Landmarks:**

Conspicuous water tower (58 m) (33°08'5S 115°41'6E).

Conspicuous tanks (33°19'2S 115°39'9E).

Conspicuous school (33°19'7S 115°37'9E).

Conspicuous tanks (33°21'5S 115°37'2E).

8.188

- 1 **Major light:**

Point Casuarina Light (black and white chequered round tower, 15 m in height) (33°19'2S 115°37'9E).

Directions for entering harbour

(continued from 8.144)

Outer approaches**8.189**

- 1 From a position WNW of Point Casuarina Light the route leads towards the alignment of the anchorage lights (33°16'S 116°41'E) (8.180) passing:

N of a 11.3 m patch (33°16'5S 115°37'6E).

8.190

- 1 **Useful mark:**

Mount Lennard (33°22'S 115°54'E) (chart Aus 335) situated 13 miles E of Point Casuarina.

Inner approach and outer harbour**8.191**

- 1 From a position about 3 miles N of Point Casuarina Light the line of bearing (157¼°) of Power Station Directional Light (orange rectangle on white round tower on metal pile, 17 m in height) (33°19'1S 115°39'7E) and at night the white sector (157°–157½°) leads towards the harbour entrance and into the dredged channel passing (with positions from McKenna Point Light (black metal tower, white bands, 10 m in height) (33°18'1S 115°38'8E)):

- 2 WSW of a 12.8 m patch (5 cables NNE); thence:
Between No 3 Light-beacon (starboard hand) and a 12.4 m patch (4½ cables NNE); thence
ENE of a 11.4 m patch (3½ cables NNE); thence:
Between 11.2 and 11.9 m patches (2¾ and 4 cables NE respectively); thence:
Between 10.6 and 11.5 m patches (2½ and 4 cables ENE respectively).

8.192

- 1 **Outer harbour.** From a position midway between No 4 and No 5 Light-beacons (port and starboard hand) (33°18'1S 115°39'1E) the route then leads generally SW passing:

SE of a light-beacon (E cardinal) marking the NE extremity of a short breakwater 2½ cables S of McKenna Point (33°18'1S 115°38'6E). Thence:
To the appropriate berth.

Inner harbour**8.193****1 Channel leading lights:**

Front light (red triangle, point up) (33°19'·3S 115°39'·1E).

Rear light (red triangle, point down) (231 m S of the front light).

2

From a position midway between No 4 and No 5 Light-beacons the alignment (180°) of these lights leads through the dredged channel, marked on each side by light-beacons, to a position between No 8 and No 7 Light-beacons (port and starboard hand) (5 cables N of the front light).

3 Inner harbour basin leading lights:

Front light (red triangle, point up) (33°19'·6S 115°39'·7E).

Rear light (red triangle, point down) (100 m SE of the front light).

The alignment (135°) of these lights leads between Point Hamila (33°19'·2S 115°39'·4E) and Point Busaco, 2 cables WSW, into the inner harbour basin.

4 Caution.

Depths of less than 10 m, as shown on the chart, exist in an area in the SE part of the inner harbour basin.

5 Useful mark:

No 2 Groyne (33°18'·2S 115°40'·1E), the N entrance to The Cut (8.197).

Basins and berths**Outer harbour berths****8.194****1 Bunbury Mole** (33°18'·5S 115°38'·5E); two berths:

No 1 Berth (NE Berth), 184 m in length with a draught alongside 8·8 m at datum, specialized for export of mineral sands.

No 2 Berth is a general purpose facility.

Inner harbour basin berths**8.195****1 Berth 3** (woodchip berth): 381 m in length, maximum draught alongside 11·6 m.

Berth 4 (alumina berth): Vessels of 225 m maximum length, maximum draught alongside 11·6 m. Also provided with facilities for discharge of caustic soda.

Berth 5 (general purpose): 240 m in length, maximum draught alongside 11·6 m.

2 Berth 8 (general purpose): 250 m in length, maximum draught alongside 11·6 m.**Port services****8.196****1 Repairs.** Limited general repair facilities are available.

Other facilities. Deratting certificates can be issued. Hospitals are available. Oily waste reception facilities are available and are provided by a private contractor with road tankers. Garbage disposal by arrangement.

2 Supplies.

Fuel is available, by road tanker only; fresh water available at all berths. Provisions are plentiful and general ship's stores can be obtained.

Communications. Regional airport: 7 km from the port with flights to Perth International Airport, distant 200 km. Twice daily road and rail service to Perth.

Leschenault Inlet and Estuary**General information****8.197****1**

Leschenault Estuary opens into the E side of Koombana Bay through The Cut (33°18'·3S 115°40'·2E), it has a shallow sand bar with depths of less than 1 m.

Passage through The Cut is extremely hazardous, due to heavy swell, and even in calm weather should only be attempted with extreme caution.

2

Leschenault Inlet is entered through Koombana Channel (33°19'S 115°38'E) which is spanned by a road and rail bridge each with a vertical clearance of 3·1 m.

BUNBURY TO CAPE NATURALISTE**General information**

Chart Aus 335 (see 1.16)

Route**8.198****1**

From Bunbury (33°19'S 115°39'E) the route to Cape Naturaliste, across Geographe Bay, leads WSW about 35 miles.

Topography**8.199****1**

From Point Casuarina (33°19'S 115°38'E) (8.170) the coast trends 21 miles SSW to the entrance to Wonnerup Inlet (33°37'S 115°25'E). For the first few miles a grassy ridge rises from the beach and 3½ miles S of Point Casuarina stands Koombana Paps (33°22'S 115°37'E), a remarkable double-peaked grassy hillock, 64 m high, with conspicuous tanks 5 cables N. South west of the grassy ridge the coast is very low. Minninup Sandpatch (33°31'S 115°31'E), and a water tower (37 m) 1 mile farther SW, are conspicuous features in this locality. Radio masts (33°40'S 115°14'E) (8.204) near the shore at the head of Geographe Bay are conspicuous.

2

Cape Naturaliste (33°32'S 115°00'E) rises to a hill over 100 m high its extremity is formed of low sand hillocks. Six miles SSE of the cape stands Mount Duckworth, with a ridge of high land between, which falls abruptly on its E and W sides. By night, the sandhills forming the shape of Cape Naturaliste are sometimes conspicuous against the dark background of the downs over them, and serve to distinguish the cape which can be readily identified on the radar display.

3

Bunker Point, 1½ miles E of Cape Naturaliste, the W entrance point of Bunker Bay (33°32'S 115°02'E) is dark, cliffy and over 60 m high, the cliffs continuing nearly straight to the cape.

Natural conditions**8.200****1**

Current. After NW gales, or a continuance of NW winds, there is a strong outset from Geographe Bay, NW, which, meeting the ocean swell off Cape Naturaliste, produces at times an appearance of broken water extending 3 to 4 miles from the cape.

2

Swell. Although Geographe Bay, which is entered between Point Casuarina (33°19'S 115°38'E) and Cape Naturaliste, 34 miles WSW, is open NW, remarkably smooth water is experienced in comparison with the strength of the wind during gales from that quarter. The W swell has been observed to diminish quickly E of a line joining Cape Naturaliste and Cape Bouvard (32°41'S 115°36'E) (chart Aus 334), especially S of a line joining Cape Naturaliste and Minninup Sandpatch.

- 3 There is a thick coating of seaweed on the bottom in depths of 30 m and less, and this probably helps to damp the swell.

Major lights

8.201

- 1 Point Casuarina Light (33°19'S 115°38'E) (8.188).
Cape Naturaliste Light (white masonry tower and lantern, 19 m in height) (33°32'S 115°01'E), situated 1 mile ESE of the cape.

Directions

(continued from 8.144)

8.202

- 1 From a position WNW of Point Casuarina Light (33°19'S 115°38'E) the coastal route to Cape Naturaliste leads WSW passing (with positions given from Cape Naturaliste (33°32'S 115°00'E)):
SSE of Naturaliste Reefs (17 miles N) (8.138); thence:
2 Between a 19.1 m shoal (12½ miles N) and Wright Bank (2 miles N) on which the sea breaks in a moderate swell. In strong gales the rollers begin 5 cables W of this bank. Mariners should not pass between Wright Bank and Cape Naturaliste. Thence:
3 Clear of a 26.5 m shoal (10 miles NW), noting the 29.5 m depth 2 miles WSW.
The route then joins the Cape Naturaliste to Cape Leeuwin route WNW of Cape Naturaliste.

8.203

- 1 **Useful marks:**
Mount Lennard (33°22'S 115°54'E) (8.190).
Radio masts (33°40'S 115°14'E) (8.204).
(Directions continue at 8.213)

Busselton

Chart Aus 335 (see 1.16)

General information

8.204

- 1 Busselton Jetty (33°38'S 115°20'E) stands on the S shore of Geographe Bay. The jetty is no longer in use and the port is closed to commercial shipping. There are no facilities available.

Landmark:

Radio masts (33°40'S 115°14'E) red and white, marked by red obstruction lights.

Dangers

8.205

- 1 Patches of gravel, with depths of 3 to 4 m over them, lie from 1 to 4 miles WSW, and a 4.1 m patch lies 5 cables ENE, respectively, of the head of the jetty.

Anchorage

8.206

- 1 Anchorage can be obtained about 5 cables W of the outer end of the jetty, in a depth of about 7 m.

Useful mark:

Light (33°38'S 115°20'E) exhibited from Busselton Jetty Head.

Anchorage

Eagle Bay

8.207

- 1 **General information.** Eagle Bay (33°33'S 115°04'E) is a small indentation in the coast about 3½ miles NW of Point Dalling (33°36'S 115°06'E). The coast between them rises almost abruptly from the beach to a height of from 100 to 130 m.

Fair anchorage can be obtained in the bay during S and SW winds, about 7½ cables offshore.

Caution. A spit with depths of 3 m extends 5 cables NE from the N entrance point.

Local knowledge is required.

CAPE NATURALISTE TO CAPE LEEUWIN

General information

Chart Aus 335 (see 1.16)

Route

8.208

- 1 From WNW of Cape Naturaliste (33°32'S 115°00'E) the passage leads S, about 60 miles, to WSW of Cape Leeuwin.

Topography

8.209

- 1 Sugarloaf Rock (33°34'S 115°00'E), a remarkable crag about 1 cable offshore, lies 1¼ miles S of Cape Naturaliste. South of this rock, for 4½ miles, there is an unbroken cliffy coast.

Cape Clairault, 10 miles S of Cape Naturaliste, is formed of sandy hillocks scantily covered with low scrub bush behind which the coastal ridge rises abruptly to a height of 204 m.

- 2 Cape Mentelle (33°58'S 114°59') is a dark green headland, faced with a steep cliff W, a conspicuous building is situated 1 mile SSE of the cape on the S side of Margaret River entrance.

Boranup Sandpatch (34°12'S 115°03'E) is a sandy table-land extending about 1 cable inland from the middle of the E side of Hamelin Bay, rising thence to a white sandstone ridge from 140 to 200 m high, 1½ miles from the beach. The patch is conspicuous and is visible in clear weather from a distance of over 20 miles.

- 3 Cape Leeuwin (34°23'S 115°08'E), the SW extremity of Australia is a small round headland, 21 m high, joined to the mainland by a low swampy isthmus. Within the land rises abruptly to a height of 149 m, 1¼ miles NNE of the cape. Thence hills extend, with a few breaks, 7½ miles NNW to Cape Hamelin, attaining a height of 213 m, 3½ miles NNW of Cape Leeuwin. Cape Leeuwin can be readily identified on the radar display.

Historic wrecks

8.210

- 1 Historic wrecks, the positions of which can be seen on the larger scale national charts, are situated as follows:

The vessel *Georgette*, close N of Isaacs Rock (34°02'S 115°00'E).

The vessels *Chaudiere*, *Agincourt* and *Katinka*, between 5 cables and 1 mile NNE of White Cliff Point (34°13'S 115°01'E).

The vessel *Cumberland*, 1¼ miles S of Cape Hamelin (34°16'S 115°02'E).

See also 1.60.

Natural conditions

8.211

- 1 **Currents.** For details of the general fairly constant S and SE current past Cape Leeuwin, see 1.125.

This same current is subject to variability and after strong S winds, especially in summer, may be found running temporarily, N. Both the S and N currents tend to set towards the coast N of Cape Leeuwin.

- 2 Currents, with considerable rates, have been experienced setting towards the land in the vicinity of the cape at all seasons of the year.

Fogs from 2 to 4 hours duration are experienced at times in the vicinity of Cape Leeuwin Light, mainly at night and in the early morning, between January and April. A smoky haze often occurs in the early morning which may reduce the range of the light considerably.

Climatic Table, see 1.170 and 1.183.

Major lights

8.212

- 1 Cape Naturaliste Light (33°32'S 115°01'E) (8.201). Foul Bay Light (white square tower and lantern, 6 m in height) (34°15'S 115°02'E) situated 7½ cables NE of Knobby Head.
Cape Leeuwin Light (white round masonry tower, white lantern, 39 m in height) (34°22.5'S 115°08.0'E).

Directions

(continued from 8.138 and 8.203)

Rounding Cape Leeuwin

8.213

- 1 Mariners passing offshore and not calling at Fremantle or other ports N of Cape Naturaliste will generally be outside the 200 m depth contour from Houtman Abrolhos (28°45'S 113°45'E) (chart Aus 417) to the approaches to that cape.

Approaching Cape Naturaliste from N, keep in depths of more than 50 m until clear of Cape Leeuwin.

- 2 The distance to which submerged dangers extend off a long stretch of the coast in the vicinity of Cape Leeuwin, and the frequent thick weather that prevails with strong onshore winds and a set towards the coast, renders it very desirable to give this dangerous cape a berth of about 15 miles in all but settled weather and good visibility.

8.214

- 1 **By day.** Approaching the coast between Cape Naturaliste and Cape Leeuwin, in clear weather, mariners may stand into a depth of 50 m.

By night. Great care should be exercised in running in to make Cape Leeuwin Light; with the weather at all thick the light may not be visible as far as Geographe Reef (34°19'S 114°59'E) (8.215) due to mist hanging about the land when it is clear at sea. Soundings should never be neglected and mariners should not stand into depths of less than 100 m.

Cape Naturaliste to Cape Leeuwin

8.215

- 1 From a position about 17 miles WNW of Cape Naturaliste (33°32'S 115°00'E) the route leads S passing:
W of Cape Clairault (33°42'S 114°58'E) (8.209), noting the depths of less than 30 m which lie up to 4½ miles SSW of the cape; thence:

W of Cowaramup Reef (33°50'S 114°58'E), which lies 2 miles NNW of Cowaramup Point. The sea breaks over this reef in a heavy swell; thence:
2 W of Cow Rock (33°58'S 114°58'E), the outermost danger off Cape Mentelle (8.209); thence:

W of Cape Freycinet (34°06'S 114°59'E), noting the dangers, which can best be seen from the chart, which extend up to 1 mile offshore between Cape Mentelle and Cape Freycinet; thence:

W of Geographe Reef (34°19'S 114°59'E), on which the sea does not always break, the outermost danger off Cape Hamelin (8.209); thence:

- 3 W of a dangerous rock, on which the sea breaks, which lies 1¼ miles SW of Cumberland Rock (10 m high) (34°20'S 115°04'E) and nearer to the route. Between Cumberland Rock and Cape Leeuwin there are many underwater rocks on which the sea breaks in bad weather, their positions can best be seen from the chart. Thence:
To a position WSW of Cape Leeuwin.

8.216

- 1 **Useful mark:**

Conspicuous sandpatch 2¼ miles SE of Cape Hamelin (34°16'S 115°02'E). In hazy weather this sandpatch can be mistaken for Boranup Sandpatch in Hamelin Bay.

(Directions continue at 9.10)

Hamelin Bay

General information

8.217

- 1 **Description.** Hamelin Bay is entered between North Point (34°10'S 115°01'E) and White Cliff Point, 4 miles S. Its S portion is protected by Hamelin Island (34°14'S 115°01'E) and the reefs which extend WNW from it, and affords good shelter during the summer months, or with winds S of W.

The bay is open between W and N, from which quarters strong gales occasionally blow, particularly from May to October, and a heavy swell is thrown in.

8.218

- 1 **Sea level** is greatly influenced by the prevailing winds, those from W and N causing the highest, and offshore winds the lowest levels. During NW gales the sea level remains from 0.9 to 1.2 m above the normal level.

Directions

8.219

- 1 **Approaching from north** give Cape Freycinet (34°06'S 114°59'E) and associated dangers a clearance of about 2 miles.

When Boranup Sandpatch (34°12'S 115°03'E) (8.209) bears 085° the route leads E passing (with positions given from Edith Rock (4 m in height) (34°12'S 115°00'E)):

- 2 N of Edith Rock, distant 3 cables, noting Grace Rock (1½ miles NNE), which dries 0.8 m, and the foul ground and shoal patches which extend SSE from Grace Rock to Middle Rock (1¼ miles ENE). In bad weather the sea breaks over the whole of this area.
- 3 The route then leads SE passing:
Clear of a 10.3 m rocky patch (2½ cables NE); thence:
NE of the foul ground which extends up to 3 cables NE of Old Man Rock (7 cables SSE); thence:

SW of South Rock (1 mile E) with a depth of 5·7 m over it; thence:

To the anchorage (8.223) as convenient.

8.220

- 1 **Approaching from south.** After clearing Geographe Reef (34°19'S 114°59'E) give Cape Hamelin (34°16'S 115°02'E) a clearance of at least 4 miles, keeping outside the 30 m depth contour, passing (with positions given from Edith Rock):

W of South West Rock (2¼ miles S), 2 m high, noting the dangers which extend up to 4 cables SW of the rock; thence:

- 2 W of Edith Rock, distant 5 cables.

The route then leads NE passing N of Edith Rock, distant 3 cables, to join the N approach route.

8.221

- 1 **Lisle Channel**, between the dangers which extend up to 5 cables SSW of Edith Rock (34°12'S 115°00'E) and Old Man Rock (7 cables SSE), is 3 cables wide and is usually taken by mariners approaching Hamelin Bay from S.

Charted depths in the channel are from 10·3 to 13 m.

- 2 When Hamelin Island summit (1½ miles SSE) bears more than 050°, with Old Man Rock and Edith Rock identified, the route then leads generally NE through Lisle Channel.

Anchorage

8.222

- 1 Mariners should moor with open hawse NW, or ride at single anchor with a long scope of cable. From the beginning of May until the beginning of November, upon the usual indications of a NW gale, mariners in vessels of

too deep a draught to find protection in the inner harbour (8.224) are advised to put to sea and seek shelter in Flinders Bay (9.12) until the gale is over.

8.223

- 1 **Recommended berth.** Outer anchorage, about 3 cables SSE of South Rock (34°12'·4S 115°01'·1E) in depths of from 10 to 12 m. Considerable swell with S winds has been reported in this anchorage.

Smoother water can be found on the line of bearing 183° of Mushroom Rock (34°13'·2S 115°01'·4E), with the SE extremity of Peak Island (3 cables WNW) bearing 236°, in depths of about 9 m.

- 2 **Caution.** South East Ledge and Inside Rocks, whose positions can best be seen from the large scale national chart, lie close NE and E, respectively, of the above two anchorages.

Harbour

8.224

- 1 **Hamelin inner harbour** lies between Peak Island (34°13'·0S 115°01'·1E) and Mushroom Reef, 2 cables ESE, on the N side, and Hamelin Island (34°13'·5S 115°00'·8E) and the adjacent reefs to the S. It affords shelter in depths of from 5 to 8 m for small craft, when the outer anchorage is unsafe.

- 2 **Entrance channel** lies between the shoal ground extending 1½ cables E from Peak Island and the reefs extending NW from Mushroom Reef and has a least charted depth of 5·7 m

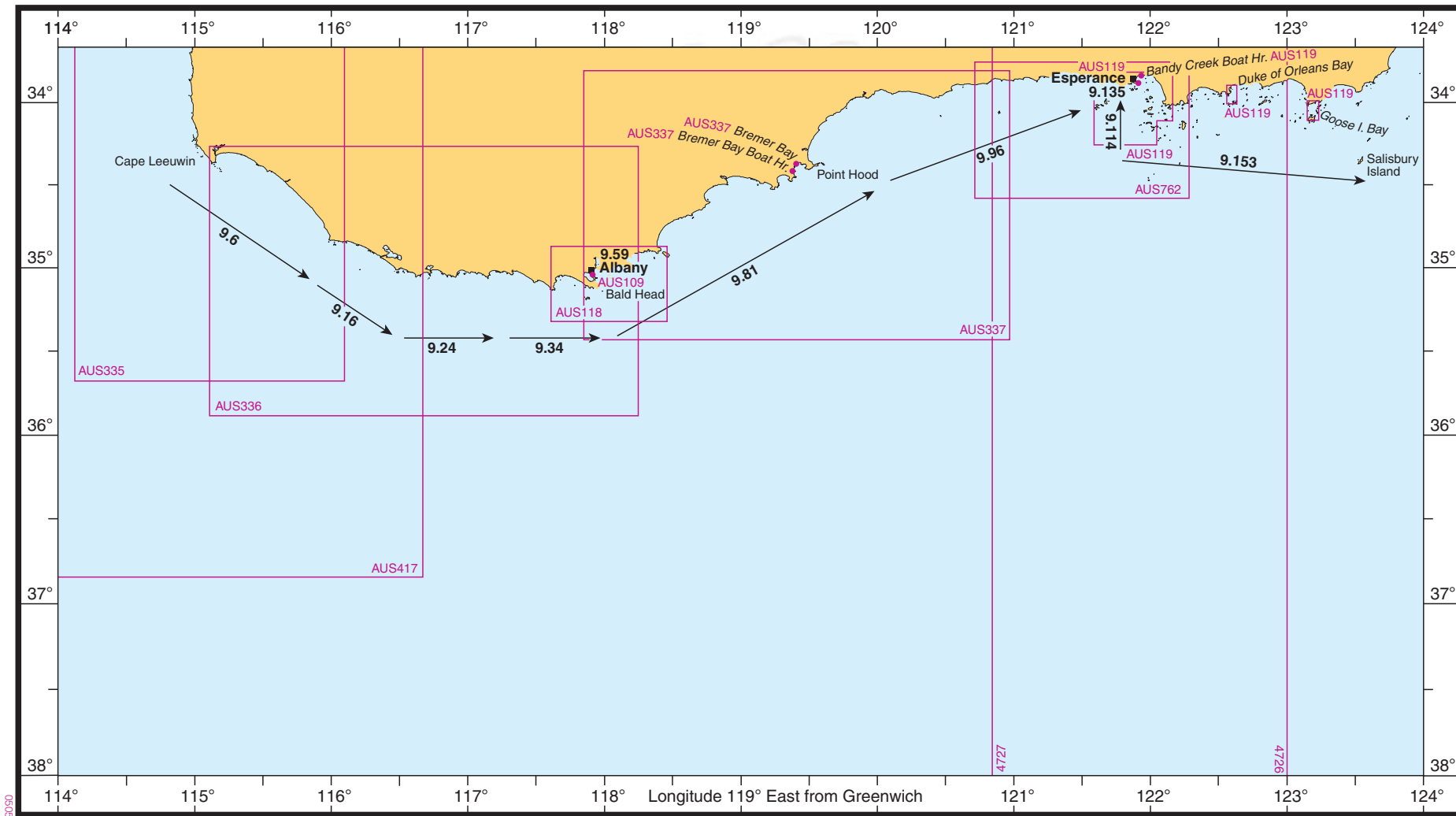
Local knowledge is required.

- 3 **Facilities:** ramp, close NE of a ruined jetty 2 cables NE of White Cliff Point.

NOTES



Chapter 9 - Southern Coast of Western Australia, from Cape Leeuwin to Salisbury Island



CHAPTER 9

CAPE LEEUWIN TO SALISBURY ISLAND

GENERAL INFORMATION

Charts 4726, 4727

Scope of the chapter**9.1**

- 1 This chapter comprises the following sections:
- Cape Leeuwin (34°22'S 115°08'E) to Bald Head about 150 miles ESE (9.5).
 - Bald Head (35°07'S 118°01'E) to Figure of Eight Island, about 192 miles ENE (9.47).
 - Figure of Eight Island (34°02'S 121°36'E) to Salisbury Island (9.105).

Routes**9.2**

- 1 Vessels rounding Cape Leeuwin and proceeding thence direct to Adelaide or Bass Strait will be coasting for about 150 miles only, between Cape Leeuwin and Albany, and then proceed well offshore until in the approaches to their destination. Directions for rounding Cape Leeuwin and description of that cape and the dangers W of it are contained in Chapter 8.

Harbours**9.3**

- 1 Principal ports are:
- Albany (35°02'S 117°53'E) (9.59).
 - Esperance (33°52'S 121°54'E) (9.135).
- These are the only ports of importance in this chapter. There are however, several small harbours and inlets which are suitable for small craft.

Natural conditions**9.4**

- 1 **Visibility.** Great caution should be exercised in making Cape Leeuwin at night as the light may not be visible at the expected range due to inshore mist, when it is clear at sea; soundings should not be neglected and vessels should not stand into depths of less than 100 m.

Currents in the vicinity of SW Australia and Cape Leeuwin set predominantly SE with a mean rate of $\frac{3}{4}$ to 1 kn, but there is a moderate probability of onshore sets, with rates of up to 4 kn, in this area.

CAPE LEEUWIN TO BALD HEAD

GENERAL INFORMATION

Chart Aus 336

Scope of the section**9.5**

- 1 This section comprises the following:
- Cape Leeuwin (34°22'S 115°08'E) to Point D'Entrecasteaux (9.6).
 - Point D'Entrecasteaux (34°50'S 116°00'E) to Point Irwin (9.16)
 - Point Irwin (35°04'S 116°55'E) to West Cape Howe, (9.24).
 - West Cape Howe (35°08'S 117°36'E) to Bald Head (9.34).

CAPE LEEUWIN TO POINT D'ENTRECASTEAUX

General Information

Charts Aus 335, Aus 336 (see 1.16)

Route**9.6**

- 1 The route passing about 15 miles SW of Cape Leeuwin and 15 miles SW of Point D'Entrecasteaux leads from the vicinity of 34°35'S 115°00'E to that of 35°05'S 115°50'E about 51 miles SE.

Topography**9.7**

- 1 The coast between Cape Leeuwin and Point D'Entrecasteaux is comparatively low and sandy with hills behind ranging from 45 to 245 m in height. Stretches of the coastline are fronted by several reefs and rocks, some of which dry, extending up to 5 miles offshore.

Several rivers flow through this stretch of coastline; quicksand has formed at the mouths of most of them. The only navigable river is Blackwood River (9.14).

Natural conditions**9.8**

- 1 **Visibility.** Great caution should be exercised in making Cape Leeuwin at night. See 9.4 for information on visibility.

Currents. See 9.4 for information on currents.

Principal marks**9.9**

- 1 **Landmarks:**
- Dickson Peak (146 m high) (34°24'S 115°32'E), a dark prominent hill.
 - Point D'Entrecasteaux (34°50'S 116°00'E), reddish, perpendicular cliffs, 120 m high, forming one of the most remarkable projections on this part of the coast.
- 2 **Major lights:**
- Cape Leeuwin Light (34°22'·5S 115°08'·0E) (8.212).
 - Point D'Entrecasteaux Light (white square tower, 3 m in height) (34°50'S 116°00'E).

Directions

(continued from 8.216)

9.10

- 1 From the vicinity of 34°35'S 115°00'E, about 15 miles SW of Cape Leeuwin the passage leads SW passing (with positions relative to Cape Leeuwin (34°22'S 115°08'E):
- SW of South West Breaker (5 miles SSE) lying at the extremity of a line of islands and rocks extending SE from Cape Leeuwin, it seldom breaks. An historic wreck (1.60), *Ringbolt Bay Wreck*, lies within a protected area 8 cables NE of Cape Leeuwin. Thence:

- 2 SW of Black Point, (21 miles E), projecting abruptly from the coast and composed of dark basaltic rock. Thence:
SW of Quagering Island (34°51'S 116°00'E), lying 5 cables SW of Point D'Entrecasteaux. A number of above-water rocks lie near the island.

Useful marks

9.11

- 1 Silver Mount (34°33'S 115°47'E) 1½ miles inland.
Callcup Hill (34°38'S 115°53'E) dark bushy topped sandhill with a tower.
Mount Chudalup (34°46'S 116°05'E), a remarkable granite hill.
(Directions continue at 9.20)

Flinders Bay

Chart Aus 336 (see 1.16)

General information

9.12

- 1 Flinders Bay is situated between Point Matthew (34°22'2S 115°09'3E), off which lie Saint Alouarn Islands, a chain of rocky islets and reefs extending to South West Breaker (9.10), and Ledge Point, 5 miles NE, off which lie several reefs and rocks some of which dry and extend up to 5 cables offshore.
- 2 **Wind.** The bay is exposed to the SE and strong SE winds sometimes blow between November and March. From May to October inclusive the SE winds are of a rare occurrence, and if they do occur are of moderate strength and of short duration.

Anchorage

9.13

- 1 Safe anchorage can be obtained in the NW part of the bay from May to October having regard to the 5-6 m patch 1¼ mile NE of Barrack Point (34°20'8S 115°10'1E) and Cole Rock (4 cables SE of Barrack Point) with a depth of 4.2 m over it.
An historic wreck (1.60), *Mayflower*, lies within a protected area 8 cables NNE of Barrack Point.
- 2 **Clearing marks.** The alignment (270°) of a beacon standing on Barrack Point with another 1¼ cables W of it, passes clear of Cole Rock.

Blackwood River

9.14

- 1 Blackwood River enters Flinders Bay 1¼ miles N of Barrack Point and the coast between is fringed by reefs and shoal patches extending up to 5 cables offshore.
The bar across the mouth of the river is very shallow, having depths of about 1 m over it, except during the winter months or with heavy freshets, when there are depths of 1.8 to 2.1 m. There is a constant surf; boats should not attempt to cross the bar without local knowledge, particularly after dark. Light-buoys mark the channel but they are frequently shifted due to the constantly changing depths.
- 2 There are depths of from 3.7 to 5.5 m for the first 2 miles within the entrance to the river, where it is known as Hardy Inlet; higher up the channel is obstructed by numerous drying shoals and sandbanks.
Swan Lake lies about 1 mile NE of the entrance to Blackwood River.

Augusta

9.15

- 1 **Description.** The town of Augusta stands N of Barrack Point (9.13), on the W bank of Blackwood River.
Port Limit is a line joining Point Matthew, Seal Islet, Saint Alouarn Island and Ledge Point.
Anchorage. See 9.13 for anchor positions.

POINT D'ENTRECASTEAUX TO POINT IRWIN

General Information

Chart Aus 336 (see 1.16)

Route

9.16

- 1 The route leads from a position about 15 miles SW of Point D'Entrecasteaux (34°50'S 116°00'E) about 50 miles E to a position S of Point Irwin.

Topography

9.17

- 1 The coast between Point D'Entrecasteaux and West Cliff Point (34°54'S 116°17'E) (14½ miles ESE) is low with sandy beaches. Detached dangerous rocks extend up to 5 miles offshore.
Between West Cliff Point and Clifly Head (9.19) 12 miles SE, the coast is of high precipitous cliffs from which detached rocks extend over 2¼ miles offshore.
- 2 From Clifly Head to Point Irwin (9.20) the coast consists principally of high cliffs, fringed with rocks and foul ground extending up to 1 mile offshore and indented by several bays.

Currents

9.18

- 1 See 9.4

Principal marks

9.19

- 1 **Landmarks:**
Point D'Entrecasteaux (34°50'S 116°00'E) (9.9).
Cow and Calf Rocks (35°01'S 116°13'E), two rocks close together, the W is 33 m high, white topped with guano and reported to be a good radar target.
West Cliff Point (34°54'S, 116°18'E), a conspicuous sand patch (1 mile NNW).
- 2 Clifly Head (35°01'S 116°29'E), a narrow cliff.
Mount Hopkins, a remarkable mass of granite, situated on a ridge, which rises abruptly from the coast 2 miles ENE of Point Nuyts. (35°04'S 116°38'E).

Major light:

Point D'Entrecasteaux Light (34°50'S 116°00'E) (9.9).

Directions

(continued from 9.11)

9.20

- 1 From the vicinity of 35°05'S 115°50'E about 15 miles SW of Point D'Entrecasteaux, the passage leads E passing (with positions relative to Chatham Island (35°02'S 116°30'E)):
S of South West Reefs (26 miles WNW) consisting of three reefs 5 cables apart, the N two awash. The S is smaller and does not break regularly thence:
- 2 S of Sandy Island (24 miles WNW) lying near the extremity of several reefs and rocks, some of which are awash. In heavy weather the locality appears a mass of breakers. Thence:

- S of Cow and Calf Rocks (13½ miles E) (9.19), steep-to so that soundings give no indication of their proximity, thence:
- 3 S of Broke Reefs (8 miles NW), a cluster of reefs lying 2 miles SSW of Broke Inlet; the shallowest part breaks constantly, thence:
- S of Chatham Island, bare and steep-to on its S side, having a few scrubby bushes near its summit, lying 5 cables SSE of Cliffy Head (9.19). A rocky islet, 27 m high, lies 1½ cables W of the Island. A shoal with a depth of 24·2 m over it lies 8 miles SW of the Island, thence:
- 4 S of Point Nuyts (6½ miles ESE), rising to an elevation of 192 m close within the point, with Thyssen Rock, 23 m high 1½ miles E; thence:
- S of Goose Islet (11½ miles E). Underwater rocks, over which the sea breaks, lie 2 cables off both the E and W sides of the islet. An underwater rock over which the depth is unknown, lies 7½ cables WSW of Goose Islet, thence:
- 5 S of Rame Head (18 miles E), sharp and perpendicular having a high rock close by. Two above-water rocks are situated 2½ cables S of Rame Head, and underwater rocks lie 7½ cables both SW and SE of them. Thence:
- S of Point Irwin (21 miles E), steep and cliffy.

Useful marks

9.21

- 1 Long Point (35°02'S 116°34'E), a narrow cliffy projection having a prominent sand patch at its head.
- Mount Frankland (34°50'S 116°47'E), a prominent peak.
- Mount Mitchell (34°46'S 116°46'E), a prominent peak.
- Granite Peak (34°43'S 116°42'E), a prominent peak.
(*Directions continue at 9.28*)

Anchorage and inlets

Chart Aus 336 (See 1.16)

Rocky Head

9.22

- 1 **Anchorage**, sheltered from NW gales, may be obtained off Rocky Head (35°02'·2S 116°44'·6E); landing can be effected inside the head.

Local knowledge is essential.

Nornalup Inlet

9.23

- 1 The entrance to Nornalup Inlet (35°02'S 116°44'E) lies in the W corner of a bay lying E of Rocky Head (9.22), and is little more than 1 cable wide between the heads. The S head is high and rocky, and the N low and sandy. A sandy spit extends across between the heads, leaving a narrow channel only, which passes close round the S head between it and a patch of rocks about 30 m distance from it. After passing these rocks the depths increase and the channel continues along the S shore for a distance of about 5 cables into the inlet; extensive sandbanks, through which several small streams flow, accumulate in the last bend.
- 2 **Local knowledge** is necessary.
- The fairway at the entrance is narrow and very shallow, except during the winter months after heavy rains, when depths of up to 3·7 m have been reported.

- 3 Entry however is always dangerous even for boats, due to the heavy swell constantly rolling into the bay even during light winds on the finest of days.

Frankland River 2½ cables in width extends 3 miles in an E direction from the NE corner of Nornalup Inlet.

Walpole River enters the N part of the Inlet and is navigable by boats for about 2 miles.

POINT IRWIN TO WEST CAPE HOWE

General information

Chart Aus 336 (see 1.16)

Route

9.24

- 1 The route leads from a position S of Point Irwin (35°04'S 116°55'E) about 35 miles E to a position S of West Cape Howe.

Topography

9.25

- 1 The coast between Point Irwin and West Cape Howe is indented with small bays separated by high headlands, backed by hills and mountain ranges.

Currents

9.26

- 1 See 9.4.

Landmark

9.27

- 1 Mount Lindesay (34°50'S 117°18'E) at the N end of Bennett Range is prominent from seaward; a ridge extends some miles E of it.

Directions

(*continued from 9.21*)

9.28

- 1 From a position S of Point Irwin (35°04'S 116°55'E), the track leads E, passing (with positions relative to Point Hillier 35°04'S 117°09'E):

S of Point Hillier, a narrow cliff faced projection with a flat top, rising abruptly to an elevation of 155 m close inland. Stanley Island, 49 m high, its summit covered in coarse grass, stands 1 cable S of the point; a rock lies off its S side. Thence:

- 2 S of Knapp Head (16 miles E), a prominent, perpendicular cliffy sea faced head, with grassy ridges rising to an elevation of 183 m about 7 cables inland. Thence:

S of West Cape Howe (23 miles ESE), the W of three bluff headlands at the S end of a promontory; the headland is reported to be a good radar target.

Useful Marks:

9.29

- 1 Tower Hill (35°01'·1S 117°14'·2E), a green ridge, 150 m high with granite boulders on it.
- Wilson Head (35°03'S 117°19'E), a broad cliffy projection 122 m high.
- Mount Shadforth (34°58'S 117°17'E), wooded, the S peak of Bennett Range.
(*Directions continue at 9.39 and 9.40*)

Bays and inlets

Foul Bay

9.30

- 1 Foul Bay (35°02'S 117°57'E), is situated between Point Irwin (9.20) and a small round head, 5 miles ENE. The bay

is encumbered with reefs and submerged rocks and in bad weather the whole bay is a mass of breakers. Irwin Inlet, having several villages on its N side, extends N from Foul Bay. The entrance is very shallow and inaccessible even for boats.

Local knowledge is necessary.

Boat Harbour

9.31

- 1 Boat Harbour (35°02'S 117°05'E) is a small rocky opening situated on the E side of a dark headland, 50 m high, situated about 7 miles ENE of Point Irwin (9.20). Rocks extend up to 5 cables SE of the N point of the entrance.

Small boats can enter in moderate weather and landing is possible on a small sandy beach at the head of Boat harbour.

Local knowledge is necessary.

William Bay

9.32

- 1 William Bay (35°03'S 117°11'E), is entered between Point Hillier (9.28) and Edward Point (35°02'S 117°15'E). There are a number of underwater rocks in the bay and small above-water ledges on its E side.

Local knowledge is necessary.

Ratcliffe Bay

9.33

- 1 Ratcliffe Bay (35°02'S 117°21'E), is entered between Wilson Head (9.29) and Rock Cliff Point about 3½ miles E. A heavy swell generally sets into the bay.

Local knowledge is necessary.

Wilson Inlet, a wide inlet, extends NE from Ratcliffe Bay. The entrance, although 5 cables wide, is generally blocked by sand. The small town of Denmark is situated at the NW of the inlet. A number of streams discharge into the inlet; fish and wild fowl are plentiful.

WEST CAPE HOWE TO BALD HEAD

General information

Charts Aus 118, Aus 336 (see 1.16)

Route

9.34

- 1 The route leads from a position S of West Cape Howe (35°08'S 117°36'E), 20 miles E to a position about 8 miles S of Bald Head.

Topography

9.35

- 1 Between West Cape Howe and Forsythe Bluff, 3½ miles NNE the coast is indented by sandy beaches and rises sharply to the inland hills.

From about Forsythe Bluff to Shelter Island (35°03'S 117°41'E) the coast is low and fronted by a number of above and below-water reefs; thence cliffs extend to Bald Head.

Prohibited anchorage

9.36

- 1 Anchoring is prohibited in a submarine cable area, lying between the N and E sides of Eclipse Island (9.39) (35°11'S, 117°53'E) and the coast between Cave Point (9.38) and Black Head, 1½ miles E, as shown on the chart.

Wind

9.37

- 1 Near Bald Head and Limestone Head, in a general SW wind of 18 to 25 kn, gusts of up to 40 kn have been reported.

Landmarks

9.38

- 1 Eclipse Islands (35°11'S 117°53'E), consisting of an island and a number of rocky islets and rocks, above and below water. The main island is scantily covered with grass and scrub. A light (9.39) is exhibited from the summit of the island.
- 2 Cave Point (35°07'S 117°54'E), a low dark cliff fronted by above-water rocks and backed by grassy ridges 200 m high; ¼ mile N of the point is a disused lighthouse (white round concrete tower; 12 m in height).
- Peak Head (35°08'S 117°57'E), a bluff rocky projection 150 m high.

Directions

(continued from 9.29)

Passage South of Eclipse Island

9.39

- 1 From a position S of West Cape Howe (35°08'S 117°36'E), the passage leads E passing (with positions relative to West Cape Howe):
 - S of Torbay Head (1½ miles E), with a round scrubby top, the E of three bluff headlands at the S end of a promontory, reported to be a good radar target, thence:
 - 2 S of Seagull Island (4¾ miles NNE), small, rocky and prominent, 20 m high, lying at the E extremity of a group of drying and below-water reefs and rocks extending 1½ miles offshore, thence:
 - S of Stony Island (8¾ miles ENE), a dome shaped granite island, 45 m high, steep-to, having two or three prominent boulders on its summit, thence:
 - 3 S of Passage Reefs (10 miles E), consisting of three reefs about 7 cables apart; they occasionally break, thence:
 - S of South West Island (13 miles ESE), barren and steep-to, 42 m high, lying at the S extremity of a group of islets extending S from the W part of Eclipse Island, thence:
 - 4 S of Eclipse Island (14 miles ESE) from where a light (round concrete tower; 14 m in height) is exhibited, thence:
 - S of Maude Reef (18 miles ESE), about 3½ miles ESE of Eclipse Island; the sea seldom breaks over the reef, thence:
 - S of Northumberland Rock (20 miles E), lying about 1 cable S of Bald Head which has a smooth round surface and is the E extremity of Flinders Peninsula.

Chart Aus 118

Passage North of Eclipse Island

(continued from 9.29)

9.40

- 1 From a position S of West Cape Howe (35°08'S 117°36'E) the track leads on the alignment (072°) of Peak Head (35°08'S 117°57'E) and Bald Head (4 miles E) passing (with positions relative to Peak Head):

SSE of Passage Reefs, (6½ miles W) (9.39), thence:
 NNW of North West Rock (5 miles SW), a small
 steep-to rock, the outermost danger extending
 8 cables WNW of Eclipse Island (9.39), thence:
 2 SSE of Green Islands (4 miles W), two islands
 1 cable apart of dark granite and low grassy
 covering; North Rock lies 5 cables SW of the
 islands.

Leading mark. West Cape Howe (35°08'S 117°36'E)
 (9.28) bearing 274°, astern, leads E from about 2 miles SSE
 of Green Islands (35°07'S, 117°52'E), passing:

3 N of Eclipse Island (4 miles SW) and S of Cave
 Point (2¼ miles W) (9.38). Cave shoal lies
 5 cables S of Cave Point, thence:

N of a shoal (2½ miles SSW) with least depth of
 10 m over it, lying 1½ miles NE of the NE end of
 Eclipse Island, thence:

4 S of Peak Head (9.38); a small rock shows above
 water close to its S extremity, thence:

Se of Vancouver Rock (2 miles SE), steep-to and
 breaks violently, thence:

S of Northumberland Rock, (3½ miles ENE) (9.39).

Caution. At night it is recommended to pass S of
 Eclipse Island and Maude Reef (9.39), in depths of not less
 than 82 m, until clear of Maude Reef.

Useful marks:

9.41

1 Grove Hill (35°06'S 117°52'E), 212 m high.
 Sharp Point (35°07'S 117°52'E), a steep cliff 165 m
 high.
 Stony Hill (35°07'S 117°57'E), a prominent mass of
 granite boulders 224 m high.
 Breaksea Island Light (35°03'S 118°03'E) (9.53).
*(Directions continue for King George Sound and
 approaches at 9.52, 9.53, 9.54 and 9.55)*

Torbay

General information

9.42

1 Torbay is situated between Torbay Head (35°08'S
 117°38'E) and the coast N of Stony Island (35°06'S

117°47'2E) and includes the boat harbours of Port Harding
 and Port Hughes.

The NW shore of the bay is fringed by reefs and islets
 extending up to 2 miles offshore.

The bay is open to the SE and too exposed for secure
 anchorage except as described below.

Torbay Head

9.43

1 **Anchorage**, may be obtained 5 cables N of the rocky
 bluff 7½ cables N of Torbay Head (35°08'S 117°38'E)
 (9.39), as shown on the chart. HMAS *Moresby*, 2351 tons,
 anchored here in 1980.

Local knowledge is essential.

Port Harding

9.44

1 **Anchorage**, is available in Port Harding (35°04'S
 117°39'E) which affords good shelter, in the W part of the
 bay as shown on the chart.

Local Knowledge is essential.

Port Hughes

9.45

1 Port Hughes (35°03'S 117°41'E), is a boat harbour
 situated NW of Shelter Island, 6½ miles NNE of West
 Cape Howe.

Foul ground extends up to 1½ cables offshore on the
 SE, S and SW sides of Shelter Island.

The harbour is protected on its E side by drying ledges.
 The entrance is from 9 to 14 m wide, with depths inside
 the harbour are between 4 and 6 m.

Seagull Island

9.46

1 **Anchorage**, less sheltered than in Port Harding or at
 Shelter Island, may be found NW of Seagull Island
 (35°04'S 117°41'E), in depth of 9 m, sand and rock, as
 shown on the chart.

Local knowledge, is essential.

Directions. The anchorage is approached round the N of
 Seagull Island, which on its E and N sides may be passed
 at a distance of 1 cable.

BALD HEAD TO FIGURE OF EIGHT ISLAND

GENERAL INFORMATION

Chart 4726

Scope of the section

9.47

1 This section comprises the following:

King George Sound and approaches (35°03'S
 117°58'E) (9.49).

Albany (35°02'S 117°53'E) (9.59).

Bald Head (35°07'S 118°01'E) to Point Hood
 (34°23'S 119°34'E) (9.81).

Point Hood to Figure of Eight Island (34°02'S
 121°36'E) (9.96).

Currents

9.48

1 Although information in this area is scarce, indications
 are that the predominant current is of a low to moderate
 constancy throughout the year and is E or NE-going with a
 mean rate of about ¾ kn.

KING GEORGE SOUND AND APPROACHES

General information

Chart Aus 118 (see 1.16)

Description

9.49

1 King George Sound, is situated between Bald Head and
 Herald Point (35°01'S 118°02'E), a high rocky head, 5 miles
 N.

King George Sound, named King George III Sound by
 Vancouver in HMS *Discovery* in 1791, is the safest and
 most convenient port along this coast of Australia and
 affords good anchorage. The SW part of the sound is
 known as Frenchman Bay (9.56) and the NW part as
 Middleton Bay (9.57). On its W side is Princess Royal
 Harbour, landlocked and available to medium sized ocean
 going vessels. The Port of Albany (9.59) lies on the N
 shore of Princess Royal Harbour (9.75).

- 2 King George Sound may be approached through either South Channel (9.53), Middle Channel (9.54) or North Channel (9.55).

Tidal streams.

9.50

- 1 Tidal streams are not appreciable in King George Sound, but run with considerable strength in the entrance to Princess Royal Harbour, the in-going stream setting SW across the entrance and the out-going stream towards NE.

Landmarks

9.51

- 1 Mount Clarence (35°02'S 117°54'E); a floodlit memorial stands on its summit.
Mount Melville (35°01'S 117°52'E); an observation tower (lit at night) stands on its summit.
Breaksea Island Light tower, (35°03'S 118°03'E), standing on the summit of Breaksea Island.
- 2 King Point Light (triangle on metal column, red stripe) (35°02'S 117°55'E) standing $\frac{3}{4}$ cable inland from King Point.
Emu Point Light tower (35°00'S 117°57'E), standing near Emu Point.

Directions

(continued from 9.41)

Approach from South

9.52

- 1 From a position about 8 miles S of Bald Head (35°07'S 118°01'E), the track leads NNE to a position about 3 miles E of Bald Head and thence WNW to the pilot boarding position (35°03'S 117°58'E), passing (with positions relative to Bald Head):
- 2 ESE of Maude Reef (6 miles SSW) (9.39), thence:
ESE of Vancouver Rock (2½ miles SW) (9.40), thence:
ESE of Belches Foul Ground (1½ miles ENE) over which there is a confused sea during W gales, breaking heavily on East Shoal.

South Channel

9.53

- 1 From a position about 3½ miles ENE of Bald Head, the line of bearing 292° on King Point Light (6½ miles NW), leads through South Channel passing (with positions relative to Bald Head):
- Between Belches Foul Ground, East and West Shoals (1½ miles ENE) and Breaksea Island (3½ miles NE), a rugged mass of rock. A light (masonry tower, white lantern; 16 m in height) is exhibited from its summit. An islet lies close to its E end, thence:
- 2 NNE of Limestone Head (1½ miles NW) on the N extremity of Flinders Peninsula, thence:
Between Seal Island (3 miles NW), steep-to except for a rocky spit that extends $\frac{3}{4}$ cable W from it and Gio Batta Patch (3¾ miles NNW), a detached area of foul ground, to the pilot boarding area.
(Directions for Albany and Princess Royal Harbour continue at 9.71)

Middle Channel

9.54

- 1 Middle Channel is to be preferred approaching from E. From a position in the vicinity of 35°03'S 118°06'E the track leads W for about 6 miles to the pilot boarding area, passing (with positions relative to Bald Head):

Between Breaksea Island (3½ miles NE) (9.53) and Michaelmas Island (4 miles NNE) covered with green and stunted trees. Thence:

- 2 S of Michaelmas Reefs (3¾ miles N) consisting of several rocky patches, thence:
S of Gio Batta Patch (3¾ miles NNW) (9.53) to the pilot boarding area.

North Channel

9.55

- 1 **Caution.** Vessels with a draught of more than 3 m should not attempt this channel without a pilot.
Leading mark. Cape Vancouver (35°01'S 118°11'E), the S extremity of an Islet rising steeply from the shore, bearing 088°, astern, just open N of Rock Dunder (35°02'S 118°09'E) (9.86) leads from about 1½ miles ESE of Herald Point ((35°01'S 118°02'E) passing (with positions from Herald Point):
- 2 S of Herald Rocks (5 cables S), thence:
S of Herald Point, grass covered and rising to Mount Taylor (1 mile NNE), thence:
N of Mount Pleasant Rock (8 cables S), thence:
N of Middle Rock (7 cables S), thence:
S of Gull Rock (2 miles W), with a small rock close W of it, thence:
N of Gio Batta Patch (2½ miles SW).
(Directions continue for Albany at 9.71)

Anchorage and bays

Charts Aus 109, Aus 118 (see 1.16)

Frenchman Bay

9.56

- 1 **General information.** Frenchman Bay is situated between Flat Rock (35°05'S 117°58'E), 3 m high lying 2 cables offshore about 7½ cables E of Waterbay Point, a rocky point, projecting from some remarkable sandy hillocks W of Flat Rock, and Mistaken Island (35°04'S 117°57'E), 2 miles NW, (a nature reserve, locally known as Rabbit Island), covered with grass and stunted trees.
- 2 There are a number of above-water rocks between Mistaken Island and the shore.
A spit extends 2 cables E from Mistaken Island; Two Sisters Rocks, and several dangerous rocks lie on this spit.
The shore of the bay is a narrow isthmus connecting Vancouver Peninsula to the mainland. The peninsula is hilly, having its summit in the centre.
- 3 The bay is well protected from E winds by Breaksea and Michaelmas Islands.
Anchorage may be obtained NNE of Waterbay Point as shown on the chart. With E winds anchorages NE of Flat Rock are to be preferred.
- 4 **Caution.** A submarine cable is laid from the vicinity of a disused Whaling Station (museum) situated 2½ cables SSW of Flat Rock to a position about 5 cables NW of Seal Island (9.53). A lighted wreck, of which only the mast is visible at chart datum, lies 3½ cables SW of Seal Island.
A pipeline projects 3 cables NNW from the disused Whaling Station.
- 5 **Marine Farms;** fish cages exist within the areas indicated on the chart, the extremities of which are marked by light-buoys (special).

Middleton Bay

9.57

- 1 Middleton Bay is entered between Oyster Harbour Entrance (9.76) and Wooding Point (35°02'S 117°55'E) (9.79), 2 miles SW, the coast embracing the bay is low.

Ellen Cove, situated near the S end of the bay, has a jetty with a depth alongside of 0.9 to 1.2 m which can be used by small craft.

Ledge Bay 9.58

- 1 Ledge Bay, a sandy cove situated W of Ledge Point (35°01'S 118°00'E) and N of Gull Rock (9.55), affords good anchorage for small vessels in depths of 6 m, as indicated on the chart on the alignment of Seal Island (9.53) and a small rock close W of Gull Rock with the W extremity of Breaksea Island just open W of Ledge Point.

A wreck, partly underwater, lies close inshore of the cove.

Local knowledge is essential.

ALBANY

General information

Chart Aus 109, (see 1.16)

Position and function 9.59

- 1 Albany (35°02'S 117°53'E), founded in 1826, stands on the N shore of Princess Royal Harbour and is a commercial port.

Port Limits 9.60

- 1 The Port of Albany includes all the waters of King George Sound (9.49) and Princess Royal Harbour, as shown on the chart.

Approach and entry 9.61

- 1 King George Sound is approached through South Channel (9.53), Middle Channel (9.54) or North Channel (9.55), whence a marked channel leads between Possession Point (35°03'S 117°55'E) and King Point 5 cables N, into Princess Royal Harbour.

Traffic 9.62

- 1 In 2002, the port was used by 104 vessels totalling 3 686 473 dwt.

Port Authority 9.63

- 1 Albany Port Authority, PO Box 175, 85 Brunswick Road, Albany, WA, 6331. Website: www.albanyport.com.au

Limiting conditions

9.64

- 1 **Controlling depth.** Approach is through a channel with a maintained depth of 12.2 m.

Deepest and longest berth. No 3 (9.73).

Tide Levels. Mean maximum range about 0.6 m. See *Admiralty Tide Tables Volume 4*.

Density of water: 1.026 to 1.027 g/cm³.

Maximum size of vessel handled. Bulk Carrier *CIC Piraeus*, 39 994 grt, 225 m LOA, 11.52 m sailing draught.

Arrival information

Notice of ETA 9.65

- 1 ETA should be reported, 24 hours and 2 hours in advance, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages

9.66

- 1 **Anchorage** A to G, with a swinging circle of 3 cables, are located in King George Sound (9.56), as shown on the chart.

Prohibited anchorage area as shown on the chart lies in the approach to the buoyed channel.

Pilotage and tugs

9.67

- 1 Pilotage is compulsory for vessels over 500 grt. Pilots board 3 miles ESE of King Point (35°02'S 117°55'E) as shown on the chart.

Tugs are available.

Quarantine

9.68

- 1 Albany is a first port of entry, see 1.54 and *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

General layout

9.69

- 1 The Port of Albany is situated on the N side of Princess Royal Harbour (9.75) and comprises:

Dolphin Berth and Land Backed Wharf, situated about 6 cables and 1 mile W of King Point, respectively.

Town Jetty extends S and SE into Hanover Bay from the N shore 4 cables W of Dolphin Berth.

Natural conditions

9.70

- 1 **Local weather.** Prevailing winds are E in the summer, and SW in the winter.

Climatic table. See 1.170 and 1.184

Directions

(continued from 9.53 and 9.55)

Entrance channel

9.71

- 1 From the pilot boarding position (35°03'3S 117°58'4E), the Atatürk Entrance is approached in the white sector (342°¼ to 344°¼) of Emu Point Directional Light (35°00'S 117°57'E) (9.51) passing (with positions relative to King Point Light (35°02'S 117°55'E)):

E of Mossie Light-buoy (safewater) (2 miles ESE).

- 2 From a position 2 miles ENE of King Point Light the track leads WSW into Princess Royal Harbour.

Leading lights:

Front light (rectangular daymark, 13 m in elevation) (35°03'S 117°52'E)

Rear light (rectangular daymark, 27 m in elevation) (1 mile WSW from the front light).

- 3 The alignment (252°) of these lights leads through the entrance channel marked by light-buoys and light-beacons (port and starboard hand), as shown on the chart, into Princess Royal Harbour, passing with (positions from King Point Light):

SSE of Whale Head Rock (1½ cables NE), thence: SSE of King Point (½ a cable ESE), on which stands King Point Light (9.51) thence:

- 4 NNW of Vancouver Peninsula with Possession Point (5 cables SSE) and Bramble Point (5 cables SSW) at its extremities, thence:

NNW of Bramble Rock (5 cables SW), marked by a beacon, thence:

NNW of No 10 Light-beacon (port hand) (7¾ cables SW).

- 5 The track leads WNW through a maintained area marked by light-beacons (lateral), as shown on the chart, to the berthing area, remaining NE of the clearing transit ($117\frac{1}{4}^\circ$) astern, of the following lights:

Clearing lights:

Front light (red triangle apex up) ($35^\circ 02' \cdot 7S$ $117^\circ 54' \cdot 4E$)

Rear light (red triangle apex down) (1.8 cables ESE from front light).

Useful mark

9.72

- 1 Wharf Light ($35^\circ 02' \cdot 2S$ $117^\circ 53' \cdot 6E$).

Berths

9.73

- 1 Land Backed Wharf (9.69), 608 m in length, three berths numbered from the W, the longest No 3 berth 227 m in length with depth alongside of 12.2 m.
Ro-Ro vessels use the E end of No 3 berth for their stern loading ramp.
- 2 Town Jetty (9.69) overall length of about 1 cable with berths for small craft.

Development: A bulk fuel facility is proposed for No 5 berth.

Port services

9.74

- 1 **Repairs:** slipway capacity 340 tonnes, minor repairs carried out.
Other facilities: Marine diesel oil is available at No 2 berth, hospital available, de-ratting carried out and certificates issued. Scale and sludge from tank cleaning, oil and bilge waste can be removed by private road tanker. Dirty ballast water and slops can be accepted ashore.
- 2 **Supplies:** fresh water available at all berths, fresh provisions available.
Communications: Airport situated 11 km from port with domestic services to Perth.

Princess Royal Harbour

9.75

- 1 Princess Royal Harbour, with the exception of the dredged area at its NE part forming the port of Albany, is very shallow but affords good shelter for small craft.
The E part of the harbour is protected by Vancouver Peninsula, with Geake Point ($35^\circ 03'S$, $117^\circ 54'E$) at its W extremity. A jetty extends about 60 m NNW from Geake Point with depth alongside of less than 1.4 m.
- 2 Between Geake Point and Stuarts Head ($35^\circ 04'S$ $117^\circ 52'E$), $1\frac{3}{4}$ miles SW the coast forms a bay in which depths are generally less than 3 m. In this bay there are several fish cages within a marine farm area. The extremities of these underwater obstructions are marked by light-buoys (special).
South Spit, a drying sandy protuberance, extends NE for about 8 cables on the SW side of this bay.
- 3 Little Grove Jetty and an extension jetty, extend $1\frac{1}{4}$ cables NE from Stuarts Head. Pagoda Point is situated at the SE extremity of Stuarts Head.
The jetties are used by a sailing club and several yellow piles used as markers are laid up to $1\frac{1}{4}$ miles from Stuarts Head.

- 4 Between Stuarts Head and Town Jetty 2 miles NNE, the harbour is mainly shoal and W of the area dries out at LW.

Submarine cable leads 4 cables NNE from Rushy Point situated 7 cables NW of Stuarts Head to the Front Leading Light (9.71).

Oyster Harbour

Chart Aus 118 (see 1.16)

General Information

9.76

- 1 Oyster Harbour is entered between Emu Point ($35^\circ 00'S$ $117^\circ 57'E$) and Ringbolt Rock (1 cable ENE). It is landlocked and affords good shelter for small craft. Extensive marine farming takes place within the harbour.

9.77

- 1 **Topography.** The shores of Oyster harbour are fringed with drying banks, the extremities of the E banks are marked by beacons.
King River discharges into the NW part of the harbour, the entrance channel, which nearly dries is marked by beacons.
- 2 Kalgan River discharges into the NE part of the harbour and is navigable by small craft for about 4 to 5 miles; the entrance channel is marked by beacons.

A jetty extends $\frac{1}{2}$ cable E from the shore $2\frac{1}{2}$ miles N of Emu Point Direction Light.

9.78

- 1 **Tidal Streams** run with considerable strength in the entrance.

Directions

9.79

- 1 Oyster Harbour is approached over a bar with a least charted depth of 2.6 m.
Local knowledge is essential
From a position about 2 miles SSE of Emu Point Direction Light ($35^\circ 00'S$ $117^\circ 57'E$), the entrance channel is approached in the white sector ($342\frac{1}{4}^\circ$ to $344\frac{1}{4}^\circ$) of the light passing (with positions relative to Emu Point Light):
- 2 ENE of Wooding Point (2 miles SW) (E extremity of the headland that forms the N side of Princess Royal Harbour (9.75) thence:
WSW of Cheyne Head ($1\frac{1}{2}$ miles SE), thence:
WSW of Cheyne Ledge Light-buoy (spar; S cardinal) (8 cables SSE), marking Cheyne Ledge, steep-to, awash at HW, thence:
- 3 Passing over the bar and WSW of Skippy Light-beacon (W cardinal).
From a position W of Skippy Light, the track leads NNE into Oyster Harbour passing over variable depths:
ESE of Emu Point (1 cable ENE), an historic wreck (1.60), *Lady Lyttleton*, lies within a protected area close NW of the point. Thence:
- 4 WNW of Ringbolt Rock ($2\frac{1}{4}$ cables ENE).
Thence the channel is clearly defined by sandbanks on either side, some marked by light-beacons and beacons.
- Leading lights:**
Front light (orange triangle, apex up) ($34^\circ 59' \cdot 8S$ $117^\circ 56' \cdot 6E$).
- 5 Rear light (orange triangle apex down) (70 m SW of the front light).
The alignment ($211\frac{1}{4}^\circ$) of these lights leads through the approach channel towards the boat pens situated about 3 cables NNW of Emu Point Direction Light.

9.80

- 1 **Useful Marks:** (Positions are relative to Emu Point Direction Light (35°00'S 117°56'E)):
 Tower (floodlit) (3½ cables NNW).
 Green Island (8½ cables NNE).

BALD HEAD TO POINT HOOD**General Information**

Charts 4726, Aus 118, Aus 337 (see 1.16)

Route**9.81**

- 1 The route leads from a position S of Bald Head (35°07'S 118°01'E) about 92 miles NE to a position 10 miles SE of Point Hood.

Topography**9.82**

- 1 From Bald Head to about 2 miles NW of Cape Vancouver (35°02'S 118°11'E) the coast is sandy, low lying with both above and below-water rocks extending 2½ cables offshore, thence steep cliffs extend to Cape Vancouver. The coast is backed by Porongurup Range, consisting of several rugged peaks, the highest is Marmabup Peak 27 miles NW of Cape Vancouver.

- 2 From Cape Vancouver to South Point, about 3½ miles N, the coast is almost perpendicular; a ledge of rocks extends 1 cable N, and a rock which generally breaks lies 3 cables NE of South Point.

From South Point to North Point about 1¾ miles NNE the coast is generally low lying fringed with rocks and ledges, thence steep cliffs extend to Mermaid Point about 2 miles W of Bald Island (9.85).

- 3 Between Mermaid Point and Channel Point about 1¾ miles NE the coast forms a rocky cove, the NW side rises vertically to a height of 196 m, forming a cliffy shore on the N side.

Between Lookout Point, about 7½ cables N of Channel Point, and Cape Riche (34°36'S 118°46'E) about 25 miles NE, the coast is indented by bays, with rocks extending up to 1 mile offshore and backed by grassy ridges.

- 4 Between Cape Riche and Cape Knob (34°31'S 119°13'E) the coast forms a large bay; the land on the W side of the bay is cliffy and that on the E side identified by almost bare sandhills.

From Cape Knob to Point Hood, 18½ miles ENE, the coast is cliffy and divided by bays.

Caution**9.83**

- 1 The coast between Bald Island (34°55'S 118°28'E), 7½ cables SE of Channel Point and Butty Head (33°54'S 121°39'E) at the W end of Archipelago of the Recherche about 173 miles ENE has not been closely surveyed and special caution is necessary in those areas where no soundings are charted. Navigation inshore of the 50 m contour should not be attempted without local knowledge.

Currents**9.84**

- 1 Information is scarce for this area, but indications are that throughout the year it is E or NE-going with a mean rate of about ¾ kn.

Landmarks**9.85**

- 1 Bald Head (35°07'S 118°01'E) (9.39).
 Breaksea Island (35°04'S 118°03'E) (9.53).
 Mount Gardner (35°00'S 118°11'E), a peaked mass of granite, partially covered with grass and poisonous scrub.
 Boulder Hill (34°56'S 118°12'E), having a remarkable square granite boulder on top.
- 2 Toolbrunup Peak (34°23'S 118°03'E), the most prominent peak of Stirling Range and situated near the centre of the range.
 Mount Manypeaks (34°54'S 118°16'E); at its summit, a succession of granite topped peaks rise abruptly from the shore.
 Bald Island (34°55'S 118°28'E), steep-to on the S side. Reported to be a good radar target.
 Warriup Hill (34°42'S 118°31'E), a prominent scrubby mount.

Directions

(continued from 9.41)

Bald Head to Bald Island**9.86**

- 1 From a position about 8 miles S of Bald Head (35°07'S 118°01'E) the route leads NE passing (with positions relative to Bald Head):

SE of Rock Dunder (8½ miles NE), a long narrow rock having a jagged top, steep-to, with a small rock lying close on its SE side. Thence:

SE of Cape Vancouver (9½ miles NE) (9.55), thence:

- 2 SE of Coffin Island (11½ miles NE), lying 1 cable offshore, steep-to on its NW and NE sides; a number of rocks extend S from the island. Two small rocks, on which the sea breaks constantly, lie 2 cables SE of the island; thence:

SE of Twin Islets (34°57'S 118°22'E), two islets 2 cables apart, each 26 m high, thence:

- 3 SE of Mermaid Point, (34°55'S 118°23'E). The coastal ridge N of the point is surmounted by huge granite boulders; the W side of the point slopes down gradually to the beach. A dangerous rock, over which the sea generally breaks, lies 4 cables SW of the point. Thence:

- 4 SE of Bald Island (34°55'S 118°28'E) (9.85), fronted by rocks extending up to 3 cables on its NW side. A detached ledge over which the sea breaks lies 2½ cables S of the island. A deep channel 7½ cables wide lies between Bald Island and Channel Point 7½ cables NW, with Lookout Point situated 7 cables N of Channel Point. An historic wreck (1.60), *Apenteur*, lies 4 miles N of Lookout Point within a protected zone.

Charts 4726, Aus 337

Bald Island to Point Hood**9.87**

- 1 From a position SE of Bald Island (34°55'S 118°28'E) the route leads NE passing (with positions from Bald Island):

SE of Bird Rock (6 cables NE), 4 m high; a small rock lies close W and another close S of Bird Rock, thence:

SE of Warriup Point (10½ miles N), a steep-to rocky point, thence:

- 2 SE of Haul Off Rock (96 m high) (16 miles NE), a prominent granite rock lying 1 mile offshore. A

low ridge of rocks extend off its W end and a detached ledge lies 5 cables SW of the highest part of the rock, thence:

SE of Ledge Point (20½ miles NE), thence:

SE of Cape Riche (24 miles NE), a cliffy projection having a level appearance. A detached reef which is reported to have not less than 5.5 m over it, and over which the sea seldom breaks, lies 4 miles SE of Cape Riche. Cheyne Island, 34 m high, lies 1 mile NW of Cape Riche. Thence:

SE of Black Head (29 miles NE), 61 m high, thence:

SE of Groper Bluff (33 miles NE), 59 m high; NW of the point, the land rises to form Mount Groper, thence:

SE of Smooth Rocks (42 miles NE), three prominent rocks bare of vegetation lying close together, the largest 51 m high; a dangerous rock lies close SE of these rocks, thence:

SE of Roe Rock (42 miles NE), 4 m high and about the size of a large boat, thence:

SE of Cape Knob (44½ miles NE), 220 m high, a rugged stony promontory, having a sandy bight on each side; a rocky islet lies near its NE point.

The track continues to lead NE (with positions relative to Point Hood (34°23'S 119°34'E)):

SE of Point Henry (12 miles SW), the W extremity of a small rocky promontory, thence:

SE of Black Point (8½ miles SW), the NE extremity of the small promontory extending NE from Point Henry, thence:

SE of Point Hood, the E extremity of a cliffy headland; a conspicuous building stands on the N side of the Point.

(Directions continue at 9.99)

Anchorage and rivers

Chart Aus 118 (see 1.16)

Inner Island

9.88

- 1 **Description.** Inner Island (35°00'S 118°10'E) is rocky and covered with grass; an above-water ledge is situated close off its S end.

Anchorage. In 1980 HMAS *Moresby*, 2351 tons, 95.7 m LOA, 4.6 m draught, found a comfortable anchorage in strong E winds in 32 m, 8½ cables WNW of the island

- 2 **Useful marks:** (with positions from Inner Island)
Black Rock (1½ miles WNW), steep-to on its seaward side.

False Island (6½ cables SE), connected to the mainland by a ridge of drying rocks.

Two Peoples Bay

9.89

- 1 Two Peoples Bay is situated between South Point (34°58'S 118°11'E) and North Point, 1¼ miles NNE, a rough stony islet connected to the mainland by a narrow ridge of rocks. A ledge of rocks extends 1 cable N from South Point and a below-water rock lies 3 cables ENE, which generally breaks.

A low rocky ledge lies 1 cable offshore at the S end of the bay with shallow water and rocks between it and the shore.

- 2 **Local knowledge** is necessary.

Anchorage. There is said to be an anchorage on sand with good holding ground, near the N shore of the bay.

Caution. This bay has not been properly surveyed, and great caution is necessary.

Waychinicup River

9.90

- 1 Waychinicup river entrance lies 6½ miles ENE of North Point (34°57'S 118°13'E) (9.89). The entrance is deep but narrow.

Local knowledge is necessary; excellent shelter for small craft can be found within the second bend of the river.

Lookout Point

9.91

- 1 A small rocky point lies about 1¼ miles WNW of Lookout Point (34°53'S 118°25'E), W of which is the commencement of a sandy beach.

Local knowledge is necessary.

Anchorage may be obtained in depths of 13 m off the S end of the beach with Mount Manypeaks (9.85) bearing 260° on the alignment (123°) of Lookout Point with the E side of Bald Island. This anchorage affords protection from winds between SSE through W to NNW.

Chart Aus 337

Cheyne Bay

9.92

- 1 **General information.** Cheyne Bay, is situated between Cape Riche (34°36'S 118°46'E) (9.87) and Groper Bluff (9 miles NE) (9.87).

A small boat harbour is situated 1 mile E of Black Head (9.87) (5 miles NE of Cape Riche); another small boat harbour lies in the vicinity of Beaufort Inlet about 2 miles N of Groper Bluff.

Local knowledge is necessary.

- 2 **Anchorage** may be obtained, sheltered from W winds, on the N side of Cape Riche. Small craft with draught of not more than 3 m can anchor between Cheyne Island (9.87) (1 mile N of Cape Riche) and a sandy beach on the shore SW; larger vessels may anchor midway between the island and the cape.

Cape Knob

9.93

- 1 **Anchorage** may be obtained in depth of 13 m at a distance of not less than 1 mile NW of the point 1¼ miles W of Cape Knob (34°32'S 119°15'E) (9.87).

Local knowledge is necessary.

Directions. This anchorage should be approached on a N heading, passing 1 mile off Cape Knob.

Dillon Bay

9.94

- 1 Dillon Bay is situated between Cape Knob (34°31'S 118°13'E) and Point Henry (5½ miles ENE) (9.87).

Horatio Island lies 2½ cables offshore near the W entrance to the Bay. Breakers and indications of shoals are reported to lie in the middle of the bay.

Local knowledge is essential when navigating within this bay.

Chart Aus 337 plan of Bremer Bay and Bremer Bay Boat Harbour

Bremer Bay

9.95

- 1 Bremer Bay, is situated between Black Point (34°28'S 119°25'E), and the W extremity of a cliffy headland (103 m high), 4½ miles NE.

Glasse Island, from where a light is displayed, lies 5 cables offshore, 2½ miles N of Black Point.

Bremer River enters Bremer Bay through Wellstead Estuary; there is a settlement on the S shore of the estuary. James Cove is situated at the NE end of the Bay.

- 2 **Boat harbour.** A boat harbour is located in the SW part of the bay 7 cables WSW of Glasse Island. The harbour is protected by a mole on the head of which stands a light.

Anchorage. It is reported that Bremer Bay appears free from dangers and affords an anchorage sheltered from all winds.

POINT HOOD TO FIGURE OF EIGHT ISLAND

General information

Charts 4726, Aus 337, Aus 762

Route

9.96

- 1 The route leads from a position about 10 miles SE of Point Hood (34°23'S 119°34'E) about 100 miles ENE to pass either side of Figure of Eight Island.

Caution. The coast between East Mount Barren (33°55'S 120°02'E) and Butty Head 86 miles E has not been surveyed and great caution is necessary.

Topography

9.97

- 1 Between Point Hood and East Mount Barren (35 miles NNE) the coast is high and rocky, backed by high mountains and Whoogarup Range, rising to an elevation of 392 m.
 - 2 From East Mount Barren to Powell Point, 26 miles E, the coast is sandy and low lying, fronted by foul ground, reefs and dangerous rocks extending a considerable distance offshore. Soundings give no indication of their proximity. Many of them are several metres below the surface and are only occasionally discernible in rough weather. The sandy low lying coast extends to Shoal Cape.
- There is heavy surf all along the coast from Shoal Cape (33°53'S 121°07'E) to Butty Head 27 miles E.

Principal marks

9.98

- 1 **Landmarks:**
 - West Mount Barren (34°13'S 119°26'E), a peaked hill.
 - Middle Mount Barren (34°04'S 119°41'E), a peaked hill.
 - East Mount Barren (33°55'S 120°02'E), a peaked hill.
- 2 **Major Light:**
 - Figure of Eight Island Light (white GRP hut; 4 m in height) (34°02'S 121°36'E).
 - Mary Ann Haven Directional Light (beacon) (33°56'S 120°08'E).

Directions

(continued from 9.87)

Point Hood to Mary Ann Point

9.99

- 1 From a position SE of Point Hood (34°23'S 119°34'E) the track leads ENE passing (with positions relative to Point Hood):
 - SSE of Doubtful Islands, (2¼ miles E), four steep, rocky islands extending 2¼ miles E from Point Hood, the highest island is 75 m high, thence:
- 2 SSE of Point Ann (12½ miles N); the mouth of Saint Mary River lies close N of Point Ann, thence:

SSE of Charles Point (16½ miles NNE); Fitzgerald River entrance lies close N of the Point, thence: SSE of Dempster Inlet (18 miles NNE), Middle Mount Barren (9.98) stands 1½ miles NE of Dempster Inlet entrance, thence:

- 3 SSE of Red Island (23 miles NNE); below-water rocks extend nearly 1 mile SW from the islet, thence:

SSE of East Mount Barren (35 miles NNE) (9.98), standing close to the coast; Culham Inlet entrance lies 1½ miles W of East Mount Barren. Thence:

- 4 SSE of Mary Ann Haven (33°57'S 120°07'E) (9.102). Thence:

SSE of Mary Ann Point, (37 miles NE), foul ground and reefs extend a considerable distance offshore. Two large shoals, on which the sea seldom breaks, lie 7 miles SSE and SSW of Mary Ann Point.

Mary Ann Point to Figure of Eight Island

9.100

- 1 From a position about 25 miles SSE of Mary Ann Point (33°57'S 120°08'E) the track continues to lead ENE passing (with positions given relative to Shoal Cape (33°53'S 121°07'E)).
 - SSE of Black Rock (37 miles WSW), thence:
- 2 SSE of West Island, (36 miles WSW), an island with a smooth and sterile aspect; a reef lies about 1 mile NNE of West Island. Breakers exist 3 miles NW and 3½ miles N of the Islet, it is reported that breakers fronting the coast extend close to the former breakers, making a safe passage between them and the coast doubtful, thence:
 - SSE of a 16.3 m patch (38 miles SW), thence:
- 3 SSE of Powell Point (30 miles W), the SE extremity of a promontory; Starvation Boat Harbour (9.103) lies N of the promontory. Thence:
- 4 SSE of Investigator Island (9.104) (19 miles SW), two small islets about 54 m high surrounded by breakers. Warden Reefs lie 2 miles E of the islets; rock and shoals extend 1¼ miles farther E. Depths in the area suggest other dangerous rocks. Thence:
- 5 SSE of Margaret Cove (8 miles W), a small bay, thence:
 - SSE of Shoal Cape, composed of sandhills which resemble white cliffs; an islet surrounded by much broken water lies close off its E side. Thence: Clear of Baynes Rock (14 miles SE) with a least depth of 13.1 m.
- 6 The track continues to lead ENE to pass either side of Figure of Eight Island (23 miles ESE) (chart Aus 119), lying at the SW end of West Group (9.110); the island has two peaks, rocky and covered in places with coarse grass and small shrub. Several above and below-water rocks extend seaward from the island. A rocky islet 30 m high lies off its S extremity. A light (9.98) is exhibited from the S summit and a white hut stands nearby.

(Directions continue for Esperance approaches at 9.112, 9.113 and for passage South of Archipelago of the Recherche at 9.155)

Anchorage and rivers

Doubtful Island Bay

9.101

- 1 **General information.** Doubtful Island Bay, is formed within Doubtful Islands (34°22'S 119°37'E) (9.99), the NE

extremity of Point Hood (9.87) and the coast N of the headland.

There are depths of 3·7 m only, in the channel between Point Hood and the two inner islands; but there is a deep channel between the two outer islands and the island next inshore of them.

- 2 The bay affords shelter in its S and SW parts, from winds between S and WNW, having regard to a dangerous rock lying near the coast about 4 miles NW of Seal Rock, 3 m high composed of sand and rock, (34°21'S 119°34'E).

Anchorage, may be obtained between Point Hood and S of Seal Rock. Approach can be made on a N heading between the two groups of Doubtful Islands, then when 5 cables N of the Islands altering course to 256°.

Chart Aus 337 (see 1.16)

Mary Ann Haven

9.102

- 1 **General information.** Mary Ann Haven is a protected anchorage formed within the reefs which extend about 1 mile S of Mary Ann Point (33°57'S 120°08'E). The haven is exposed to all except offshore winds, during SW gales it is protected by the outer reefs, which break heavily, and is quite smooth inside.

Hopetoun, a small town is situated on Mary Ann Point.

- 2 **Directions.** Mary Ann Haven Directional Light bearing 340° (white sector) on the summit of Table Hill (35°56'·1S 120°08'·2E), leads E of all dangers in the approaches to the haven.

Boat Ramp Leading Lights:

Front light (orange triangle point up on beacon), (33°57'·1S 120°07'·3E).

Rear light (orange triangle point down on white pole) (1627 m from front).

- 3 The alignment (308°) of these lights leads for about 1¼ miles to a position 2½ cables NNE of Seal Island (33°57'·7S 120°07'·7E) close N of an unnumbered beacon.

The alignment (275°) of No 1 Beacon (piles) (33°57'S 120°06'E), 3 m high, standing on a reef on the W side of the haven and No 2 Beacon (piles) standing 1¼ cables E of No 1 Beacon, leads into the entrance (less than 1 cable wide) towards the anchorage. Both beacons are reported (1989) to be in poor repair.

- 4 **Anchorage** may be obtained within the reefs in depths of about 5 m with good holding, and outside the entrance

in depths of 7 m with No 1 Beacon and No 2 Beacon in line.

A light (post, elevation 5 m) is exhibited from the end of a breakwater extending S from Mary Ann Point. There is a jetty and ramp on the SW corner of the breakwater.

Starvation Boat Harbour

9.103

- 1 Starvation Boat Harbour, known locally as Bedford Harbour, is entered close N of a promontory of which Powell Point (33°55'S 120°33'E) (9.100) is the SE extremity and North Powell Point 4 cables NNE is the NE extremity. Inside Rock, with a least depth over it of 3·9 m, and having depths of less than 5·5 m extending 1 cable ENE from it, lies 2½ cables off North Powell Point. A rocky shoal with least depth of 3·2 m over it lies 5 cables NE of North Powell Point. Dangerous reefs extend 5 to 6 miles E from a position 1 mile NE of North Powell Point; the sea breaks over them in places along their entire length in any but the finest weather. The harbour affords good shelter during SW winds.

- 2 **Anchorage** may be obtained in a depth of 8 m 3½ cables N of North Powell Point, but care must be exercised to avoid the 5·4 m patch about 1 cable N of this anchorage.

Caution. Mariners are advised that the areas off Starvation Boat Harbour are incompletely surveyed and uncharted dangers may exist.

Investigator Island

9.104

- 1 Investigator Island is formed by two small islets lying about 19 miles SW of Shoal Cape (33°53'S 121°07'E); on each of which stand two hillocks. They are joined at their S ends by a narrow rocky, boulder strewn beach, enclosing an almost circular basin which affords an anchorage for vessels of up to 37 m in length in depths of about 18 m. It is entered from the NW and is almost steep-to on each side. A depth of 1·6 m lies close NW of the E islet.

- 2 It is reported (1989), that Investigator Island affords very good shelter from all directions except the N. It is used frequently by yachts and fishing vessels in the event of bad weather.

Seals are numerous; Cape Barren geese, which are protected, inhabit the islets and there are a number of tern rookeries. Gropers may be caught at the anchorage, but are more plentiful near the rocks.

FIGURE OF EIGHT ISLAND TO SALISBURY ISLAND

GENERAL INFORMATION

Charts 4726, 4727, Aus 762, Aus 119

Scope of the section

9.105

- 1 This section comprises the following:-
Esperance Bay (33°54'S 121°58'E) West Approaches (9.110).
Esperance Bay East Approaches (9.114).
Esperance (33°52'S 121°54'E) (9.135).
Passage South of Archipelago of the Recherche (9.153).

Caution

9.106

- 1 Archipelago of the Recherche (9.107) is inadequately surveyed and local knowledge is required. Passages should be avoided at night. Furthermore, unless proceeding to Esperance, mariners are advised to avoid the area at all times due to the haze (9.109). No navigation should be attempted between Termination Island (34°28'S 122°00'E) (9.155) and The Causeway (9.110) (25 miles NNW), or N of a line joining Termination Island and Salisbury Island (77 miles E) (9.117), except as described at 9.117 and 9.121 as there are numerous below-water dangers which

only break in heavy weather. Other charted dangers may exist S of this line.

Topography

9.107

- 1 Archipelago of the Recherche consists of a vast number of islands and reefs extending along the coast from Figure of Eight Island (34°02'S 121°36'E) to the N rock of Eastern Group (10.9) 123 miles E and lying up to 30 to 40 miles offshore.

The main islands are described with the routes which pass adjacent to them leading towards Esperance Bay, the locations of the remainder can best be seen on the chart.

Regulations

9.108

- 1 The Archipelago is a nature reserve and landing on the islands is restricted.

Natural conditions

9.109

- 1 **Currents.** Information is scarce for this area but what is available suggests that about 20% of all sets occurring from April to September and about 30% of all those from October to March are towards the shore. After steady winds a drift of 1 kn is discernible.

Tidal streams are not apparent in the Archipelago.

- 2 **Sea level.** The range of the diurnal tide is small. Barometric pressure can cause the predicted levels to be in error by as much as 0.3 m.

Visibility is frequently affected by haze among the islands.

Local magnetic anomaly has been observed among the islands of the Archipelago. It was reported in 1981 that the magnetic variation was increased by 5° in a position W of Termination Island (34°29'S 122°00'E).

ESPERANCE BAY WEST APPROACHES

General information

Chart Aus 762, Aus 119

Description

9.110

- 1 Esperance Bay is situated between Observatory Point (33°54'S 121°47'E) and Cape Le Grand (34°01'S 122°07'E), 17 miles ESE.

The W side is indented by three bays which have sandy beaches. The N and E side from the town of Esperance to the headland which rises to Mount Le Grand about 13 miles SE, consists of a long stretch of sand, broken only by Bandy Creek (9.135) and Wylie Head (33°50'S 121°59'E).

- 2 Within the Bay are a number of islands, islets and dangers.

The Port and town of Esperance (9.135) lie on the NW side of the Bay.

There are two entrances in the W approach to Esperance Bay, West Channel and Causeway Channel.

- 3 West Channel (9.112), entrance lies between Butty Head (33°54'S 121°39'E), and West Group, which consists of three principal islands and a number of islets, rocks and dangers lying from 8 miles SSW to 6½ miles SSE of Butty Head.

Causeway Channel (9.113), which is deep and free from danger, lies between West Group, Sunk Rocks and Douglass Patch, on the N, and The Causeway on the S.

- 4 The Causeway, which consists of rocks and underwater reefs, extends NE from Giant Rocks (34°11'S 121°40'E) to Long Island 16 miles ENE of them.

With local knowledge, an approach from the E may be made through Archipelago of the Recherche. See 9.117, 9.121.

Major light

9.111

- 1 Figure of Eight Island Light (34°02'S 121°36'E) (9.98).

Directions

(continued from 9.100)

West Channel

9.112

- 1 **Caution.** Attention is drawn to the Reliability diagram shown on chart Aus 119. The chart for the area is based on a Reconnaissance or inadequate survey.

From a position W of Figure of Eight Island (34°02'S 121°36'E) and clear of Baynes Rock (9.100), the track leads ENE passing (with positions relative to Observatory Island (33°56'S 121°48'E)):

- 2 NNW of Figure of Eight Island (9.100), thence:
SSE of Butty Head (7 miles WNW), formed by a prominent conical hill; Bayliss rock, over which the sea always breaks heavily, lies 7 cables W of Butty Head. Thence:

The track then leads E, passing:

- 3 S of Butty Harbour (5½ miles NW), only suitable for small coasting vessels, thence:
N of Capps Island (6 miles SW); dangerous rocks lie 1 cable E and 2½ cables SE respectively of Capps Island. Thence:

N of Sunk Rocks (4½ miles SSW), two rocks, steep-to on which the sea breaks heavily during moderate S winds and swell, thence:

- 4 S of Gig Rocks (1 mile W), with foul ground extending 2½ cables WSW. Canning Island lies 3 cables NE of Gig Rocks; a dangerous rocky reef extends 1½ cables NE from the E extremity of the island. Thence:

- 5 S of foul ground extending 5 cables SW of Observatory Island, very rocky with stunted vegetation on a rugged summit; a rock, on which the sea breaks occasionally lies 1 cable off its E extremity, thence:

N of Douglass Patch (3 miles SSE), a small rocky ridge, on which the sea breaks in heavy weather, and noting the 22.2 m patch lying 1 mile W of the ridge, thence:

- 6 S of Sunday Patch (1¼ miles E), a detached shoal over which the sea breaks in heavy weather lying 7 cables SSE of Swell Rocks over which the sea always breaks, thence:

S of Charley Island (3 miles E), with a well defined summit, rocky and sparsely covered. Little Devil and Devils Rock are situated on a ledge extending about 4 cables SE; another rock lies 1 cable N from the island. Thence:

- 7 S of Cull Island (4½ miles E), rocky with very little vegetation, flat summit from where a light (white hut, 2 m high) is exhibited. Rabbit Island, situated at the end of a bank extending S from Dempster Head (33°53'S 121°54'E) lies 2 cables NW of Cull Island.

The track then joins that through Causeway Channel (9.113) to the pilot boarding area.

Causeway Channel

9.113

- 1 **Caution.** Giant Rocks (34°11'S 121°40'E) should be given a wide berth by vessels approaching from the S. From a position S of Figure of Eight Island, (34°02'S 121°36'E) the track leads NE passing (with positions given from Smith Rock (34°03'5S 121°51'8)):
 - NW of Giant Rocks (12 miles SW), two groups of rocks lying 6 cables apart, and:
 - SE of Figure of Eight Island (12½ miles W) and Triple Rock lying 7 cables SE of it, thence:
- 2 NW of Dart Reefs (8 miles SW), and a dangerous rock over which the sea breaks heavily and Moby Dick Reef lying about 2 miles E and over which the sea breaks. Thence:
 - SE of Whale Rock (10½ miles W), in the middle of West Group, thence:
 - SE of Boxer Island (9 miles WNW) and Fury Rock 1 mile ENE, thence:
- 3 SE of Sunk Rocks (5½ miles NW) (9.112), thence:
 - NW of Smith Rock and the dangers lying 5 cables NW of it, thence:
 - NW of a rock (4 m high) (1 mile NE) lying 7 cables NW of Hendy Island, thence:
 - SE of Douglass Patch (5 miles NNW) (9.112), thence:
- 4 NW of Coates Reef (6½ miles NE) over which the sea nearly always breaks, thence:
 - SE of Charley Island (7½ miles N) (9.112) thence:
 - NW of Thomas Island (33°59'S 121°59'E), the W of a group of three islands, thence:
 - SE of Cull Island (15½ miles NE) (9.112).
- 5 From a position about 1½ miles SE of Cull Island the track leads N to the pilot boarding area passing (with positions relative to Cull Island):
 - W of Magistrate Rocks (3 miles E), a conspicuous group of rocks. The E rock is 14 m high, the SW rocks are awash and the sea always breaks heavily over the W of Magistrate Rocks, thence:
 - E of Cull Island and Pot Rock, a 7-4 m patch 4 cables N.

(Directions continue for Esperance at 9.150)

ESPERANCE BAY EAST APPROACHES

General information

Charts 4727 (see 1.16), Aus 762, Aus 763, Aus 119

Route

9.114

- 1 Vessels approaching Esperance Bay through Causeway Channel (9.113) from the E and S are recommended to pass well S of Salisbury Island (34°22'S 123°33'E), clear of Pollock Reef (9.155), and S of Termination Island (34°28'S 122°00'E). This will lead S of Archipelago of the Recherche.

With local knowledge an approach may be made through Archipelago of the Recherche from a position about 2 miles W of Salisbury Island (34°22'S 123°33'E), about 85 miles WNW to Esperance pilot boarding area.

Topography

9.115

- 1 Sandy Bight, an extensive bay which has not been surveyed, lies between Cape Pasley (33°57'S 123°32'E) and Cape Arid about 19 miles WSW.

From Cape Arid (34°01'S 123°10'E) to Mississippi Point about 43 miles W, the coast in general consists of a succession of sandy beaches and rocky points backed by sandhills.
- 2 Between Mississippi Point and Cape Le Grand (34°01'S 122°07'E), the coast is rugged and bold, indented by five bays with sandy beaches.

Archipelago of the Recherche (9.107) extends 30 to 40 miles offshore.

Directions

9.116

- 1 Passage through the archipelago should not be attempted late in the afternoon or at night; if unable to reach Esperance in daylight, anchor at Goose Island Bay (34°05'S 123°12'E) (9.126) or NNE of South Twin Peak Island (34°00'S 122°48'E) or in Duke of Orleans Bay (33°56'S, 122°35'E) (9.130)

Local Knowledge, see 9.106. The routes below have been used satisfactorily in the past.

East outer approach

9.117

- 1 From a position about 2 miles W of Salisbury Island (34°22'S 123°33'E), the track leads WNW, passing (with positions from Salisbury Island):
 - W of Salisbury Island, the SE and largest island of Archipelago of the Recherche. It is rocky and covered with matted stunted scrub; underwater rocks extend 2½ cables off the S point of the island; two rocky ledges, awash, the S one having on it a rock, are situated about 7½ cables off its NW side. Vessels should not approach within 7½ cables of its S side. Thence:
- 2 2 miles SSW of Penguin Rock (17 miles NW), thence:
 - 2½ miles SSW of Douglas Island (34°10'S 123°08'E), consisting of two hills connected by a low narrow neck; dangerous rocks on which the sea breaks with any swell lie off the E and W sides of the island. Thence:
- 3 With the S extremity of Douglas Island bearing 090°, astern, the track leads W passing (with positions from Douglas Island):
 - 1½ miles N of Matthew Rock (7½ miles WSW), which seldom breaks except in heavy swell, thence:
- 4 2 miles S of Foam Rocks (14½ miles WNW); the sea always washes over them in a great mass of foam. A small underwater reef on which the sea only breaks at intervals, lies 6 cables ENE of Foam Rocks, thence:
 - 1¼ miles N of an obstruction (15 miles WSW) reported (1973), thence:
- 5 2¼ miles S of Sulphur Reefs (34°07'S 122°42'E). The S reef is awash and always breaks; the N reef seldom breaks, but breakers are charted about 2½ miles N of the S reef. Vessels should not attempt to pass between or within 5 cables of these reefs. Thence:

1¼ miles N of Spray Reef (34°11'S 122°32'E), steep-to and nearly awash, and over which the sea breaks heavily, thence:

- 6 1½ miles N of Draper Island (34°12'S 122°30'E), bare and rocky. Detached reefs and underwater rocks extend up to 5 cables from the island in places; a rock 7 m high lies on the reef NE of the island and a rock 5 m high on the reef NW of it. An underwater rock, on which the sea breaks occasionally, lies 5 cables SW of the island.

Draper Island to Hope Island

9.118

- 1 From a position about 1½ miles N of Draper Island (34°12'S 122°30'E) the track leads NW passing (with positions from Draper Island):
 - 2½ miles SW of Walker Reef (5 miles N), awash at its SW end, the remainder of the reef being covered. The sea always breaks on the reef, thence:
 - 1½ miles NE of Finger Island (9 miles NW), having a rounded appearance, and:
- 2 5 miles NE of Mondrain Island, (12 miles NW), covered with thick scrub, its summit surmounted by a very large boulder, prominent from all directions. A number of rocks and shoals lie close to the island and islets lie up to 1 mile off its W side. The sea breaks heavily, with a S swell on the shoal patches off the S end of the island.
- 3 The track then leads W passing (with positions from Finger Island (34°06'S 122°21'E):
 - Midway between Stokes Bank (2 miles NW) and Outtrim Reef (4 miles NNW), the latter awash and on which the sea always breaks, thence:
 - 1 mile N of French Reef (4 miles NW) on which the sea always breaks, thence:
 - Between Black Rock (7¾ miles WNW), two steep-to rocks, and:
- 4 Hope Island (9 miles WNW), bare and rocky with a well defined summit near its S end; an islet lies close to its S extremity. Foul ground extends up to 1½ cables off the W side of the island and a rock 1 m high lies off the middle of the W side. Foul ground also extends E from the N extremity of the island. A shoal of 11 m was reported (1973) 2½ miles E of the island.

Hope Island to Cape Le Grand

9.119

- 1 From a position about 2 miles NE of Hope Island (34°05'S 122°10'E) the track leads WNW passing:
 - 1 mile S of Ram Island (34°02'S 122°09'E), a rocky formation; a reef on which the sea occasionally breaks lies 2 cables S of the island and rocks about 1 m high, lie about 1 cable off its S and E sides.
- 2 The track then leads NW passing (with positions from Ram Island):
 - 1½ miles NE of Pasco Island (2 miles SW), the summit of which is covered in small scrub. Thence:
- 3 7½ cables NE of a dangerous rock (1½ miles WSW), lying 4 cables NE of Cloud Island (34°03'S 122°05'E); thence:
 - S of Cape Le Grand (1 mile NW), bald rocky and steep-to; it is the SW extremity of an irregular

shaped headland on which stands Mount Le Grand, a round granite hill. A black rock 4 m high lies close SE of the Cape.

Cape Le Grand to pilot boarding area

9.120

- 1 From a position about 6 cables S of Cape Le Grand (34°01'S 122°07'E) the track leads NW passing (with positions from Cape Le Grand):
 - NE of Cliff Island (1 mile W), sparsely covered with grass. Shoal ground extends close off its E end and a below-water rock lies close off its W end, thence:
- 2 NE of Murray Rock (2½ miles NW); foul ground extends 1½ cables W and SW from the rock, thence:
 - NE of Thistle Rock (4 miles NW), over which the sea always breaks. A dangerous rock lies 2 cables NE of Thistle Rock. Thence:
- 3 NE of Time Rock (5 miles NW), thence:
 - NE of Woody Island (5½ miles NW).

The passage then leads W for about 4 miles (with positions relative to Woody Island):

 - S of Steep Rocks (2½ miles NW) lying 5 cables S of the W end of Black Island (9.113), thence:
- 4 S of Magistrate Rocks (2½ miles NW) (9.113).
 - From a position about 5 cables S of Magistrate Rocks the passage leads NW to the pilot boarding area about 1½ miles NE of Cull Island Light (9.112).

(Directions continue for Esperance at 9.150)

East inner approach

9.121

- 1 **Caution**, numerous rocks and dangers lie close to the track and frequent fixing is necessary.

Salisbury Island to Bearing Rock

9.122

- 1 From a position about 2 miles W of Salisbury Island (34°22'S 123°33'E) (9.117), the track leads NW passing (with positions from Salisbury Island):
 - 1½ miles SW of Dome Island (16 miles NW), a small, bare dome shaped mass of granite; underwater rocks extend 1½ cables off both its E and SW extremities, thence:
- 2 5 cables NE of Middle Island (34°06'S 123°12'E), densely wooded except on the slopes near the coast. Flinders Peak, the highest point, is the summit of a prominent, smooth, domed hill, at the NW end of the Island. Dangerous rocks, on which the sea always breaks heavily, extend nearly 5 cables from the S part of the island. Thence:
- 3 In the deep clear channel 5 cables wide between North East Point of Middle Island and Miles Island. North East Point should not be approached within 2 cables; Miles Island is surrounded by foul ground except on the SE side. Thence:
- 4 The track leads NW through Arid Strait (with positions from Miles Island):
 - 3 cables NE of Russell Rock (3½ miles WNW), black, flattish, thence:
 - SW of Darling Shoal (4 miles NW), breaks at times, thence:

- 5 SW of Arid Island (4½ miles NW), bare, thence:
NE of Finch Shoal (5½ miles WNW), on which the
sea nearly always breaks, thence:
NE of Austin Bank (6¼ miles WNW), which breaks
in a heavy swell, thence:
1½ miles SW of Bearing Rock (8 miles NW); foul
ground extends 2 cables S and W from it.

Bearing Rock to Cornwall Island 9.123

- 1 From a position about 2¼ miles WSW of Bearing Rock
(33°59'S 123°06'E) the track leads W for about 5 miles, to
a position about 1¼ miles N of Ward Bank (34°01'S
122°58'E) whence the track leads WSW passing (with
positions from Bearing Rock):
- 2 SSE of Cap Island (8¼ miles WNW); shoals and
dangerous rocks lie from 5 cables to 1¼ miles SW
of the island, thence:
SSE of numerous unnamed islets, rocks and reefs
lying up to 4 miles W to SW of Cap Island which
may be seen on the national large scale chart,
thence:
- 3 1 mile SSE of North Twin Peak Island (12 miles W);
the summit is bare, with a remarkable granite
boulder 5 cables N of it, thence:
1 mile SSE of South Twin Peak Island (14½ miles
W), bare and from a distance appears much lighter
than North Twin Peak Island, and:
- 4 NNW of Kermadec Island (14 miles SW), lying
6 miles S of North Twin Peak; dangerous rocks lie
about 3 cables W and 4 cables NNE of the Island.
Kermadec Rocks lie between 2½ cables and
5 cables S of Kermadec Island, thence:
- 5 5 cables N of Sail Rock (34°03'S 122°45'E),
prominent; when viewed from S or E resembles a
vessel under sail, and N of Slipper Island lying
close W of Sail Rock. A dangerous reef that does
not always break lies 4 cables SW of Slipper
Island. Thence:
- 6 The track then leads W for about 3½ miles passing:
S of Tizard Island (34°01'S 122°41'E), flat and rocky
with scattered boulders on its upper parts; a rock
6 m high lies off its NE end and an underwater
rock over which the sea is reported to break lies
2 cables SSW of the island.
- 7 From a position 9 cables S of Tizard Island the track
leads WNW passing (with positions from Tizard Island)
NE of Mart Rock (2 miles SW), breaks with a heavy
swell, thence:
- 8 5 cables SW of Marts Islands (2¼ miles NW), a
group of islands and rocks. The E part of the
group consists of four islets lying close together.
The W part of the group consists of one islet with
several rocks from 1 to 9 m high. The islet in the
W part of the group is the highest and most
prominent of the whole group 132 m high, with
smooth bare granite sides; an underwater rock lies
1 cable from the NW point of the islet and
between them is an above-water rock. Thence:
- 9 4 cables NE of York Islands (5 miles WNW), a group
of five islands. The E-most is prominent with a
dark patch of vegetation on its E face, steep-to and
shows as a prominent peak from SE. The other
islands are low, dark and bare. A double headed
reef, steep-to and nearly awash, reported to break

in a heavy swell, lies 5 cables E of the S Island,
thence:

- 10 Between Hammer Head (6 miles NW), a rocky
headland of rounded appearance, sparsely covered
with vegetation, steep-to, and:
Cornwall Island (7 miles WNW), rocky and bare.

Cornwall Island to Cape Le Grand 9.124

- 1 From a position about 1¾ miles N of Cornwall Island
(34°00'S 122°32'E) the track leads WSW (passing with
positions from Cornwall Island):
6 cables SSE of Station Island (2½ miles N), rocky
with few patches of scrub on it; dangerous rocks
lie close to the N and W sides. A dangerous reef
which always breaks lies 3 cables off the E point
of the island. Thence:
- 2 SSE of an islet 4 m high, lying 8 cables S of Cheyne
Point (33°57'S 122°31'E); an islet 55 m high lies
1 cable W of Cheyne Point. Thence:
NNW of Scatterbreak Reef (4½ miles WNW), upon
which the sea always breaks, thence:
- 3 3 cables SSE of Broughton Island (5¼ miles WNW),
bare and rocky; underwater rocks lie close to its
NE and SW ends. A shoal with a depth of 3.5 m
over it and over which the sea breaks in a S swell,
lies 7½ cables N of Broughton Island. Thence:
- 4 3 cables NNW of Tory Islands (11 miles W), a group
of four rocky islets, with very little vegetation. The
N islet is the largest. An underwater reef lies
2½ cables off the S islet and an above-water rock
lies close SW of the islet. Thence:
- 5 6 cables SSE of Mississippi Point (34°00'S
122°17'E). Mississippi Hill, its sides covered in
places with short thick scrub, rises from the coast
1¼ miles WNW of the point; a cairn stands on the
summit. Mississippi Reefs lie close off the point;
the inner reef is awash, the outer, 3 cables SE of
the point, is below water and the sea breaks over
it at intervals. Thence:
- 6 5 cables NNW of Rob Island and Roy Island
(15 miles WSW), two islets close together, bare
and rocky; an underwater reef, on which stands a
rock 2 m high, lies 5 cables SE of Roy Island; a
2.7 m patch is reported (1973) to lie 4 cables
WNW of Rob Island.
- 7 From about 2½ miles W of Rob Island (34°02'S
122°14'E) the track leads WNW passing (with positions
from Cape Le Grand (34°01'S 122°07'E)):
Between Ram Island (9.119) and New Island
(1¼ mile E), separated from the mainland by a
shallow passage.
- 8 The track then leads W to pass S of a rock (4 m high)
lying close SE of Cape Le Grand (9.119), and joins the
route given at 9.120 to the pilot boarding area.

Useful marks 9.125

- 1 Mount Le Grand (34°00'S 122°08'E), (9.119) a
rounded granite hill.
Free Island (33°58'S 122°25'E), bare and rocky.
Mount Belches (33°56'S 122°35'E), dome shaped,
rocky hill with smooth steep slopes; an uncharted
cairn 3 m high, prominent from all directions
stands on the summit.
Howick Hill (33°44'S 122°46'E), prominent summit.
(Directions continue at 9.119)

Anchorages and bays

Charts 4727, Aus 119 plan of Goose Island (see 1.16)

Goose Island Bay

9.126

- 1 Goose Island Bay is situated on the N side of Middle Island (9.122), between North East Point (9.122) and Goose Island (34°05'S 123°11'E). Sailor Rock, consisting of two smooth granite boulders lying close together, lies 5 cables E of Goose Island; the sea breaking over the rock indicates its position. Blind Rocks extending 2 cables N, are three dangerous granite boulders, with least depth over them of between 1.2 and 1.8 m (charted as dangerous rocks). A dangerous rock lies about 2¾ cables S of Sailor Rock.

- 2 Close behind the sandy beach at the head of the bay is a shallow salt-water lagoon, with a considerable deposit of salt around its edges.

Local knowledge is necessary.

Caution is necessary navigating in the vicinity of these rocks as they are very small and not easily seen.

- 3 **Directions.** The bay is approached directly from the E inner approach (9.121).

When leaving Goose Bay, follow directions given at 9.122 passing not less than 5 cables N of Goose Island.

- 4 **Anchorage,** may be obtained, sheltered from W winds, off the E side of Goose Island in depths of about 13 m. In the summer during strong E winds, anchorage may be obtained in depths of 13 m in the SE corner of the bay, on the alignment (302°) of Sailor Rock with the NE point of Goose Island and the alignment (253°) of Flinders Peak (9.122) with Andrews Point.

The bay is sheltered from the swell and from all except N winds.

Arid Bay

9.127

- 1 Arid Bay is situated between Cape Arid (34°01'S 123°09'E) and a point 2 miles N, off which lie Barrier Islands. The N island is 18 m high, the S island is 39 m high, and foul ground with several above-water rocks lies between the islands. Bearing Rock (33°59'S 123°06'E) (9.122), lies 1½ miles WSW of the N Barrier Island.

Local knowledge, is essential.

- 2 **Barrier Anchorage,** inside these islands, may afford shelter from NE gales for a small vessel in depths of 9 m.

Caution. The only approach to Barrier Anchorage is between the foul ground extending from Cape Arid and the S Barrier Island; the line of bearing 278°, astern, of the summit of Bearing Rock, passes between them and N of a 5.3 m patch lying 1¼ miles NW of the cape. A dangerous underwater rock lies 8 cables N of Cape Arid.

Chart 4727 (see 1.16)

Tagon Bay

9.128

- 1 Tagon Bay is situated between Tagon Point (33°54'S 122°59'E), and a point 1¾ miles NE. Tagon Point is the extremity of a rocky promontory, covered in shrub, S of which lie two small islets; foul ground extends 3 cables in a S and W direction from the outer one.

- 2 An islet, with dangerous rocks lying off its N and S ends, lies 7½ cables E of Tagon Point. Tagon Reef, steep-to and on which the sea always breaks, lies 2 miles S of Tagon Point.

Local knowledge is necessary.

Anchorage is sometimes obtained by coasters, but is not recommended as the bottom is uneven. The bay is exposed to the S swell.

Alexander Bay

9.129

- 1 Alexander Bay is situated between a point (33°54'S 122°45'E), 25 m high, off which lies Ben Island, having a prominent sandy summit, and Alexander Point (4 miles ESE). There is a channel with depths from 5.5 to 9.1 m between Ben Island and the point NW of it. Rocks lie 5 cables N of the island. Alexander Hill, the summit of which is marked by a granite cairn, stands 2 miles NE of Alexander Point. Inshore Island lies off Alexander Point and is the largest of three islands situated within 1½ miles S and W of the point; rocks lie close off all sides of this island and off the point. A detached rock lies 7½ cables E of Inshore Island and Taylor Boat harbour is situated NE of the island.

- 2 An historic wreck, *Batoe Bassi*, lies 4 cables NE of Inshore Island and has been declared a protected zone. See 1.60.

Local knowledge is essential within this bay.

Anchorage, sheltered from W winds, may be obtained at the W end of the bay in its SW corner for vessels with a draught of not more than 3 m.

Charts 4727, Aus 119 plan of Duke of Orleans Bay (see 1.16)

Duke of Orleans Bay

9.130

- 1 **General information.** Duke of Orleans Bay is entered between Nares Island (33°56'S 122°36'E), rugged and covered with small bushes with little grass, lying close to the S point of the bay, and Table Island, about 1 mile N, situated close to the N point of the bay. The island is steep, rocky, flat topped and prominent; close E lies High Island, a rocky islet 8 m high. John Island, bare and rocky with boulders on and near its summit, lies 5 cables SE of Table Island; a rocky shoal with least depth of 4.4 m over it extends ½ cable off its W extremity. Dodd Rock, awash at HW, lies midway between John and Nares Islands; it is always visible and generally breaks.

- 2 Dailey River, enters Duke of Orleans Bay immediately N of Table Island, fronted by sand banks, generally awash at HW; the river is navigable by boats for up to 1 mile.

Local knowledge is necessary.

- 3 **Directions,** from the vicinity of 34°10'S 122°40'E, about 2½ miles SSW of S Sulphur Reef (34°08'S 122°41'E), the approach leads NNW maintaining the line of bearing 343° of Mount Belches right ahead. After passing between York Islands and Marts Islands proceed as requisite to the anchorage.

- 4 **Anchorage,** may be obtained for vessels of not more than 4.9 m draught, in depth of about 6 m, with the white topped rock close off the NW point of Nares Island bearing about 125°, distant 2 cables, having regard to Dodd Rock. Bay Rock lies in the centre of the bay with a least depth over it of 1.2 m and breaks with any swell.

Cheyne Bay

9.131

- 1 Cheyne Bay is situated between Cheyne Point (33°57'S 122°31'E), and Hammer Head (33°58'S 122°35'E), a steep-to, rocky headland of rounded appearance, sparsely covered with vegetation. Station Island (9.124) lies off the W side of the bay. Lorraine Island lies 1 mile NNW of Hammer Head and several smaller islets lie 2½ cables off the E and W shores.

- 2 **Anchorage** may be found in depths of between 4 and 7 m in sand and weed in both bays on the W side of the peninsula joining Mount Belches (33°56'S 122°35'E) and Hammer Head.

Caution. An uncharted rocky ledge ($33^{\circ}57'16\text{S}$ $122^{\circ}34'35\text{E}$), which dries at LW extends about 50 m N from the S shore at the entrance to the S arm of the N bay.

Chart 4727 (see 1.16)

Rossiter Bay

9.132

- 1 Rossiter Bay, a small bight, lies about 1 mile N of Mississippi Point ($34^{\circ}00'\text{S}$ $122^{\circ}17'\text{E}$). A chain of six islets extend in a line across the entrance of the bay and offers but poor shelter during E winds; the bay affords shelter from W winds only.

Other islands and rocks lie in the bight between Mississippi Point and Cheyne Point, positions of which are shown on the chart.

- 2 **Local knowledge** is necessary.

Anchorage may be found in depths of 7 m. A rock 1.2 m high lies in the E approach to the bay, $3\frac{1}{4}$ miles ENE of Mississippi Point; a dangerous reef, on which the sea breaks, extends $2\frac{1}{2}$ cables NNE. An underwater rock lies 1 mile W of the 1.2 m high rock.

Chart Aus 762

Lucky Bay

9.133

- 1 Lucky Bay ($34^{\circ}00'\text{S}$ $122^{\circ}14'\text{E}$) is situated close W of Mississippi Head.

Local knowledge is required.

Natural conditions. During E winds a S swell sets into the bay, but a boat could find shelter in the NW corner, under a rocky point, where there is a remarkable cave. With W winds violent squalls sweep down from the hills on the NW side of the bay.

- 2 **Anchorage**, sheltered from N and E winds may be obtained in 22 m, coarse sand, close under the islands that form the SE side of the bay.

Esperance Bay

9.134

- 1 **Woody Island.** Anchorage can be found NE of the island in depths of about 30 m, as shown on chart Aus 119. Anchorage can also be found, see chart, in depths of 14 to 20 m, $3\frac{1}{2}$ miles NNW of Cape Le Grand ($34^{\circ}01'\text{S}$ $122^{\circ}07'\text{E}$).

ESPERANCE

General information

Chart Aus 119 with plan of Esperance

Position and function

9.135

- 1 Esperance ($33^{\circ}52'\text{S}$, $121^{\circ}54'\text{E}$) is situated on a small flat in front of sandhills on the NW shore of Esperance Bay.

The town is a farming and mineral centre; the commercial port exports nickel, iron ore and grain.

Bandy Creek ($33^{\circ}50'\text{S}$ $121^{\circ}56'\text{E}$), which contains a boat harbour, is situated $2\frac{1}{2}$ miles NE of Esperance.

Topography

9.136

- 1 The country in the vicinity of Esperance consists generally of sandhills covered with coarse grass and small shrub, further inland are extensive shallow salt lakes with a more undulating scenery but nowhere are the hills more than 150 m high.



Aerial View of Esperance (9.135)

(Original dated 2002)

(Photograph – Esperance Port Authority)

Port limits**9.137**

- 1 The port limit is defined by the area of water within a radius of 10 miles from the W entrance point of Bandy Creek (33°50'S 121°56'E), about 2½ miles NE of Esperance, as shown on the chart.

Approach and entry**9.138**

- 1 The approach is from S through Esperance Bay and entry on a SW heading through a dredged channel marked by leading lights and light-beacons.

Traffic**9.139**

- 1 In 2002, the port was used by 179 vessels totalling 11 339 833 dwt.

Port Authority**9.140**

- 1 Esperance Port Authority, Box 35, Esperance, W A. 6540.

Website: www.esperanceport.com.au

E-Mail: esppa@esperanceport.com.au

Limiting conditions**9.141**

Controlling depth. The maintained depth alongside Berth Nos 1 and 2 is 14.5 m.

Deepest and longest berth. Berth No 1 is the longest, No 3 is the deepest (9.151).

Density of water: 1.025 to 1.028 g/cm³.

Arrival information**Notice of ETA****9.142**

- 1 ETA should be reported 7 days, 48 and 24 hours and 1 hour in advance of arrival. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages**9.143**

- 1 Anchorages A to E are as shown on the chart. The holding ground is reported to be moderate to good with a sand bottom within the vicinity of anchorages A and D.

Pilotage and tugs**9.144**

- 1 **Pilotage** is compulsory. Pilot boards about 1½ miles NE of Cull Island Light as shown on the chart. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Tugs are available.

Regulations concerning entry**9.145**

- 1 Vessels are normally berthed during daylight hours, but may berth at night or sail at any time subject to the Harbour Masters authority.

Quarantine**9.146**

- 1 Esperance is a first port of entry. For details see *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour**General layout****9.147**

- 1 Esperance harbour is protected on the SE by a breakwater extending NNE thence ENE from the NE side of Dempster Head (33°53'S 121°54'E).
- 2 A dredged area about 3 cables square lies to the NW of the breakwater in which are situated Berths 1 to 3. A small marina, protected by a breakwater projecting ENE, SE and S is situated about 8 cables N of Dempster Head. Taylor Street Landing lies on the N side of the breakwater. James Street Swimming Jetty extends ¼ cables from the shore about 1 mile N of Dempster Head, with a slipway situated S of it. Berthing alongside this jetty is prohibited. Tanker jetty, which is no longer used for berthing, but only as a promenade lies 1½ miles N of Dempster Head.

Natural conditions**9.148**

- 1 **Swell.** With weather from the SE there is usually a ground swell, which affects berths at the harbour.

Climatic table. See 1.170 and 1.185.

Landmarks**9.149**

- 1 Dempster Head Microwave Tower (33°52'·6S 121°53'·6E), a conspicuous tower, 150 m in height, standing 4 cables NW of Dempster Head.
- Low Rock (33°51'S 121°58'E).
- Limpet Rock (33°53'S 121°58'E), conical; there is deep water within a distance of 1 cable from it.
- Lion Island (33°53'S 122°01'E), some rocks, from 1 to 6 m high, lie midway between the island and the mainland.

Directions

(continued from 9.113 and 9.120)

9.150

- 1 From the pilot boarding position about 1½ miles NE of Cull Island Light (33°55'S 121°54'E) (9.112) the track leads N passing (with positions relative to Cull Island):
- E of Cook Rock (2 miles N) lying 5 cables SE of Dempster Head, thence:
- 2 E of Esperance S Breakwater (3 miles N), a light stands on a mole projecting SE from the breakwater and a light (pillar, 3 m high) stands at its head.
- From a position about 1 mile E of the end of the breakwater, the entrance channel is approached in the white sector (300°–315°) of Tanker Jetty Light for about 6 cables.
- 3 From a position about 7 cables ENE of the end of the breakwater, the track leads WSW into Esperance harbour:

Leading lights:

Front light (white tower, red triangle topmark point up) (33°52'·3S 121°53'·7E).

Rear light (white tower, red triangle topmark point down) (210 m from the front light).

- 4 The alignment (242½°) of these lights leads through the maintained entrance channel marked by light-beacons (port and starboard hand), as shown on the chart, into Esperance harbour.

Berths**9.151**

- 1 The following berths are available:
- Berth No 1, length 244 m, depth 14.5 m with a grain loader. Vessels normally berth port side to.

Berth No 2, length 213 m, depth 14.5 m with a bulk ore loader. Bulk fertilizer is discharged at this berth. Vessels normally berth port side to.

Berth No 3, length 230 m, depth 19 m used for loading of iron ore. Vessels normally berth starboard side to.

Port services

9.152

- 1 **Repairs:** Minor repairs can be carried out.
Facilities: hospital, tank cleaning. There are no facilities for the reception of oily waste. De-ratting can be carried out and certificates issued.

Supplies: fresh water available at Berths 1 and 2; fresh provisions not plentiful; marine diesel oil available by road tanker only.

Communications. Airport 24 km from port.

PASSAGE SOUTH OF ARCHIPELAGO OF THE RECHERCHE

General information

Charts 4726, 4727, Aus 762, Aus 119 (see 1.16)

Route

9.153

- 1 The route leads from a position about 8 miles S of Figure of Eight Island (34°02'S 121°36'E) about 102 miles ESE to a position about 15 miles S of Salisbury Island, passing S of Archipelago of the Recherche (9.107).

Principal marks

9.154

- 1 **Landmarks:**
 Salisbury Island (34°22'S 123°33'E) (9.117). An excellent mark for making the Archipelago.
Major Light:
 Figure of Eight Island Light (33°57'S 120°07'E) (9.98)

Directions

(continued from 9.100)

9.155

- 1 From a position S of Figure of Eight Island (34°02'S 121°36') (9.100), at the entrance to Causeway Channel (9.113) the track leads S then SE for 30 miles to a position

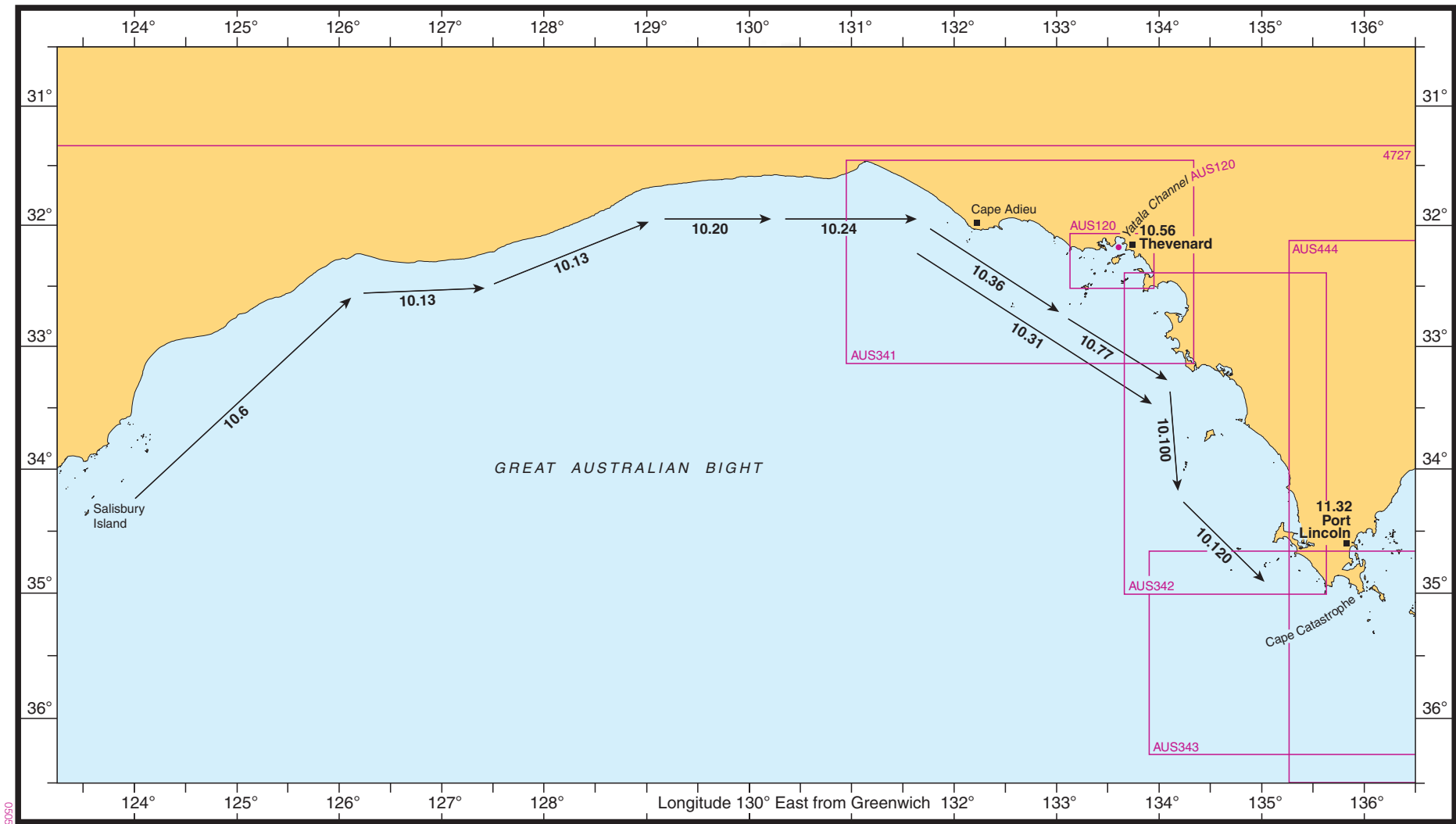
SW of Termination Island passing (with positions relative to Figure of Eight Island):

- W of Giant Rocks (8½ miles SSE) (9.113), thence:
 2 W of Waterwitch Rocks (18 miles SSE), two underwater rocks and over which the sea breaks only occasionally, in moderate weather. Trinity Rock, with least depth of 6.6 m over it, lies approximately 2 miles W of Waterwitch Rocks. Thence:
 3 SW of a shoal (29 miles SSE) with least depth of 13.1 m over it, thence:
 SW of Termination Island (32 miles SE), the S island of the Archipelago, a solid mass of very light colour rock, scantily covered and not easily seen from a distance. From E or W the summit appears well defined.
 4 From a position about 8 miles S of Termination Island (34°28'S 122°00'E) the track leads E to pass well S of Archipelago of the Recherche to a position, about 15 miles S of Salisbury Island (34°22'S 123°33'E), passing (with positions relative to Termination Island):
 S of Brown Reef (3 miles NE), consisting of an islet, 0.6 m high, round which the sea always breaks, thence:
 5 S of Twin Rocks (13 miles NE), two rocks 2 cables apart; the N rock 37 m high is surrounded by an atoll shaped rock formation, thence:
 S of La Perouse Rock (19 miles NE), which seldom breaks, thence:
 6 S of Dampier Rock (22 miles NE), which seldom breaks, thence:
 S of Dalrymple Rock (25 miles NE), which occasionally breaks.
 The passage continues E passing (with positions relative to Salisbury Island):
 S of Recherche Rock (32 miles WNW), steep-to; the sea breaks on it at intervals, thence:
 7 S of Pollock Reef (34°33'S 123°34'E), an underwater rock, steep-to, with a depth of less than 2 m over it, and over which the sea breaks heavily with S and W swell, lying 11 miles S of Salisbury Island (9.117). In the summer months with the predominant wind from the E, Pollock Reef is most difficult to make out beyond a distance of about 1 mile since the breaking on the reef is very similar to the surrounding waves.
(Directions continue at 10.9)

NOTES



Chapter 10 - Salisbury Island to Cape Catastrophe



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CHAPTER 10

SALISBURY ISLAND TO CAPE CATASTROPHE

GENERAL INFORMATION

Charts 4709, 4727

Scope of the chapter

10.1

- 1 This chapter comprises the following sections:
- Salisbury Island (34°22'S 123°33'E) to Cape Adieu about 460 miles ENE (10.4).
 - Cape Adieu (32°01'S 132°09'E) to Cape Blanche about 115 miles SE (10.29).
 - Cape Blanche (33°01'S 134°08'E) to Cape Catastrophe about 150 miles SE (10.99).

Through Route

10.2

- 1 The through route leads from a position about 15 miles S of Salisbury Island (34°22'S 123°33'E) about 620 miles E to a position S of Cape Catastrophe.

Harbours

10.3

- 1 Thevenard (32°09'S 133°39'E) (10.56) is the only port of any size on this stretch of coast; in addition there are several anchorages in bays and coves, most of which are affected by the heavy swell.

SALISBURY ISLAND TO CAPE ADIEU

GENERAL INFORMATION

Chart 4727

Scope of Section

10.4

- 1 This section comprises the following:
- Salisbury Island (34°22'S 123°33'E) to Twilight Cove (10.6).
 - Twilight Cove (32°17'S 126°00'E) to Eucla Roads (10.13).
 - Eucla Roads (31°45'S 129°00'E) to Twin Rocks (10.20).
 - Twin Rocks (31°29'S 131°08'E) to Cape Adieu (10.24).

Currents

10.5

- 1 Information is very scarce for this area, but what is available suggest that about 20% of all sets occurring from April to September and about 30% of all those from October to March are towards the coast.

SALISBURY ISLAND TO TWILIGHT COVE

General information

Chart 4727

Route

10.6

- 1 **Caution.** The portion of Archipelago of the Recherche which lies NE of Salisbury Island (34°22'S 123°33'E), Dome Island (34°10'S 123°21'E) and Middle Island (34°06'S 123°12'E) has not been surveyed. Vessels should approach this area with extreme caution.

The route leads from a position about 15 miles S of Salisbury Island (34°22'S 123°33'E) about 183 miles NE to a position 20 miles SE of Twilight Cove.

Topography

10.7

- 1 The coast between Cape Pasley (33°57'S 123°32'E) and Point Culver about 87 miles NE is low and sandy, fronted by rocks and islands which lie up to 19 miles offshore and backed by a steep limestone terrace, extending from about 15 miles N of Cape Pasley to a bluff 87 m high about

55 miles NE of Point Dempster (33°38'S 123°48'E), thence a cliff formation about 76 m high, the upper third of which is brown, and the lower portion almost white, without any distinguishable features, extends to near Twilight Cove, where the cliff recedes from the coast.

Landmarks

10.8

- 1 Salisbury Island (34°22'S 123°33'E) (9.117). An excellent mark for making Archipelago of the Recherche.
- Mount Pasley (164 m high) (33°55'S 123°33'E), with a cairn on its summit, a prominent feature on this part of the coast.

Directions

(continued from 9.155)

10.9

- 1 From a position about 15 miles S of Salisbury Island (34°22'S 123°33'E) the track leads NE passing (with positions relative to Cape Pasley 33°57'S 123°32'E):
- SE of Pollock Reef (36 miles S) (9.155), thence:
 - SE of Salisbury Island (25 miles S) (9.117), and
 - Chester Reef, an extensive shoal, with least depth of 10.4 m over it lying about 5½ miles SE of the S end of Salisbury Island. Thence:
- 2 SE of Cooper Island (18 miles S), 33 m high, light colour with a rugged coastline; Cape Pillar Rock, a dangerous rock with least depth of 3.4 m over it, lies about 1½ miles NNE of Cooper Island. Dangerous reefs, including a rock which dries at 1 m, extend 5 miles NE of the island. Thence:
- 3 SE of Cape Pasley, with a rock 1.2 m high, lying 7½ cables E. A number of unnamed islets lie about 3 miles SSE and NE respectively from Cape Pasley. Thence:
- Clear of Round Island (18½ miles SE), a prominent lump of rock; two small rocks lying 5 cables N and WNW respectively of Round Island are also prominent, and:
- 4 SE of Bellinger Islands (6 miles NE), consisting of two islands; breakers were reported (1911), about 1 mile SSW of the islands during heavy swell. There is a prominent sandhill standing on the point NW of the islands. Thence:

SE of Sunken Rock (11 miles NE), breaks occasionally, thence:

- 5 SE of Point Malcolm (12½ miles NE), a low sandy projection extending E from the coast; an above-water rock from which a dangerous rocky ledge extends for over 2 miles NNE, is situated near its extremity. A shoal with a least depth of 9.1 m over it lies about 5 miles E of the point; breakers were reported (1911), during heavy swell, 2 miles E of the point. A dangerous reef, on which the sea always breaks lies 6 miles NNE of the point. Thence:
- 6 SE of Eastern Group (20 to 29 miles NE), consisting of eight rock islets; Daw Islet is the largest and is situated at the S end of the group, and rises at its N end to an elevation of 150 m. At its S end there is a sugarloaf hill about 140 m in height, the land between being low. Pointer Island and Anvil Island lie 9 miles and 7½ miles N respectively of the islet, and:
- 7 SE of Point Dempster (23½ miles NE); a reef extends about 1 mile NE from the point. Cormorant Rock named after the black faced cormorant which often perch on it, lies about 7 miles E of Point Dempster; Six mile Island lies about 1¼ miles S of Cormorant Rock. A reef extends from these islets and the depths NE of the islets, at about 4 to 5 miles offshore, are irregular. Thence:
- 8 The track continues NE passing (with positions relative to Point Culver (32°54'S 124°42'E)):
- SE of a bluff (10 miles W), 87 m high, terminating a steep limestone terrace extending NE from about 10 miles SW of Point Dempster, thence:
- 9 SE of Point Culver, a cliffy point about 76 m high, without any distinguishing feature; the upper part of the cliff formation is brown and the lower portion is white, thence:
- SE of Small Rock (16 miles NE), an above-water rock near the coast; no known dangers exist near this cliffy coast, thence:
- 10 SE of Point Dover (47 miles ENE), projecting from the coast, but it is necessary to be near the coast before it can be distinguished, thence:
- SE of Twilight Cove (77 miles ENE), which affords good landing and near which the cliffs recede from the coast; foul ground extends about 1 mile from the coast from 1½ to 6½ miles ENE of the cove.
(*Directions continue at 10.16*)

Bays and anchorages

Daw Islet 10.10

- 1 **Description.** Two small islets lie close off the SW end of Daw Islet (33°52'S 124°08'E) (10.9), and give protection to an indentation on its SW coast.
On Daw Islet, seals abound. Cape Barren geese, which are protected, inhabit it; and mutton birds frequent it from September to May. Herrings and other small fish may be caught at the anchorage, and groper near the rocks.
- 2 **Caution.** This portion of the Archipelago has not been surveyed, vessels should approach these islands with extreme caution.
Anchorage may be obtained in depths of about 18 m in sand, weed and rock.
- 3 **Directions.** Approach the anchorage on a line of bearing of about 140° on the sugarloaf hill at the S end of Daw

Islet, until a small sandy beach at the head of the bay bears about 145°, maintain this line of bearing and anchor as soon as a depth of 18 m is reached.

Israelite Bay

10.11

- 1 **Description.** Israelite Bay (33°37'S 123°48'E) is a small bay close N of Point Dempster (10.9). A reef extends about 1 mile NE from Point Dempster, and a small pier in ruins, is situated about 1 mile NW of the point.

The bay is encumbered by a number of shoals, which can best be seen from aloft in favourable conditions.

Anchorage may be obtained in depths of 5 to 7 m inside the reef extending NE from Point Dempster.

- 2 **Directions.** From the S, the anchorage is approached in depths of not less than 9 m, passing about 2 miles off Point Dempster. The alignment (260°) of the small pier and a slight rise in the distant background, leads to an anchorage about 5 cables from the pier, in a depth of about 7 m.

Twilight Cove

10.12

- 1 Twilight Cove (32°17'S 126°01'E), indents the coast slightly and affords good landing on a sandy beach.

TWILIGHT COVE TO EUCLA ROADS

General information

Chart 4727

Route

10.13

- 1 The route leads from a position about 20 miles SE of Twilight Cove (32°17'S 126°01'E) about 150 miles ENE to a position about 20 miles SSE of Eucla Roads.

Topography

10.14

- 1 A steep limestone terrace extends ENE from Twilight Cove, and runs parallel with the coast about 15 miles inland, to Eucla about 150 miles ENE, where it gradually approaches the coast again and forms the actual line of coast E of Eucla.

The coast between Twilight Cove and Eyre (32°16'S 126°17'E), is low backed by sandhills; foul ground extends about 1 mile from the coast for 1½ miles E to 6½ miles ENE of Twilight Cove.

- 2 From Low Sandy Point (32°18'S 126°23'E), to Low Point about 100 miles E, the coast consists of a level ridge, on which there are some trees and shrubs. The depths off this part of the coast are fairly regular.

Between Low Point (32°01'S 128°15'E), and Eucla Roads, 35 miles ENE, the coast is backed by low hills and should not be approached within a distance of 5 miles.

Climatic table

10.15

- 1 See 1.170 andn 1.186.

Directions

(Continued from 10.9)

10.16

- 1 From a position about 20 miles SE of Twilight Cove (32°17'S 126°01'E), the track leads E and then ENE passing (with positions relative to Twilight Cove):

SSE of Eyre (14 miles E), thence:

S of Scorpion Bight (36 miles E), fronted by dangerous rocks. An historic wreck (1.60), *Eyre wreck*, within a protected area, lies 10½ miles SE of Scorpion Bight. Thence:

- 2 SSE of Red Rocks Point (77 miles E), fronted by dangerous rocks; an iron tank stands about 1 mile N of the point, thence:

The track continues to lead ENE passing (with positions relative to Red Rocks Point (32°13'S 127°30'E):

SSE of Low Point (39 miles ENE), thence:

- 3 SSE of Eucla (71 miles ENE), a township situated about 5 cables inland, thence:

SSE of Eucla Roads (31°45'S 129°00'E) (10.19).

Useful marks

10.17

- 1 Eyre Sand-Patch, a white patch near the coast, and a peaked sandhill, covered with scrub, that rises about 4½ miles inland from Eyre (32°16'S 126°17'E).

Delisser Sands (31°42'S 128°57'E), a bare patch of sands that extend for more than 1 mile in a NE direction from a position about 2 miles E of Eucla, rising to several prominent bare peaks.

Wilson Bluff (31°41'S 129°00'E) (10.22).

Tower (31°51'S 128°25'E).

(Directions continue at 10.22)

Anchorage

Eyre

10.18

- 1 **Anchorage.** Vessels have ridden at anchor with safety off Eyre (32°16'S 126°17'E), SW of the peaked sandhill, during heavy weather from all quarters.

Eucla Roads

10.19

- 1 Local knowledge is essential. Eucla Roads (31°45'S 129°00'E) is the only known anchorage between that off Eyre (10.18) and Fowlers Bay (10.42), a distance of more than 300 miles.

Anchorage. Eucla Roads affords shelter at all times to vessels of not more than 4 m draught.

The anchorage is protected by a rocky shoal that lies S and SW of it; the outer edge of this shoal lies about 1½ miles offshore, and is generally marked by breakers.

- 2 A rocky shoal 2 miles long, with depths of from 4-6 to 5-5 m over it and on which the sea breaks with a heavy swell, lies parallel with the coast S of Delisser Sands (10.17).

Caution, Wilson Bluff (10.22), makes the best landfall when approaching Eucla Roads, but the approach should be made with great caution.

EUCLA ROADS TO TWIN ROCKS

General information

Charts 4727, Aus 341

Route

10.20

- 1 The route leads from a position about 20 miles SSE of Eucla Roads (31°45'S 129°00'E) about 110 miles ENE to a position about 18 miles SSE of Twin Rocks.

Topography

10.21

- 1 The coast, a short distance E of Eucla, consists of sandhills, rising to a height of 15 m. The limestone terrace, which closes the coast in this vicinity, passes about 2½ miles N of Eucla; it is covered with mallee scrub, and

has the appearance of a dark brown mass of bushes as far as the eye can see.

- 2 From a short distance E of Eucla to Wilson Bluff the coast is a low sandy ridge backed by the limestone terrace.

From Wilson Bluff to a position about 10 miles E of Murdeyerrah Sands (10.22) the coast is steep and dark; a perpendicular cliff with a white substratum, having no remarkable feature, extends about another 94 miles E to the head of the Great Australian Bight.

Directions

(continued from 10.17)

10.22

- 1 From a position about 20 miles SSE of Eucla Roads the track leads E passing (with positions from Wilson Bluff (31°41'S 129°00'E)):

SSE of Eucla Sands (1 mile W), partly bare hills, extending back about 2½ cables to the limestone terrace that rises above them, thence:

- 2 S of Wilson Bluff a remarkable and nearly perpendicular cliff 90 m high, forming the W extremity of the line of cliffy coast that extends to the head of the Great Australian Bight. The bluff itself is dark, but immediately E of it the lower part of the cliff coast is white and continues so for about 2½ miles to the W of Murdeyerrah Sands. Thence:

- 3 S of Murdeyerrah Sands (5 miles E), situated on the slopes of scrub covered hills, which rise to a height of 100 m; the highest part of these sands is a bare peak about 37 m high, thence:

S of Small Saddle (31°34'S 130°09'E), 82 m high, thence:

- 4 SSE of Twin Rocks (31°28'S 131°08'E), situated close inshore of the junction of the cliff and sand, at the head of Great Australian Bight. Conspicuous bare sandhills extend more than 1 mile inland from the head of the bight, rising to an elevation of 57 m. There is usually a heavy surf here, which breaks about 5 cables offshore in a depth of 5-5 m; even in good weather this renders landing impracticable, or very hazardous.

Useful marks

10.23

- 1 Towers, between 61 and 76 m high, standing at distances from the coast varying from 1½ miles to 8 miles, between Eucla and the head of Great Australian Bight, as shown on the chart.

(Directions continue at 10.27)

TWIN ROCKS TO CAPE ADIEU

General information

Chart Aus 341

Route

10.24

- 1 The route leads from a position about 18 miles SSE of Twin Rocks (31°28'S 131°08'E) about 45 miles SE to a position about 15 miles SW of Cape Adieu.

Topography

10.25

- 1 The coast between Twin Rocks (31°28'S 131°08'E), and Cape Adieu, 60 miles SE, consists of a series of low dark, rocky points and sandy beaches, fronted by rocks and foul ground, on which the sea breaks at a general distance of about 5 cables offshore.

Swell**10.26**

- 1 The coast from Head of Great Australian Bight (31°30'S 131°10'E) to Cape Adieu 60 miles SE is fully exposed to the heavy SW swell which constantly rolls in, even in the season of the SE winds.

Directions*(continued from 10.23)***10.27**

- 1 From a position SSE of Twin Rocks (31°28'S 131°08'E), the track leads SE passing (with positions relative to Twin Rocks):
 - SW of Shoulder Hill (29½ miles ESE), thence:
- 2 The track continues to lead SE passing (with positions relative to Cape Adieu (32°01'S 132°09'E):
 - SW of a dangerous reef (17 miles NW) about 5 cables in extent N-S, on which the sea breaks in a heavy swell, thence:
- 3 SW of D'Entrecasteaux Reef (10½ to 12½ miles W), which is divided into two parts. The N and largest

part is underwater, except for a number of rocks awash near its NE extremity; its edges are always marked by breakers. The S part which is about 5 cables S of the N part, breaks only with a heavy swell. Soundings give no indication of their proximity. Thence:

- 4 SW of Cape Adieu, a dark cliffy point, 36 m high, bordered by underwater rocks; two detached underwater rocks, which break with a heavy swell, lie ¾ miles W and 1½ miles SSW, respectively, of the cape.

Caution. Soundings are not a good guide when approaching the coast in the vicinity of D'Entrecasteaux Reef, and it should be given a wide berth at night.

Useful mark**10.28**

- 1 Tower (31°45'S 132°07'E), with an elevation of 196 m.
(Directions continue for offshore route at 10.35 and Coastal route at 10.40).

CAPE ADIEU TO CAPE BLANCHE**GENERAL INFORMATION***Chart Aus 341, Aus 342***Scope of the section****10.29**

- 1 This section comprises the following:
 - Cape Adieu (32°01'S 132°09'E) to Cape Blanche, offshore route (10.31).
 - Cape Adieu to Saint Francis Islands, coastal route (10.36).
 - Denial Bay and Approaches (10.46).
 - Thevenard (32°09'S 133°39'E) (10.56).
 - Saint Francis Island (32°31'S 133°18'E) to Cape Blanche (10.77).

Marine farms**10.30**

- 1 There are a number of marine farms in the bays and anchorages within this section and within the port limits of Thevenard. These farms may be floating or fixed structures, generally marked by buoys or beacons, which may be lit, and should be avoided. See also 1.61, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

**CAPE ADIEU TO CAPE BLANCHE
OFFSHORE ROUTE****General information***Charts Aus 341, Aus 342***Route****10.31**

- 1 The offshore route leads from a position about 15 miles SW of Cape Adieu (32°01'S 132°09'E) about 104 miles SE to a position about 20 miles WSW of Cape Blanche.

Topography**10.32**

- 1 See 10.37

Offshore dangers**10.33**

- 1 Yatala Reef (32°37'S 132°36'E) is a dangerous, isolated reef, consisting of a rock, with a depth of probably less than 1·8 m over it, on which the sea always breaks, and about 2 cables S of this rock, another rock, with greater depths over it on which the sea breaks only occasionally. A below-water rock, with 2 m or less over it, was reported (1983) to lie 6 cables N of Yatala Reef.

Yatala Reef, lies near the E side of a bank with depths of less than 50 m, over it but the depths do not vary sufficiently for soundings to indicate its proximity.

- 2 The reef is visible most days under normal conditions. When a large swell is running the reef is visible at night at about 5 cables and can be picked up on radar at 6 to 8 miles. With little or no swell the reef cannot be seen at night nor can it be picked up by radar.

Caution. Vessels should not approach within 2 miles of this dangerous reef at night or in hazy weather.

Currents**10.34**

- 1 See 10.5

Directions*(continued from 10.28)***10.35**

- 1 From a position about 15 miles SW of Cape Adieu (32°01'S 132°09'E) the track leads SE passing :

SW of Nuyts Reefs, extending 9 miles S from Cape Adieu, consisting of a number of rocks and islets and below-water rocks, as shown on the chart. The highest islet is 13 m high; these islets appear steep-to, except off the N point where the sea breaks nearly 2 cables N of some rocky heads which lie off that point. The N rock is 6 m high, with deep water between it and the highest islet. There are considerable depths close S of the two S reefs, which are always covered and do not always break. With a W gale and high swell, the breakers on them can be seen before the islets are sighted. Thence:

- 2 The track continues to lead SE passing (with positions relative to Hart Island (33°39'S 133°08'E)):

Clear of Yatala Reef (26 miles W), a dangerous, isolated reef (10.33), thence:

SW of Hart Island, the outermost of the Saint Francis group (10.51), a nearly bare rock, steep-to, except for an under-water rock within 1 cable of its SW point, thence:

- 3 SW of Cannan Reefs (5 miles E), the only above-water rock on this reef is 7 m high and about 2 cables long in an E-W direction, washed bare by the sea. A breaking rock lies 2 cables WSW, a rock awash lies 3 cables NNE and another rock, which breaks occasionally, lies 7½ cables NNE from the above-water rock. A shoal, with a depth of 5 m over it, was reported (1968), to lie 4½ miles SSE of Cannan Reefs. Thence:

- 4 The track continues to lead SE passing (with positions relative to Cape Blanche (33°01'S 134°08'E)):

SW of Point Westall (7½ miles NNW), generally steep and reddish in appearance, with fringing shelves of rock, on which the sea breaks heavily. There are also heavy breakers on a reef which extends 1 mile SW from a point 1¾ miles SE of Point Westall. Thence:

- 5 SW of an 18.3 m shoal patch (7½ miles W); thence: WSW of Cape Blanche, a bold cliffy point forming the W extremity of a projecting headland. A sandy hill, rises above the cliff close to the cape. Rocks and breakers extend 1 mile W and N from Cape Blanche.

(Directions continue for offshore route at 10.104 and coastal route at 10.105)

CAPE ADIEU TO SAINT FRANCIS ISLAND

General information

Chart Aus 341

Route 10.36

- 1 The route leads from a position about 15 miles SW of Cape Adieu (32°01'S 132°09'E), about 63 miles ESE to a position about 7 miles SSW of Rocky Point (32°12'S 133°15'E).

Topography 10.37

- 1 Nuyts Reef (10.35) extends 9 miles S from Cape Adieu (32°01'S 132°09'E) thence the coast between Cape Adieu and Point Sinclair 43 miles ESE, consists principally of dark cliffs, backed by sandhills and fronted by foul ground, with rocks extending up to 2 miles offshore which only break with a heavy swell, and indented by bays separated by headlands.
- 2 Between Point Sinclair (32°07'S 132°59'E) and Point Bell 10 miles SE there is a nearly straight sandy beach backed by sandhills, detached rocks and islands extend up to 3½ miles offshore; thence a sandy beach, backed by bare sandhills and fringed with rocks and islands extending up to 4½ miles offshore extends to Rocky Point.

Swell 10.38

- 1 This stretch of the coast is fully exposed to the heavy swell which constantly rolls in, even in the season of the SE winds.

Major light

10.39

- 1 Evans Island Light (32°22'.7S 133°28'.7E) (10.48)

Directions

(continued from 10.28)

10.40

- 1 From a position about 15 miles SW of Cape Adieu (32°01'S 132°09'E), the track leads ESE passing (with positions relative to Point Fowler (32°02'S 132°29'E)):

SSW of Nuyts Reefs (18 miles WSW) (10.35), thence:

- 2 SSW of Cape Nuyts (7 miles W), a rocky cliff with sandhills immediately above it. An underwater rock lies 1½ miles WSW from Cape Nuyts. Another underwater rock, which is surrounded by considerable depths and which seldom breaks, lies 1 mile ESE of the cape. An isolated rock, lies close E of the NE side of Cape Nuyts. Thence:
- 3 SSW of Scott Point (4½ miles WNW), faced by steep cliffs; the point slopes down to the swamps behind, thence:

SSW of Point Fowler, faced by dark cliffs, and appearing flat on top when seen from seaward. Rocks extend 1½ cables off the SE extremity of the point and three rocky banks, with depths of 16.4 m to 18.3 m over them, lie from 5 cables to 1½ miles SE of it. The sea breaks on these banks with very high rollers and the heavy swell that accompanies and follows a SW gale. Thence:

- 4 SSW of Eyre Bluff (13 miles ENE), a steep rocky islet connected to the coast by a drying reef. Eyre Bluff is fringed with reefs, and underwater rocks extend to a distance of 1 mile offshore. A rocky shoal with a depth of 18.3 m over it, lies 4 miles SSW of the Bluff, thence:

- 5 SSW of Point Sinclair (26 miles ESE), a promontory projecting 2 miles from the general line of the coast. Sinclair Island, composed of granite lies 2 miles S of Point Sinclair and a rock with a breaker off its E end, lies midway between the island and the point.

The track continues to lead ESE passing (with positions relative to Point Sinclair (32°07'S 132°59'E)):

- 6 SSW of Pudding Rock (2 miles SE), a bare granite rock. A reef awash, 2½ cables in extent, lies midway between Pudding Rock and Point Sinclair; underwater rocks extend 4 cables SW from the reef and there is an underwater rock between it and Pudding Rock. Thence:

- 7 SSW of a dark rock (10 miles SE), 4 m in height, which lies 1½ miles SSW of Point Bell, a promontory projecting 2½ miles from the general line of the coast. Its summit is covered with short grass, and the S extremity is a low, smooth granite point, from which drying rocks extend for a distance of 2 cables. An extensive shoal with depths of from 17.4 to 21 m is centred about 9 miles SSW of Point Bell, thence:

- 8 SSW of Flinders Rock (13½ miles SE), with depths of 12.8 to 18 m for a distance of 5 cables all round it. It breaks occasionally with a moderate swell, thence:

SSW of Purdie Islands (16 miles SE) consisting of a large granite islet and a number of above and below-water rocks situated about 4 miles SSW of Rocky Point. Depths of more than 18 m are found

close to all the dangers of this group, but there is a 7.5 m patch 2½ miles SE of the 24 m islet.

Useful marks

10.41

- 1 Nantabi Sand (31°55'S 132°33'E) a conspicuous mark rising to an elevation of 40 m.
Tower (5 miles WNW of Nantabi Sand), standing 2 miles from the coast.
Chadinga Hill (32°03'S 132°58'E), the summit of bare sands extending 3½ miles inland from Point Sinclair (32°07'S 132°59'E).
Saint Francis Island Light (10.51).
Tower (31°56'S 132°55'E)
(Directions continue at 10.51)

Bays and anchorages

Chart Aus 341 (see 1.16)

Fowlers Bay

10.42

- 1 Fowlers Bay, which includes Port Eyre, is entered N of Point Fowler (32°02'S 132°29'E) (10.40). 5 Breakers occur 4½ miles NNE of the point during heavy swell. Fowlers Bay, abounds with fish of many varieties.
- 2 A jetty 362 m in length, equipped with a small mobile crane and a light at its head, extends E from the beach, about 3 miles NW of Point Fowlers. In 1972 the state of the jetty was such that it was closed to commercial shipping and only suitable for vessels no longer than fishing craft. There are landing steps on the N side of the jetty. The least depth at the jetty is reported to be 2.6 m, a metric tide pole stands on the S side. There are some fresh water tanks near the jetty
- 3 **Port Eyre**, is formed at the W end of Fowlers Bay, N of Point Fowler; it affords anchorage with all winds, as the sea raised outside by a SE wind quickly decreases in height inside depths of 10 m, N of the point.

The township of Port Eyre is also known as Fowlers Bay.

Useful marks,

Nantabi Sand (8 miles NE of Point Fowler) (10.41).
Tower (7 miles N of Point Fowler).

- 4 **Directions.** Approach rounding Point Fowler at a distance of not less than 1 mile in fine weather, and of not less than 2 miles in heavy weather. When Point Fowler bears 250° or less the track leads NW, passing NE of a rock awash 1 mile NNW of the point. When the steep face of the sandhill near the jetty bears 284°, the track leads along this line of bearing to the anchorage.

Caution. Approach to Port Eyre should not be attempted at night.

- 5 **Anchorage**, may be obtained in depths of from 9 to 10 m, with the jetty bearing about 284° and Point Fowler bearing 165°, or further inshore according to draught. Small vessels able to anchor in 5.5 m or less require to allow a depth at LW of 0.9 m more than their draught for safe anchorage, but in greater depths than 5.5 m, about 1.8 m should be allowed for the increased height of the seas with a strong SE wind. The bottom consists of sand and weed, the holding is good.

- 6 **Landing place**, at the jetty or opposite the S building of the town; there is usually good landing on the beach for a distance of about 5 cables S of the jetty. The surf commences about half-way between the jetty and Nantabi Sand, and increases further E.

Chart Aus 341

Clare Bay

10.43

- 1 Clare Bay is a small bay (31°57'S 132°41'E) where landing can be effected by small craft.

Local knowledge is necessary.

Port Le Hunte

10.44

- 1 Port Le Hunte (32°06'S 133°00'E) was formerly a landing place for stores and provisions, for the surrounding farming district. Its jetty can no longer be used by shipping and vessels are warned not to attempt to berth at it on account of wreckage on the bottom in its vicinity.

Anchorage. Vessels intending to anchor, should do so outside the 5 m depth contour.

East of Point Bell

10.45

- 1 The bight E of Point Bell (32°12'S 133°08'E) affords anchorage at all seasons, for vessels of about 3 m draught, in depths of from 4 to 5 m, the bottom is sand.

Directions. From a position about 3 miles SSE of Point Bell, the line of bearing 003° of a prominent bare sand peak, 35 m high, situated about 2½ miles NNE of the summit of Point Bell, passes between the reefs off Point Bell and Flinders Rock (10.40), which lies 3¼ miles E of Point Bell. When a shed, near the beach on the low neck of the N part of Point Bell, bears 284°, the track leads along this bearing, to the anchorage.

- 2 **Anchorage** may be obtained in depth of over 4 m with the shed, near the beach bearing about 284° and the E extremity of Point Bell bearing 183°.

DENIAL BAY AND APPROACHES

General Information

Charts Aus 341, Aus 120

Description

10.46

- 1 Denial Bay is situated between Point Peter (32°13'S 133°29'E) and Saint Peter Island (4¾ miles SE); its N part is known as Murat Bay (10.56) and the NW part as Tourville Bay (10.55). Denial Bay is separated from Decres Bay (10.83), SE of it, by Cape Vivonne (32°12'S 133°41'E) (10.58).

Port of Thevenard lies on the SE shore of Murat Bay and the town of Ceduna lies on the E shore.

Approaches

10.47

- 1 Denial Bay (32°15'S 133°30'E), may be approached from the S or W. The S approach leads from a position SSE of Saint Francis Island (32°31'S 133°18'E) about 46 miles to the pilot boarding area (32°13'S 133°34'E).

The W approach leads from a position SSW of Purdie Islands (32°16'S 133°13'E) about 19 miles ENE to the pilot boarding area.

Principal marks

10.48

- 1 **Landmarks**

Mount Younghusband (32°15'S 133°38'E), a conspicuous hill on the NE side of Saint Peter Island (10.52).

Saint Francis Island Light structure (32°31'S 133°18.2'E) (10.51)

Major light

Evans Island Light (32°22'·7S 133°28'·7E) (white GRP hut, 2 m high).

Directions**South approach**

(continued from 10.41. Directions for Saint Francis Island to Cape Blanche are given at 10.81)

10.49

- 1 From a position SSE of Saint Francis Island (32°31'S 133°18'E) the recommended track leads N passing (with positions relative to Saint Francis Island):
 - E of a shoal patch (1½ miles S), thence:
 - E of Cannan Reefs (7½ miles SSW) (10.35), thence:
- 2 E of Fenelon Island (3½ miles S), very steep, rising to a single summit; an above-water rock lies about 2 cables off its N point and detached boulders extend about 1 cable from its NW and E points. Thence:
- 3 E of Masillon Island (1½ miles S), with three peaks of almost equal height. The island is steep-to except for a few rocks close offshore. A bight indents the W side of the island. Thence:
- 4 E of Saint Francis Island (10.51), thence:
- 4 E of Freeling Island (2¼ miles NE), an island dark in appearance with a rounded summit and the most E of a group of islands situated less than 1 cable apart, thence:
- Between Lacy Island (7 miles NNE), the largest island of Lacy Islands, which has a steep, apparently inaccessible coast, free from outlying dangers, and:
- 5 Evans Island (11½ miles NE); detached below-water and above-water rocks extend 2½ cables off both its NW and SE points, and a breaking rock lies 5 cables from its SW end. A light (10.48) stands on its summit. Thence:
- W of Goat Island (14½ miles NE), its W side free from danger; a reef lies 6 cables off its SE side.

Useful marks:**10.50**

- 1 Franklin Islands (32°28'S 133°39'E) (10.85).
(Directions continue at 10.52)

West approach

(continued from 10.41)

10.51

- 1 From a position about 3½ miles SSW of Purdie Islands (32°16'S 133°13'E), the track leads ENE passing (with positions relative to Lounds Island (32°16'S 133°22'E)):
 - 2 NNW of West Island (15 miles SSW), lying 1 mile W of Saint Francis Island (32°31'S 133°18'E). There are a number of loose boulders on the slope on its W side, which have been washed there by heavy seas. Breakers extend 4 cables N from West Island, and there are high rollers, which break at times, 5 cables S of it. A long bare rocky islet 7 m high, lies between Saint Francis Island and West Island; the passage on either side of this islet should not be attempted. Thence:
 - 3 NNW of Saint Francis Island (14 miles SSW), the largest island of Isles of Saint Francis; it is nearly covered with low green bushes. Its round summit, is on the E side. The sea breaks heavily on the exposed W, S and E sides of the island, which are faced by steep cliffs. A rock, lies 1 cable off the

SE point of the island, and there is a breaker 1 cable S of the rock; underwater rocks extend 4 cables S from the S point. The E and N sides, outside Petrel Bay (10.53), are steep-to and free from danger. A light (white GRP hut, 4 m in height) (32°31'S 133°18'E) is exhibited from the E summit. Thence:

- 4 SSE of a depth of 7·5 m (5 miles WSW) about 1 mile S of an isolated rocky lump, the E most rock of the Purdie Islands. Thence:
- NNW of an islet (5 miles SSW), the most N of Lacy Islands; a drying rock, with an underwater rock 1 cable N of it, lies 3 cables E of the islet; an above-water rock is situated 5 cables WSW of the islet, thence:
- 5 SSE of Lounds Island, steep-to all round, lying 2¾ miles SSE of Lounds Reef, which breaks occasionally, thence:
- WNW of Goat Island (10.49).

Goat Island to pilot boarding area**10.52**

- 1 From a position WNW of Goat Island the recommended track leads NE for about 8 miles to the pilot boarding area, passing (with positions relative to Goat Island (32°19'S 133°31'E)):
 - SE of Point James (8 miles NNW), a small projection, with three dark rises about 47 m high a short distance NW of it, and:
 - 2 NW of a buoy (N cardinal) (4 cables NE) thence: Between Point Peter (6 miles N), a grassy summit which slopes gradually to the point at the E extremity of an irregular peninsula forming the S side of Tourville Bay (10.55), and:
 - 3 Saint Peter Island (8 cables NE); the S part of the island has two parallel ranges of hills covered with bushes and coarse grass. Mount Younghusband (10.48), forms a landmark on the E side. Thence: S of a rock (8 miles NNW), lying 3 cables SW of Cape Beaufort (32°10'S 133°33'E) to the pilot boarding area, as shown on the chart.
(Directions continue at 10.72)

Anchorage and bays**Petrel Bay****10.53**

- 1 Petrel Bay (32°30'S 133°18'E), an indentation on the N side of Saint Francis Island, close W of the NE point has a sandy beach.

Local knowledge is necessary.

Anchorage may be obtained sheltered from all but N and NE winds. With W winds, anchorage may be found, in the W part of the bay in depths of about 16 m sand and weed, with the W point bearing 329° distance 4 cables.

- 2 With SE winds, which are most frequent in summer, anchorage may be found in the same depths, with the line of bearing 025° of the W side of Egg Island (32°28'S 133°19'E) just open W of Smooth Island (4 cables SW), and with the NE end of the E point of the bay bearing 093°.

Goat Island**10.54**

- 1 **Local knowledge** is essential.

Anchorage. Temporary anchorage, sheltered from the SE, may be found 1 mile N of the E end of Goat Island (32°19'S 133°31'E) (10.49), sheltered by the ridge, but the bottom is rocky in places.

Tourville Bay**10.55**

- 1 **Description.** Tourville Bay is situated between Point Peter (32°12'S 133°29'E) and Cape Beaufort (4½ miles ENE). Drying sandbanks occupy the greater portion of the bay, the shores of which are, for the most part, lined with mangroves; the coast near Cape Beaufort however is steep.

Davenport Creek is a mangrove creek on the S side of the bay. The least depth outside its entrance is 2·1 m, but within the depths increase to about 4 m.

- 2 **Local knowledge** is essential.

Tidal streams attain a rate of 2½ kn in the bay at springs.

Anchorage may be found for vessels of less than 3·7 m draught, in Davenport Creek, but the space is confined and it is necessary to moor. The most convenient place is at the S end of the first reach, where the direction of the creek turns NW.

THEVENARD**General information****Position****10.56**

- 1 Thevenard (32°09'S 133°39'E), is situated on Cape Thevenard at the entrance to Murat Bay, and includes Ceduna (32°08'S 133°40'E), a small town situated on the E side of Murat Bay, and Denial Bay Jetty (32°06'S 133°35'E) situated in the NW corner of Murat Bay.

Function**10.57**

- 1 Thevenard is a commercial port, importing fertiliser and exporting grain, seeds, gypsum and salt.

Topography**10.58**

- 1 Murat Bay, is a grassy point, with a prominent clump of bush on its summit, and connected to the mainland, E of it, by a low isthmus, with mangroves on it. The shores of Murat Bay consists of sandy beaches and cliffy points with a few mangroves in the N part and near Cape Thevenard (4¾ miles ENE); drying sand and rocky ledges extend 5 cables offshore in places, and generally speaking, depths of less than 5·5 m extend from 1 to 1½ miles offshore. The hills rising from the coast are covered in scrub.
- 2 Bosanquet Bay is situated between Cape Thevenard (10.56) and Cape Vivonne (3½ miles SE), a flat grassy point. At the E end of this beach is a prominent red cliff, about 18 m in height, and between this cliff and Cape Vivonne, the coast consists of low rocky points and sandy beaches, backed by hills covered with scrub.

Port Limits**10.59**

- 1 The port limits lie NE of a line drawn from Cape Beaufort to Saint Peter Island, thence to Wittelbee Point (32°12'S 133°44'E) (10.83), as shown on the chart.

Approach and entry**10.60**

- 1 Murat Bay is approached from S and W through Denial Bay, via Yatala Channel (10.72) and entered between Cape Beaufort (32°10'S 133°34'E) and Cape Thevenard (4¾ miles ENE).

Traffic**10.61**

- 1 In 2002 the port was used by 113 vessels totalling 2 182 952 dwt.

Port Authority**10.62**

- 1 Flinders Ports, Port Manager Thevenard. Thevenard, SA 5690. Website: www.flindersports.com.au

Limiting conditions**10.63**

- 1 **Controlling depth.** Yatala Channel has a maintained depth of 8·2 m.

Deepest and longest berth. Thevenard Wharf (10.75).

Tidal levels. Mean spring range about 1·2 m; mean neap range is negligible. See information in *Admiralty Tide Tables*.

The actual height of the tide for deep-draught vessels leaving the port, can be obtained from the gauging station on the NE side of the building near the inboard end of the berths at Thevenard Jetty.

- 2 **Abnormal water levels.** East winds may lower the sea level by from 0·3 to 0·6 m.

Density of water: 1·027 to 1·028 g/cm³.

Maximum size of vessel handled: 180 m LOA, beam 28 m. Vessels exceeding port limits may be accepted at the discretion of the Port Manager. Largest vessel to date (1999): Chettinad Prince, 24 653 grt, 42 592 dwt, 30·5 m beam.

Arrival information**Notice of ETA****10.64**

- 1 The ETA should be reported, 24 hours and 4 hours in advance, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages**10.65**

- 1 Anchorage for vessels awaiting a pilot for extended periods may be obtained with Entrance Light-beacon bearing 055°, distance 4 miles.

Caution. Mariners should not approach Entrance Light-beacon before the pilot has boarded owing to restricted sea room.

Pilotage and tugs**10.66**

- 1 **Pilotage** is compulsory; the pilot boards about 1 mile SW of Entrance Light-beacon, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

The Pilot vessel is 15 m in length, painted orange hull and white superstructure, with word PILOT on side.

Tug is available.

Regulations concerning entry**10.67**

- 1 Ships are required to have an under-keel clearance of at least 0·3 m at the berth. A clearance of 0·9 m is required within Yatala Channel.

Maximum permissible length of ship using Thevenard Wharf (10.75) is 180 m, but depends on draught and beam.

Vessels without a bow thruster berth during daylight hours only, but may sail at any time depending on tide.

Quarantine**10.68**

- 1 Thevenard is a first port of entry, for details see 1.54 and *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

General layout

10.69

- 1 The port consists of a concrete jetty 392 m in length, extending W from Cape Thevenard. There is a berth on each side of the jetty. A light (red metal column) stands at the head of the jetty.

Vessels using the jetty are recommended to secure bows out; during heavy S and NW winds they should leave the jetty, and anchor in the inner harbour, on account of the heavy surge alongside.

- 2 Ceduna has a jetty W of the town. A sector light is displayed from the head of this jetty.

Denial Bay Jetty extends from the shore in the NW corner of Murat Bay. A light (white metal column) is exhibited from the head of the jetty.

Natural conditions

10.70

- 1 **Tidal streams** in the shoal grounds at the S end of Denial Bay have a rate of from 1½ to 2 kn at springs; in the dredged channel the NE and SW going streams set across the channel at a rate of probably less than ½ kn; in the N part of Murat Bay the streams are almost imperceptible.

Climatic table. See 1.170 and 1.187.

Landmarks

10.71

- 1 Yatala Channel Entrance Light-beacon (black framework tower on piles) (32°11'9"S 133°34'5"E). Mount Younghusband (32°15'S 133°38'E) (10.48). Thevenard Silos (33°09'S 133°39'E).

Directions

(continued from 10.52)

Yatala Channel

10.72

- 1 From the vicinity of the pilot boarding position (32°12'6"S 133°33'7"E), the track leads NE into Yatala Channel passing (with positions relative to No 1 Light-beacon (32°11'4"S 133°35'6"E)):

SE of Yatala Channel Entrance Light-beacon (1 mile SW) (10.71), thence:

SE of No 2 Light-beacon (port hand) (2 cables W), thence:

NW of No 1 Light-beacon (starboard hand).

- 2 The track then continues to lead generally NE then E and ESE through Yatala Channel, dredged and marked by Light-beacons (lateral) as shown on the chart passing:

SSW of No 10 Light-beacon (metal column on tripod, port hand) (8 cables ENE).

- 3 The track then leads E to pass:

S of Bird Rock (1¼ miles ENE), consisting of a number of granite boulders awash at HW, situated near the SE end of a large drying sand bank and marked by a light-beacon, thence:

Between No 11 Light-beacon (starboard hand) (1½ miles E) and No 12 Light-beacon (red metal framework, port hand) (1½ miles E).

- 4 The track then leads NE then generally N through a dredged channel marked by light-beacons as shown on the chart passing:

Between No 19 Light-beacon (starboard hand) (2 miles ENE) and No 20 Light-beacon (port hand).

5 Leading Lights:

Front light (32°10'9"S 133°38'0"E).

Rear light (378 m from front light).

The alignment (166½°) astern of these lights lead through The Cutting, a dredged channel marked by light-beacons as shown on the chart to pass:

Between No 26 Light-beacon (port hand) (2¾ miles NE) and No 25 Light-beacon (starboard hand).

- 6 The track then leads N and NE through the dredged area marked by light-beacons as shown on the chart to pass;

Between No 28 Light-beacon (port hand) and No 29 Light-beacon (starboard hand) marking the end of Yatala Channel.

The track then leads ENE towards the berth.

The Cutting to Ceduna

10.73

- 1 From a position WSW of Thevenard Wharf the track leads N, passing W of a shoal, lying 5 cables N of Thevenard Wharf (10.75), its W extent marked by a light-buoy (port hand), to a position WSW of Ceduna Jetty Sector Light (white metal column) (32°08'S 133°40'E). The jetty is then approached as requisite in the green sector (066°–119°) of the light. It is reported the light may be difficult to distinguish.

Useful marks

10.74

- 1 Beacon (starboard hand) (32°09'6"S 133°38'4"E), marking Daphne Rock, awash at LW neaps. Thevenard Wharf light (10.69). Ceduna Aero Light (metal tower) (32°07'8"S 133°42'0"E), displayed on request. Kongwirra Hill Tower (31°08'S 133°47'E), 132 m in height (chart Aus 341).

Anchorage and Berths

10.75

- 1 **Anchorage** may be found about 7½ cables SW of Ceduna Jetty as shown on the large scale national chart.

Anchorage may also be found in depths of 7 m, over a space of 4 square miles within Murat bay.

Anchorage for small vessels may be found about 1 mile ESE of Denial Bay Jetty in position shown on the large scale national chart.

- 2 **Berths:**

Thevenard Wharf, with a berth on each side, 198 m in length with depth alongside of 9.8 m.

Ceduna Jetty, 2 cables in length with depth alongside of 3.2 m.

Denial Bay Jetty, 300 m in length with depths alongside of 3 m.

Ceduna Jetty and Denial Bay Jetty, are closed to commercial traffic and used only by fishing vessels.

Port services

10.76

- 1 **Repairs:** minor repairs carried out; diving services available.

Other facilities: deratting and deratting certificates issued; hospital available. Oily bilge water, oil sludge including dirty ballast water, can be removed by private road tanker.

Supplies: diesel fuel by road tanker, with 10 days notice; fresh water available at berth; provisions.

Communications: Airport, Ceduna 6½ km NE.



Thevenard Wharf and Conspicuous Building (10.75)

(Photograph – Ian Routledge)



Ceduna Jetty (10.75)

(Photograph – Ian Routledge)

SAINT FRANCIS ISLAND TO CAPE BLANCHE

General information

Chart Aus 341

Route

10.77

- 1 The route leads from a position E of Saint Francis Island (32°31'S 133°18'E) about 45 miles SE to a position WSW of Cape Blanche.

Topography

10.78

- 1 Between Cape Vivonne (32°12'S 133°41'E) and Point Brown (22½ miles SSE) the coast is cliffy and fronted with rocks and islands up to a distance of 8 miles offshore; it is indented with bays. Inland there are rises covered with mallee scrub.

Between Point Brown (32°33'S 133°51'E) and Cape Bauer (15 miles SE) the coast is indented by Streaky Bay (10.87), thence the coast to Cape Blanche (18 miles S) consists of rocky points between bays, backed by sandy hills.

Marine farms

10.79

- 1 There are marine and fish farms within the anchorages and bays in this area, see 10.30, 1.61, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Major lights

10.80

- 1 Cape Bauer Light (white hut, 4 m in height) (32°44'S 134°04'E)
Evans Island Light (32°22'·7S 133°28'·7E) (10.48)

Directions

(continued from 10.49)

10.81

- 1 From a position E of Saint Francis Island (32°31'S 133°18'E), the track leads SE passing (with positions from Cape Bauer (32°44'S 134°04'E)):
SW of Franklin Islands (26 miles NW) (10.85), thence:
SW of Olive Island (4½ miles W), a flat topped rock which is much frequented by seals; there are numerous rocks, on which the sea generally breaks, in the vicinity. Thence:
2 SW of Point Westall (11 miles S) (10.35), thence:
Clear of a 18·3 m patch (20 miles S), thence:
SW of Cape Blanche (18 miles S) (10.35), a bold cliffy point.

Useful marks

10.82

- 1 Mount Westall (32°54'S 134°05'E), the summit of which is prominent and even-shaped.
(Directions continue for offshore route at 10.104 and coastal route at 10.105)

Anchorages and bays

Decres Bay

10.83

- 1 **General information.** Decres Bay (32°14'S 133°44'E) is situated between Cape Vivonne (10.58) and Cape D'Estrees (5¾ miles SE), and consists for the most part of two long sandy beaches, backed by low sand hills and separated by Wittelbee Point, low and rocky. There are depths of from 7 to 9 m throughout the greater part of the bay.
- 2 **Directions.** Decres Bay may be approached from Denial Bay or through Waterwitch Channel (10.84) and Smoky Bay (10.84). The approach from Denial Bay may be made through a channel (32°12'S 133°41'E), leading between Cape Vivonne and a drying spit that extends NE from Saint Peter Island (10.52). The channel has a least width of about 3½ cables, with depths of from 3·7 to 5·5 m. The channel is marked on its N side by a beacon (pile; starboard hand) and on its S side by a light-beacon.
- 3 **Anchorage** sheltered from W winds may be obtained at the W end of the bay.
Useful mark:
High cliff (32°15'S 133°45'E).

Smoky Bay

10.84

- 1 **Description.** Smoky Bay (32°18'S 133°49'E) is situated between Cape D'Estrees (32°16'S 133°46'E) and Eyre Island (5¾ miles SE). Eyre Island is almost entirely covered with mangroves and swamps.
The bay is protected by shoals, that extend E from Saint Peter Island and by Eyre Island with its surrounding banks.
- 2 Goalen Rocks (32°24'S 133°43'E) lie at the SW end of the shoals and banks that extend from Eyre Island.
The coast consists of limestone cliffs, rocky points and sandy beaches backed by sandhills.
Laura Bay is a shallow bay and situated at the N part of Smoky Bay, 2½ miles ENE of Cape D'Estrees.
Local knowledge is essential.
- 3 **Natural conditions.** Tidal streams in Waterwitch Channel run in the direction of the channel; in the outer part of the channel; they attain a rate of 1 kn at springs, and in the narrow part of the channel, a rate of 2 kn. Inside Smoky Bay the streams are very slight.
- 4 **Directions.** Smoky Bay is entered through Waterwitch Channel (32°20'S 133°43'E), which leads between the shoals extending 8 miles E from Saint Peter Island on the N, and the bank extending 3 miles NNW from Eyre Island on the S, with a least depth of 5·5 m lying at the E end of the fairway. The channel is marked on the N side by a beacon (pile; port hand), standing 2¾ miles SSW of Cape D'Estrees.
- 5 **Anchorage** may be found in depths of 7 m, sand, with the extremity of Cape D'Estrees bearing about 293° and the prominent hill (32°15'S 133°50'E) (see below) bearing about 034°.
Anchorage may also be found 5 cables NW of Smoky Bay Jetty, as shown on the chart.
Small vessels may anchor anywhere inside the banks according to their draught.
Smoky Bay Jetty (32°23'S 133°56'E), projects 2 cables W from the shore in the S part of the bay. The jetty is closed to commercial traffic.
There is a small fishing community at Smoky Bay.

6 Useful marks:

- Mount Younghusband (32°15'S 133°38'E) (10.48).
 Rocky islet (32°16'S 133°50'E), 9 m high.
 Prominent hill (32°15'S 133°50'E), 44 m high.
 Saddle Peak (32°18'S 133°53'E), a saddle shaped sandhill.
 Windippy Hill (32°26'S 133°52'E).

Franklin Islands

10.85

- 1 Franklin Islands (32°28'S 133°39'E), the two principal islands of the Franklin Islands group are flat-topped and about the same height and connected by a drying bar.
 A chain of rocks, about 1¼ miles in length, some of which are above water, lies nearly parallel with the S coast of the W island, at a distance of from 3 to 7 cables from it. Drying rocks extend nearly two cables N from a rock lying 6 cables ENE of the E island.
- 2 **Anchorage** suitable only during SE winds, may be found in depths of 11 to 16 m sand, on the N side of the W island about 4 cables offshore.
- Caution.** In the approach to the anchorage, an underwater rock on which the sea breaks occasionally, lying 5 cables ENE of the NE point of the W island must be avoided.
- 3 **Directions.** Approach rounding the W side of the W island at a distance of about 1 mile, avoiding the W end of the chain of rocks lying S of the island. Then steer on the alignment (123°) of the HW mark on the S point of the E island and the HW on the NE end of the W island. The track leads on this alignment until on the line of bearing 156° of the point between the two sandy beaches on the N side of the W island; maintain this line of bearing and anchor almost immediately with the NW point of the W island bearing 244°.
- 4 Smaller vessels may anchor farther in, with the NW point of the W island bearing 262°.

Saint Mary Bay

10.86

- 1 **Description.** Saint Mary Bay (32°31'S 133°51'E), is situated between Point Dillon (32°30'S 133°51'E) and Point Brown (2 miles S). Detached underwater rocks extend some distance off the coast and it should not be approached nearer than 2 miles.

Streaky Bay

Chart Aus 342 (see 1.16)

General information.

10.87

- 1 Streaky Bay (32°35'S 134°04'E), is entered between Point Brown (32°33'S 133°51'E) (10.88) and Cape Bauer (15 miles SE), forming the NW extremity of Gibson Peninsula.
- The bay recedes about 15 miles to the NE and is the only secure anchorage for vessels of any size, in all weathers between King George Sound (9.49), 800 miles W, and Port Lincoln (34°43'S 135°51'E), 200 miles SE.
- 2 The coast of the bay in general consists of low rocky points and sandy beaches fronted by underwater reefs and rocks and backed by sandhills and grass flats behind in places.
- The bay has two drying banks which separate three channels leading into its inner part.
- 3 North Bank, which dries in places, extends about 6½ miles offshore from a position 1¼ miles S of Carawa Jetty (32°31'S 134°12'E). South Sand, a drying sandbank,

extends 4¾ miles W from a position 1½ miles W of Perlubie Hill (32°38'S 134°17'E) (10.90).

Carawa Jetty extends 1¼ cables WSW from the shore about 7 miles ESE of Point Lindsay (32°29'S 134°05'E).

Blanche Port and the town of Streaky Bay lie in the S part of the bay

Directions

10.88

- 1 From a position SW of Point Brown (32°33'S 133°51'E), the track leads ENE passing (with positions from Point Brown):
- SSE of Point Brown, reddish in appearance, steep on its E side and gradual on its W side. A dangerous rock lies 3 cables S of the point. Thence:
- 2 SSE of a dangerous rock (2½ miles ESE) lying 1 mile S of Point Collinson (2 miles E), and:
 Clear of a patch (4½ miles SE) with a least depth of 9.1 m and over which the sea breaks with a heavy swell.
- The track continues to lead ENE to a position S of Point De Mole (7½ miles ENE).
- 3 **Warburton Channel**, (32°32'S 134°06'E), the channel is about 1 mile wide and leads ENE between the shoal area to the S of Point Lindsay (32°28'S 134°05'E) and the NW edge of North Bank (10.87). The least depth in the channel is 8.5 m.
- 4 **Directions.** Warburton Channel is approached from a position S of Point De Mole (32°31'S 133°59'E) on the line of bearing 081° on Carawa Jetty (32°31'S 134°12'E) passing (with position from Carawa Jetty):
- N of a beacon (pile; black triangle point down topmark) (4 miles W), marking the S side of the channel.
- 5 The track then leads ENE until on a line of bearing 089° on Carawa Jetty. Then proceed on that bearing to the anchorage or to berth as required.
- Tidal streams** attain a rate of 1 kn at springs in Warburton Channel.
- 10.89**
- 1 **Dashwood Channel** (32°36'S 134°08'E), leads E between the S side of North Bank and the bank extending W from South Sand. The least depth in the channel is about 4.6 m in the vicinity of the bar.
- Directions.** Dashwood Channel is approached from a position SE of Point De Mole (32°31'S 133°59'E), on the line of bearing 108° on Perlubie Hill (32°39'S 134°17'E), passing (with positions from Perlubie Hill):
- 2 NNE of Dashwood Rock (11¼ miles W), a dangerous pinnacle rock on which the sea only breaks occasionally even with a heavy swell, thence:
 SSE of a beacon (port hand) (8½ miles NW), marking the SW end of the shoal water which extends SW from North Bank. A second beacon lies 1½ miles E of this beacon, marking the SE end of the same shoal water.
- 3 From a position with the beacon bearing 344° distance 1¾ miles, the track leads as requisite to cross the bar in the best charted water.
- Tidal streams** attain a rate of 1½ kn at springs.
- 10.90**
- 1 **South Channel** (32°40'S 134°08'E), with a least depth of 3 m in the fairway, leads E between the shoal water that extends SW from South Sand and the shoal area that faces the N side of Gibson Peninsula (32°45'S 134°08'E).

Directions. South Channel is approached on the line of bearing 093° on Eba Island (32°41'S 134°16'E) (10.93) passing:

- 2 Close N of South Channel Light (black metal pile) (32°41'S 134°10'E), marking the S side of the bar of South Channel.

Tidal Streams in South Channel run at less than 1 kn at springs.

3 **Useful marks:**

- Perlubie Hill (32°39'S 134°17'E), a prominent bare sand patch.
- Pigface Island (32°42'S 134°17'E).
- Cape Bauer Light (32°44'S 134°04'E) (10.80).
- Point Gibson Light (32°44'S 134°14'E) (10.93).

Anchorage

10.91

- 1 **Gascoigne Bay** lies between Point Collinson (32°33'S 133°53'E) and Point De Mole (5½ miles ENE).

Local knowledge is necessary.

Anchorage may be found in the NW part of the bay for coasters as indicated on the chart, in depths of 4 m, sand and weed, with Point Collinson bearing 218° and Point De Mole bearing 090°.

- 2 **Caution.** The approach to this anchorage passes between two underwater rocks, on which the sea usually breaks, lying ¾ miles and ½ miles W respectively of Point De Mole.

Clearing bearing. The line of bearing 009° on the sandhill (uncharted) 24 m high situated 3 miles W of Point De Mole, passes between the two rocks.

- 3 **North part of Streaky Bay.** Anchorage in the N part of the bay is in depths of from 5 to 13 m W of Carawa Jetty; or, in depths of 9 m, sand and weed as indicated on the chart, with Point Lindsay bearing 272°, distant ¾ miles, and the summit of the prominent sandhill inside Acraman Creek bearing 309°. There is good shelter and fairly smooth water in this locality, under all conditions of wind and weather.

- 4 **East Part of Streaky Bay.** Vessels that can pass through Dashwood Channel (10.89) may anchor anywhere inside North Bank or South Sand but with W gales there is an unpleasant short sea near the E shore of Streaky Bay and considerable strain on the cables is experienced. Under these conditions the anchorage SE of the middle of North Bank, and as near as possible to its edge, provides the best shelter.

Blanche Port

General information

10.92

- 1 Blanche Port (32°47'S 134°13'E), occupies the extreme S part of Streaky Bay and is enclosed by Gibson Peninsula (10.87). It affords a perfectly land-locked anchorage for vessels which can navigate the approach channels. The shore is fronted by sandy beaches, and cliffy banks, some of a red colour.
- 2 Streaky Bay town is situated at the S end of Blanche Port. The surrounding district is both agricultural and pastoral, and the town is of some importance as a distributing centre.

Streaky Bay is now only used as a fishing port.

Directions

10.93

- 1 Blanche Port can be approached through Dashwood Channel (10.89) or South Channel (10.90).

Approach from Dashwood Channel. From a position E of the bar, the track leads on a line of bearing on Perlubie Hill not less than 113°, passing (with positions from Perlubie Hill (32°39'S 134°17'E)):

- NNE of a beacon (starboard hand) (2 miles WNW), marking the E extremity of South Sand.
- 2 From a position NE of the beacon (2 miles WNW) the track leads on a line of bearing 177° on the W end of Eba Island (2 miles SSW), passing:
 - Between the E end of South Bank and Perlubie Hill, thence:
- 3 With Perlubie Hill bearing 060° (astern) the track leads SW to pass not less than 6 cables W of Eba Island, covered with coarse grass and low bushes.
 - From a position W of Eba Island the track leads S, passing:
 - E of Point Gibson Light (red metal framework on piles) (6 miles SSW), the red sector (126°–141°), covers the dangers close E of Point Gibson as shown on the chart.
- 4 From a position about 4 cables E of Point Gibson Light, the track leads SSW passing:
 - Between Perforated Rocks, two perforated rocks, each 1.5 m in height and full of holes, and a beacon (starboard hand) marking Fairway Rock (7 miles SSW), covered by a red sector of Point Gibson Light.
- 5 From a position W of Crawfords Landing (7½ miles SSW), the track continues in the white sector (175°–201°) of Flinders Jetty Head Light (white metal column) (9½ miles SSW), as requisite for the anchorage or jetty, noting Sponge Rocks North and South, lying close W of the track.
- 6 **Approach from South Channel.** Having crossed the bar and passed N of the South Channel Light (10.90) the track continues to lead ESE to a position about 1½ miles W of Eba Island, thence, as above.

Useful mark:

One Tree Hill (32°47'S 134°14'E).

Anchorage

10.94

- 1 Blanche Port affords anchorage in a depth of about 5 m, mud, with Flinders Jetty Head Light bearing 180° and the N extremity of the low rocky point at Crawford Landing bearing 082°. Small vessels anchor nearer to the jetty, there being depths of from 3 to 4 m for a distance of about ¾ mile from it.

Berth

10.95

- 1 Flinders Jetty (32°48'S 134°12'E) is a wooden jetty, which extends ¾ cables N from the S shore of Blanche Port and has depths of 3.2 m alongside, either side of its outer end. A light (10.93), is exhibited at its head.

Port services

10.96

- 1 **Repairs:** there is a slipway for fishing vessels of up to 11 m in length.
- Other facilities,** Hospital is available.
- Supplies:** small quantities of supplies can be obtained.

Anchorage and bays

Chart Aus 341

Corvisart Bay

10.97

- 1 Corvisart Bay (32°49'S 134°05'E), is situated between Cape Bauer (32°44'S 134°04'E), and Point Westall (11 miles S). The shore of the bay consists of sand and rock backed by sandhills. The Dreadnoughts, a reef with a depth of 7.3 m over its outer end over which the sea occasionally breaks, extends more than 1 mile N from the coast about 2 miles NE of Point Westall. With the exception of this reef, there are considerable depths in the bay.

The bay is open to the SW and too exposed for safe anchorage.

Sceale Bay

10.98

- 1 Sceale Bay (32°58'S 134°10'E) is a clear sandy bay situated between a rocky point about 4½ miles ESE of Point Westall (32°55'S 134°03'E) and Cape Blanche

(7½ miles SE). Yanerbie Hill situated on the end of a large patch of bare sand on the N shore of the bay is prominent.

- 2 A small jetty, which can no longer be used by shipping, extends about 80 m NNE from the shore at the S end of the bay.

Local knowledge is necessary.

Anchorage for small vessels may be found at both ends of the bay during SE winds, however, it is not safe during W winds except close inshore at the NW part.

- 3 **North Anchorage.** The recommended anchorage in the N part of the bay is with Mount Westall bearing 307° and the near point 206°.

Clearing bearings. The line of bearing 034° on Yanerbie Hill, passes W of a rocky patch, with a least depth of 8.2 m over it on which the sea breaks at times, lying 4½ miles NNE of Cape Blanche (10.81). On reaching the line of bearing 275° of the N part of the entrance to Scearle Bay, this patch will have been cleared.

- 4 **South Anchorage.** The recommended anchorage is on the line of bearing 172° of the junction of the long sandy beach and the rocky coast of Cape Blanche, according to draught.

CAPE BLANCHE TO CAPE CATASTROPHE

GENERAL INFORMATION

Charts Aus 342, Aus 343

Scope of the section

10.99

- 1 This section comprises the following:
Cape Blanche (33°01'S 134°08'E), to Whidbey Isles (34°44'S 135°08'E) (10.100).
Whidbey Isles (34°44'S 135°08'E) to Cape Catastrophe (34°59'S 136°00'E) (10.120).

CAPE BLANCHE TO WHIDBEY ISLES

General information

Chart Aus 342

Routes

10.100

- 1 The offshore route leads from a position about 25 miles WSW of Cape Blanche (33°01'S 134°08'E), about 50 miles SSE to a position SW of Pearson Islands (10.104), thence leads about 60 miles SE to a position W of Whidbey Isles.
The coastal route leads from a position WSW of Cape Blanche (33°01'S 134°08'E), about 53 miles SE to a position SW of Cape Finnis (10.105), thence for about 64 miles S to a position W of Whidbey Isles.

Topography

10.101

- 1 The coast between Cape Blanche (33°01'S 134°08'E) and Point Labatt about 10 miles SE, consists of sandy beaches backed by sandhills and fronted by underwater rocks extending up to 2 miles offshore.
From Point Labatt (33°10'S 134°15'E) to Cape Radstock about 5 miles SE the coast is cliffy.
- 2 From Cape Radstock (33°12'S 134°19'E) to Cape Finnis about 36 miles SE the coast is indented by Anxious Bay (10.108).
Between Cape Finnis (33°38'S 134°49'E) and Point Whidbey about 60 miles SSE, the coast is cliffy. Investigator Group, consisting of a number of islands and

underwater rocks, extend about 40 miles SW from Cape Finnis.

Current

10.102

- 1 The currents between Greenly Island (34°39'S 134°47'E), Rocky Island (34°49'S 134°42'E), and Whidbey Isles (34°44'S 135°08'E), are very strong, causing in many places about those islands a confused sea during and after a gale. Amongst the outer islands, from November to May, and after a continuance of SE winds, the currents sets NW and attains a velocity of up to 2 kn. From May to November during W winds, the current sets E at about the same rate.

Major lights

10.103

- 1 Pearson Island Light (white hut, 4 m in height) (33°57'S 134°16'E).
Whidbey Isles Four Hummocks Light (white hut, 18 m in height) (34°47'S 135°02'E)

Directions

(continued from 10.35)

Offshore route

10.104

- 1 From a position WSW of Cape Blanche (35°01'S 134°08'E), the track leads SSE passing (with positions from Pearson Islands N Island (33°57'S 134°16'E):
WSW of Ward Islands (11½ miles N). The NW island, the largest of these islands, is bald, flat topped and surrounded by underwater rocks. A detached reef lies 1 mile WNW of the NW island. Thence:
- 2 WSW of Pearson Islands, the SW and outermost of Investigator Group, consisting of four islands of bold, granite formation; a light is exhibited from the W side of the N island (10.103).
From a position WSW of Pearson Islands, the track leads SE passing (with positions from Four Hummocks light (34°47'S 135°02'E):

- 3 SW of Greenly Island (14 miles NW), a bold mass of granite, with considerable depths at a distance of 1 mile all round the island, thence:
Clear of Rocky Island (15½ miles W), a prominent granite rock. An underwater rock, on which the sea always breaks, lies 5 cables W of its N point, and rocks extend 2 cables from its S part. Rocky Island is reported to be a good radar target. Thence:
- 4 W of Four Hummocks, four steep, rounded granite islands, with several above-water rocks amongst them. A light (10.103) is exhibited from the summit of the S island.
(Directions continue for offshore route at 10.125)

Coastal route

10.105

- 1 From a position WSW of Cape Blanche (33°01'S 134°08'E), the track leads SE passing (with positions from Point Weyland (35°15'S 134°38'E)):
SW of Cape Radstock (16 miles WNW), steep and bold. A rock with a depth of 3-6 m over it lies 2¼ miles SE of the cape. Thence:
- 2 NE of Flinders Island (26½ miles SSW) (10.113) on which there is a light (10.113), thence:
SE of The Watchers (21 miles S), two rocks lying about 1 mile apart, surrounded by underwater rocks, thence:
- 3 SE of Waldergrave Islands (22 miles SSE), two islands lying about 5 cables apart, and connected by dangerous rocks, only one of which is above water, and:
NE of Topgallant Isles (28 miles S), consisting of an islet and a number of bare rocks, that extend nearly 1 mile SE from it. Topgallant Isles are steep-to. Thence:
SW of Cape Finnis (25 miles SSE), a rocky headland with a rounded top; dangerous rocks extend for about 1½ miles NW from the N side of the Cape.
- 4 From a position SW of Cape Finnis (33°38'S 134°49'E), the track leads S passing (with positions from Drummond Point (34°09'S 135°14'E)):
W of Krause Rock (8½ miles WSW), a bank with a depth of 12-1 m, over which the sea breaks heavily in a high swell. Less water than charted has been reported (1956) in the vicinity of the rock. Thence:
- 5 W of Point Whidbey (27 miles SSW), fronted by low cliffs; a round hill rises to a height of 62 m about 1 mile from the point. Thence:
E of Greenly Island (34°39'S 134°47'E). A rock lies 5 cables ENE of the island. Thence:
W of Four Hummocks Islands (10.104).

Useful marks

10.106

- 1 Drummond Point (34°09'S 135°14'E), a prominent cliffy head; Mount Hope situated 5 miles E and Mount Drummond situated 6 miles ESE of the point are both prominent.
Mount Greenly (34°21'S 135°22'E), appearing as a sharp peak when viewed from N or S; when viewed from the W it has rather a long summit, falling steeply towards the N and gradually S in three steps.
Marble Range with two remarkable summits, the S (34°28'S 135°29'E) being very rocky near the top.

Perforated Island (34°43'S 135°09'E), irregular in shape and surrounded by steep cliffs, on which the sea breaks heavily. There is a hole through the island, near the top, about 2½ cables from its N end.

Rocky Island (34°49'S 134°43'E) (10.104).

(Directions continue for coastal route at 10.126)

Bays and anchorages

Scearcy Bay

10.107

- 1 Scearcy Bay (33°06'S 134°12'E), is situated between Slade Point (33°04'S 134°10'E) and Point Labatt (7 miles SE). This coast is sandy, and fronted by foul ground and backed by sandhills. Underwater rocks over which the sea breaks heavily, extend up to 2 miles offshore in the vicinity of Point Labatt.

Local knowledge is essential.

Landing. There is good landing in moderate weather, in the N part of the bay.

Anxious Bay

10.108

- 1 Anxious Bay (33°23'S 134°34'E), is situated between Cape Radstock (33°12'S 134°20'E), and Cape Finnis (35 miles SE).

The coast for a distance of about 5 miles ENE from the entrance to Baird Bay (33°11'S 134°22'E) consists of rock and sand backed by sandhills. Dangerous rocks, over which the sea breaks, extend more than 1 mile offshore along this stretch of coast. Farther SE, to a position about 10 miles SE of Point Weyland, the coast is cliffy and fringed with rocks. Thence the coast consists principally of sandy hills and sandy beaches, broken by several rocky points. Baird Bay (10.109) and Venus Bay (10.110) indent Anxious Bay.

- 2 The coast between Point Weyland and Cape Finnis may be approached to a distance of 1 mile.

Caution. Anxious Bay is fully exposed to the prevailing SW swell.

Useful marks:

- Calca Bluff (33°04'S 134°21'E), marking the W end of a sandy, scrub covered range.
Mount Hall (33°04'S 134°29'E), the summit of a flat-topped, sandy, scrub covered range.
- 3 Point Weyland (33°15'S 134°38'E), a conspicuous cliffy point.
Mount Camel (33°16'S 134°45'E), showing above the sandhills on both sides of it.
Talia Hill (33°20'S 134°53'E), a round isolated hill.
Bramfield Hill (33°35'S 134°58'E), a round isolated hill.

Baird Bay

10.109

- 1 Baird Bay (33°07'S 134°19'E), is a shallow inlet and is entered 1½ miles E of Cape Radstock (33°12'S 134°19'E) over a bar which has a least depth of 3 m. Jones Island, and numerous rocks over which the sea generally breaks, lie in the centre of the entrance.

Local knowledge is essential.

Chart Aus 342 (see 1.16)

Venus Bay

10.110

- 1 **Description.** Venus Bay (33°14'S 134°37'E), is entered between two low rocky points 1½ miles ENE of Point Weyland (10.108). The entrance is fronted by a bar, the outer part of which usually breaks, except with the ingoing

tidal stream and in moderate weather; in bad weather, with the outgoing stream it is a mass of breakers.

- 2 There are depths of 6.4 m over the outer and most exposed part of the bar, and there is a least depth of 3.9 m over the inner and narrowest part of the entrance.

The bay is landlocked and is available to vessels of 3.7 m draught, but is only used by fishing vessels.

- 3 The bay is foul over most of its area. Germein Island (33°13'S, 134°40'E) situated on the N side of the channel to Port Kenny is low and swampy, with mangroves near the coast except at the S end, where there is a sand ridge.

The town of Venus Bay stands on the S shore of the bay about 5 cables E of the entrance and Port Kenny stands on the N shore about 3½ miles N.

- 4 **Tidal Streams** run through the entrance, in the direction of the channel, at a rate of from 3 to 4 kn.

Caution. The channels inside the bar are subject to frequent changes and are marked by beacons.

Local knowledge is essential.

10.111

- 1 **Directions.** The approach is made from a position about 7½ cables SE of Point Weyland (33°15'S 134°29'E) and well clear of Howard Rock, a dangerous rock lying 2½ cables SE of Point Weyland and over which the sea breaks heavily in bad weather. At HW, when the sea is smooth, it may not show.

- 2 **Leading lights:**

Front (white; triangle point up topmark).

Rear (white; triangle point down topmark).

The alignment (027°) of these two light-beacons situated on the N side of the N point of the entrance, leads through the best water on the outer part of the bar.

- 3 The alignment (069°) of a beacon (port hand), standing on the S edge of a drying patch, ENE of the entrance and a beacon (black; triangle topmark), standing 3 cables ENE of the first beacon, leads through the entrance points and the best water on the inner part of the bar, thence E passing N of a beacon marking a shoal with a depth of 1.8 m over it, towards the anchorage.

A channel marked by beacons (lateral) leads towards Port Kenny (33°10'S 134°41'E).

10.112

- 1 **Anchorage** space is limited, but sheltered anchorage may be obtained in a position SSW of the inner leading marks.

Jetties:

Port Kenny: a jetty extends about 32 m S from the shore about 3½ miles N of the entrance to the bay.

- 2 Venus Bay: a jetty extends about 37 m N from the shore about 7 cables E of the entrance to the bay. There is a small crane on the jetty.

Chart Aus 342

Flinders Island

10.113

- 1 **Description.** Flinders Island (33°43'S 134°29'E) is the largest island of Investigator Group. The N and W sides of the island are generally foul with underwater rocks extending more than 1 mile from the coast. A prominent hill is situated about 1½ miles from the S point of the island. A light (white GRP hut, 4 m in height) is displayed from Point Malcolm, a steep cliff on the NE point of the island. Anchorage may be found off the beach in the S bay on the NE side of the island, sheltered from W or SW gales, or in the summer from moderate S or E winds.

Local knowledge is essential.

- 2 **Cautions.** Attention is drawn to the reliability diagram shown on chart Aus 342. The chart for the island is based on a reconnaissance or incomplete survey.

A detached reef, the centre of which dries, lies 5 cables E of the S extremity of the beach.

Directions. If approaching from the S, pass between Flinders Island and Topgallant Isles (3½ miles E), thence the line of bearing 099° (astern) of the N isle of Topgallant Isles, leads into the anchorage, taking care to avoid the detached reef lying off the S extremity of the beach.

- 3 **Anchorage** may be found in depths of from 11 to 14 m, about 5 cables offshore, with the SE point of the island bearing 169° and the N point of the beach bearing 301°.

Smaller vessels may anchor in depths of from 5 to 7 m, between the detached reef and the shore, with the SE point bearing 161° and the junction of sand cliff at the S end of the bay bearing 271°.

Vessels should leave these anchorages if the wind shifts to N or NE, before the sea has time to rise.

Chart Aus 342 (see 1.16)

Waterloo Bay

10.114

- 1 **General information.** Waterloo Bay (33°38'S 134°52'E) is entered between Wellesley Point (33°39'S 134°52'E) and Wellington Point (1 mile SE).

The bay, which is protected by reefs occupying the greater part of the entrance, affords shelter in all weathers except SW gales, and has a least charted depth of 3.6 m in the fairway.

The small town of Elliston stands on the E side of the bay.

- 2 **Local knowledge** is essential.

Leading lights:

Front light (red column, white triangle topmark) (33°38'5S 134°42'6E).

Rear light (red column, white triangle topmark) (365 m from front light).

- 3 The alignment (031¾°) of these lights, displayed from the head and root of the jetty, leads through the entrance across the bar in the greatest depth and smoothest water.

Useful mark:

Bramfield Hill (33°35'S 134°58'E) (10.108) (chart Aus 342).

- 4 **Jetty** extends 2¼ cables SW from the shore about 8 cables NE of Wellesley Point. The jetty is suitable for vessels of up to 45 m in length.

Caution. An obstruction, probably consisting of an old mooring cable, was reported (1955) to lie at a distance of between 120 and 245 m SW of the jetty.

Hospital, available.

Coffin Bay

10.115

- 1 **General information.** Coffin Bay (34°30'S 135°20'E) is entered between Point Sir Isaac (34°26'S 135°12'E), the N point of Coffin Bay Peninsula, and a salient point 7 miles E.

The bay, named after Admiral Sir Isaac Coffin Greenly, is divided into two parts by Horse Peninsula, which extends 6 miles S from the coast near Mount Dutton (34°29'S 135°25'E). Its W and S portions are known as Port Douglas (10.116), and its E portion Mount Dutton Bay. Kellidie Bay leads off the SE end of Port Douglas.

- 2 The W coast of Coffin Bay, between Point Sir Isaac and Point Longnose (8½ miles SE) forms a bay, low with rocky points and sandy beaches; conspicuous bare sandhills stand



Coffin Bay Peninsula – Pt. Whidbey, Reef Pt, Sir Isaac & Mt. Greenly from SSW (10.115)

(Original dated 1986)

(Photograph – Australian HO)

(Photograph – Ian Routledgey)

close to the beach about 2 miles E of the junction of the S and E trend of the coast.

The E coast of Coffin Bay, between Frenchman (34°24'S 135°22'E) and Horse Peninsula, consists of rugged cliffs, backed by wooded hills, thence the coast is bordered by a sandy beach.

3 Useful marks

Point Sir Isaac Light (34°26'S 135°12'E).

Mount Dutton (34°29'S 135°25'E), gradual slopes and well covered by trees.

Marble Range (34°28'S 135°29'E) (10.106).

Anchorage. The outer part of Coffin Bay is exposed and anchorage is not recommended. However, anchorage for small vessels may be found in the bight SE of Point Sir Isaac; the recommended berth is in 4-6 m, mud, with Frenchman bearing 062° and the NE extremity of Point Sir Isaac bearing about 340°.

Port Douglas

10.116

- 1 **General information.** Port Douglas (34°32'S 135°23'E) is entered over a bar (least charted depth 0.6 m) that lies between the E extremity of Point Longnose (34°32'S 135°21'E) and the coast 2¾ miles NE. Within there are depths of from 3 to 7 m over a considerable area, and in the NW part of the port there is a basin with depths of from 4 to 9 m.

The Brothers, two small islets, lie about 4½ miles SSE of Point Longnose and Rabbit Islet, rocky, lies 1¼ miles SSE of the SE extremity of Horse Peninsula.

- 2 **Local knowledge** is essential.

Tidal streams at the entrance turn 1 hour after HW and LW; they run in the direction of the channel, where the fairway is N and S, but across the part that trends nearly E and W inside the entrance. After prolonged W winds, the stream is very strong at the entrance, from 1 hour after HW to 1 hour after LW.

- 3 **Directions.** No 1 Light beacon (starboard hand) (34°29'8S 135°22'3E), marks the entrance to a channel marked by light beacons, passing over the bar and through the sandbanks as shown on the chart.

Caution. The shoals and depths are liable to change; great care must be taken that the beacons are not approached too close.

- 4 **Anchorage** may be found in depths of 4 m, sand and mud, with the W entrance to Mount Dutton Bay bearing 043°, and Rabbit Islet bearing 094°.

Mount Dutton Bay

10.117

- 1 **General information.** Mount Dutton Bay (34°34'S 135°25'E) is approached through Port Douglas (10.116) and entered between the SE extremity of Horse Peninsula and the mainland 5 cables E. There are depths of from 3 to 7 m

in its S part, which is steep-to on its E side; the N part of the bay is shallow.

A small rocky islet lies in the NE part of the bay.

- 2 **Local knowledge** is necessary.

Anchorage may be obtained in depth of 2 to 3 m, mud, with the line of bearing 356° of Mount Dutton (10.115) open W of the rocky islet.

Jetty (34°32'S 135°26'E), with a depth alongside of 1.2 m at its head, extends ½ cable S from the shore at the N end of the NE corner of the bay.

Kellidie Bay

10.118

- 1 **General information.** Kellidie Bay (34°36'S 135°28'E), situated E of the S part of Port Douglas, is shallow; it is connected to Port Douglas by a narrow channel with a rocky bar that nearly dries.

Submarine cable, marked by notice boards, is laid across the entrance to Kellidie Bay.

- 2 **Directions.** Kellidie Bay is entered through a narrow channel well marked by light-beacons.

Jetty at the town of Coffin Bay extends from the S shore of the bay, with a depth of 3.4 m alongside. The jetty is used by fishermen and pleasure craft.

Supplies: fresh water at jetty.

Chart Aus 342

Avoid Bay

10.119

- 1 **Description.** Avoid Bay (34°37'S 135°14'E) is situated between Point Whidbey (34°35'S 135°06'E) and Point Avoid, 11½ miles SE. Black Rocks, a group of islets and rocks, the highest 47 m, lie 5 miles NNW of Point Avoid. A reef over which the sea breaks heavily surrounds this islet.

Price Island and a limestone island, 55 m high, lie 2½ miles SW and 7 cables S respectively of Point Avoid. A sunken reef lies between the point and the limestone island.

- 2 The shore of the bay is sandy, fronted in parts by dangerous rocks and reefs some extending up to 1 mile offshore.

Caution. Attention is drawn to the Reliability diagram shown on chart Aus 342, uncharted navigational dangers may exist.

WHIDBEY ISLES TO CAPE CATASTROPHE

General information

Charts Aus 342, Aus 343

Route

10.120

- 1 The offshore route leads from a position about 8 miles W of Four Hummock Islands (34°47'S 135°02'E) about 68 miles SE to a position about 27 miles S of Cape Catastrophe.

The coastal route leads from a position about 8 miles W of Four Hummocks (34°47'S 135°02'E) about 58 miles SE to a position about 8 miles S of Cape Catastrophe.

Topography

10.121

- 1 From Point Avoid (34°41'S 135°20'E) to Shoal Point about 10 miles SE, the coast consists of sandy beaches, backed by sandhills.

From Shoal Point (34°47'S 135°29'E) to Cape Wiles about 14 miles SSE, the coast is fronted by high cliffs, which are steep to in places.

- 2 Sleaford Bay (10.128) indents the coast between Cape Wiles (35°57'S 135°40'E) and Cape Tournerfort, about 8 miles ENE.

From Cape Tournerfort (34°55'S 135°51'E) to Cape Catastrophe about 8 miles SW, the coast is cliffy divided by bays.

Lobster and crab fishing

10.122

- 1 During the period 1 October to 31 May, mariners may encounter surface floats associated with such activities inshore of the 500 m line. See 1.6.

Major lights

10.123

- 1 Whidbey Isles Four Hummocks Light (34°47'S 135°02'E) (10.103).
South Neptunes Light (red round brick tower, 5 m in height) (35°20'4S 136°06'8E) (11.10).
Waterhouse Point Light (35°03'6S 136°12'1E) (11.10)

Other aid to navigation

10.124

- 1 **Racon:**
South Neptunes Light – as above.

Directions

(continued from 10.104)

Offshore route

10.125

- 1 **Caution.** Attention is drawn to the Reliability diagram shown on chart Aus 343. Sections of the chart for this area are based on a Reconnaissance or inadequate survey.

From a position W of Four Hummocks (34°47'S 135°02'E), the track leads SE passing (with positions from Liguanea Island (35°00'S 135°37'E)):

- 2 SW of Liguanea Island, cliffy and rather flat-topped; a detached reef, with its S end above water, extends about 5 cables SSW from the island. Thence:
Clear of The Cabbage Patch (16 miles S), a shoal with a depth of 14.9 m over it, and over which the sea breaks.
3 The track continues generally SE passing:
SW of West Point and Williams Island lying within 3 miles SW and S of Cape Catastrophe (34°59'S 136°00'E) (10.126).

Coastal route

(continued from 10.105)

10.126

- 1 From a position W of Four Hummocks (34°47'S 135°02'E), the track leads SE passing (with positions from Four Hummocks):

SW of Four Hummocks (10.104), thence:

SW of Stuart Reef, (17 miles E), a dangerous underwater reef on which the sea breaks heavily during a heavy swell. Shoal Point, fronted by high cliffs and having a round green hill as a summit, lies 6½ miles ENE. Thence:

- 2 SW of Cape Rock (25 miles ESE) and an underwater rock, over which the sea breaks, lying 2½ miles NNE of it, thence:

SW of Liguanea Island (31½ miles ESE) (10.125), lying 2 miles S of Cape Carnot.

- 3 The track then leads E passing (with positions from Liguanea Island):

S of Williams Island (17 miles E), flat topped, lying 1 mile SSE of West Point and separated from the mainland by a passage with considerable depths. A light (white GRP tower, 6 m in height) is displayed from the W summit of Williams Island. Thence:

- 4 To a position about 8 miles S of Cape Catastrophe (18½ miles E), high and generally rocky with a ledge of black rocks, over which the sea breaks, extending ½ cable S.

Useful marks

10.127

- 1 Rocky Island (34°49'S 134°42'E) (10.104).
Perforated Island (34°43'S 135°09'E) (10.106).
North Neptunes (34°14'S 136°04'E) (11.13)
(*Directions continue at 11.21*)

Bays and anchorages

Sleaford Bay

10.128

- 1 Sleaford Bay (34°54'S 135°46'E), is situated between Cape Wiles (34°57'S 135°41'E) (10.121), and Cape Tournefort, 8½ miles ENE. Cobbler Hill, a prominent conical hill stands about 6½ miles N of the bay. A heavy swell sets in at all times and during bad weather there is a very confused sea. No anchorage is recommended in any part of it.

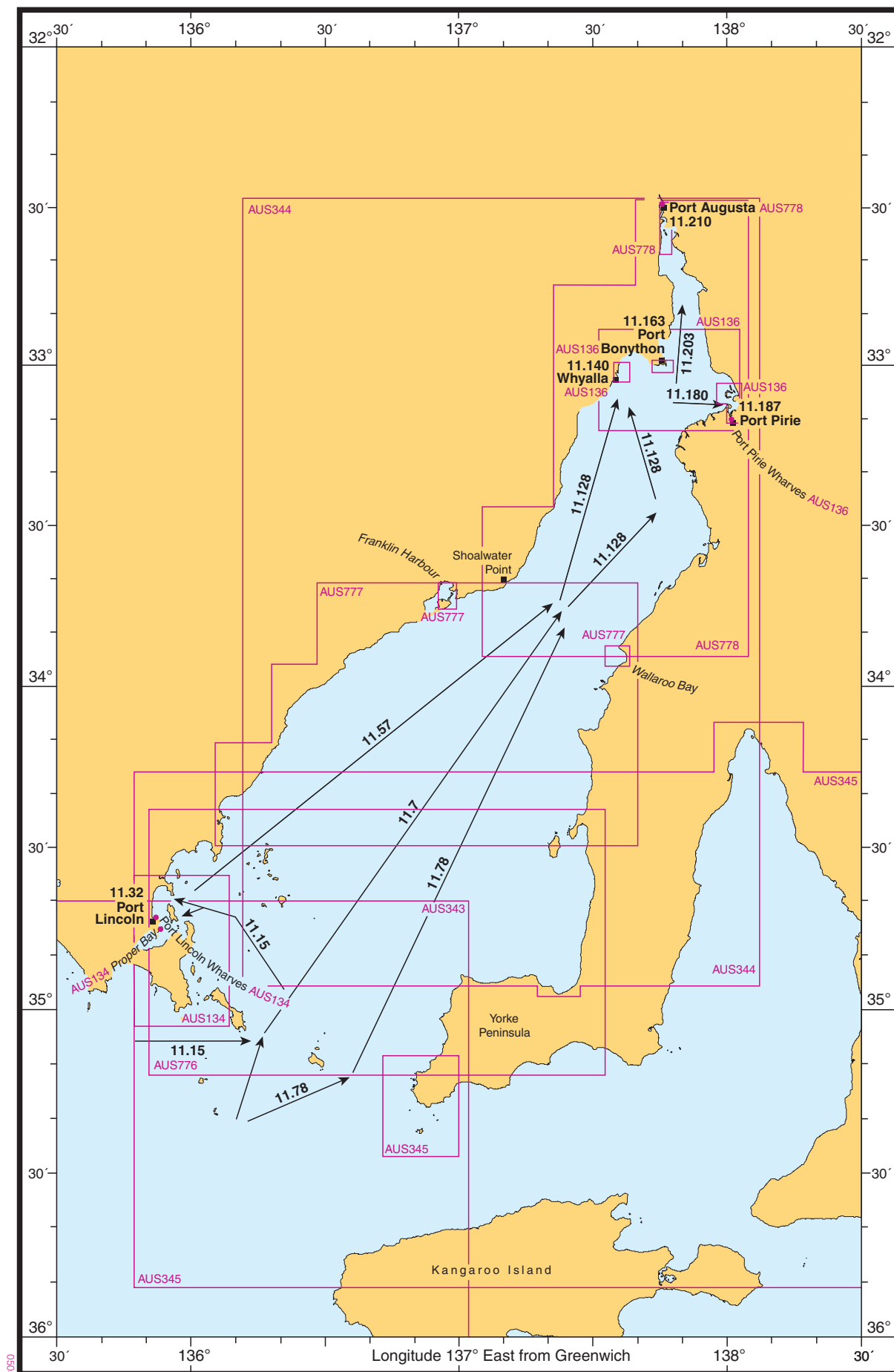
Chart Aus 776

Jussieu Bay

10.129

- 1 Jussieu Bay (34°57'S 135°54'E) is situated between Cape Tournefort (34°55'S 135°51'E) and West Point about 6½ miles SE. Curta Rocks, a chain of low rocks and islets, extend 2 miles S from the coast about 1 mile SE of Cape Tournefort.

Chapter 11 - Spencer Gulf and Approaches



CHAPTER 11

SPENCER GULF AND APPROACHES

GENERAL INFORMATION

Scope of chapter

11.1

- 1 This chapter comprises the following sections:
 Neptune Islands (35°16'S 136°06'E) to Shoalwater Point (11.6).
 Shoalwater Point (33°40'S 137°12'E) to Port Augusta (11.127).

Offshore route

11.2

- 1 The offshore route leads from a position S of Neptunes Islands (35°16'S 136°06'E) about 124 miles NE to a position about 12 miles SE of Shoalwater Point where it joins the preferred routes as shown on chart Aus 778.

Harbours

11.3

- 1 Principal ports are:
 Port Lincoln (34°36'S 135°54'E) (11.32).
 Wallaroo (33°56'S 137°38'E) (11.110).
 Whyalla (33°02'S 137°36'E) (11.140).
 Port Bonython (32°59'S 137°46'E) (11.163).
 Port Pirie (33°11'S 138°01'E) (11.187).
 In addition there are several minor ports, anchorages and bays.

Exercise areas

11.4

- 1 The following firing practice areas lie within this chapter:
 Dangerous Reef, a circle radius 1 mile centred on 34°55'9S 136°14'5E.
 Thistle Island, a circle radius 2 miles, centred on 34°59'7S 136°13'2E.
 Alamein, an area encompassing most of the waters from Point Lowly (11.171) to Flinders Channel (11.208).
 For further information see 1.9, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Natural conditions

11.5

- 1 **Currents.** Apart from local characteristics mentioned below, current regimes in Spencer Gulf appear to follow a seasonal pattern.
 From October to March a S-going current of low to moderate constancy and mean rate about $\frac{3}{4}$ kn predominates, possibly because of the effect produced by the seasonal W-going current which flows across the entrance with moderate constancy and mean rate also about $\frac{3}{4}$ kn.
 2 From April to September, however, two regimes may be noted. South of an approximate line Dutton Bay (34°05'S 136°24'E) to Tiparra Bay (34°04'S 137°30'E), the predominant current is N to NW, going with moderate constancy and mean rate a little over $\frac{1}{2}$ kn, probably as a result of forcing by the seasonal E going current of moderate or low constancy and mean rate about $\frac{1}{2}$ kn which predominates across the entrance. North of the line the current may be found to be predominantly S going with low constancy and mean rate of $\frac{1}{2}$ kn or so, probably because of outflow produced by the winter rains.
 Individual rates may reach 2 kn during any season.
 3 **Local magnetic anomaly.** Local magnetic disturbances affecting the compass to a very marked degree have been reported by vessels navigating Spencer Gulf, especially between Middle Bank (33°35'S 137°37'E) and Tiparra Reef, 25 miles SW. This magnetic attraction is stronger on the W side of the gulf, but it has been reported (1965) that there are considerable magnetic disturbances on the E side as well. South bound vessels find that the compass becomes sluggish after shaping course from Middle Bank to Tiparra Reef, and the farther W the vessel happens to be the more sluggish the compass becomes. It has been reported (1939) that the variation changed from 1°W to 8°E, within a distance of 2 miles, in a position about 11 miles WSW of Tiparra Reef Lighthouse.

NEPTUNE ISLANDS TO SHOALWATER POINT

GENERAL INFORMATION

Chart Aus 444

Scope of section

11.6

- 1 This section comprises the following sub sections:
 Neptune Islands (35°16'S 136°06'E) to Shoalwater Point-Offshore Route (11.7).
 Neptune Islands (35°16'S 136°06'E) to Boston Bay (11.15).
 Port Lincoln (34°43'S 135°56'E) (11.32).
 Boston Bay (34°41'S 135°53'E) to Shoalwater Point, (11.57).
 Neptune Islands (35°16'S 136°06'E) to Point Riley, (11.78).
 Wallaroo (33°56'S 137°38'E) (11.110).

NEPTUNE ISLANDS TO SHOALWATER POINT — OFFSHORE ROUTE

General information

Charts Aus 343, Aus344, Aus 776, Aus 777

Route

11.7

- 1 The offshore route leads from a position S of Neptune Islands (35°16'S,136°06'E) about 120 miles NE to a position about 12 miles SE of Shoalwater Point Beacon.

Topography

11.8

- 1 See 11.16 and 11.58.

Natural conditions**11.9**

- 1 **Tidal streams.** At the entrance to Spencer Gulf the rates of the NW and SE tidal streams vary from less than $\frac{1}{2}$ to $\frac{3}{4}$ kn.

Climatic table. See 1.170 and 1.188.

Major lights**11.10**

- 1 South Neptunes Light (red round brick tower, 5 m in height) (35°20'4S 136°06'8E).
 Wedge Island Light on SE point (white lantern on square white concrete tower, 6 m in height) (35°10'5S 136°29'1E).
 Shoalwater Point Light (white metal column on GRP cabinet) (33°39'6S 137°12'8E).
 Waterhouse Point Light (white GRP hut 4 m in height) (35°03'6S 136°12'1E)

Other aids to navigation**11.11**

- 1 **Racons:**

South Neptunes Light – as above.

Light-beacon (33°44'0S 137°29'7E)

For details see *Admiralty List of Radio Signals Volume 2*.

Directions**11.12**

- 1 **Caution.** When rounding the SE end of Thistle Island it should be given a berth of more than 2 miles, to avoid South Rock and the race caused by the tidal stream (11.19).
 From a position S of South Neptunes (35°20'S 136°07'E), the track leads NNE passing (with positions from Wedge Island (35°10'S 136°28'E)):
- 2 ESE of South Neptunes (19 miles SW), two islands of black-looking granite, lying $2\frac{1}{2}$ cables apart, with a number of dangerous rocks lying between them, and extending up to 2 cables NW. A light (11.10) is exhibited from the summit of South Neptunes. Thence:
- 3 ESE of Waterhouse Point (12½ miles NW), a rugged cliffy head at the SE extremity of Thistle Island. A light (11.10) is exhibited from Waterhouse Point. And:
- 4 WNW of Wedge Island, the largest of Gambier Islands, rising gradually from its N part to reach its summit at its SE end, thus giving the island a wedge shaped appearance when seen from a distance. West Rock, awash and over which the sea always breaks, lies 4 cables W of the N point of the island. A light (11.10) is exhibited from the SE end of the island.
- 5 The track then leads NE passing:
 NW of Ward Rock (1 mile N), which does not show in quiet weather, and is dangerous in a heavy swell, as then it breaks violently at times, thence:
 NW of Middle Rock (2¼ miles NNE), and North North East Rocks (4 miles NNE), both awash, thence:
 Clear of Rosalind Shoal (20 miles N) with a depth of 16.7 m over it and lying close to the track, thence:
- 6 SE of Buffalo Reef (25½ miles N), the S and outer-most islet of Sir Joseph Banks Group (11.58), and over which the sea sometimes breaks with considerable violence.
- The track continues to lead NE passing (with positions from Tiparra Reef (34°04'S 137°24'E)):

- 7 NW of Tiparra Reef, a bank of sand, $2\frac{1}{2}$ miles in extent, with depths of less than 5 m over it. A light (metal pile) is exhibited, from a drying ledge lying on the S of the bank, at about mid-length. Thence:

Clear of Clan MacDougall Shoal (33°53'S 137°13' E), with a least depth of 10.6 m over it.

- 8 SE of Shoalwater Point Beacon (S cardinal) (33°42'S 137°14'S) standing $2\frac{1}{2}$ miles SSE of Shoalwater Point (chart Aus 778), which is low and off which the coastal bank dries up to $1\frac{1}{2}$ miles offshore and has depths of less than 10 m up to 6 miles offshore. A light (11.10) is exhibited from the point.

Useful marks**11.13**

- 1 South West Rock (35°11'S 136°25'E), a mass of granite with a cleft running NNE dividing it into two equal parts.
 North Island (35°07'S 136°28'E), with stunted vegetation, and a few caesarean trees.
 Dangerous Reef Light (white GRP tower 6 m in height) (34°49'0S 136°12'8E), standing near the centre of the reef.

(Directions continue for passage West of Middle Bank at 11.132 and East of Middle Bank at 11.134)

Anchorage**Wedge Island****11.14**

- 1 **Anchorage**, sheltered from NW through W to SE, may be obtained in 11 to 13 m, off the sandy beach on the NE side of Wedge Island, SE of the underwater rocks which extend from the low point near the N extremity of the island. The best position is about $2\frac{1}{2}$ cables offshore with the stone house, or the E corner of the field bearing 184° and the point of the island 139°.

NEPTUNE ISLANDS TO BOSTON BAY**General information**

Charts Aus 776, Aus 134

Routes**11.15**

- 1 Passage S of Thistle Island leads from a position about 8 miles S of Cape Catastrophe (34°59'S 136°00'E) S then E round Thistle Island and N to join the preferred route, shown on the charts, to the pilot boarding position $1\frac{1}{2}$ miles ESE of Point Boston.
 Passage N of Thistle Island between Observatory Point (34°56'S 136°06'E) and Black Rock ($1\frac{1}{4}$ miles N).
- 2 Passage inshore of Thistle Island leads from a position S of Cape Catastrophe (34°59'S 136°00'E) through Thorny Passage (11.24) lying between Cape Catastrophe and Thistle Island, thence passing between Taylor Island (34°53'S 136°01'E) and Grindal Island ($1\frac{1}{2}$ mile SE) thence E of Cape Donington (34°43'7S 135°59'6E) to the pilot boarding position as above.

Topography**11.16**

- 1 Between Cape Catastrophe (34°59'S 136°00'E) and Point Boston (20 miles N), the coast generally is indented with sandy bays fronted by detached rocks and islands extending more than 10 miles offshore.

Restricted area**11.17**

- 1 A restricted area, with a radius of 2 miles, is centred on 34°59'·5S 136°13'·3E. Two submarine pipelines extend into the area from the vicinity of Horny Point (35°00'S 136°11'E).

Marine Farms**11.18**

- 1 A number of marine farms are located in the approaches to Louth Bay (11.64). These farms may be floating or fixed structures and may be marked by buoys or beacons which may be lit.

Natural conditions**11.19**

- 1 **Tidal streams** at the entrance to Spencer Gulf set NW and SE with rates varying from less than ½ to ¾ kn. The passage between Williams Island (35°02'S 135°58'E) and the mainland is deep and clear, but strong NE-going and SW-going streams run close round Cape Catastrophe, and between it and Williams Island; with onshore winds, these streams cause a race, which is dangerous to small vessels.

- 2 At springs the N-going and S-going streams attain a rate of from 2 to 3 kn through Thorny Passage, and 1 kn between Taylor Island and the mainland.

Between Observatory Point (34°56'S 136°06'E), and Porter Rock (3 miles NNE), the in-going stream sets NE, and the out-going stream SW, at a rate of about 1½ kn.

- 3 **Caution.** The N-going and S-going streams sweep round Waterhouse Point (35°04'S 136°12'E) at a rate of 2 kn. The S-going streams, meeting the SW swell causes, with S winds, a dangerous race which is felt up to 2 miles off the point.

In the vicinity of the islands, between Cape Catastrophe (34°59'S 136°00'E) and Thistle Island, there are tide rips which are so violent at times as to swamp a boat.

- 4 **Climatic table.** See 1.170 and 1.188.

Major lights**11.20**

- 1 Cape Donington Light (grey concrete tower 17 m in height) (34°43'·7S 135°59'·6E).
Waterhouse Point Light (35°03'·6S 136°12'·1E) (11.10).
Point Boston Light (metal framework tower) (34°39'·0S 135°56'·2E).

Directions

(continued from 10.127)

Passage South and East of Thistle Island**11.21**

- 1 From a position S of Cape Catastrophe (34°59'S 136°00'E) the track leads E passing (with positions from Waterhouse Point (35°04'S 136°12'E)):

N of Low Rocks (8½ miles SW), a straggling mass of rocks; a rock awash, and over which the sea breaks heavily, lies 4 cables NNE of these rocks, thence:

- 2 S of South Rock (1½ miles SW), just awash, steep-to, and over which the sea always breaks, thence:
S of Waterhouse Point (11.12).

From a position SE of Waterhouse Point, the track leads N passing (with positions from Dangerous Reef (34°49'S 136°13'E)):

E of an obstruction (11¼ miles S); thence:

E of a light-buoy (special) (moorings) (7 miles S); thence:

- 3 E of a shoal, over which the sea breaks heavily, (1¼ miles SE) with a least depth of 2·7 m over it. The track then leads NNW, NW and W following the preferred route passing:

ENE of Dangerous Reef, consisting of four large rocks. A light (11.13), is exhibited from near the centre of the reef. And:

- 4 WSW of Bridget Shoal (6½ miles NE) with a least depth of 12·5 m; thence:

ENE of a shoal patch (4¼ miles NW) with a least depth of 12·5 m; thence:

Between Sibsey Islet Light (white GRP hut, 2 m in height) (10 miles N) exhibited from the centre of the island, and Jane Shoal (9 miles NNW) with a depth of 10·9 m; thence:

- 5 N of Cape Donington (12 miles WNW), the NE extremity of a peninsula that extends 4 miles N from the coast, noting Davidson Rock 3 miles N. A light (11.20) is exhibited from a position about 1 cable S of the cape. And:

S of Rabbit Island (16¾ miles NW), noting Nowland Shoal 4 cables S. Thence:

To the pilot boarding area, 1½ miles ESE of Point Boston (11.51), as shown on the chart.

Useful marks**11.22**

- 1 Point Fanny Light (metal framework tower) (34°44'·1S 135°55'·1E).
Point Bolingbroke Light (34°32'·4S 136°05'·4E) (11.62).

(Directions continue at 11.51 and 11.62)

Passage North of Thistle Island**11.23**

- 1 From a position NE of Waterhouse Point (35°04'S 136°12'E), there is a passage, with a least depth of 5·5 m, leading between Observatory Point (34°56'S 136°06'E) and Black Rock (1¼ miles N), as shown on the chart.

Leading marks: The white sector (298°–304°) of Taylor Island Light (white GRP tower, 9 m in height) (34°52'·5S 136°00'·6E), leads in this passage to meet with directions as at 11.25.

Thorny Passage**11.24**

- 1 **General information.** Thorny Passage lies between Cape Catastrophe (34°59'S 136°00'E) and Thistle Island; it is obstructed by a number of islands and dangers. The only safe channel is the passage between Cape Catastrophe and Smith Island (1 mile E). This channel is free from danger.

Caution. It is dangerous to pass between Little Island and Lewis Island, as the tidal streams sweep from one to the other, at a rate of over 3 kn, with strong eddies and tide rips. With a strong N-going stream, these tide rips extend more than 1 mile N of Little Island.

11.25

- 1 **Directions.** From a position S of Cape Catastrophe (34°59'S 136°00'E) the white sector (355°–001°) of Taylor Island Light (34°52'·5S 136°00'·6E) (11.23) leads N, passing (with positions from Smith Island (34°59'S 136°01'E)):

E of Williams Island (3 miles SW) (10.126), which is almost flat topped, and covered with stunted bushes. A light (10.126) is exhibited from the W summit of the island. Thence:

- 2 Between Cape Catastrophe (1 mile W), and: Smith Island, flat-topped and steep-to, thence: W of Lewis Island (1½ miles N), differing in aspect from the other islands in Thorny Passage being peaked whilst all the others are flat-topped, thence: W of Little Island (1¾ miles N), a mass of black granite of irregular form, thence:
- 3 W of Grindal Island (3½ miles N), flat-topped and covered with detached bushes.
- From a position about 1 mile S of Taylor Island (34°53'S 136°01'E), the track leads NE passing: SE of Taylor Island, mostly covered in scrub, but the S end is grassy. A light (11.23) is exhibited from the summit of the island.
- 4 From a position about 1 mile E of Taylor Island Light, the track leads N passing (with positions from Cape Donington (34°44'S 135°59'E)):
- E of Maclaren Point (4 miles S), a promontory, projecting 5 cables from the general line of the coast, thence:
- E of Cape Donington, (11.21) noting Donington Reef (11.52) 3 cables NNE.
- Thence as at 11.21.

Useful mark:**11.26**

- 1 Hopkins Island (34°58'S 136°03'E), sandy and flat-topped with steep cliffs.

Bays and anchorages**Thistle Island****11.27**

- 1 Anchorage may be obtained off the NE side of Thistle Island, in depths of 12 m, sand, with Observatory Point (34°56'S 136°06'E), bearing 276°, distant about 7½ cables and the SE end of the beach, bearing between 194° and 184°.
- Local knowledge** is required.
- 2 The tidal stream never runs at more than ½ kn; sometimes it is reversed in direction, the in-going stream running SE and the out-going stream NW, but with no regularity, and it frequently runs one way for 24 hours.

Whalers Bay**11.28**

- 1 **General information.** Whalers Bay (35°00'S 136°11'E) affords sheltered anchorage from S and W winds for coasters. Approximately 20 houses (1994) are situated 500 m from Whalers Bay beach.

Local knowledge is essential.

Anchorage, may be found, in depths of 7 m, sand, with Horny Point (35°00'S 136°11'E) bearing 071°, distant 2½ cables. A rock, which is awash, lies close W of Horny Point.

Waterhouse Bay**11.29**

- 1 Waterhouse Bay (35°03'S 136°12'E), is entered 1 mile N of Waterhouse Point (11.12), and affords anchorage for coastal vessels.
- Local knowledge** is essential.
- Caution,** a rocky patch, 1 cable long E-W, nearly awash and over which the sea breaks only at times, lies 1 cable offshore, about 2½ cables NW of the point.
- Anchorage,** may be found in depths of 5 m, sand.

Memory Cove**11.30**

- 1 Memory Cove (34°58'S 135°59'E), a small bight, is well sheltered from all winds from the NNW through W to SE. With NE or N winds a short sea gets up, which washes the sand from the beach leaving the rocks exposed.

Local knowledge is essential.

- 2 **Anchorage,** may be found in depths of 9 m, sand, on the alignment (088°) of the E point of the cove with the N cliff of Hopkins Island (34°58'S 136°03'E) and the E corner of the beach bearing 184°, larger vessels anchor further out in depths of 14 to 16 m, on the alignment of the E point of the cove with the N extremity of Smith Island (34°59'S 136°01'E) (11.25).

Taylor Island**11.31**

- 1 **Tidal streams,** see 11.19

Anchorage. The passage between Taylor Island and the mainland is free of danger and anchorage may be found in depths of 16 m, marl, with the S point of Taylor Island bearing 139°, and a remarkable high, striped limestone cliff on the mainland bearing 229°.

PORT LINCOLN**General information**

Chart Aus 134

Position**11.32**

- 1 Port Lincoln (34°43'S 135°56'E), is a large bay situated between Cape Donington (34°44'S 135°59'E) and Point Boston (5¼ miles NNW). The S part is known as Port Lincoln and the N part as Boston Bay. Port Lincoln includes Spalding Cove (34°46'S, 135°58'E), Porter Bay (34°44'S, 135°53'E) close S of Kirton Point (34°43'S 135°53'E), and Proper Bay also known as Port Lincoln Proper. The town of Port Lincoln is situated in the SW part of Boston Bay.
- 2 Porter Bay (33°44'S 135°53'E), with Lincoln Cove Marina at its head, is entered between Billy Lights Point (33°45'S 135°53'E) and Kirton Point (1½ miles NNW) (11.32). The S shore of the bay, consists of low rocky cliffs and sandy beaches backed by scrub covered hills. Foul ground extends about 2½ cables in all directions from the S entrance point of the bay.

Function**11.33**

- 1 Port Lincoln is a deep-water port and the main grain exporting port in South Australia. It is also the base for a large fishing industry, supporting over 100 boats.
- Port Lincoln forms the finest natural harbour in South Australia. The anchorage between Boston Island and the mainland is perfectly landlocked and affords anchorage to a large number of vessels.

Port Limits**11.34**

- 1 The limits of Port Lincoln include the waters, rivers, creeks and inlets of Spencer Gulf within a line drawn 3 miles seaward of a straight line between Cape Donington and Point Boston, as shown on the chart.

Approach and entry**11.35**

- 1 Port Lincoln and the anchorage in Boston Bay may be approached either N or S of Boston Island; the preferred

approach is to pass N of Boston island, which is wider and less obstructed, from whence a dredged channel marked by light-beacons leads to the principal berths.

- 2 A recommended route has been established from a position $2\frac{1}{2}$ miles ESE of Dangerous Reef Light (11.13), 333° for $10\frac{1}{2}$ miles to $2\frac{1}{2}$ miles S of Sibsey Islet Light (11.21), thence 313° for $3\frac{3}{4}$ miles, thence 263° to the pilot boarding position for Port Lincoln.

Traffic

11.36

- 1 In 2002, 120 vessels with a total of 5.7 million dwt used the port.

Port Authority

11.37

- 1 Flinders Ports Proprietary Ltd, PO Box 354, Port Lincoln, SA 5606. Website: www.flindersports.com.au

Limiting conditions

11.38

- 1 **Controlling depth.** Approach is through a channel maintained to 14.6m (2004).

Deepest and longest berth. Main Shipping Pier, No 4 and No 5 Berths (11.55).

Tidal levels. Mean maximum range about 1.3 m; mean minimum range about 0.3m. See information in *Admiralty Tide Tables Volume 4*.

- 2 **Maximum size of vessel handled.**

Oil Tankers LOA 182 m.

Grain carriers LOA 262 m draught 14.7 m

Phosphate carriers LOA 196 m.

Arrival information

Notice of ETA

11.39

- 1 ETA should be signalled 24 hours and 4 hours in advance. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages

11.40

- 1 **Boston Bay** ($34^\circ 41'S$ $135^\circ 53'E$), is situated between Kirton Point ($34^\circ 43'S$ $135^\circ 53'E$) and Point Boston ($4\frac{3}{4}$ miles NNE).

The Bay is protected from the sea by Boston Island. The shores of the bay consists mainly of sandy beaches backed by sandhills.

- 2 Anchorage, clear of marine farms (11.47), may be found at the N and S ends of the bay, in a depth of 13 m; the holding ground is reported to be fair or moderate.

North Shields ($34^\circ 38'S$ $135^\circ 52'E$), lies on the N shore of Boston Bay at the W end of the sandy beach. A jetty extends 1 cable SE from the village, with a depth alongside of 2.7 m. The jetty is closed to commercial traffic.

11.41

- 1 **Point Boston.** Anchorage, good holding ground, may be found 2 miles SE of Point Boston, in a depth of 18 to 22 m.

11.42

- 1 **Spalding Cove** ($34^\circ 46'S$ $135^\circ 58'E$) is entered between Cape Colbert ($34^\circ 44'S$ $135^\circ 59'E$) and Surfleet Point ($1\frac{3}{4}$ miles SW), and extends about 3 miles S. The shores consist of low rocky points and sandy bays, and on the E side there is a good deal of sandy cliff with scrub covered rises at the back. There are general depths of 9 to 14 m to

within 1 mile of the cove head and to within 5 cables of both sides.

- 2 There are no dangers in Spalding Cove and anchorage may be found anywhere in the bay in depths of between 9 and 14 m. The best anchorage is in the bay next S of the summit of Cape Colbert; with a strong N wind there is a short sea in the cove.

Pilotage and tugs

11.43

- 1 **Pilotage** is compulsory for vessels over 35 m LOA. Pilots board $1\frac{1}{2}$ miles ESE of Point Boston, as shown on the chart.

Tug is available.

Regulations concerning entry

11.44

- 1 Ships are required to have an underkeel clearance of 10% of maximum draught.

Daylight berthing only; sailing day or night.

Quarantine

11.45

- 1 Port Lincoln is a first port of entry. See 1.54 and *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

General layout

11.46

- 1 Port Lincoln is situated in the SW part of Boston Bay. The berthing areas are (with positions relative to Kirton Point ($34^\circ 43'S$ $135^\circ 53'E$)) at Port Lincoln Wharves (3 cables to 1 mile W) and BHP Jetty in Proper Bay (2 miles S) with Lincoln Cove Marina in Porter Bay ($1\frac{1}{4}$ miles S).

Marine farms

11.47

- 1 Marine farms are located throughout Port Lincoln, Boston Bay and Proper Bay as shown on the chart. These may be floating or fixed structures and may be marked by buoys or beacons which may be lit.

Natural conditions

11.48

- 1 **Winds** from the W prevail.

Tidal streams about 2 to 3 miles outside the port entrance set N and S. There is very little tidal stream in any part of Port Lincoln.

Principal marks

11.49

- 1 **Landmarks:**

Stamford Hill ($34^\circ 47'S$ $135^\circ 56'E$), sides covered with scrub; a white marble monument erected in memory of Captain Matthew Flinders stands on its summit, and forms the most prominent feature in Boston Bay.

North Side Hill ($34^\circ 45'S$ $135^\circ 49'E$), with a conical summit and a large boulder on one side, the only prominent hill on the W side of Port Lincoln.

- 2 Winter Hill ($34^\circ 42'S$ $135^\circ 50'E$), long flat summit with a radio mast standing on it. Radio masts, marked by lights stand $3\frac{1}{2}$ cables NNE of Winter Hill. Point Boston Light structure ($34^\circ 39'0S$ $135^\circ 56'2E$) (11.22).

Point Fanny Light structure ($34^\circ 44'S$ $135^\circ 58'E$) (11.22).

11.50**Major Lights:**

Cape Donington Light (33°43'·7S 135°59'·6E) (11.20).
Point Boston Light as above.

Directions

(continued from 11.22)

North of Boston Island**11.51**

- 1 From the vicinity of the pilot boarding area, the entrance channel is approached in the white sector (259°–268°) of No 1 Light-beacon (34°39'·8S 135°54'·3E), passing (with positions from Kirton Point (34°43'S 135°53'E)):

S of Point Boston (5¼ miles NE), the N entrance point of Boston Bay. It is broad and low and is the S extremity of a peninsula which has two round grassy hills on it. A light (11.22) is exhibited from the SE extremity of the point. Thence:

- 2 N of Maria Point (3¼ miles NE), the N point of Boston Island, low and rocky; Kangaroo Reef, marked by a light buoy (port hand), extends 6 cables NE from Maria Point. Thence:

N of Entrance Light-beacon, a directional beacon (4 miles NE).

The track leads generally WSW then SW and SSW, through the dredged channel marked by light-beacons as shown on the chart, passing:

- 3 ESE of Bass Shoal (2 miles N), thence:
ESE of No 3 Light-beacon, marking the E edge of Le Hunte Shoal (1½ miles N), thence as required to the berth.

Leading Lights:

Front light (beacon; white triangular topmark apex up) (34°43'·3'S 135°52'·1E).

- 4 Rear light (beacon; white triangular topmark apex down) (46 m SW of the front light).

The alignment (239½°) of these lights leads towards the berthing area at the root of Shipping Pier.

South of Boston Island**11.52**

- 1 From a position about 1 mile NE of Cape Donington, the track leads WSW passing (with positions from Cape Donington (34°44'S 135°59'E)):

NNW of Donington Reef (3 cables NNE), with a depth of 5·0 m over its outer end. A wreck lies on its W side. Thence:

NNW of Cape Donington (11.21), thence:

Between Cape Colbert (7½ cables WSW) and Hayden Point (2 miles SW) the SE extremity of Boston Island (2 miles W).

- 2 From a position 3½ cables S of Point Fanny, proceed as necessary to the berths at Shipping Pier and Kirton Point Jetty, taking care to avoid dangers the positions of which may best be seen on the chart. The track continues on the line of bearing, 245°, on BHP jetty (34°45'S 135°53'E), for the approach to the berth in Proper Bay passing NNW of the light-beacons (port hand) 7½ cables and 1·9 miles WSW of Point Fanny.

Useful marks**11.53**

- 1 Four grain silos (34°43'·4S 135°52'·0E) standing close SW of the root of Shipping Pier.
Radio mast, 5 cables S of Kirton Point.

Anchorage and Berths**Proper Bay****11.54**

- 1 Proper Bay (34°46'S 135°54'E), is entered between Surfleet Point (34°46'S 135°57'E) and Billy Lights Point (3½ miles W). The bay extends almost 8½ miles in a general SW direction. Proper Bay Jetty (11.55) lies 7 cables S of Billy Lights Point. The coast of this bay consists generally of sandy beaches backed by sandhills. General depths of 5 to 9 m are found in the bay as shown on the chart.

- 2 **Anchorage**, may be found in depths of 7 m, at the head of Proper Bay, with North Side Hill (34°45'S 135°49'E) bearing 004°, and a black point, at the S end of the beach at the head of the port, bearing 263°.

Berths**11.55**

- 1 Berths are available as follows (with positions from Kirton Point (34°43'S 135°53'E)):

Shipping Pier (5 cables W), with 9 berths; No 1 berth extending W from the root of the pier is no longer in use; No 2 berth is closed and used for recreational fishing only. The longest berths are No 4 on the W side and No 5 on the E side of the pier, both 330 m in length with depth alongside of 15·2 m. Berth No 9, has Ro-Ro facilities, stern ramp from the shore, with depth alongside of 5·7.

- 2 Petroleum products, Kirton Point Jetty (2 cables W), a T head jetty, having a wharf length face of 61 m. Berth length is 274 m, with depth alongside of 9·9 m.

Town Jetty (1 mile W), overall length of about 1¼ cable, with landing steps on the S side with depths from 3·4 to 4 m alongside.

- 3 Proper Bay Jetty (2 miles S), an L head jetty, with dolphins at each end. Head face length 122 m. Berth length 274 m, with depth alongside of 10·4 m.

Port Services**11.56**

- 1 **Repairs:** slipway for vessels 60 m LOA, capacity 1800 tons; minor repairs carried out.

Other facilities: hospital available; de-ratting can be carried out and de-ratting certificates issued. There are no facilities for the reception of oily waste.

Supplies: fresh water available at all berths; diesel fuel only available, supplied in drums or by road tanker; fresh provisions available, fresh vegetables are scarce at times.

Communications. Airport 12 km.

BOSTON BAY TO SHOALWATER POINT**General information**

Charts Aus 776, Aus 777

Route**11.57**

- 1 The route leads from a position about 1½ miles SE of Point Boston (34°39'S 135°36'E), about 90 miles NE to a position about 13 miles SE of Shoalwater Point Beacon (33°40'S 137°12'E).

Topography**11.58**

- 1 The coast between Point Boston (34°39'S 135°56'E) and Shoalwater Point Beacon (88 miles NE) consists generally



Port Lincoln Shipping Pier and Silos (11.55)

(Photograph – Ian Routledge)

of sandy beaches between rocky points and indented by bays, backed by hills and mountain ranges, stretches of the coast are fronted by rocks, as shown on the chart.

- 2 Sir Joseph Banks Group, consisting of about 20 islands, islets and above-water rocks, is situated E of Point Bolingbroke (34°32'S 136°06'E) (11.62).

Submarine cable

11.59

- 1 Care should be taken not to anchor in an area 1½ miles either side of a submarine cable laid between Shoalwater Point (33°39'S 137°12'E) and Point Riley (33°53'S 137°36'E).

Principal marks

11.60

- 1 **Landmarks:**
Pillawarta Hill (34°24'S 135°57'E).
Elbow Hill (33°43'S 136°48'E), a bold round summit appearing by itself.
Major lights:
Shoalwater Point Light (33°39'·6S 137°12'·8E) (11.10) (Chart Aus 778).
Point Boston Light (34°39'·0S 135°56'·2E) (11.22).

Other aid to navigation

11.61

- 1 **Racon.**
Middle Bank South Light-beacon (33°44'·0S 137°29'·7E).

Directions

(continued from 11.22)

11.62

- 1 From a position SE of Point Boston the track leads ENE, passing (with positions relative to Point Boston (34°39'S 135°36'E)):
SSE of Nowland Shoal (3 miles NE) with a depth of 6·7 m over it, thence:
SSE of Berlin Rock (7¼ miles ENE).
- 2 Thence the track leads NE passing (with positions relative to Winceby Island (34°30'S 136°17'E)):
SE of Point Bolingbroke (10½ miles SW), a rocky point from which shoals extend nearly 2 miles S and E. A light (white GRP hut, 4 m in height) is exhibited from the point. Thence:
- 3 NW of a rock (3¾ miles SW) which covers and uncovers lying mid way between Kirkby Island, shaped like a haycock and Marum Island, thence:
NW of Winceby Island, the N island of the Sir Joseph Banks Group. A light (white GRP tower; 6 m in height) is exhibited from the summit of the island. Thence:
NW of Judith Shoal (2 miles NE).
- 4 The track then leads NNE for about 45 miles to join the preferred route, shown on the chart, 14 miles W of Cape Elizabeth (34°08'S 137°27'E). The track then follows the preferred route for about 26 miles to a position 12 miles ESE of Shoalwater Point Beacon (11.12), passing (with positions relative to Warburto Point (34°00'S 137°32'E) (11.103)):

- 5 ESE of a shoal patch with a least depth of 13.1 m (20 miles W); thence:
WNW of Tiparra Reef (7 miles WSW), marked by a light (11.82); thence:
ESE of Clan MacDougall Shoal (33°53'S 137°13' E) (11.12).

Useful mark.

Middle Bank South Light-beacon (33°44'·0S 137°29'·7E).

(Directions continue for passage W of Middle Bank at 11.132 and E of Middle Bank at 11.134)

Bays and anchorages

11.63

- 1 **Caution.** Attention is drawn to the zone of confidence and reliability diagrams on charts; the coastal sections covering the bays and anchorages in this area are based on reconnaissance or incomplete surveys.

Louth Bay

11.64

- 1 **General information.** Louth Bay (34°34'S 136°00'E), is entered between Point Boston (34°39'S 135°56'E), and Point Bolingbroke (10 miles NE). The bay is indented by three distinct smaller bays.

Local knowledge, is necessary.

Caution. See 11.63.

- 2 The S bay is situated between a point 2½ miles N of Point Boston and Louth Island, about 1½ miles farther NNE, and is shallow. Tod River enters the bay about 4 miles NW of Point Boston; the mouth of the river is generally blocked with mud and weed.

- 3 The middle bay is situated between Louth Island (34°35'S 135°57'E) and Peake Point (5½ miles NE); its shores consists of rocky points and sandy bays with high, well wooded and cultivated land behind. There are depths of more than 11 m at its entrance.

- 4 Peake Bay, the N of the bays, is situated between Peake Point (34°31'S 136°01'E), a cliffy point, and Point Bolingbroke (4 miles ESE), a shoal with a least depth of 4.6 m, lies 6 cables S of Point Bolingbroke, and a rock with a least depth of 0.3 m over it lies between the point and the shoal; a dangerous wreck lies 3 cables E of the shoal. Bolingbroke Reef a drying reef, extends 3 miles W from Point Bolingbroke and restricts the entrance of Peake Bay to 7½ cables. A dangerous rock was reported (1973) lying 2 miles SW of Point Bolingbroke.

- 5 **Anchorage.** The best anchorage in Louth Bay may be found N of the sandspit extending from Louth Island, in depths of about 6 m, sand.

A good anchorage, sheltered from all but S winds, may be found in depth of about 5 m off the first long sandy beach in Peake Bay, N of Point Bolingbroke.

- 6 **Landing Place.** A jetty, with depth alongside of 1.5 m, extends about ½ cable N from the shore at a position about 1 cable W of Point Warna, 2 miles NNW of Louth Island; a 0.9 m patch lies offshore about 7½ cables N of the jetty, which is closed to commercial traffic. A large rock is situated adjacent to the E side of the jetty

Blyth Island

11.65

- 1 **Anchorage** sheltered from W and S winds may be obtained under the lee of the S part of the bank connecting Blyth Island (34°34'S 136°18'E) a sandy islet and Hareby Island (34°35'S 136°18'E), with Blyth Island bearing 308° and the N extremity of Hareby Island bearing 240°.

Local knowledge is essential.

Caution. See 11.63. An above-water rock (not charted) lies 3 cables NE of Blyth Island, with drying rocks lying between the rock and the island.

Reevesby Island

11.66

- 1 Reevesby Island (34°32'S 136°17'E), is the largest island in the N part of Sir Joseph Banks Group. A round green hill, with a clump of bushes near the top, rises to its summit at the S end of the island. A sandspit, with a rock awash at its extremity, extends about 4 cables W from a position about 1 mile S of the NW extremity of the island.

Local knowledge is essential.

Caution. See 11.63.

- 2 **Anchorage**, may be found NE of Partney Island (34°31'S 136°15'E) in depths of between 5 and 9 m.

Chart Aus 777

Tumby Bay

11.67

- 1 **Description.** Tumby Bay (34°23'S 136°10'E), also known as Harveys Bay, is entered between Tumby Island (34°25'S 136°08'E), and the coast E of the entrance to Salt Creek, 4½ miles NNE. A rocky ledge, which dries, extends 6 cables ENE from the NE point of Tumby Island a beacon (port hand), marks the E extremity of this reef.

From a position about 3 or 4 miles E of Tumby Island the range of coastal hills N of the bay is prominent.

- 2 A low, sandy shore forms the bay that lies between the point near Tumby Island and a low rocky point, 1½ miles NW of it. A rock awash, marked by a light-beacon (port hand) lies 3 cables N of the low, rocky point, and there are a few drying rocks lying between it and the coast W of it. The entrance to a swamp lies W of the low, rocky point. The shore of Tumby Bay, between the entrance to the swamp and the entrance to Salt Creek, is formed by a sandy beach, backed by a wooded bank.

- 3 The bay affords anchorage and the town of Tumby is situated in the SW corner of the bay, about 2½ miles NW of Tumby Island.

Local knowledge is required.

Caution. See 11.63.

Pilotage, is not compulsory, but a pilot can be obtained from Port Lincoln if desired.

11.68

- 1 **Directions.** Approach on a line of bearing 269° of the town jetty.

Useful mark:

Tumby Jetty Light (white wooden mast) (34°23'S 136°04'E).

- 2 **Anchorage**, may be found on the line of bearing 269° of the town jetty, in depths of from 5 to 9 m. There are depths of 5 m at a distance of about 5 cables offshore.

Anchorage may also be found, in depths of from 4 to 5 m, with the N end of Tumby Island bearing 122°.

- 3 **Jetty** extends about 2 cables E from the shore near the township. The jetty is closed to commercial shipping.

Supplies: fresh water is available, and most types of provisions.

Facilities: hospital available.

Lipson Cove

11.69

- 1 Lipson Cove (34°16'S 136°16'E), is formed by a sandy beach and a rock that extends about 2 cables NE from the S end of the beach; the cove contains a damaged and disused jetty.

Local knowledge is necessary.

Caution. See 11.63.

- 2 The anchorage area is only 3 cables across and provides little room for manoeuvre with the wind from the NE; it should only be used when the wind is offshore and likely to continue so.

Anchorage may be found in depths of 5 m about midway between the NE end of the rock and the N end of the beach.

Mottled Cove

11.70

- 1 Mottled Cove (34°06'S 136°21'E), is a small sandy bay, situated about 1 mile N of Cape Burr (34°07'S 136°21'E). Port Neill, a small settlement, stands at the SW corner of the cove. A light-beacon is situated 2 cables NW of Cape Burr. A fish haven marked by a buoy (special) lies 1¼ miles NE of the Cape.

Local knowledge is necessary.

Caution. See 11.63.

- 2 **Anchorage** may be obtained in depths of 5 m, between Cape Burr and the jetty.

Berth. An L-shaped jetty, extends about 250 m NE from the shore at Port Neill. The jetty is closed to commercial traffic.

Dutton Bay

11.71

- 1 Dutton Bay (34°05'S 136°24'E), is formed by a slight curve in the coast between Cape Burr (34°07'S 136°21'E), and a sandy point (11 miles NE).

Local knowledge is necessary.

Caution. See 11.63.

- 2 **Anchorage.** Good anchorage for small vessels may be obtained on the coastal bank in the N part of the bay, 10 miles NE of Port Neill jetty (11.70), in depths of 5 m, sand, about 1 mile offshore with Cape Driver (33°56'S 136°35'E) bearing 043° and the SW extremity of the long beach, 7¾ miles N of Port Neill bearing 263°.

Arno Bay

11.72

- 1 Arno Bay (33°55'S 136°35'E) is situated between Cape Driver (33°56'S 136°35'E) and a position 2 miles N. Salt Creek is the name given to the head of the bay. A drying reef extends 2 cables from a sandy point about 5 cables N of Cape Driver and a similar reef extends 3 cables SE from another sandy point 1½ miles further N. A dangerous rock, marked by a beacon (isolated danger), lies 2 cables SW of the latter reef.

- 2 A salt creek enters the bay in a position about 8 cables NNE of Cape Driver. The bar across the entrance to the creek has depths of 1.5 m over it at HW and is navigable by boats for a distance of 5 cables.

Local knowledge, is necessary.

Caution. See 11.63.

- 3 **Anchorage** for small vessels may be obtained in depths of 6 m, sand, with Cape Driver bearing 195°, distant nearly 1¼ miles and the mouth of the creek bearing 257°. This anchorage affords protection from winds between N and SW.

Landing. A jetty extends 1 cable SE from the shore close N of the creek. The jetty is closed to commercial traffic.

Port Gibbon

11.73

- 1 Port Gibbon (33°49'S 136°49'E), is the bay extending from Gibbon Point (33°50'S 136°47'E) to The Knob a low rocky point (¾ miles NE).

A ledge of rocks extends for some distance offshore 2½ cables E of the low rocky point.

Local knowledge is necessary.

Caution. See 11.63.

- 2 **Anchorage,** for small vessels, sheltered from W wind may be found, in depth of 6 m, with Gibbon Point bearing 229° distant 5 cables.

Berth, a jetty, 60 m in length, with depths alongside of 2.1 m extends S from the shore 2 miles NNE of Gibbon Point.

Franklin Harbour

11.74

- 1 **Description.** Franklin Harbour (33°44'S 136°57'E) is situated between Germein Point (33°45'S 136°58'E) and Victoria Point (1¼ miles NE). The entrance is fronted by a bar, over which the sea generally breaks, except with an offshore wind. The harbour is a large sheet of shallow water that affords good shelter from all weathers. The shores round the harbour are generally very low, swampy and covered with mangroves, except in the NE corner, where there is a bare sandy beach.

- 2 Entrance Island, which is divided into two parts, is situated 7½ cables within the entrance. The SW part is cliffy on its E side, and sloping on the W; the highest part is about 4 cables from the S end. the Island is infested with Death Adders of the most venomous description.

Franklin Harbour is a fishing port only, and is closed to commercial traffic.

Cowell (33°41'S 136°56'E), a small town stands, in a gap in the mangroves on the W side of the harbour.

11.75

- 1 **Tidal streams,** are reported to attain a rate of up to 6 or 7 kn at times, owing to the large area of Franklin Harbour and the comparative narrowness of the entrance.

A long continuance of S or SW winds raises the level of the water in the harbour, as much as 0.6 to 0.9 m; the tidal streams are then very strong.

Local knowledge is necessary.

Caution. See 11.63.

11.76

- 1 **Directions.** Franklin Harbour is entered over a bar with least charted depth of 3 m. The channel inside the bar is indicated by 5 sets of leading light-beacons, and marked by light-beacons and unlit beacons to Cowell jetty, as shown on the plan.

From a position about 2½ miles S of Victoria Point (33°45'S 136°59'E) the approach leads NW.

- 2 **Leading lights Set No 1:**

Front light (white triangle, black border, on pile structure) (33°43'9, 136°58'3E).

Rear light (white triangle, on post) (5 cables from front light).

The alignment (330°) of these lights leads into the entrance channel to Franklin Harbour, passing (with positions from the Entrance Light-beacon (33°45'4S 136°59'2E):

- 3 Close NE of the Entrance Light-beacon, marking the SW side of the channel. The underwater remains of a beacon lie on the NE side of the channel about 3 cables NE of the Entrance Light-beacon. Thence:

Between Germein Point (1¼ miles NW), a low point, composed of masses of sand and weed which shift around from time to time, and Victoria Point (1¾ miles N), faced by a red cliff.

- 4 From a position about 1½ cables SSE of No 1 Light-beacon, the track leads WNW.

Leading lights Set No 2:

Front light (framework tower on piles) (33°43'9S 136°57'1E).

Rear light (white framework tower on piles) (180 m W of the front light).

- 5 The alignment (277°) of these lights leads through the entrance channel passing (with positions from the front light):

S of the beacon (3 cables E), marking the SW ledge of Entrance Island (11.74).

From a position SW of the beacon above, the track alters N towards the alignment of the next set of leading lights.

- 6 From a position about 2 cables NNE of No 3 Light-beacon, the track leads NNE.

Leading lights Set No 3:

Front No 5 Light-beacon (red framework tower on piles) (33°43'0S 136°57'6E).

Rear No 6 Light-beacon (structure as above).

- 7 The alignment (024°) of these lights continues to lead through the channel.

Caution, the out-going stream runs very strongly here especially after a long continuance of S or SW winds.

The channel beyond this is indicated by leading lights as shown on the chart.

- 8 **Useful marks:**

N Jetty Head Light (red metal column) (33°41'4S 136°56'1E).

11.77

- 1 **Berths at Cowell:**

N Jetty, extends 320 m SE from the head of a causeway and has a depth of 3 m alongside. A light is exhibited at its head.

S Jetty, extends 147 m E from the head of a causeway.

Hospital available.

Supplies: provisions in small quantities; fresh water available at N Jetty.

NEPTUNE ISLANDS TO POINT RILEY

General information

Charts Aus 343, Aus 776, Aus 777

Route

11.78

- 1 The route leads from a position about 7 miles S of South Neptunes (35°20'S 136°07'E), 120 miles NNE to a position about 11 miles WNW of Point Riley.

Topography

11.79

- 1 Between Cape Spencer (35°18'S 136°52'E) and Corny Point (25 miles NNE), the coast is generally composed of a



Corny Point from N (11.79)

(Original dated 1986)

(Photograph – Australian HO)

succession of sandy beaches and rocky points, fronted by rocks and islands extending up to 3 miles offshore.

From Corny Point (34°54'S 137°01'E), to Island Point (34 miles NE), the coast consists generally of sandy beaches and rocky points and is indented by Hardwick Bay.

- 2 Between Island Point (34°26'S 137°26'E), and Cape Elizabeth (18 miles N), the coast consists mainly of sandy beaches fronted by rocks and ledges extending in places, up to 5 cables offshore. The last 8 miles to Cape Elizabeth is backed by white sandhills. From Cape Elizabeth to Point Riley (33°53'S 137°36'E), sandy beaches and bays continue, fronted by rocks and reefs which extend up to 9 miles offshore.

Submarine cable

11.80

- 1 Care should be taken not to anchor in an area 1½ miles either side of a submarine cable laid between Shoalwater Point (33°39'S 137°12'5E) (chart Aus 778) and Riley Point (33°53'S 137°36'E)

Major lights

11.81

- 1 South Neptunes Light ((35°20'4S 136°06'8E) (11.10).
Althorpe Island Light (white stone tower with lantern; 20 m in height) (35°22'4S 136°51'9E).
Cape Spencer Light (white square concrete tower and lantern; 9 m in height) (35°18'0S 136°53'1E).
- 2 Wedge Island Light (35°10'S 136°29'1E) (11.10).
Corny Point Light (white round stone tower; 15 m in height) (34°53'8S 137°00'6E).
Warbuto Point Light (white GRP hut on red framework tower; elevation 32 m) (34°00'4S 137°33'1E).

Directions

11.82

- 1 From a position about 7 miles S of South Neptunes (35°02'S 136°07'E) the track leads ENE passing (with positions from South Neptunes):
NNW of Lake Macquarie Bank (26 miles E) with a depth of 29.5 m over it, thence:
SSE of Suzanne Shoal (22 miles ENE), and Louise Shoal, a rocky patch, lying 1½ miles NNW in the vicinity of which the sea breaks heavily during SW gales.
 - 2 From a position about 8 miles W of West Cape (35°15'S 136°49'E), the track leads NNE passing (with positions from West Cape):
WNW of Lawrey Shoal (2¾ miles WNW), thence:
WNW of West Cape, a cliffy point. A light (cylindrical steel tower, white lantern; 9 m in height) is exhibited from the point. Thence:
WNW of Waller Shoal (2¼ miles NNW), thence:
 - 3 WNW of Webb Rock (17 miles NNE); a knob on the outer part of the rock is awash, and over it the sea generally breaks heavily, except during the summer with continuous E winds when it breaks only at intervals, and then only slightly. Thence:
WNW of Corny Point (23 miles NNE), a double sloping, rocky projection. A light (11.81) is exhibited from the point.
- The track continues to lead NNE to join the preferred route about 15 miles W of Cape Elizabeth (11.103), passing (with positions from Wardang Island (34°30'S 137°21'E):

4

NNW of Wardang Island, covered with grass except near the coast, and rising to a summit near its W side. There are sandhills towards its N end and some remarkable cliffy points. Above and below-water rocks extend up to 5 cables from the S part of the island. Historic wrecks lie close offshore on the W side of the island. A light (white GRP hut; 4 m in height) is exhibited from the summit of the Island. Goose Islet, small and grassy, lies 3 cables off the N point of Wardang Island.

5

Thence the track continues NNE passing:

WNW of Tiparra Reef (24 miles N) (11.103). A light (metal pile) (34°04'0S 137°23'4E) is exhibited from the SW end of the reef. Thence:

WNW of Point Riley (37 miles NNE), a cliffy projection, fronted by rocky ledges that extend up to 2½ cables offshore.

(Direction continue at 11.134)

Bays and anchorages

Chart Aus 345 with plan of Althorpe Islands

11.83

- 1 **Caution.** Attention is drawn to the reliability diagrams on charts; the coastal sections covering the bays and anchorages in this area are based on reconnaissance or incomplete surveys.

Pondalowie Bay

11.84

- 1 **General information.** Pondalowie Bay (35°14'S 136°50'E) is a small bay indenting the coast between a point 7½ cables NNE of West Cape (35°15'S 136°49'E) and Royston Head (2½ miles NNE). A reef of underwater rocks, over which the sea breaks during SW gales, extends 5 cables seaward from the S point of the bay. The E shore of the bay consists of a sandy beach backed by sandhills.
- 2 The entrance is fronted by three islets, dark coloured on their W side; with the sun against them these islets appear black against the sandhills on the shore.
The S islet is small and steep to and is joined to the S point of the bay by drying ground. A dangerous rock, over which the sea breaks at times during SW gales, lies 3½ cables NE of the islet, close inside the entrance to the bay.
- 3 The middle islet lies about 7½ cables N of the S islet and is separated from the mainland by a rocky channel; a drying reef extends 4 cables from its W point, and a similar reef extends about 1 cable from its S side.
The N islet lies close to Royston Head (35°12'S 136°50'E) and is connected to it by a drying reef.
- 4 **Local knowledge** is necessary.
Caution. See 11.83
Directions. Pondalowie Bay is entered between the S and middle islets, the channel between the islets is nearly 7½ cables wide with a depth of 11 m (36 ft). A light is exhibited from the S islet.
- 5 **Clearing bearing.** The line of bearing 105° of a high sandhill, open S of S islet, passes clear of the dangerous rock NE of that islet, and the reef extending S from the middle islet; this line of bearing passes the S islet, which is steep-to, at a distance of about 1 cable.
Anchorage, sheltered from winds between N through E to WSW, may be obtained in the S bight of Pondalowie Bay about 2½ cables offshore. The holding ground is poor, smooth limestone with a thin covering of sand.



West Cape & Pondalowie Bay from SSW (11.84)

(Original dated 1986)

(Photograph – Australian HO)

Chart Aus 776

Formby Bay**11.85**

- 1 **General information.** Formby Bay (35°05'S 136°56'E) is an indentation on the coast between Royston Head (35°12'S 136°50'E) and Daly Head (10 miles N) which is steep and rocky with a grassy summit.

The coast consists of a sandy beach 5 miles long, backed by high sandhills. Rocks extend up to 2 cables offshore from the S point. A reef, part of which is 1 m high, extends about 5 cables seaward from Daly Point.

Caution. See 11.83.

Hardwicke Bay**11.86**

- 1 **General information.** Hardwicke Bay (34°40'S 137°20'E), is situated between Corny Point (34°54'S 137°01'E), and the S point of Wardang Island (28 miles NE).

The coast between Corny Point and Souttar Point (13 miles E) is formed by a sandy beach backed by gently rising woodland. A spit with depths of less than 5 m extends 3¼ miles NNW from a low sandy point 8¼ miles E of Corny Point.

- 2 Between Souttar Point (34°54'S 137°17'E) and Point Turton (4 miles ESE) the coast consists of small stony beaches and limestone cliffs. A sandy beach, which trends E and NE for 5 miles from Port Turton, forms the head of Hardwicke Bay.

The coast between the NE end of this sandy beach and Point Gawler (25 miles N), consists of sandy beaches and low rocky points backed by a coastal range of sandhills.

- 3 **Caution.** See 11.83.

The general depths of the bay are between 14 and 20 m, but there are irregular depths in the middle and between 5 and 10 miles SW of Wardang Island (11.82) the depths are very irregular. The rocky bottom raises a disturbed sea in the bay during W gales.

- 4 Port Turton (11.88) is situated in the SE part of the bay, Port Minlacowie (11.91) and Port Rickaby (11.92) on the E shore and Port Victoria (11.94) at the N end.

Anchorage sheltered from all S winds, which are the only ones that blow with much strength, may be found in many parts of the bay. The bottom at all ports in the bay is rocky, but with a good scope of chain, a vessel should ride comfortably.

- 5 **Tidal streams.** The N-going and S-going streams follow the direction of the coast. The tidal streams are not as strong inshore as they are further out.

Directions. As a general rule when approaching any of the ports in Hardwicke Bay, there are depths of more than 9 m to within a distance of 1 mile of the shore, but in some parts, off Port Victoria and Point Turton, such depths are found much nearer in; at night, to avoid all dangers, vessels should anchor immediately depths of less than 9 m are obtained.

Corny Point**11.87**

- 1 **Caution.** See 11.83.

Anchorage, may be obtained, off Corny Point settlement, in depths of about 8 m, with Corny Point bearing 257°. Anchorage, with good holding ground and smooth water may also be found, in depths of 5 m, about

5 cables offshore between Souttar Point Light (pile beacon; 6 m in height) (34°53'2S 137°12'4E) and Souttar Point (4 miles ESE).

Port Turton

11.88

- 1 Port Turton (34°57'S 137°21'E), is situated close E of Point Turton (34°56'S 137°21'E), and is a fishing port only.

Local knowledge, is necessary.

Caution. See 11.83. The bottom in the neighbourhood of Port Turton is so rocky that a broken sea gets up very quickly, subsiding as quickly when the wind goes down.

11.89

- 1 **Directions.** The port should be approached, keeping Corny Point (34°54'S, 137°01'E) on a line of bearing of less than 237° astern, until Mount Gore (101 m high) (35°00'S 137°16'E) (chart Aus 444), with a radio mast at its summit, bears more than 181°, thence as requisite for jetty or anchorage. Vessels with a draught of less than 4-6 m, may keep Corny Point on a line of bearing astern of less than 247°, until Mount Gore bears more than 163°, thence as requisite for berth.

11.90

- 1 **Anchorage**, may be obtained in depths of 6 to 7 m, with the jetty bearing 230°, distant 3 cables. Anchorage for small vessels may be found on a line of bearing 241° of the jetty, distance 1½ cables.

Berth: a jetty with depths of 3-4 m alongside its outer end, extends ¾ cable from the SE side of Point Turton (11.86). A light (white wooden mast) is exhibited at the head of the jetty. The jetty is closed to commercial shipping.

- 2 **Caution**, a number of rocks, with depths of from 0-6 m to 1-2 m over them, lie off either side of the jetty and at its extremities.

Port Minlacowie

11.91

- 1 **General information.** Port Minlacowie (34°51'S 137°28'E), is situated 8½ miles NE of Point Turton (11.86). The shore is backed by low sandhills, covered with bushes and small trees, and fronted by a ledge of rocks which dry out for a distance of 1½ cables.

A number of dangerous rocks, with depths of 0-6 to 3-4 m over them, lie up to about 2½ cables offshore.

- 2 **Local knowledge**, is necessary.

Caution. See 11.83.

Anchorage, may be obtained, in depths of about 6 m, about 3½ cables offshore, or in a depth of 7 to 8 m, about 6½ cables offshore.

Port Rickaby

11.92

- 1 **General information.** Port Rickaby (34°40'S 137°30'E), is situated 11 miles N of Port Minlacowie and is fronted by a sandy beach. A jetty which can no longer be used by shipping extends about 1 cable W from the shore.

- 2 A tree-topped hill rises to its summit about 2½ cables S of the jetty. A sandy beach, which is clear of rocks, lies between a rocky point 1¾ cables N of the root of the jetty, and a position about 4 cables farther N, from which rocky ledges that dry extend 4 cables seaward. Two bare sandhills rise behind this clear beach.

A drying reef lies 1 cable off the rocky point 1¾ cables N of the root of the jetty.

- 3 Depth of less than 5 m do not extend more than 1½ cables off the clear beach, but a number of rocky

patches, with depths of from 4 to 5 m over them, lie about 4 cables off the middle of the beach; beyond this, the bottom is very irregular, but there are no depths of less than 5 m.

Local knowledge is necessary.

Caution. See 11.83.

- 4 **Directions**, when approaching Port Rickaby, vessels should keep at least 1 mile off the coast until the S bare sandhill, on which there is a pole, bears between 072° and 140°.

Anchorage, may be obtained in depths of from 7 to 8 m, with the S of the two bare sandhills, on which there is a pole, bearing 095°, about 7½ cables offshore; small vessels may anchor about 2 cables offshore, in depths of about 6 m on the same bearing.

Chart Aus 777

Balgowan

11.93

- 1 Point Warrenne (34°19'S 137°30'E), is a low rocky projection with grassy summit, and a sandy beach on either side. The settlement of Balgowan is situated on the point.

Caution. See 11.83.

A jetty, having a depth of 2-3 m alongside its outer end, extends ¾ cable from the point. A reef lies about 1 cable W of the jetty which is no longer used by shipping.

Port Victoria

Chart Aus 776

General information

11.94

- 1 **Description.** Port Victoria (34°27'S 137°28'E) is the name given to the bight on the N side of Hardwicke Bay, E of Wardang Island, and the peninsula of which Point Pearce (34°28'S 137°26'E) is the S extremity.

The town of Port Victoria stands 7½ cables N of Point Gawler (34°30'S 137°28'E).

Caution. See 11.83.

Approach. Port Victoria is approached through Hardwicke Bay.

Limiting conditions

11.95

- 1 **General depths.** Depths in the harbour are from 6 to 9 m, but the N and W sides of the harbour are shallow.

Harbour

11.96

- 1 Port Victoria affords shelter from all winds except those between SW and S; the holding ground is not good, and NW and W gales generally terminate with a gale from SW, when this anchorage becomes dangerous.

Within the harbour are a jetty in front of Port Victoria and a ramp 7 cables S of it.

- 2 **Tidal streams.** At the anchorage NE of Wardang Island (11.82) the tidal stream sets N and S; the N-going stream attains a rate of about 1¼ kn. Tidal streams in the vicinity of Rocky Island Channel, set NW and SE with rates of 2½ kn at springs.

- 3 **Marine farms.** A number of marine farms, which may be floating or fixed structures, are located in Port Victoria. These are normally marked by buoys or beacons which may be lit.

Directions

11.97

- 1 From a position about 34°32'S 137°25'E at the N end of Hardwicke Bay the approach leads generally NNE.

Eclipse Rock (34°30'S 137°28'E), lies 2¾ cables W of the head of the jetty (11.101). The rock is marked by a beacon (starboard hand).

- 2 Within the harbour the ramp (11.96) is approached on the alignment (108½°) of leading lights:

Front (34°30'·6S 137°28'·7E).

Rear (87 m from front light).

Side channels

11.98

- 1 **Local knowledge** is necessary.

A channel leads into Port Victoria passing N of Rocky Island (34°29'S 137°26'E).

Three channels, which are liable to change, intersect the spit that extends ENE from Bird Point, the E extremity of Wardang Island, to Rocky Island. The E channel, known locally as Rocky Island Channel, is the deepest and is marked on its E side by two beacons (port hand).

Anchorage

11.99

- 1 **Wardang Island.** Anchorage may be obtained in depths of 8 m, sand and mud, NE of Wardang Island with the summit of Goose Islet (11.82) bearing 268°, and Bird Point bearing 179°. Small vessels may anchor farther S. There is shelter from all but N and W winds.

- 2 **Caution.** Historic wrecks, both marked by buoys (orange) lie 1 mile E of Goose Islet, and 5 cables off the NE of Wardang island. A further three historic wrecks lie in the vicinity of Wardang Island as shown on the chart. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

11.100

- 1 **Port Victoria.** Off the jetty, anchorage, may be found for vessels with a draught of 5·5 m, in depths of from 6 to 7 m, with the head of the jetty bearing 134°, distant not less than 5 cables; vessels of greater draught anchor in depths of from 7 to 8 m, with the jetty bearing 095°, distant not less than 1 mile.
- 2 Small vessels unable to go alongside the jetty, may with the permission of the harbourmaster, obtain anchorage in depths of 3 m or over, with the head of the jetty bearing 162°, distant 1½ cables.

Berths

11.101

- 1 The jetty has an L-shaped head with depth of 3·4 m alongside its outer end and 1·8 m for a distance of about 120 m within its outer end. There are landing steps with a depth of 3 m alongside. A light is exhibited from the head of the jetty, which is closed to commercial traffic.

A ramp is situated 3 cables E of Point Gawler (11.94).

Port services.

11.102

- 1 **Hospital** at Maitland 7 km distant.
Supplies: fresh water, provisions in limited quantities.

Tiparra Bay

Chart Aus 777

General information

11.103

- 1 Tiparra Bay (34°04'S 137°30'E), is entered between Cape Elizabeth (34°08'S 137°27'E), a rounded sandy point off which a drying ledge extends 3 cables W, and Warbuto Point (8½ miles NNE), a rocky point projecting about 1½ miles WSW from the mainland.

Tiparra Reef (34°04'S 137°24'E) (11.12), divides the entrance into two parts.

- 2 Port Hughes (34°05'S 137°33'E), a small town and fishing port is situated in the middle of the E shore; Port Moonta (34°04'S 137°33'E), another fishing port, is situated about 1½ miles NNE.

The shore of Tiparra Bay is in general fronted by drying sand flats, with rocky ledges in the N part. The bight in the SE part of the bay is backed by salt swamps.

Caution. See 11.83.

Tidal streams

11.104

- 1 Tidal streams in the vicinity of Cape Elizabeth, Tiparra Reef, and Warburto Point, are strong and irregular. Off Cape Elizabeth the streams set NW and SW at a rate of up to 2 kn.

Over Tiparra Reef tidal streams set NNE and SSW, at a rate of 2 kn; outside the reef the streams set in a more N and S direction.

In Tiparra Bay, the tidal streams follow, the general direction of the shore, but are not so strong as outside the bay.

Directions

11.105

- 1 **Local knowledge**, is essential.
Vessels approaching Tiparra Bay from the W should keep the line of bearing less than 128° on Cape Elizabeth, until at least 1 mile S of Tiparra Reef Light (34°04'S 137°24'E) (11.12).
- 2 Small craft approaching from the S, having passed W of Cape Elizabeth beacon (W cardinal) marking the outer end of a dangerous rocky patch, and clear of a dangerous wreck (position approximate), 1¼ miles W of the beacon, may enter the bay in a least depth of 7·3 m, with a sandhill (34°06'·5S 137°31'·7E) (30 m high) having considerable bare space on its side, bearing 084°.
- 3 Vessels of light draught may use the entrance between the bank extending from Warburto Point and Tiparra Reef; the 30 m sandhill is a good mark.
The channel between the rocky patch and Cape Elizabeth should not be used, as the tidal streams attain a rate of 3 kn.

11.106

- 1 **Useful marks:**
Port Hughes N and S Breakwater Lights (beacons) (34°04'·5S 137°32'·7E).

Anchorage

11.107

- 1 Anchorage, may be obtained in depths of from 7 to 9 m, about 5 cables off Port Hughes; or about 7½ cables off Port Moonta, in similar depths.

Anchorage, sheltered from SW gales, may be found in depths of 8 m, mud, in the S part of Tiparra Bay with the N extremity of Cape Elizabeth bearing 238° and the 30 m sandhill (11.105) bearing 092°.

Berths

11.108

- 1 Port Hughes has a jetty with depths alongside of 6·1 m extending 2¼ cables W from Middle Point (34°05'S 137°33'E), a rocky projection with a smooth grassy summit. The jetty is closed to commercial traffic. There is a slipway for small craft near the jetty.

Port Moonta (1½ miles NNE of Port Hughes) has a jetty with depths alongside of 2·1 m, extending 2¾ cables W from the shore.

Port services**11.109**

- 1 **Hospital** situated at Moonta, 1½ miles distant.
Supplies: fresh water, provisions in limited quantities.

WALLAROO**General information**

Chart Aus 777 and plan of Wallaroo Bay

Position**11.110**

- 1 Wallaroo (33°56'S 137°37'E) stands on the SE shore of Wallaroo Bay, situated between Point Hughes (33°56'S 137°36'E) and Point Riley (3½ miles N).

Function**11.111**

- 1 Wallaroo is a small commercial port used for the importation of fertilisers and the export of grain and seeds.

Topography**11.112**

- 1 Point Riley is a cliffy projection that is not easily distinguished until well in, either S or N of it; the land at the back of it is much higher than the point. Point Riley is fringed with rocky ledges extending 5 cables offshore. Moonta Shoal and Riley Shoal which is a bank of hard sand, lie 1½ miles SW and 1 mile WSW respectively of Point Riley.
- 2 The head of Wallaroo Bay is a fine sandy beach, the coast becoming rocky and rugged between the beach and Point Riley. White sandhills are situated on the coast, 5 cables NNE of Wallaroo.

Approach and entry**11.113**

- 1 The port is approached from the W through a dredged channel marked by light-beacons.

Traffic**11.114**

- 1 In 2002, 68 vessels totalling 3 088 706 dwt used the port.

Port Authority**11.115**

- 1 Flinders Ports Proprietary Ltd, Wallaroo, S.A. Australia 5556. Website: www.flindersports.com.au

Limiting conditions**Controlling depth****11.116**

- 1 **Controlling depth.** The maintained depth in the channel is 8.5 m.

Deepest and longest berth. Wallaroo Jetty, No 2 North (11.125).

Tidal levels. Mean maximum range about 1.5 m; mean minimum range about 0.7 m. See information in *Admiralty Tide Tables Volume 4*.

- 2 **Density of water:** 1.028 to 1.030 g/cm³.

Maximum size of vessel handled: 37 222 grt, draught 9.6 m.

Arrival information**Notice of ETA****11.117**

- 1 ETA should be reported 72 hours and lesser intervals in advance, see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages**11.118**

- 1 Although Wallaroo Bay is so open, the force of the sea is broken, and there is good and secure anchorage. In suitable light the bottom shows very clearly in the approaches, the weeds on the bottom appearing like rocks with white sand between them.

Anchorage for vessels awaiting a pilot for extended periods may be obtained between 1 and 2 miles W of the Entrance Light-beacon.

Pilotage and tugs**11.119**

- 1 **Pilotage** is compulsory for all vessels over 35 m LOA. The pilot boards about 1½ miles W of the Entrance Light-beacon, as shown on the chart, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Tugs. Vessels over 200 m LOA or 30 m beam require two tugs for berthing.

Quarantine**11.120**

- 1 Wallaroo is a first port of entry. See 1.54 and *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour**General layout****11.121**

- 1 The port of Wallaroo consists of an exposed jetty extending 870 m from the shore abreast the town.

Tidal streams**11.122**

- 1 Outside the line between Point Hughes and Point Riley, a W gale prolongs the NE-going stream and stops the SE-going stream altogether.

The tidal streams are barely felt at the anchorage N of New Jetty, but a strong W wind causes the prolonged NE-going stream to flow into Wallaroo Bay, producing a discernible outflow to windward in the S part of the bay, in the vicinity of the port.

Directions**Entrance channel****11.123**

- 1 From a position E of the pilot boarding position (33°54'S 137°31'E), the track leads E into Wallaroo entrance channel passing with positions from the Entrance Light-beacon (starboard hand) (33°54'5S 137°33'2E)).

N of the Entrance Light-beacon, marking the S side of the outer end of the channel, thence:

- 2 Between No 1 Light-beacon (starboard hand) (4 cables E) and No 2 Light-beacon (port hand).

The track continues to lead E, then generally SE and S, through the maintained channel marked by light-beacons (port and starboard hand) as shown on the chart, passing: W of No 12 Light-beacon (port hand), thence:

As requisite into the turning area and towards the berth.

- 3 **Lights in line:**

Front light (white triangle apex up, black border) (33°55'9S 137°36'9E).



Wallaroo Jetty and Silos (11.125)

(Photograph – Ian Routledge)

Rear light (white triangle, apex down, black border)
(305 m from front light).

The alignment ($120\frac{1}{2}^\circ$) of these lights, assist in berthing vessels.

Useful marks

11.124

- 1 Chimney ($33^\circ56'S$ $137^\circ38'E$), prominent, square, built of light coloured bricks. It is the E of several chimneys at the Wallaroo smelting works rising high above the surrounding country. It can be seen over Warburto Point (11.104).
Grain Silos ($33^\circ56'S$ $137^\circ37'E$), conspicuous, situated near the root of the Wallaroo Jetty.
Wallaroo Jetty Head Light (white metal tower) ($33^\circ55'6S$ $137^\circ36'6E$).

Berths

11.125

- 1 Wallaroo Jetty has three berths on each side. The longest No 2 berth is on the N side, 290 m in length, with depth alongside of 9.5 m. On the N side of the jetty, approximately 600 m E of the Jetty Head Light, a spur jetty extends NE. A light is exhibited from its seaward end.

Port Services

11.126

- 1 **Repairs:** minor repairs carried out.
Other facilities: hospital available. De-ratting can be carried out and exemption certificates issued. There are no facilities for the reception of oily waste.
Supplies: marine fuel available by road tanker. Fresh water available at Wallaroo Jetty. Fresh provisions.

SHOALWATER POINT TO PORT AUGUSTA

GENERAL INFORMATION

Chart Aus 778

Scope of the section

11.127

- 1 This section comprises the following:
Shoalwater Point ($33^\circ40'S$ $137^\circ12'E$) to Whyalla (11.128).
Whyalla ($33^\circ02'S$ $137^\circ36'E$) (11.140).
Port Bonython ($33^\circ01'S$ $137^\circ46'E$) (11.163).
Germain Bay (11.180).

Port Pirie ($33^\circ11'S$ $138^\circ01'E$) (11.187).

Point Lowly to Port Augusta (11.203).

SHOALWATER POINT TO WHYALLA

General information

Chart Aus 778

Route

11.128

- 1 The passage W of Middle Bank leads from a position ESE of Shoalwater Point ($33^\circ40'S$ $137^\circ12'E$) about 42 miles NE to a position SW of Whyalla.

The passage E of Middle Bank leads from a position ESE of Shoalwater Point about 30 miles N to a position W of Yarraville Shoals Light-beacon (11.132).

Topography

11.129

- 1 The coast between Shoalwater Point (33°40'S 137°12'E) and Plank Point (15 miles NNE), is low.

Between Plank Point (33°27'S 137°21'E) and the foot of Mount Young (21½ miles NNE), the coast consists either of beach or mangrove bushes. Western Shoal, with several drying patches, extends 4½ miles off the coast in the neighbourhood of Mount Young.

- 2 The coast between Mount Young (33°06'S 137°29'E) and Whyalla (6½ miles NE), is very low and swampy for some distance inland and fringed with mangroves. Drying sand-flats extend from 5 cables to 1 mile off this stretch of coast.

From Point Riley (33°53'S 137°36'E), to the S limits of Tickera Bay (7 miles NE), the coast is rocky with limestone cliffs, thence a sandy beach, fronted by a drying flat extends to Port Broughton (33°35'S 137°55'E).

Principal marks

11.130

- 1 **Landmark:**

Mount Young (33°06'S 137°29'E), the most prominent feature of this part of Spencer Gulf, rises steeply on all sides. The hill when seen from a distance appears as a double peak.

Major Light:

Shoalwater Point Light (33°39'·6S 137°13'·0E) (11.10).

Point Lowly Light (white round stone tower; 25 m in height) (33°00'·0S 137°47'·1E).

Other aid to navigation

11.131

- 1 **Racon.**

Middle Bank South Light-beacon (33°44'·0S 137°29'·7E).

Directions

(continued from 11.13 and 11.62)

Passage West of Middle Bank

11.132

- 1 From a position about 13 miles ESE of Shoalwater Point (33°40'S 137°12'E), the track leads along the preferred route as shown on the chart passing (with positions from Plank Shoal Light-beacon (33°30'S 137°28'E)):

ESE of Shoalwater Point (16 miles SW) (11.12), thence:

- 2 W of Middle Bank South Light-beacon (white lantern on metal framework tower, 11 m in height) (14 miles S), standing on the S edge of Middle Bank, with depths of less than 10 m over it, thence:

- 3 W of Middle Bank Light-beacon (white lantern on metal framework structure; 11 m in height) (8 miles SSE) standing near the centre of Middle Bank, thence:

E of Plank Shoal Light (white GRP hut on metal column, 12 m in height), standing on Plank Shoal, 2½ miles in extent, with a least depth of 8·8 m over it, thence:

- 4 WNW of Yarraville Shoals Light (white hut on piles; 8 m in height) (14¼ miles NNE), standing on the

centre of Yarraville Shoals, with a least depth of 6·4 m over them.

The preferred track continues NE passing (with positions from Point Lowly Light (11.130)):

- 5 SE of a light-beacon (white GRP hut on metal column, 6 m in height) (17 miles SW), standing 1½ miles SE of Western Shoal (11.130), thence: NW of Port Bonython Entrance channel buoy (starboard hand) (11 miles SSW).

The track then leads N towards Whyalla pilot boarding area (33°03'S 137°39'E), as shown on the chart.

Useful marks

11.133

- 1 Hummock Hill (33°02'S 137°36'E), a grassy round hill. A conspicuous tower, stands 7½ cables WNW of Hummock Hill (chart Aus 136).

Mount Laura (33°00'S 137°31'E), a conspicuous sharp wedge shaped hill with a very nearly perpendicular W face.

Plank Point (33°27'S 137°21'E), easily identified by the obelisk on it.

(Directions continue at 11.155)

Passage East of Middle Bank

11.134

- 1 **Caution.** Attention is drawn to the reliability diagrams on charts; the coastal sections covering bays and anchorages in this area are based on reconnaissance or incomplete surveys.

From a position ESE of Shoalwater Point the track leads NE passing (with positions from Middle Bank Light-beacon (33°37'·0S 137°32'·7E)):

- 2 NW of Point Riley (16 miles S) (11.82), thence: SE of Middle Bank South Light-beacon (7½ miles SSW) (11.62), thence:

SE of Middle Bank Light-beacon (11.132), thence: NW of Port Broughton Light (white beacon on wooden piles) (17 miles ENE).

- 3 Thence the track leads NW passing (with positions from Plank Shoal Light (33°30'·0S 137°28'·5E)):

SW of Wood Point (20¾ miles ENE), a low sandy projection, with a clump of trees a little inland of it, thence:

SW of beacon (starboard hand) (17½ miles ENE), marking the outer end of a drying spit, thence:

- 4 SW of Point Jarrold (21 miles NE), a low sandy point from which the sand and mud flats dry out for a distance of about 1¼ miles, thence:

SW of Yarraville Shoals Light (11.132).

From a position SW of Yarraville Shoals Light the track continues along the preferred route at 11.132.

Useful mark

11.135

- 1 Barn Hill (33°36'S 138°08'E) (chart Aus 444), flat top with a saddle and a small peak immediately N of it; it is prominent.

Bays and anchorages

Shoalwater Point

11.136

- 1 **Anchorage** may be obtained anywhere on the coastal bank NE of Shoalwater Point (33°40'S 137°12'E), in depths of from 3 to 9 m. The sea is generally calm and the holding good.

Western Shoal**11.137**

- 1 **Anchorage** may be obtained SW of Western Shoal (33°10'S 137°31'E) (11.129), in depths of from 3 to 4 m, with Mount Young bearing 012°.

Tickera Bay**11.138**

- 1 Tickera Bay (33°46'S 137°42'E), is a slight indentation with a smooth sandy beach, fronted by sand flats. A red cliff, stands about midway along the shore of the bay. Tickera settlement is situated SW of the cliff.

Caution. See 11.134.

- 2 **Anchorage**, sheltered from winds S of SW, may be obtained, about 1 mile offshore, in depths of about 5 m, with the buildings of the settlement bearing 174°; this anchorage is partially protected by a spit, with depths of less than 5 m over it, that extends N from the S end of the bay.

Hamilton Lagoons**11.139**

- 1 **Description**, Hamilton Lagoons (33°35'S 137°55'E), consists of two inlets, named Mudoora Arm to the S and Fisherman Bay to the N. Both lagoons, which nearly dry, are surrounded by swampy land except on their E sides, which are thickly wooded. The entrance to Fisherman Bay can easily be identified from seaward, having a red cliff on its N side and a small mangrove islet 1 mile W of it, but the channel dries.

- 2 Port Broughton, a fishing port is situated on the E side of Mudoora Arm.

Local knowledge, is essential.

Caution. See 11.134.

Directions. Mudoora Arm is approached from a position WNW of Port Broughton Light-beacon (11.134), and entered through Mudoora channel, about 18 m wide and with depths of 3 m (1953). The channel is marked by beacons.

- 3 **Anchorage**, with good holding ground, may be obtained in depths of 10 m, about 2 miles W of Port Broughton Light-beacon.

A buoy (special) is moored on the W side of an artificial reef of car bodies, with a least depth of 4.5 m, lying about 1¼ miles NW of Port Broughton Light-beacon.

- 4 **Berths.** A T-headed jetty, which is closed to commercial traffic, extends 365 m WNW from the shore fronting the town of Port Broughton and has depths alongside of 2.4 m; there is a swinging berth, 90 m in extent, off the jetty.

WHYALLA**General information**

Charts Aus 136 and plan of Whyalla

Position**11.140**

- 1 Whyalla (33°02'S 137°36'E), is situated on the W shore of Spencer Gulf and is one of the major ports of the gulf.

Function**11.141**

- 1 Whyalla is a commercial port with an outer and inner harbour. It is also the largest ship-building port in Australia and vessels of up to 60 000 tons have been built there. Principal exports are coke, iron ore and steel; imports coal and limestone.

Port Limits**11.142**

- 1 Port Whyalla includes all the waters, rivers, creeks and inlets within an area adjacent to and extending about 4 miles SE of the port as shown on the chart.

Approach and entry**11.143**

- 1 Outer Harbour and Inner Harbours are approached from the E through separate channels as shown on the chart.

Traffic**11.144**

- 1 In 2002, 68 vessels totalling 2 367 846 dwt used the port.

Port Authority**11.145**

- 1 OneSteel Whyalla Steelworks, Port Augusta Road, PO Box 147, Whyalla, S.A. Australia 5600.

Limiting conditions**11.146**

- 1 **Controlling depths – Outer Harbour:**

Approach from ENE is through a channel with a maintained depth of 7.6 m.

Approach from E is through a channel with a maintained depth of 10.7 m.

Inner Harbour:

Approach is through a channel with a maintained depth of 10 m.

- 2 **Deepest and longest berth.** Ore Jetty. (11.160).

Mean tidal levels. Mean maximum range about 2.2 m; mean minimum range about 0.6 m. See *Admiralty Tide Tables Volume 4*.

Density of water: approximately 1.028 to 1.035 g/cm³.

Maximum size of vessel handled: 59 962 grt, draught 12.5 m, 255 m LOA.

Arrival information**Notice of ETA****11.147**

- 1 ETA should be reported 48 hours and 24 hours in advance, see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorage**11.148**

- 1 Anchorage may be found in depths of about 10 m, with No 1 Light-beacon (starboard hand) (33°02'.5S 137°37'.6E) bearing 000° distant 1 mile, good holding ground, hard clay and sand.

Pilotage and tugs**11.149**

- 1 **Pilotage**, provided from Port Pirie, is compulsory. Pilot boards about 1¼ miles SE of No 1 Light-beacon. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Tugs are available.

Exclusion zones**11.150**

- 1 **Caution.** A 20 m Exclusion Zone exists around all the shoreline of the Whyalla operations of the Broken Hill Proprietary Company in Port Whyalla. The zone covers all the steelworks' shoreline and 20 m seaward, commencing on the S side of the Pellet Plant Ore Jetty, thence generally W, E and N around the jetty, Tailings Dam Revetment, Inner Harbour, the E and W breakwaters to the edge of the mangroves. The zone also incorporates a 20 m radius around all navigation beacons within Port Whyalla.

Mariners are advised to keep clear of the Exclusion Zone at all times.

Quarantine

11.151

- 1 Whyalla is a first port of entry. See 1.54 and *Admiralty List of Radio Signals Volume 1* (2).

Harbour

General layout

11.152

- 1 The port of Whyalla consists of an Outer Harbour and Inner Harbour. Outer Harbour has a jetty extending ESE from the coast at the foot of Hummock Hill (11.133). Inner Harbour is a basin 1 mile N; the two harbours are separated by Tailings Dam. A small basin, containing marina facilities, protected by breakwaters, and from which a jetty extends ESE from its S point, is located SW of Outer Harbour.

Berthing signals

11.153

- 1 Berthing signals (Diagram 11.153) controlling movements are shown for Outer Harbour from a mast on top of the ore loader at Ore Jetty (11.160), and for Inner Harbour from a tower at the seaward end of the wharf.

Place	Signal	Meaning
Outer harbour by day	One yellow ball	Vessel must not berth.
	Two yellow balls	Vessel may berth.
at night	One red light (or neon strip)	Vessel must not berth.
	One green light (or neon strip)	Vessel may berth.
Inner harbour	One intensified red light	Vessel must not enter berth.
	One intensified green light	Vessel may enter.

Natural conditions

11.154

- 1 **Climate** is hot and dry. The warmest weather is from November to March; S of the port, the heat is modified by the sea breeze. July and August are the coldest months. Prevailing winds are SW.

Tidal streams. About 5 cables offshore in the vicinity of Hummock Hill the in-going stream sets N and the out-going stream sets S. Off Black Point (32°59'S 137°43'E) the in-going stream sets E and the out-going stream sets W.

Directions

(continued from 11.133)

Outer Harbour Approach from East

11.155

- 1 From the Whyalla pilot boarding area (33°04'S 137°39'E), the track leads NW towards the entrance channel into Outer Harbour.

Leading lights:

Front light (white triangle on metal tripod) (33°02'2S 137°35'9E).

Rear light (white triangle on ore bin) (402 m from front light).

- 2 The alignment (280°) of these lights leads through the dredged entrance channel marked by light beacons (port and starboard hand) as shown on the chart to the berthing area.

Outer harbour Approach from East-north-east

11.156

- 1 From a position about 7 cables N of No 1 Light beacon (33°02'4S 137°37'7E) (starboard hand) the track leads WSW into Outer Harbour:

Leading lights:

Front light (triangle on tower) (33°02'3S 137°35'9E), exhibited at the head of Ore Jetty (11.160).

- 2 Rear light (triangle on tower) (9 cables from front light).

The alignment (251°) of these lights leads through an unmarked channel as shown on the chart.

Inner Harbour

11.157

- 1 From a position E of No 1 Light beacon (33°02'4S 137°37'76E), the track leads NW towards the entrance channel, passing:

Between No 1 Light beacon (starboard hand) (33°02'1S 137°37'5E) and

No 2 Light-beacon (port hand) (1 cable SW).

Leading lights:

- 2 Front light (triangle daymark on beacon) (33°00'9S 137°35'4E).

Rear light (black rectangular daymark on tower, 13 m high) (510 m from front light).

The alignment (306½°) of these lights leads through the entrance channel marked by light beacons (port and starboard hand), as shown on the chart, to the berthing area in Inner Harbour.

11.158

- 1 **Turning lights:**

Front Light No 14 Light-beacon (red square on piles) (33°01'1S 137°35'5E).

Rear Light (neon rectangle) (155 m from front light).

The alignment (216½°) of these lights assist vessels swinging in the basin.

- 2 **Turning lights:**

Front light (neon triangle) (33°00'9S 137°35'2E).

Rear Light (neon rectangle) (246 m from front light).

The alignment (301¼°) of these lights assist vessels berthing.

Useful marks

11.159

- 1 Positions are given from Hummock Hill (33°02'S 137°36'E):

Hummock Hill (11.133).

Mount Laura (4 miles NW) (11.133).

Ore Jetty Light (4½ cables E) (11.156).

Blast Furnace (1½ miles N).

Hospital (7 cables WNW).

Radio tower (8½ cables WNW).

Berths

11.160

- 1 Outer Harbour:

Ore Jetty, length 170 m, with a turning dolphin about 70 m from the seaward end and a mooring tripod a similar distance from the shore end: depth alongside of 11.6 m

11.161

- 1 Inner Harbour:
Main wharf (Blast Furnace wharf), 701 m in length with 4 berths. The longest berth (No 4) is 183 m in length, with depth alongside of 10.7 m

Port Services**11.162**

- 1 **Repairs:** of an essential nature only can be undertaken.
Other facilities: Ro-Ro facilities at No 4 berth Main wharf Inner Harbour; hospital available; de-ratting can be carried out and exemption certificates issued. Oily mixtures containing chemicals, oily bilge water and oil sludge can be removed by private road tanker
Supplies: diesel oil available in drums or by road tanker; fresh water available at all berths; fresh provisions available.
Communications. Airport, 6.4 Km from port, daily service to Adelaide

PORT BONYTHON**General information**

Chart Aus 136 and plan of Port Bonython

Position**11.163**

- 1 Port Bonython (33°01'S 137°46'E), is situated at the head of Spencer Gulf close E of Stony Point (33°00'S 137°45'E).

Function**11.164**

- 1 Port Bonython is an oil terminal for crude oil and LPG from Moomba with which it is connected by a pipeline 600 km in length.

Port Limits**11.165**

- 1 Port limits extend about 3½ miles S from Point Lowly between the limits of Whyalla and Port Pirie, as shown on the chart.

Approach and entry**11.166**

- 1 The port is approached SE of Fairway Bank, lying about 6 miles ESE of Port Whyalla (11.140), through a channel, marked by light-buoys.

Traffic**11.167**

- 1 In 2002, 32 vessels totalling 1 955 205 dwt used the port.

Port Authority**11.168**

- 1 Santos Ltd, PO Box 344 Whyalla S.A. Australia 5600.

Limiting conditions**11.169**

- 1 **Controlling depth.** Approach is through a channel with a least charted depth of 18.4 m.
Tide levels. See levels at Whyalla (11.146).
Density of water: usually 1.030 g/cm³.
Maximum size of vessel handled. *Polysaga*, 79 918 grt *BP Achiever*, 15.4 m draught. Port can accept vessels up to 110 000 tons but draught may be restricted due to depth of water in N of Spencer Gulf.

Arrival information**Notice of ETA****11.170**

- 1 ETA should be sent at least 48 and 24 hours in advance, see *Admiralty List of Radio Signal Volume 6 (4)*.

Outer anchorages**11.171**

- 1 **Anchorage** may be found in a depth of about 16 m sand, good holding ground in a position near the pilot boarding area, about 10 miles SW of Point Lowly (33°00'S 137°47'E) a long, low projection, the land rising gradually about 5 cables W of the point. A light (11.130) is exhibited from the SE extremity of the point.

False Bay is an indentation in the coast between Whyalla (33°02'S 137°36'E) and Black Point (7 miles ENE). It affords good anchorage with N or W winds.

The shore of the bay is fronted by a drying sandbank, which extends over 1 mile offshore in places.

Ballast dumping ground lies at the mouth of the bay, as shown on the chart, for discharge of solid ballast.

Pilotage and tugs**11.172**

- 1 **Pilotage**, provided by Port Pirie, is compulsory for all vessels over 35 m LOA. Pilots board about 10 miles SW of Point Lowly (33°00'2S 137°47'2E), as shown on the chart. See *Admiralty List of Radio Signals Volume 6 (4)*.

Tugs are available.

Regulations concerning entry**11.173**

- 1 Tankers will not be berthed during the hours of darkness, without the prior approval of the Harbour Master.
2 **Restricted area.** The jetty is enclosed within a restricted area, as shown on the chart. Whenever the berth operations lights, exhibited from the jetty head, are operating, vessels are prohibited from entering the area without prior permission from Port Bonython.

Harbour**General layout****11.174**

- 1 Port Bonython consists of a concrete T-headed loading platform erected on steel piles, extending 1¼ miles S from the shore about 1¼ miles WNW of Point Lowly. A swinging basin with a least depth of 20 m extends 500 m from the jetty face.

Submarine pipeline is laid from the T head jetty NNE to the shore.

Tidal streams**11.175**

- 1 In the area off the berth at springs the rate of the in-going tidal stream reaches 1¼ kn and the out-going tidal stream reaches 1¾ kn. Both in-going and out-going streams run slightly across the line of the berth towards the shore.

Major light**11.176**

- 1 Point Lowly Light (33°00'0S 137°47'1E) (11.130).

Directions**11.177**

- 1 From Entrance Light-buoy (starboard hand) (33°09'S 140°40'E), the track leads NE passing (with positions from Point Lowly Light (35°00'0S 137°47'1E)):
SE of No 2 Light buoy (port hand) (10 miles SSW).

The track continues to lead NE between Eastern Shoal, its shallowest area marked at its N and S ends by light-beacons (cardinal), to the SE, and Fairway Bank to the NW, through the channel marked by light-buoys as shown on the chart passing:

E of No 8 Light-buoy (1½ miles SSW), thence:
As requisite for the berth.

Berths

11.178

- 1 Dolphin T-head, lit at E and W ends, berthing face 340 m, depth alongside 20 m. Berth consists of four berthing dolphins and four mooring dolphins.

Port services

11.179

- 1 **Repairs:** available from Whyalla.
Other facilities: hospital at Whyalla; de-ratting carried out and exemption certificates issued.
Supplies: fresh provisions available; fresh water available at berth; diesel fuel by road tanker only.

GERMEIN BAY

General information

Chart Aus 136

Description

11.180

- 1 Germein Bay is situated between a mangrove point (33°12'S 137°50'E) and Ward Spit (10 miles N), a drying spit that extends 5½ miles W from Ward Point (33°01'S 137°57'E).
The approaches to the bay and the bay itself are fouled by numerous shoals, sandbanks and shallows.
- 2 Eastern Shoal fronts the S half of the bay, extending 11 miles NNE from a position 33°13'5S 137°42'0E. It shoals in a NE direction; Weroona Sands lie at its N end.
Mount Ferguson (33°06'S 138°02'E) is a rounded grassy hill, isolated by a mangrove swamp, standing on the E shore of the bay, backed by wooded and generally low country. A light is exhibited from the summit.
- 3 From a position about 1 mile NE of Mount Ferguson a sandy beach and drying sand flat curve round the NE part of the bay to Ward Point.
Cockle Spit, a detached shoal the centre part of which dries, lies in the centre of the bay.
Port Germein lies on the N side of the bay, and the channel leading to Port Pirie lies on the SE side of the bay.
- 4 Germein Bay may be approached through either the N channel (11.183), or S channel (11.184). The N channel, which is lighted, is the principal channel.

Natural conditions

11.181

- 1 In the approach to Germein Bay, after a few days of fine weather, the water becomes clear and the shoals can be discerned but during and after bad weather the mud and sand are disturbed from the bottom and the deepest water is often the most discoloured.
Tidal streams in the N channel set NE and SW at a rate of about 1½ kn at springs.

Principal marks

11.182

- 1 **Landmarks:**
Mount Ferguson (33°06'S 138°02'E) (11.180), reported to show up well against the dark scrub of the slopes of Flinders Range.
Major light:
Point Lowly Light (33°00'0S 137°47'1E) (11.130).

Directions

(continued from 11.177)

North channel

11.183

- 1 From a position about S of Point Lowly Light (11.130), the track leads E passing (with positions from Point Lowly Light):
N of Eastern Shoal N End Light-beacon (N cardinal) (4½ miles S), marking the N side of Eastern Shoal, thence:
S of Ward Spit Light (three pile beacon; 6 m in height) (3½ miles SE).
- 2 The track then leads in the white sector (073°–085°) of Port Germein Jetty Light (white metal tower) (33°02'3S 137°59'6E), passing (with positions from Port Germein Jetty Light):
S of a light-beacon (port hand) (5¾ miles W), marking the S extremity of Ward Spit, thence:
- 3 N of Cockle Spit (2½ miles SW) marked by a light-beacon (N cardinal) and by beacons as shown on the chart, thence:
As requisite for Germein Port Jetty or Port Pirie approach channel.
(Directions continue for Port Pirie at 11.200)

South channel

11.184

- 1 **Local knowledge** is necessary.
From a position about 11 miles S of Point Lowly Light, the track leads NE passing (with positions from Point Lowly Light):
SE of Eastern Shoal S End Light (beacon, S cardinal) (33°10'0S 137°43'7E), thence:
NW of a beacon (9¼ miles S).
- 2 The track leads ENE, thence E passing:
SSE of a beacon (isolated danger) (6½ miles SE), marking a shoal with least depth of 1.5 m over it, lying WSW of Cockle Spit shoal. Thence:
N of a buoy (special) marking a fish haven; thence:
- 3 S of a beacon (S cardinal) marking the S extremity of Cockle Spit shoal.
As requisite for Port Germein Jetty or approaches to Port Pirie, for which the chart is the best guide.
(Directions continue for Port Pirie at 11.200)

Anchorage

11.185

- 1 **Anchorage** may be obtained in depths of from 5 to 7 m, S of Ward Point, and clear of the white sector of Port Germein Jetty Light.
Anchorage may also be found, in a position about 1½ miles NW of Eastern Shoal N End Light-beacon.
Caution. Anchorage near Cockle Spit is not recommended for vessels of light draught under adverse weather conditions.

Port Germein**11.186**

- 1 Port Germein (33°02'S 138°00'E), a town and former port, lies 5 miles NNW of Mount Ferguson (11.180).

A jetty, no longer used by shipping, extends 8 cables SSW from the shore fronting the town. A light (11.183) is exhibited from the head of the jetty.

PORT PIRIE**General information**

Chart 136 and plan of Port Pirie

Position**11.187**

- 1 Port Pirie (33°11'S 138°01'E) lies on the W side of a tidal inlet at the SE end of Germein Bay (11.180).

Function**11.188**

- 1 Port Pirie is a commercial port, and is the principal port for the mines at Broken Hill, some 250 miles NE, and for the grains of the N agricultural areas of South Australia.

Port limits**11.189**

- 1 The port limits are all the waters contained within a triangular area the apex of which is 13 miles W of Mount Ferguson (11.182), as shown on the chart.

Approach and entry**11.190**

- 1 Port Pirie is approached through Germein Bay N channel (11.183) or S channel (11.184), whence a marked channel leads into the port, as shown on the chart.

Traffic**11.191**

- 1 In 2002, 95 vessels totalling of 2 383 142 dwt used the port.

Port Authority**11.192**

- 1 Flinders Ports Proprietary Ltd, 153 Ellen Street, Port Pirie, S.A. Australia 5540.
Website: www.flindersports.com.au

Limiting conditions**11.193**

- 1 **Controlling depth** is 6.4 m in the entrance channel.
Vertical clearance. A power cable, with a safe overhead clearance of 53.5 m, spans the channel between No 7 and No 8 berths.

Deepest and longest berth. No 2 berth (11.201).

Tidal levels. Mean maximum range about 2.4 m; mean minimum range about 0.5 m. See *Admiralty Tide Tables Volume 4*.

Density of water: between 1.033 and 1.035 g/cm³.

Maximum size of vessel handled. With Port Manager/Master consultation and approval:

Maximum LOA day 185 m; night 180 m

Maximum beam 30 m

Arrival information**Notice of ETA****11.194**

- 1 ETA should be reported, 24 hours and 4 hours in advance, see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorages**11.195**

- 1 Anchorage may be obtained in or W of Germein Bay (11.171 and 11.185).

Pilotage and tugs**11.196**

- 1 **Pilotage** is compulsory for vessels over 35 m LOA. Pilot boards 2 miles W of Eastern Shoal N End Light-beacon, as shown on the chart. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Tugs are available.

Traffic regulation**11.197**

- 1 Speed of vessels in the harbour, when S of No 43 Light-beacon, must not exceed 4 kn.

Harbour**General layout****11.198**

- 1 The harbour fronts the town of Port Pirie. The berths are all on the W side of the harbour. There is a swinging basin 295 m in diameter and dredged to 6.4 m situated off the berthing area. Light-beacons mark the E edge of the dredged area.

Local weather**11.199**

- 1 The prevailing winds are from NNE to NW. During January and February freak thunder squalls, up to 40–50 kn, may occur.

Directions

(continued from 11.183)

11.200

- 1 From a position N of Cockle Spit Light-beacon (N cardinal) (33°03'.3S 137°56'.2E), the track leads ESE passing (with positions relative to Cockle Spit Light-beacon):

WSW of Port Pirie Entrance Light-beacon (1½ miles E).

Port Pirie is entered through a channel 92 m wide, with three sets of leading light-beacons and marked by light-beacons to the port area as shown on the chart.

- 2 **Leading lights:**

Front light (white pile) (33°05'.6S 137°58'.7E).

Rear light (white pile) (592 m from front light).

The alignment (165¼°) of these lights leads through the entrance channel passing (with positions from the Front Light-beacon):

Between No 1 Light-beacon (starboard hand) (2 miles NNW) and No 2 Light-beacon (port hand) (2 miles NNW), thence:

- 3 Between No 7 Light-beacon (starboard hand) (3 cables NNW), (a tide gauge on the beacon shows the depth of water between No 7 Light-beacon and Port Pirie Harbour) and No 8 Light-beacon (port hand) (3½ cables NNW).

The track continues to lead generally SE, S and SW through the channel as shown on the chart to a position W of No 42 Light-beacon (port hand) (33°09'.3S 138°00'.8E).

- 4 **Second set of leading lights:**

Front light (33°10'.5S 138°00'.8E).

Rear light No 56 Light-beacon (pile) (580 m from front light).

The track then leads on the alignment (182¼°) of these lights passing (with positions from the front light):



Chimney at Pirie Port (11.200)

(Photograph – Ian Routledge)

- 5 E of No 43 Light-beacon (starboard hand) (1 mile N), S of this beacon speed regulations (11.197) come into force.

From a position WNW of No 46 Light-beacon (port hand) (3 cables N), the track leads on the alignment (194½°) of the 3rd set of leading lights across the harbour towards the berths.

- 6 **Third set of leading lights:**
Front Light (33°10'·8S 138°00'·6E).
Rear Light (74 m from front light).

There are two sets of turning lights to assist vessels in the swinging basin, as shown on the chart.

Useful mark.

Chimney 33°10'·1S 138°00'·6E

Berths**11.201**

- 1 The berths are all on the W side of the harbour and are numbered from 1 to 11. The longest berth is No 2 berth, 190 m in length with depth alongside of 8·2 m.

No 5 to No 10 berths inclusive are a continuous wharf 1045 m in length with depth alongside of 8·2 m.

Port services**11.202**

- 1 **Repairs:** Machinery repairs carried out. Slipway available for craft up to 21 m in length.

Other facilities: Tank washings, oily mixtures containing chemicals, oily bilge water and oil sludge can be removed by road tanker.

- 2 Hospital available. Deratting carried out and exemption certificate issued.

Supplies: Freshwater available at all berths. Light diesel is available by road tanker. Fresh provisions available.

Communications. Airport 8 km S of town.

POINT LOWLY TO PORT AUGUSTA**General information**

Chart Aus 778 including plans Approaches to Port Augusta and Port Augusta.

Route**11.203**

- 1 The route leads from a position SE of Point Lowly (33°00'S 137°47'E) N to Port Augusta.

Topography**11.204**

- 1 Between Point Lowly and Two Hummock Point (15 miles N), the coast is indented by small bays and consists generally of cliffs, rocky points and thick mangroves, backed by hills and fronted by hard sand flats that dry at half tide.

- 2 Between Two Hummock Point (32°45'S 137°48'E) and a position 2 miles N of Commissariat Point (32°36'S 137°46'E), the shore consists of a rough stony beach, fringed with mangroves and fronted by drying sandbanks. Thence the width of the gulf contracts to about 7 cables between mangroves on either side, and assumes more the appearance of a river which narrows towards Port Augusta.

- 3 The coast on the E side of the upper Gulf is backed by Flinders Ranges, the summits of the range lying 8 to 10 miles inland.

Between Ward Point (33°00'S 137°57'E) and Yatala Harbour (16 miles N) the coast is bordered by a hard sand

flat, which dries out to a distance of from 7½ cables to 2 miles; the coast continues indented by bays and filled with drying sands up to Port Augusta.

Submarine pipeline

11.205

- 1 A gas pipeline runs from a position 3 cables S of Douglas Point (11.208) to the E shore 7 cables NW of Mount Manbray (11.209).

Natural conditions

11.206

- 1 **Tidal streams**, which turn about the time of HW and LW, generally set fairly up and down the main channel, at a rate of from 1½ to 2 kn, except S of Douglas Bank (32°48'S 137°50'E) where the in-going stream sets NW and the out-going stream SE; the tidal streams also set across the main channel in the vicinity of East Sands (32°40'S 137°48'E).

Sea level is affected by barometric pressure which can cause the tide to be 0.6 to 1.5 m above its predicted level.

Principal marks

11.207

- 1 **Landmarks:**

Mount Remarkable (32°48'S 138°09'E) (chart Aus 444).

Mount Brown (32°30'S 138°00'E).

Devil's Peak (32°26'S 137°59'E) (chart Aus 444).

Major light:

Point Lowly Light (33°00'0S 137°47'1E) (11.130).

Directions

(continued from 11.177)

11.208

- 1 From a position SE of Point Lowly (33°00'S 137°47'E), the track leads NNE passing (with positions from Point Lowly):

ESE of Point Lowly Shoal (1 mile NNE), thence:
ESE of Backy Point (5 miles N), a bold black rocky point projecting SE from the coast; there is a race off the point. Thence:

ESE of Douglas Point (8¾ miles N), a rocky point, backed by a low black cliff 2½ miles NE, thence:

- 2 ESE of Douglas Bank (11½ miles NNE); a beacon (pile, red and white bands; diamond topmark), stands on the shallowest part of the bank. There is a clear channel 5 cables wide W of Douglas Bank, but the principal channel is on the E side.

- 3 The track leads NNW passing:
WSW of No1 beacon (starboard hand) (12½ miles N); thence:

ENE of No 2 beacon (port hand) (14 miles N), which marks the outer edge of Two Hummock Spit, thence:

ENE of No 4 Light (black framework tower) (15 miles N), situated on the outer edge of the drying sand flat E of Two Hummock Point.

- 4 There is a clear channel, with depths of 11 to 12.5 m on either side of Middle Bank. The W and more direct channel, is to be preferred. The track leads NW entering Flinders Channel, passing (with positions from No 4 Light-beacon):

Between No 6 beacon (port hand) (3 miles NW), marking the edge of the drying sandbank fronting Mangrove Point, and No 3 beacon (starboard hand) (3½ miles N) marking the S extremity of East Sands; thence:

- 5 NE of No 8 beacon (port hand) (4 miles NW), marking the edge of a 5.5 m spit, extending 2½ cables E from the S end of West Sands, thence:

NE of No 10 beacon (port hand) (5 miles NW), marking the E edge of West Sands, thence:

NE of No 12 beacon (port hand) (5¼ miles NW), marking the N edge of West Sands and noting the buoy (special) 4 cables NW, marking a fish farm.

- 6 The track then leads N passing (with position from No 9 Light (starboard hand) (32°39'S 137°46'E):

W of No 7 beacon (starboard hand) (5 cables S), marking the N extremity of East Sands; thence:

W of No 9 Light beacon; a tide gauge on the beacon indicates the height of the tide above chart datum, thence:

- 7 The channel marked by beacons and light-beacons, continues for a farther 11 miles to Port Augusta, as shown on the chart.

Useful marks

11.209

- 1 Mount Mambray (32°52'S 137°55'E), covered with thick scrub.

Monument Hill (32°50'S 137°47'E), with a cairn on its summit.

Mount Gullet (32°49'S 137°55'E), with a broad base, and a round flatish top, covered with brush.

The Bluff (32°37'S 137°44'E), the highest point of the range backing the W coast of the upper Gulf.

Port Augusta

General information

11.210

- 1 **Description.** Port Augusta (32°30'S 137°46'E) is a safe natural harbour situated in the upper reaches of Spencer Gulf. It is closed to commercial shipping.

Limiting conditions

11.211

- 1 **Vertical clearance.** Two overhead power cables with a vertical clearance of 45 m and 46 m, span the channel from a position close S of Curlew Point (32°33'S 137°46'E).

Tidal levels. Mean maximum range about 2.7 m; mean minimum range about 0.1 m. See *Admiralty Tide Tables Volume 4*.

Harbour

11.212

- 1 Port Augusta stands on both the E and W sides of the upper Gulf and consists of Commonwealth Wharf which is now in ruins, fronting the town on the E side of the upper Gulf. Mill Jetty extends from the shore NE of Commonwealth Wharf and West Jetty fronts the town on the W side of the Upper gulf. A wharf fronts Thomas Playford Power Station, 3 miles S of the main harbour.

- 2 A causeway crosses the gulf 1½ cables NE of Commonwealth Wharf, and obstructs navigation above the port.

Bays and anchorages

South of Douglas Bank

11.213

- 1 Anchorage may be found in any part of the upper reaches of Spencer Gulf, S of Douglas Bank (32°48'S 137°49'E). The most convenient is in depths of 11 m, near the shore on the E side, where the current is less than in the deeper water on the W side.

- 2 During strong SE winds which prevail from December to March, a vessel seeking anchorage for the night or awaiting for a tide, should when within Point Lowly, anchor under the lee of Ward Spit, in depths of 11 m having regard to the 4.9 m and 8.9 m shoals lying 5 miles NE and 4 miles ENE respectively, from Point Lowly.

Fitzgerald Bay

11.214

- 1 Fitzgerald Bay (32°55'S 137°47'E) is situated between Point Lowly (33°00'S 137°47'E) and Backy Point (5 miles N). The bay is formed by low whitish cliffs and stony beaches. A hard sand flat which dries extends 5 cables from the head of the bay; shallow water extends 2½ cables beyond the flat. There is a salt water swamp within the head of the bay.

A shoal with least depth of 7.6 m lies about 3 miles N of Point Lowly.

- 2 **Anchorage** has been recommended in depths of 7 to 11 m with Point Lowly bearing 179° distant 3 miles. From May to September, when strong N and W winds are frequent, more shelter may be obtained in depths of 11 m, sand, near the head of the bay, with Backy Point bearing from 050° to 072°, distant about 1 mile, where a vessel is out of the stream. A buoy (special) marks a fish haven 2 miles N of Point Lowly.

Yatala Harbour

11.215

- 1 Yatala Harbour (32°45'S 137°53'E), is a basin of shallow water situated in the sand and mud flats, between the mangrove point about 3 miles NNW of Mount Gullet

(32°49'S 137°55'E) (11.209), and Red Cliff Point (32°42'S 137°50'E), where the coast recedes and forms a bight fronted throughout by a drying sand and mud flats.

Caution. The soundings shown on the chart are from very old surveys.

Blanche Harbour

11.216

- 1 Blanche Harbour (32°42'S 137°46'E), is situated W of a drying spit which extends 1 mile N of Mangrove Point (32°43'S 137°47'E). There are depths of 3-6 m in parts of the harbour.

Local knowledge, is essential.

- 2 The mouth of the harbour is fronted by West Sands, a drying sand bank, extending about 1½ miles N of Mangrove Point.

There are narrow channels on either side of West Sands, which are suitable for small craft only.

Port Paterson

11.217

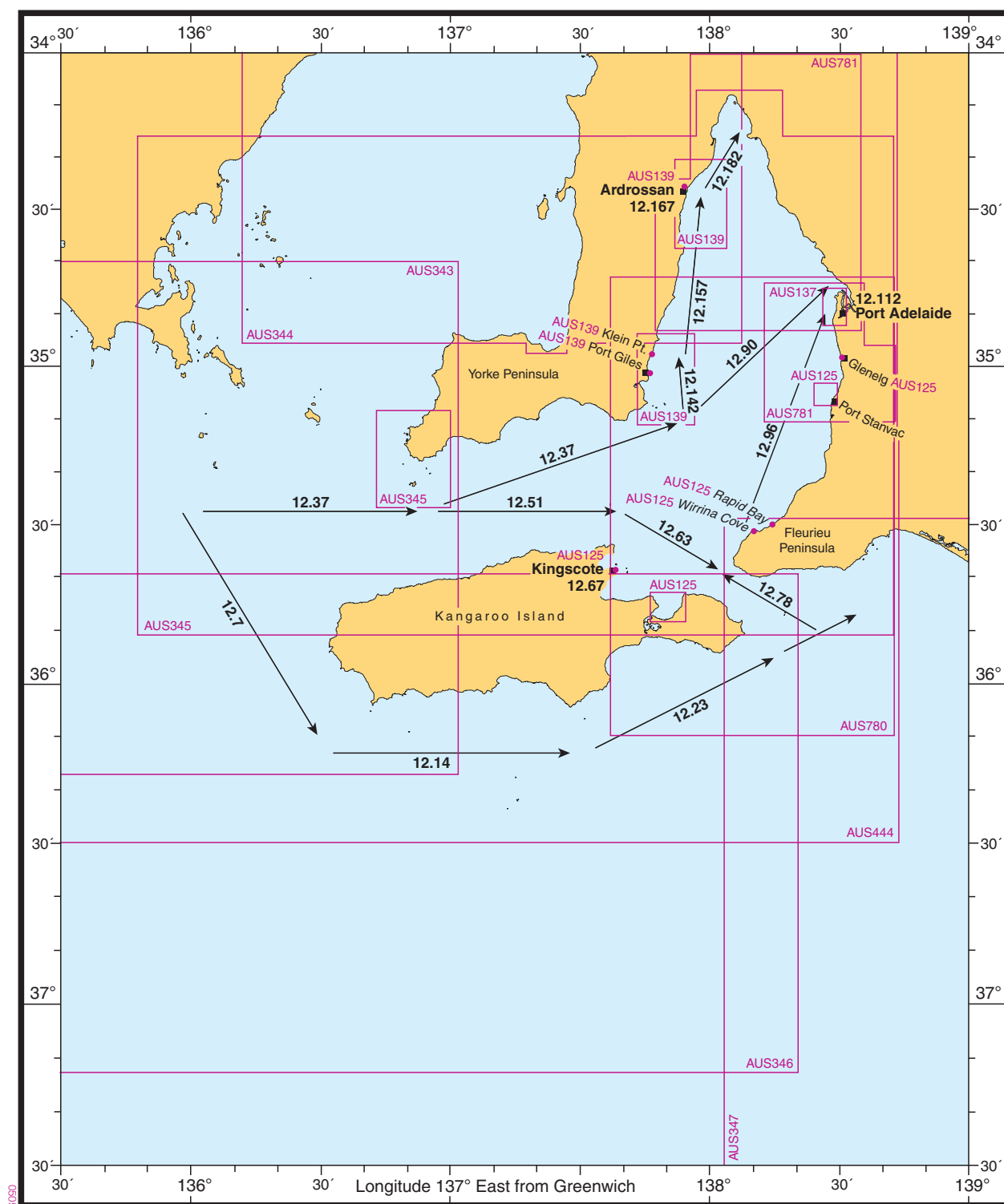
- 1 Port Paterson (32°35'S 137°48'E), is entered between Point Paterson (32°36'S 137°49'E) and Snapper Point (3 miles NNW). It contains only very extensive drying sand and mud banks. The shores of the bay are mostly swampy.

Local knowledge, is essential.

The approach to Port Paterson is through a channel between the drying banks, near the N end of Bluff Reach.

- 2 The best time to use this channel is at LW, when the banks on each side are uncovered; when the banks are covered tide rips occur and the channel cannot be discerned.

Chapter 12 - Kangaroo Island, Investigator Strait, Gulf of Saint Vincent and Approaches



CHAPTER 12

KANGAROO ISLAND, INVESTIGATOR STRAIT, GULF OF SAINT VINCENT AND APPROACHES

GENERAL INFORMATION

*Chart 4709***Scope of the chapter****12.1**

- 1 This chapter comprises the following sections:
- Kangaroo Island — South Coast (35°49'S 137°15'E) (12.4).
 - Investigator Strait (35°30'S 137°00'E) (12.34).
 - Backstairs Passage (35°44'S 138°10'E) (12.78).
 - Gulf of Saint Vincent (35°00'S 138°10'E) (12.86).

Harbours**12.2**

- 1 Principal ports are:
- Port Adelaide (34°51'S 138°30'E) (12.112).

Port Giles (35°02'S 137°46'E) (12.150).

Ardrossan (34°26'S 137°55'E) (12.167).

Marine protected areas**12.3**

- 1 A number of locations within the scope of this chapter are designated marine protected areas. See (1.61), *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

KANGAROO ISLAND — SOUTH COAST

GENERAL INFORMATION

*Charts Aus 343, Aus 346***Area of section****12.4**

- 1 This section comprises the following sub sections:
- Neptune Islands (35°16'S 136°06'E) to Cape du Couedic (12.7).
 - Cape du Couedic (36°04'S 136°42'E) to Cape Gantheaume (12.14).
 - Cape Gantheaume (36°05'S 137°28'E) to Cape Willoughby (12.23).

Currents**12.5**

- 1 The E going current divides at Cape du Couedic (12.11), and part runs N along the W coast considerably augmenting the in-going stream, which sets N, and at times quite overcomes the out-going stream, which sets S.
- Kangaroo Island lies at the approximate E limit of the W-going current which flows across the entrance to Great Australian Bight from October to March.

Lobster and crab fishing**12.6**

- 1 During the period 1 October to 31 May, mariners may encounter surface floats associated with such activities inshore of the 500 m line. See 1.6.

NEPTUNE ISLANDS TO
CAPE DU COUEDIC

General information

*Chart Aus 343***Route.****12.7**

- 1 The route leads from a position S of Neptune Islands (35°16'S 136°06'E) about 47 miles SE to a position SW of Cape du Couedic.

Topography**12.8**

- 1 The coast between Cape Borda (35°45'S 136°35'E) and Vennachar Point (8 miles S) is composed of dark limestone cliffs, thence low cliffs backed by scrub covered hills extend to Cape du Couedic (12.11).

Major lights**12.9**

- 1 South Neptunes Light (35°20'S 136°07'E) (11.10).
Cape Borda Light (white square stone tower; 10 m in height) (35°45'3S 136°35'7E).
Cape du Couedic Light (round masonry tower, red dome, white lantern; 25 m in height) (36°03'5S 136°41'9E).

Other navigation aid**12.10**

- 1 **Racon.**
South Neptunes Light (35°20'S 136°07'E) (11.10).

Directions*(continued from 10.125)***12.11**

- 1 **Caution.** The coast between Cape Borda (34°45'S 136°35'E) and Vennachar Point (8 miles S) should be avoided as with a heavy W swell, there are rollers off Ravine de Casoars (12.12) to a distance of 1 mile.
- From a position S of South Neptunes (35°20'S 136°07'E) the track leads SE passing (with positions from Cape Borda Light (35°45'S 136°36'E)):
- 2 SW of Cape Borda, the NW point of Kangaroo Island, a bold cliffy headland. A light (12.9) is exhibited from near the extremity of the cape. Thence:
- SW of Cape Bedout (11 miles S), a round point, backed by a scrub covered hill; an islet lies 1 cable off it. In a heavy swell there are rollers in depths of 24 to 29 m about 1 mile S of the cape. Thence:
- 3 SW of Cape du Couedic (19 miles S), the SW point of Kangaroo Island. It is a narrow promontory, the



Kangaroo Island – Cape de Couedic from SW (12.11)

(Photograph – Australian HO)

(Original dated 1986)



Kangaroo Island – Cape Borda from N (12.11)

(Photograph – Australian HO)

(Original dated 1986)

SW face of which slopes to the sea, whereas the N and S sides are steep cliffs. A light (12.9) is exhibited near the extremity of the cape. For dangers off Cape du Couedic, see 12.17.

Useful marks:

12.12

- 1 Ravine de Casoars (35°48'S 136°35'E), a break in the cliffs 2½ miles S of Cape Borda, which can be seen from a considerable distance.
Conspicuous bare sand patch extending 7½ cables along the coast from a point 5 cables S of the mouth of Rocky River (35°58'S 136°40'E).
(Directions continue at 12.17)

Bays and anchorages

West Bay

12.13

- 1 West Bay is situated between the S extremity (35°53'S 136°32'E) of Vennachar Point and a point about 7½ cables farther S; a low islet lies about 3 cables off this point. The N and S shores of the bay are cliffy, with rocks extending a short distance from the shore. The depths within the bay decrease gradually from 18.3 m in the entrance, to 7.3 m near its head.
- 2 An historic wreck, *Loch Vennachar*, within a protected area lies close to Vennachar Point. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.
Local knowledge is necessary.
Anchorage. Small vessels sometimes anchor in West Bay, but the heavy swell, which comes with a W wind, renders this a risky proceeding. Anchorage is only safe while the wind continues offshore. The heavy swells are accompanied by rollers up to 1 mile S of the entrance.

CAPE DU COUEDIC TO CAPE GANTHEAUME

General information

Chart Aus 346

Route

12.14

- 1 The route leads from a position SW of Cape du Couedic (36°04'S 136°42'E) about 38 miles E to a position S of Cape Gantheaume.

Topography

12.15

- 1 The coast between Cape du Couedic (36°04'S 136°42'E) and Cape Gantheaume (38 miles E) is generally cliffy indented by bays and backed by hills.
A group of rocks, consisting of North Rocks, Young Rocks and South-west Rock lie 17 to 23 miles S of Cape Kersaint (36°02'S 137°08'E). They stand above water and are not dangerous by day in clear weather but should be given a wide berth at night.

Major light

12.16

- 1 Cape du Couedic Light (36°03'5S 136°41'9E) (12.9).

Directions

(continued from 12.12)

12.17

- 1 Attention is drawn to the reliability diagram shown on charts Aus 343 and Aus 346, uncharted navigational dangers may exist, mariners are warned to exercise care within this area.
From a position SW of Cape du Couedic (36°04'S 136°42'E) the track leads E passing (with positions from Cape du Couedic):
- 2 Clear of a reported (1960) depth of 7.3 m (24 ft) (3½ miles SW), thence:
S of Casuarina Islets (2 cables and 1½ miles S), two islets both composed of large bare rocks. The S islet has been reported to be a good radar target. Thence:
- 3 Clear of Lipson Reef (8 miles SE), the above-water portion of which is of very small extent. An area of broken water surrounds the reef and over which the swell breaks with violence. There are considerable depths at a distance of 1 mile from the reef, but this locality has not been closely examined. Thence:
- 4 S of Cape Bouguer (10 miles E), three cliffy projections with rocks at their base. An historic wreck, *Montebello*, within a protected area lies 4 miles E of Cape Bouguer. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*. Thence:
S of Cape Kersaint (20 miles E), a bold cliffy headland with a scrub covered hill above it. A depth of 8.2 m (27 ft) is reported (1960) to lie 4½ miles S of the cape. Thence:
- 5 S of South East Snare (26 miles E), a dangerous pinnacle rock over which the sea breaks occasionally. In bad weather it breaks heavily. Thence:
Clear of North Rock, Young Rocks and South-west Rock (12.15), thence:
- 6 S of Quin Rock (36°05'S 137°25'E), a small rock and over which the sea seldom breaks. A depth of 9.1 m (30 ft) is reported (1961) to lie 2¼ miles SSE of the rock. Thence:
S of Cape Gantheaume (36°05'S 137°28'E), steep to on its W side and sloping on its E side. A reef, with several rocks above water and the outer one awash extends 5 cables SW from the cape. There are breakers 1 cable W of the outer rock.

Useful marks

12.18

- 1 Kirkpatrick Point (36°03'S 136°46'E), a sloping point, having three remarkable rocks, one of which is 30 m (100 ft) high, situated on top.
Prominent clump of trees (35°50'S 136°57'E), situated on a tableland in the middle of Kangaroo Island.
Remarkable sand patch, at the top of the cliff, close to the coast, 2 miles NE from Cape Bouguer (36°03'S 136°54'E).

Mount Mary (35°58'S 137°13'E), a round sandhill with vegetation on it.

Mount Bloomfield (35°58'S 137°14'E), a conical and barren sandhill.

Pelorus Islet (36°07'S 137°32'E) (12.27).

(Directions continue at 12.27)

Bays and anchorages

Weirs Cove

12.19

- 1 Weirs Cove (36°03'S 136°44'E) is situated in the W part of the bay contained between Cape du Couedic (36°04'S 136°42'E) and Kirkpatrick Point (3 miles ENE).

Berth: A jetty extends about ¼ cable offshore in Weirs Cove, with depths of 3 m alongside its outer end.

Sanderson Bay

12.20

- 1 Sanderson Bay (36°02'S 136°48'E), is situated between Kirkpatrick Point (36°03'S 136°46'E) and Cape Younghusband (2½ miles E). The shores are composed of moderately high cliffs, with three little sandy beaches in the NW part of the bay.

Hanson Bay

12.21

- 1 Hanson Bay (36°02'S 136°52'E), is entered between Cape Younghusband (36°02'S 136°49'E) and Cape Bouguer (5 miles E) and has considerable depths over a rocky bottom. Being open to the S and SW, the bay is not suitable as an anchorage. The W and E shores are cliffy, while there are four sandy beaches, with low land behind them in the N part of the bay.
- 2 A detached rock lies 5 cables ENE of Cape Younghusband, in the W part of the bay.

Douglas Rock, an isolated pinnacle, awash, over which the sea does not always break, lies 1½ miles offshore in the W part of Hanson Bay.

Vivonne Bay

12.22

- 1 **Description.** Vivonne Bay (36°00'S 137°12'E) is situated between Point Ellen (36°00'S 137°11'E), a grassy mound bordered by low rocks, and the mouth of Eleanor River (1¼ miles NE). A light is exhibited from Point Ellen. The shores are sandy with low limestone cliffs near Point Ellen and a small rocky point 6 cables NNW of that point. Harriet River flows into the W part of the bay. Although these two rivers drain a considerable area of country, they are not usually open to the sea except after heavy rain.

Anchorage may be obtained during N or W winds.

- 2 From November to April, when the SE winds are prevalent, the anchorage in D'Estree Bay (12.29) is to be preferred, as it provides smoother water and more sea room.

Berth: a jetty with depths alongside of 1 m extends 79 m offshore in the W part of Vivonne Bay.

CAPE GANTHEAUME TO CAPE WILLOUGHBY

General information

Charts Aus 346, Aus 780

Route

12.23

- 1 The route leads from a position S of Cape Gantheaume (36°05'S 137°28'E) about 37 miles ENE to a position SSE of Cape Willoughby.

Topography

12.24

- 1 The coast between Cape Gantheaume (36°05'S 137°28'E) and Cape Linois (7½ miles NE) consists generally of fairly high cliffs and sandy beaches; rocks extend about 1 cable from the points. Between Cape Linois (36°01'S 137°35'E) and Cape Willoughby (28 miles ENE) the coast in general is cliffy, indented by bays and fronted in places by sandy beaches.

Currents

12.25

- 1 For information on currents see 12.5.

Landmark

12.26

- 1 Cape Willoughby Lighthouse (white round stone tower; 26 m in height) (35°50'S 138°08'E).

Directions

(continued from 12.18)

12.27

- 1 From a position S of Cape Gantheaume (36°05'S 137°28'E) the track leads ENE passing (with positions from Cape Hart (35°54'S 138°03'E)):

Clear of Pelorus Islet (28 miles WSW), a bare rock over which the sea breaks magnificently during a heavy swell. A reef with several above-water rocks on it, extends 2 cables E from the islet, and an above-water rock lies close to its SW side. There is a clear and deep channel between the islet and Cape Gantheaume. Thence:

- 2 SSE of Cape Linois (23 miles WSW), a bold cliff headland, thence:

SSE of Cape Hart, a low rocky point, steep-to; a reef, on which the sea breaks heavily extends 2 cables SW from Cape Hart. And:

Clear of a depth of 9.1 m (30 ft) (reported 1961) which lies 11 miles S of Cape Hart (35°54'S 138°03'E), charted position is approximate.

- 3 The track continues to lead ENE passing (with positions from Cape Willoughby (35°51'S 138°08'E)):

Clear of Fenris Bank (10 miles S) with a depth of 18.3 m (60 ft) over it, and over which the sea breaks heavily at times; tide rips occur SW of the bank. And:

Clear of Sanders Bank (15 miles SE), with a least depth of 22 m (12 fm) and over which the sea breaks on its SE edge after heavy W gales. Thence:

- 4 SSE of Cape Willoughby (6 miles NE), a bold, rocky headland and the E extremity of Kangaroo Island. A light (12.26) stands on the E side of the cape.

Useful marks

12.28

- 1 Tinline Point (35°59'S 137°37'E), a low limestone projection with a remarkable detached, cracked



Point Tinline (12.28) with D'Estrees Bay & Osmanli Reef (12.29)

(Photograph – Australian HO)

(Original dated 1986)

rock on it; the crack is open when seen from N or S.

Prospect Hill (35°51'S 137°45'E), a sandhill covered with bushes.

Two prominent sand patches, 2¼ and 1¾ miles WSW, from Reynolds Point (35°52'S 137°44'E).

(Directions continue at 12.33)

Bays and anchorage

D'Estree Bay

12.29

- 1 **Description.** D'Estree Bay (35°55'S 137°39'E) is situated between Tinline Point (35°59'S 137°37'E) and Reynolds Point (8 miles NE), a high bluff point, with a steep-to fringing reef.

The shore of the bay for the first 4 miles is sandy backed by several whitestone cliffs; from thence, NE to Reynolds Point, it is bold and cliffy.

- 2 There are several underwater rocks close to the shore.

Osmanli Reef, formed by a number of detached patches, the N and outer one with a depth of less than 1.8 m (6 ft) (charted as dangerous rock) over it, lies 3½ cables NNE of Tinline Point. During fine weather the reef only breaks occasionally and it is recommended to give Tinline Point a berth of at least 1 mile.

- 3 In the W part of the bay the depths shoal rapidly from 9 to 5 m (30 to 18 ft) about 5 cables offshore. The bottom at these depths is sandy with patches of limestone crust. The N side of the bay is steeper, with depths of 9 to 11 m (30 to 36 ft) less than 5 cables offshore.

- 4 **Anchorage.** Good anchorage, where the swell is hardly felt in ordinary weather with offshore winds, may be obtained in depths of about 9 m (30 ft), sand, in the W part of D'Estree Bay, with the highest limestone cliff in the bay bearing 275° and the extremity of Tinline Point bearing 182° distant 2¼ miles. By keeping Tinline Point bearing

182°, depths of 8 to 9 m (27 to 30 ft), will be maintained to within 7½ cables of the point.

- 5 **Landing.** In ordinary weather and even with moderate SE winds, there is no surf at all on the beach between 5 cables from Tinline Point and 5 cables N of the highest limestone cliff; within this part the landing is good.

CAPE WILLOUGHBY TO NEWLAND HEAD

General information

Chart Aus 780

Route

12.30

- 1 The route leads from a position SSE of Cape Willoughby (35°51'S 138°08'E) about 22 miles NE to a position SE of Newland Head.

Topography

12.31

- 1 Dudley Peninsula, the E extremity of Kangaroo island which terminates in Cape Willoughby (35°51'S 138°08'E), is separated from the mainland of Fleurieu Peninsula by Backstairs Passage (12.78). Fleurieu Peninsula between Porpoise Head (35°40'S 138°13'E) and Newland Head (15 miles E) is composed of bold rocky points with several hills rising to 300 m (1000 ft) within 1 or 2 miles of the coast.
- 2 The Pages (12.33), situated about 13 miles offshore, lie near the middle of the E entrance to Backstairs Passage.

Principal marks

12.32

- 1 **Landmark:**

Cape Willoughby Light (12.26).

Major light:

South Page Light (white GRP hut, 7 m in height) (35°46'7S 138°17'5E).

Directions*(Continued from 12.28)***12.33**

- 1 From a position SSE of Cape Willoughby (35°51'S 138°08'E) the track leads NE passing (with positions from Cape Willoughby):

Clear of Threshold Bank (7 miles SE), with a least depth of 16.5 m (54 ft) over it.

- 2 SE of The Pages (8½ miles NE), a group of islets and rocks. North Page, a rocky islet, is the most N

and largest of the group; South Page is situated 1 mile SSW of North Page. A light (12.32) is exhibited from the South Page. Thence: SE of Newland Head (35°39'S 138°31'E), a steep cliff.

Useful mark

- 3 West Island (35°37'S 138°35'E), (13.13).
(Directions continue for Newland Head to Cape Jaffa at 13.12)

INVESTIGATOR STRAIT**GENERAL INFORMATION***Chart Aus 345***Scope of section****12.34**

- 1 This section comprises the following sub sections:
Neptune Islands (35°16'S 136°06'E) to Troubridge Shoals (12.37).
Neptune Islands (35°16'S 136°06'E) to Marsden Point (12.51).
Marsden Point (35°34'S 137°38'E) to Cape Jervis (12.63).

Topography**12.35**

- 1 Investigator Strait, the only channel to Gulf of Saint Vincent from the W, and between Spencer Gulf and Gulf of Saint Vincent, lies between the N coast of Kangaroo Island (35°49'S 137°15'E) and the S coast of Yorke Peninsula. With the exception of the rocks in the vicinity of Althorpe Island (35°22'S 136°52'E) and the shoal off Point Davenport (35°10'S 137°20'E), both on the N side, the strait is free from offshore dangers. The greatest depths are on the S side, which is steep-to, and vessels may pass through the strait with confidence.

The bottom is mostly broken shells mixed with sand or coral.

Current**12.36**

- 1 The predominant current through much of Investigator Strait sets NE, but towards the W end the majority of sets may be found to be NW-going from about October to March. Constancy is very low and rates are variable, some being in excess of 2 kn.

NEPTUNES ISLANDS TO TROUBRIDGE SHOALS**General information***Charts Aus 345, Aus 780***Route****12.37**

- 1 The route leads from a position S of Neptune Islands (35°16'S 136°06'E) about 90 miles ENE to a position SE of Troubridge Shoals.

A passage leads between Althorpe Island (35°22'S 136°52'E) and Seal Island (3¼ miles NE).

Topography**12.38**

- 1 Between Cape Spencer (35°18'S 136°53'E) and Troubridge Shoals (48 miles ENE), the coast is indented by several bays between cliffy points.

Major lights:**12.39**

- 1 South Neptunes Light (35°20'S 136°07'E) (11.10).
Althorpe Island Light (35°22'S 136°51'·7E) (11.81).
Cape Spencer Light (35°18'S 136°53'E) (11.81).
Troubridge Hill Light (red brick tower, 33 m in height) (35°10'·1S 137°38'·4E).

Other aid to navigation**12.40****Racons:**

- 1 Troubridge Hill Light – as above.
South Neptunes Light (35°20'S 136°07'E) (11.10).

Directions*(continued from 10.125)***12.41**

- 1 **Caution.** It is wise to give the N shore of the straits a wide berth, the depths vary but little and do not give warning of the approach to shoals. If obliged to stand over towards Yorke Peninsula, depths of not less than 24 m (13 fm) should be maintained.
- 2 From a position S of Neptunes Islands the track leads ENE passing (with positions from Yorke Point (35°14'S 137°11'E):
SSE of Althorpe Island (18 miles WSW), nearly flat-topped, with steep sides. It is the S and largest of a group of three islands, lying 4½ miles SSW of Cape Spencer, with Haystack Island and Seal Island, both bare rocks, lying 3¾ miles NE and 3½ miles ENE respectively from it. A light (12.39) is exhibited from near the centre of Althorpe Island. Thence:
- 3 SSE of Rhino Head (10½ miles WSW) a sloping, cliffy head with a remarkable pinnacle rock on its extremity; this head resembles the head of a rhinoceros. Thence:
Clear of Orcades Bank (9¾ miles SSW), with a least depth of 18 m (60 ft) over it; thence:
- 4 SSE of Yorke Point projecting S from the coast; an islet lies close under the cliff at Yorke Point, thence:
SSE of Point Davenport Shoal (10 miles ENE), with depths of less than 3.6 m (12 ft) over it, thence:
- 5 SSE of Troubridge Hill (23 miles ENE), presenting a cliff face to the sea but grassy and sloping on the landward side. A light (12.39) is exhibited from the hill. An historic wreck, *Clan Ranald*, lies about



Investigator Strait – Althorpe Island from NE (12.41)

(Original dated 1986)

(Photograph – Australian HO)

2 cables W of Troubridge Hill and has been declared a protected area. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*. Thence:

- 6 SSE of Troubridge Point (25 miles WNW), the W point of the entrance to Gulf of Saint Vincent. From this position the track leads generally NE passing: SE of Marion Reef (35°09'S 137°49'E), a group of dangerous rocks with depths of less than 1.8 m (6ft) over them and over which the sea breaks, lying at the S end of Troubridge Shoals. Marion Reef Light-beacon (white GRP hut on Pile with platform) stands off the SE end of the reef. Thence:
- 7 SE of Troubridge Island (35°07'S 137°49'E), covered with bushes.

Useful marks:**12.42**

- 1 Cootes Hill (35°06'S 137°27'E), a prominent hummock. Troubridge Island Lighthouse (24 m in height, disused) (35°07'S 137°49'E).
(Directions continue for Port Adelaide at 12.94, and MacDonnell Sound at 12.145)

Side channels*Chart Aus 345 plan of Althorpe Islands***Inshore passage North of Althorpe Island****12.43**

- 1 **Althorpe Island Leading Lights:**
Front (white brick hut, 2 m in height) (35°22'·2S 136°51'·7E).
Althorpe Island Light (white stone tower with lantern; 20 m in height) (35°22'·4S 136°51'·7E)
From a position SW of Reef Head (35°17'S 136°51'E) the alignment (157°) of these lights track leads SSE passing

(with positions from Althorpe Island Light (35°22'S 136°51'E)):

- 2 NE of Emmes Reef (4¼ miles NNW), a steep-to rock and over which the sea breaks heavily, and Brook Shoal with a depth of 8.8 m (29 ft) over it lying 8 cables SW of Emmes Reef. Emmes Reef and Brook shoal are covered by the red sector (065°–095°) of Cape Spencer Light (35°18'N 136°53'E). Thence:
- 3 SW of Packman Shoal (3½ miles N), thence: Once clear of the Red sector of Cape Spencer Light the track leads SE between Althorpe Island and Seal Island (¾ miles NE), a bare rock, noting the 8.5 m (28 ft) shoal 5 cables W.

Passage North of Haystack Island**12.44**

- 1 **Local knowledge** is essential. Small craft may pass between Cape Spencer (35°18'S 136°53'E) and Haystack Island (1½ miles SW), noting Packman Shoal (12.43) close to the track.

Anchorage and bays**Althorpe Island****12.45**

- 1 **Anchorage** sheltered from W gales, may be found in depths of 14 to 18 m (48 to 60 ft), sand, off a remarkable yellow overhanging cliff on the E side of Althorpe Island (35°23'S 136°51'E).

Berth: a jetty projects from the NE side of the island, with depth of 3.4 m alongside.

Stenhouse Bay**12.46**

- 1 **Description.** Stenhouse Bay is situated between a point 3 miles ENE of Cape Spencer (35°18'S 136°53'E) and Rhino Head (1½ miles further NE) (12.41). A jetty extending 205 m SE from the W shore of the bay is protected from the SW swell by the W point. It is no

longer in use by commercial shipping and is popular with recreational fisherman and divers.

- 2 **Tidal streams** in the bay set NNW and SSE at a rate of about 1 kn.

Caution. Foul ground extends about ½ cable SE of the head of the jetty and the depth in the approach to the jetty is 6.7 m (22 ft). The hull of a sailing vessel, about 90 m long was placed about 1¼ cable SSE of the head of the jetty, and sunk in that position, in 1933. Part of the hull is visible at LW.

Chart Aus345

Marion Bay

12.47

- 1 **Description.** Marion Bay (35°14'S 137°00'E), is situated between Penguin Point (35°15'S 136°59'E), a low cliffy projection, and a cliffy point (4½ miles ENE). The head of the bay is shallow and fouled by a rocky bottom covered with weeds. After a strong W gale, heavy rollers set in from the SW, and the whole bay becomes a mass of breakers.

- 2 **Jetty** 267 m in length, with a depth at its head of 2.1 m, extends SE from the shore about 7½ cables N of Penguin Point.

Foul Bay

12.48

- 1 **Description.** Foul Bay (35°11'S 137°15'E) is situated between a point 1¼ miles NE of Yorke Point (35°14'S 137°11'E) (12.41) and Point Davenport (9 miles NE of Yorke Point), a very low point on the beach and not easily identified from the S. Foul Bay is shallow, and the depths in the W part decrease gradually towards the shore. At the head of the bay and towards Point Davenport the depths are very irregular with rocky patches.

- 2 The SW swell sets into the bay, but in quiet weather there is no surf on the beach.

A beacon (S cardinal), stands on the edge of a drying flat off Point Davenport.

Tidal streams set NNE and SW at a rate of about 1½ kn.

Sturt Bay

12.49

- 1 **Description.** Sturt Bay (35°08'S 137°27'E), is situated between Point Davenport (35°10'S 137°20'E) and Point Gilbert (8½ miles ENE). The shore of the bay consists of a sandy beach with some sand hills on its W part. A level, scrub-covered range, commences near Marion Bay (12.47), and extends, almost parallel with the coast to a position abreast the head of Sturt Bay, and 4 miles inland where it terminates abruptly forming a well defined summit known as The Shoulder (35°02'S 137°25'E). It is a useful mark.

Dangerous rocks extend 3 cables S from Point Gilbert.

- 2 **Local knowledge** is necessary.

Directions. The line of bearing of less than 359° of The Shoulder passes E of Point Davenport Shoals in depths of not less than 11 m (36 ft). When making for the anchorage, having identified Point Davenport, a vessel should then steer for it bearing 252°.

Useful mark:

Cootes Hill (35°06'S 137°27'E) (12.42).

- 3 **Anchorage.** Sturt Bay affords good anchorage in depths of 7 to 9 m (24 to 30 ft), fine sand mixed with clay, good holding ground, about 1 mile NE of Point Davenport. This anchorage gives shelter from winds from the NE through N to SSE, Point Davenport Shoal completely breaking the SW swell. With the wind strong between SE and NE a short

sea sets in, which is made more unpleasant by the tidal streams, which set NE and S at this anchorage.

Port Moorowie

12.50

- 1 **Description.** Port Moorowie (35°07'S 137°31'E) is situated between a point about 1 mile E of Point Gilbert (35°07'S 137°30'E) and a reef extending SW from this point which is awash for a distance of 2 cables and has depths of 1.8 m (6 ft) over it for a further 2¾ cables.

Local knowledge is necessary.

- 2 **Tidal streams** are hardly felt inside the port, but outside in depths of 18.3 m (60 ft) they set W and E with rates of 1½ kn at springs.

Anchorage may be found in depths of 3 to 5 m (12 to 18 ft) in a round pool, 2 cables in diameter, between the reef and the coast N of it. It is capable of holding several vessels of not more than 3 m (10 ft) draught.

NEPTUNE ISLANDS TO MARSDEN POINT

General information

Chart Aus 345

Route

12.51

- 1 The route leads from a position S of Neptune islands (35°16'S 136°06'E) about 74 miles E to a position N of Marsden Point.

Topography

12.52

- 1 The coast between Cape Borda (35°45'S 136°35'E) and Cape Forbin (10 miles E) is bold and cliffy.

From Cape Forbin (35°42'S 136°47'E) to Cape Dutton (18 miles ENE) the coast is very rugged and cliffy.

Between Cape Dutton (35°38'S 137°09'E) and Cape Cassini (9 miles ENE) the coast consists of high broken cliffs, indented by several small coves; thence generally high dark cliffs continue to Marsden Point.

Principal marks

12.53

- 1 **Landmark:**

Mount MacDonnell (35°38'S 137°18'E) round-topped; it is the highest land on the N side of Kangaroo Island.

- 2 **Major lights:**

South Neptunes Light (35°20'S 136°06'E) (11.10).

Cape Borda Light (35°45'S 136°35'E) (12.9).

Althorpe Island Light (35°22'S 136°52'E) (11.81).

Point Marsden Light (red beacon on white GRP hut, 3 m in height) (35°34'2S 137°37'3E).

Other aid to navigation

12.54

- 1 **Racon.**

South Neptunes Light (35°20'S 136°07'E) (11.10).

Directions

12.55

- 1 From a position S of Neptune Islands (35°16'S 136°06'E) the track leads E passing (with positions from Cape Cassini (35°35'S 137°20'E)):

N of Cape Borda (35°45'S 136°35'E) (12.11), thence:

N of Cape Torrens (35°42'S 136°47'E), a high point, thence:

N of Cape Forbin (27 miles WSW), a rugged cliffy point, thence:

- 2 S of Althorpe Islands (26 miles WNW) (12.41). Althorpe Island Light (11.81) stands near the centre of Althorpe Island. Thence:
- N of Cape Dutton (9 miles WSW), a sloping cliffy point; an underwater reef extends nearly 2½ cables NE from the cape. A tidal race makes up off the cape at times, which in strong winds, looks like breakers. Thence:
- 3 N of Cape Cassini, composed of white limestone and backed by a range of scrub-covered hills, thence:
- N of Marsden Point (15 miles E), a rocky headland fringed by rocks extending about 1 cable from the point. A light (12.53) stands on the summit of woody land about 5 cables W of Marsden Point.

Useful marks

12.56

- 1 Castle Hill (35°42'S 136°56'E), the highest part of a range of hills.
- Freestone Hill (35°37'S 137°28'E), a flat-topped hill wooded in clumps (not charted).
- Table Topped Hill (35°38'S 137°32'E), has a tall clump near its S fall.
- (Directions continue at 12.66)

Bays and anchorages

Snug Cove

12.57

- 1 **Description.** Snug Cove (35°42'S 136°51'E), the second cove E of Cape Forbin (12.55), is only open NW and is partially protected by some rocks, which extend from a point W of it. The cove is 1½ cables in length and less than 1 cable wide, with depths of 3·7 to 9·1 m in it. The cove may be identified by a small peaked islet, situated close to the point, and also by a high cliff, with some white marks near its summit, 1¼ miles E of it.
- 2 Small coasters lie in depths of 1 to 2 m, close to the beach on the N side, secured head and stern.
- An historic wreck, the barque *Fides*, within a protected area lies about 5 cables WNW of the cove. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Snellings Beach

12.58

- 1 **Description.** Snellings Beach (35°40'S 137°05'E) is situated 5 miles E of the mouth of Western River (35°41'S 136°59'E), and is bordered by cliffs which are lower than those to the W of it. Middle River, blocked by sand in the summer, but navigable for a short distance by boats in winter, flows into the sea through Snellings Beach.
- Local knowledge** is necessary.
- 2 **Caution.** Vessels anchoring off the beach should give its NE point a berth of about 2½ cables to avoid a reef that extends off it, over which the sea generally breaks.
- Anchorage** sheltered from S winds may be obtained in depths of 5 m (18 ft), about 1 cable off Snellings Beach, and in depths of 12 m (42 ft) about 5 cables off.

Stokes Bay

12.59

- 1 Stokes Bay (35°37'S 137°13'E) is situated 3 miles E of Cape Dutton.
- Local knowledge** is necessary.
- Anchorage** during S winds for coasters may be obtained in depths from 7 to 12 m (24 to 42 ft), over a rocky bottom, about 2 cables from the beach.

Dashwood Bay

12.60

- 1 **Description.** Dashwood Bay (35°35'S 137°24'E) is a small bay situated about 3½ miles E of Cape Cassini.
- Local knowledge** is necessary.
- Anchorage** may be obtained in depths of about 9 m (30 ft), sand about 2½ cables from the beach.

Smiths Bay

12.61

- 1 **Description.** Smiths Bay (35°36'S 137°27'E) is a shallow bay with a black boulder beach, 1½ miles in length, situated about 6 miles E of Cape Cassini.
- Local knowledge** is necessary.
- Anchorage** during offshore winds may be obtained, in depths of 10 m (33 ft), 2½ cables off the middle of the black boulder beach.

Emu Bay

12.62

- 1 **Description.** Emu Bay (35°35'S 137°32'E) is situated between Cape D'Estaing (35°35'S 137°30'E), a cliff about 15 m high with a whitish face, to the N and a rocky point 3½ miles E. The SE shore of the bay consists of a fine sandy beach, 2½ miles long. The depths which are more than 9 m (30 ft) in the centre of the bay decrease gradually towards the shore.
- 2 **Berth.** A jetty 110 m in length with depth of 1·2 m alongside its outer end, extends NE from the shore in the W part of the bay, 1 mile SE of Cape D'Estaing. A light stands on the head of the jetty which is closed to commercial traffic.
- Local knowledge** is necessary.
- 3 **Anchorage** may be obtained in depths of 9 m (30 ft), on the alignment (072°) of the E rocky point of the bay and the N extremity of White Point a white cliff face about 1½ miles E of Emu Bay with Cape D'Estaing bearing 275°.
- Smaller vessels can obtain smoother water nearer in depths of 5 m (18 ft) with Cape D'Estaing bearing 297°, and the W end of the beach bearing 230°.

MARSDEN POINT TO CAPE JERVIS

General information

Charts Aus 345, Aus 780

Route

12.63

- 1 The route leads from a position about 5 miles N of Marsden Point (35°34'S 137°38'E) about 21 miles SE to a position WSW of Cape Jervis.

Topography

12.64

- 1 Marsden Point (35°34'S 137°38'E) and Kangaroo Head (16 miles SE) are the N and S entrance points respectively of Nepean Bay. The bay is deeply indented by Bay of Shoals (12.74), Western Cove (12.75) and Eastern Cove (12.76). Kingscote Harbour (12.67) is situated at the entrance to the Bay of Shoals.

Principal marks

12.65

- 1 **Landmark:**
- Tree Hill (35°38'S 138°10'E), the highest point of the range inland of Cape Jervis.
- Major lights:**
- Point Marsden Light (12.53).

Cape Jervis Light (grey concrete tower and lantern, 18 m in height) (35°36'S 138°05'E).

Directions

(continued from 12.56)

12.66

- 1 From a position N of Marsden Point (35°34'S 137°38'E), the track leads SE passing (with positions from Cape Jervis (35°36'S 138°06'E)):
 - NE of a light-beacon (octagonal pile) (20 miles W) marking the E edge of a drying sandspit extending SE from Cape Rouge, (12.74) thence:
- 2 NE of Hardstaff Shoals (11 miles WSW), two shoals with a least depth of 6.4 m (21 ft) over each. Thence:
 - Clear of Landing Shoal (6 miles WSW) depending on draught, thence:
- 3 NE of Kangaroo Head (11 miles SW), a bluff rocky point on which a prominent white cairn stands. The head is steep-to and the tidal stream sets rapidly past, forming an eddy S of this point during the W-going stream and causing strong ripples that are dangerous to open boats. And:
- 4 WSW of Cape Jervis, a high bold headland with very little vegetation, intersected by gullies, and with several cliffy projections. The W and most prominent of these projections is referred to as The Cape. A light (12.65) is exhibited from the cape.

Useful mark

- 5 Hog Bay Breakwater Light (red metal column) (35°43'S 137°56'E).
(Directions continue for Newland Head at 12.83, and for Port Stanvac at 12.101).

Kingscote Harbour

Charts Aus 780, Aus 125 plan of Kingscote Harbour

General information

12.67

- 1 **Description.** Kingscote Harbour (35°39'S 137°39'E) is situated at the entrance to Bay of Shoals, between Beare Point (35°39'S 137°38'E) and the S end of the sand-spit (2 miles E). The harbour comprises a jetty and an anchorage, affording shelter from N and W winds, in depths of about 5 m. There are depths of 7 m S of the SE end of the sand-spit, but it is not so well sheltered there.
- 2 An historic wreck *Robert Burns*, within a protected area lies about 2¼ miles E of Beatrice Point. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Kingscote the principal township of Kangaroo Island is situated on the W shore of the harbour.

Port Authority. Marine Group, Transport SA, PO Box 205, Port Adelaide, S.A. 5015.

Directions

12.68

- 1 Kingscote Harbour is approached from the E on the line of bearing 285° on Table-Topped Hill (35°38'S 137°32'E) (12.56) (chart Aus 345) passing:
 - S of a light (pile beacon) (35°40'S 137°41'E) situated at the S end of the sand-spit extending SE from Cape Rouge (12.74). The spit is covered by the red sector (110°–210°) of the light.
 - The line of bearing 314° on Beatrice Point (35°38'S 137°38'E), leads W of the sand-spit to the anchorage.

Useful marks:

12.69

- 1 Light-beacon (35°38'6S 137°41'5E) (12.66).
Rolls Point Light (35°39'7S 137°37'9E).
Kingscote Harbour Jetty Head Light (35°39'4S 137°38'6E).
Hill (35°39'S 137°38'E) 70 m high, with a beacon standing on its summit.
Conspicuous silo standing 7 cables W of the root of the jetty.

Anchorage

12.70

- 1 The best anchorage may be found in depths of about 6 m about 7½ cables E of the jetty. A good berth may be found for small craft in depths of about 3.7 m), soft sand, with Beatrice Point (12.74) bearing 286°.

Berth

12.71

- 1 Kingscote Jetty extends 350 m E, fronting Kingscote town, with depths of 4.6 m at its head. The jetty is fitted for Ro-Ro vessels with a lift bridge at its outer end where trailer ships berth stern-to.

Port services

12.72

- 1 **Facilities:** hospital available.
Supplies: small quantities of stores and provisions available. Fresh water available.
Communications: vehicle ferry service to Port Lincoln (11.32).

Anchorage and river berth

Chart Aus 345, Aus 780

Marsden Point

12.73

- 1 **Anchorage**, affording shelter from winds W of NW and out of the tidal stream, may be found in depths of 7 to 11 m (24 to 36 ft), good holding ground, with Marsden Point bearing between 325° and 314°, distant 5 cables to 1 mile.

Bay of Shoals

12.74

- 1 **Description.** Bay of Shoals is a shallow sheet of water enclosed between Cape Rouge, a low sandy point (35°35'S 137°38'E) and Beatrice Point (2¾ miles S). A drying sandspit extends 5 miles SE from Cape Rouge, and depths of less than 5.5 m (18 ft) extend 1¼ miles farther SE. Three islets, stand on the sandspit, the NW is Bushy Islet and the two E are Beatrice Islets. Entrance to the bay is afforded by a narrow channel between Bushy Islet and a light-beacon (port hand), 5 cables N of Beatrice Point. Inside the bay, which is only used by small coasters, there are depths of 2 to 3 m (9 to 10 ft).
- 2 **Tidal streams** in the narrow channel that leads into the Bay of Shoals attain a rate of from 3 to 4 kn.
Local knowledge is necessary.

Western Cove

12.75

- 1 **Description.** Western Cove (35°42'S 137°38'E) is the inner part of a bight, situated between Beare Point (35°39'S 137°38'E) and Point Morrison (8 miles SE), a moderately high headland with a few straggling rocks off it. The land round the head of the cove is low and swampy and continues so to Beare Point at the entrance to Kingscote Harbour.

Cygnat River which flows into the sea between Beare Point and the head of the cove, is only navigable by boats at HW.

- 2 A drying sand flat extends 2½ to 5 cables offshore from a position about 2½ miles W of Point Morrison nearly to Beare Point. Frenchman Rock (35°43'S 137°43'E) a rocky patch lies about 1¾ miles W of the point.

Marine farms are situated close to the S shore of the cove.

- 3 **Anchorage** may be found in any part of Western Cove, except off the red cliffs on the S side, where the bottom is rocky. A good anchorage may be found in depths of 5 m (18 ft), with the E-most sandhill of the W group of sandhills on the S side of the cove, bearing 185°, distant 5 cables.

Charts Aus 780, Aus 125 plan of Eastern Cove and American River.

Eastern Cove

12.76

- 1 Eastern Cove lies between Point Morrison (35°43'S 137°47'E) (12.75) and Kangaroo Head (6 miles E). The cove affords shelter for coasters and small craft which have been overtaken by bad weather. Larger vessels will not find much shelter from N winds.
- 2 The shores of the cove consist generally of rocky points and sandy beaches. Extensive sand flats front the shore to the S of Ballast Head (35°45'S 137°48'E), drying out for a distance of 5 cables off Strawbridge Point (2 miles SW) (12.77). The SW part of the cove is obstructed by a bank with depths of less than 5 m over it. American River and Pelican Lagoon are entered from the SW part of the cove.
- 3 **Marine farms** may be found within an area SW of Ballast Head, as shown on the chart. These may be floating

or fixed structures and may be marked by buoys or beacons which may be lit.

Anchorage may be found on the W side of the cove in depths of 7 to 12 m, ooze and mud, with Ballast Head bearing between 230° and 320° distant from 5 cables to 1½ miles. The holding ground is not so good towards the E side of the cove, where there are extensive patches of limestone rock.

- 4 A N gale throws a high short sea into Eastern Cove; to be free of this, coasters usually find anchorage under Ballast Head in depths of about 5 m, with the point bearing 027°, or as far in as their draught allows. For this local knowledge is necessary.

American River and Pelican Lagoon

12.77

- 1 **General information.** The small town of American River (35°47'S 137°47'E) is situated on the W side of the channel of the same name leading to Pelican Lagoon. There is a least depth of 0.9 m in the fairway which is much obstructed by sandbanks; in Pelican Lagoon, there are depths from 1.9 to 7.3 m (6 to 24 ft).
- 2 **Tidal streams** in American River, with rates varying between 2 and 3 kn, change from 1 to 2 hours after the times of HW and LW.
Local knowledge is necessary.
Directions. American River is approached from Eastern Cove, and entered N of Strawbridge Point.
- 3 American River Approach Light-beacon (port hand) (35°46'.7S 137°47'.9E) marks the entrance to a channel marked by beacons and dredged to 3 m (1969) leading to American River and Pelican Lagoon as shown on the chart.
Berth. A jetty 27 m in length, with a depth of 4 m alongside fronts American River town.

BACKSTAIRS PASSAGE

General information

Chart Aus 780

Route

12.78

- 1 The main route passes S of Yatala Shoal (35°44'S 138°11'E) and leads from a position NE of Kangaroo Head (35°43'S 137°54'E) about 17 miles SE to a position E of Cape Willoughby.
A secondary route passes N of Yatala Shoal and leads from a position SW of Cape Jervis (35°37'S 138°06'E) about 20 miles ESE to a position SE of Newland Head.

Topography

12.79

- 1 Backstairs Passage (35°44'S 138°10'E), the E entrance of Gulf of Saint Vincent and Investigator Strait, lies between Dudley Peninsula, the E end of Kangaroo Island, and the W end of Fleurieu Peninsula (7 miles NE). It is navigable by the largest vessels that navigate Gulf of Saint Vincent and presents but few difficulties.

The SW side of the passage, is generally bold and cliffy. The NE side, is generally bold and rocky, with scrub-covered hills intersected by deep ravines.

Tidal streams

12.80

- 1 Tidal streams in Backstairs Passage set NW and SE and are rapid and sometimes irregular, with rates varying between 2½ to over 4 kn. The rate of the stream is charted

as 2½ kn, but it varies according to the strength and direction of the prevailing winds. The influence of the streams in the S part of the channel does not extend far outside Cape Willoughby (35°51'S 138°08'E).

Principal Marks

12.81

- 1 **Landmark:**
Cape Willoughby Light (35°51'S 138°08'E) (12.26).
Major light:
Cape Jervis Light (35°36'S 138°06'E) (12.65).

Directions

(continued from 12.66)

Kangaroo Head to Cape Willoughby

12.82

- 1 From a position NE of Kangaroo Head the track leads SE passing (with positions from Kangaroo Head (35°43'S 137°54'E)):
NE of Hog Point (1¾ miles E). A jetty extends 145 m E from the NE extremity of the point, A light (12.66) is exhibited from the head of the jetty. Thence:
NE of Snapper Point (7 miles ESE). Thence:
SW of Yatala Shoal (12 miles E) with a least depth of 5.5 m (18 ft) and over which the sea breaks; it appears possible that the depths over the shoal may vary, thence:



Cape Willoughby (12.27) & Cape St. Alban (12.82) from SSE

(Original dated 1986)

(Photograph – Australian HO)

NE of Cape Saint Alban (12 miles SE). A light, (white round masonry tower; 9 m in height) (35°48'3S 138°07'6E), is exhibited from the cape. Thence:

- 3 NE of Cape Willoughby (12½ miles SE) (12.27). A light (12.26) is exhibited from the E side of the cape. Thence:
SW of South Page (35°47'S 138°18'E) (12.33), from where a light is exhibited.

Cape Jervis to Newland Head 12.83

- 1 From a position SW of Cape Jervis (35°37'S 138°06'E) the track leads ESE passing (with positions from Cape Jervis):

NNE of Yatala Shoal (6½ miles SE), and;
SSW of Porpoise Head (7 miles ESE), bold and rocky, thence:
NNE of The Pages (14 miles SE), thence:
SE of Newland Head (35°39'S 138°31'E).

(Directions continue at 13.12)

Anchorage and bays

Hog Bay 12.84

- 1 **Description.** Hog Bay (35°43'S 137°57'E) lies on the E side of Hog Point. The land about the point is cultivated and the small town of Penneshaw lies along its shores. A jetty extends E from the NE extremity of Hog Point and there is a shallow boat harbour on the E side of the point.

Local knowledge is necessary.

- 2 **Anchorage** may be found in depths of from 3 to 7 m (12 to 24 ft) in the E part of the Bay.

Smaller vessels also anchor off the entrance to the boat harbour, where they are out of the way of the tidal streams.

Caution. A seawater intake structure and pipeline is situated approximately 1 mile W of Penneshaw. The intake structure is located 220 m offshore in about 8 m of water. The route of the intake pipe is delineated by two lead markers positioned on the shore. The front marker is located approximately 250 m from the intake structure.

- 3 An anchorage exclusion zone has been established around the pipeline. Vessels are prohibited from anchoring within 30 m either side of the lead line for a distance of 250 m seaward of the front lead.

Berth. There is a jetty 145 m in length, with depths of 5.5 m (18 ft) alongside its outer end.

Communications. A ferry plies from Hog Bay (35°43'S 137°57'E) to Cape Jervis (10 miles NE).

Antechamber Bay 12.85

- 1 Antechamber Bay (35°48'S 138°06'E) is situated between Cape Coutts (35°46'S 138°04'E) and Cape Saint Alban about 3¼ miles SE. The NW side of the bay is high and rocky, the SW shore is low and the SE shore is high and woody. Chapman River flows into the W part of the bay.

Anchorage may be found in any part of the bay, at a distance of between 5 and 7 cables offshore. Small craft anchor further in according to draught. The tidal stream is weak inside depths of 5.5 m (18 ft).

- 2 From its appearance it would seem likely that a heavy swell would enter the bay with ESE winds but this is not the case. The strong tidal currents in the passage raise such a ripple that the swell is smoothed before it reaches the shallow water. The heaviest swell is raised during strong S gales when the swell rounds Cape Saint Alban. The S part of the bay is the smoothest but with proper precaution, a vessel will ride in any part of the bay.

GULF OF SAINT VINCENT

GENERAL INFORMATION

Charts Aus 780, Aus 781

Scope of the section

12.86

- 1 This section comprises the following sub sections:
 Troubridge Shoals (35°08'S 137°48'E) to Port Adelaide (12.90).
 Cape Jervis (35°36'S 138°06'E) to Port Adelaide (12.96).
 Port Adelaide (34°50'S 138°30'E) (12.112).
 Troubridge Shoals (35°08'S 137°48'E) to MacDonnell Sound (35°03'S 137°50'E) (12.142).
- 2 Port Giles (35°02'S 137°46'E) (12.150).
 MacDonnell Sound (35°03'S 137°50'E) to Ardrossan (12.157).
 Ardrossan (34°26'S 137°55'E) (12.167).
 Ardrossan (34°26'S 137°55'E) to Port Wakefield (12.182).

Topography

12.87

- 1 Gulf of Saint Vincent, situated between Yorke and Fleurieu Peninsulas, was so named by Captain Flinders in honour of John Jervis, Earl of Saint Vincent and First Lord of the Admiralty when HM Surveying Vessel *Investigator* sailed from England.

When entering the gulf, the high ranges of hills on the E side may be seen for a considerable distance.

Exercise area

12.88

- 1 A military exercise area is situated in the N part of the Gulf. See 1.9, 12.159, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Current

12.89

- 1 Although information for the Gulf is scarce, there is evidence that, N of about Holdfast Bay (34°59'S 138°30'E), a S going current of about ¾ kn predominates from about April to September.

TROUBRIDGE SHOALS TO
PORT ADELAIDE

General information

Charts Aus 780, Aus 781 plan of approaches to Port Adelaide

Route

12.90

- 1 The route leads from a position SSE of Marion Reef Light-Beacon (35°09'S 137°49'E) (12.41) at SE extremity of Troubridge Shoals about 34 miles NE to a position W of Port Adelaide Entrance Light-beacon (12.94).

Currents

12.91

- 1 Outside Troubridge Shoals the tidal streams run roughly parallel with the coast at a rate from 2 to 3 kn at springs.

Principal marks

12.92

- 1 **Landmarks:**
 Mount Lofty (34°59'S 138°43'E), the highest part of the range of hills on the E side of Gulf of Saint Vincent.

Three prominent television towers standing near the summit of Mount Lofty; lights are exhibited from the two outer towers. A white obelisk stands near the summit of the mountain in memory of Captain Flinders.

Major Lights:

Troubridge Hill Light (35°10'S 137°38'E) (12.39).
 Marino Rocks Light (white concrete tower and lantern, 15 m in height) (35°03'·3S 138°30'·6E).
 West Torrens Aero Light (34°56'·5S 138°31'·8E).

Other aid to navigation

12.93

- 1 **Racon:** Troubridge Hill Light (35°10'·1S 137°38'·4E) (12.39).

Directions

(continued from 12.42)

12.94

- 1 From a position SSE of Marion Reef Light-beacon (35°09'S 137°49'E) (12.41) at SE extremity of Troubridge Shoals the track leads NE passing (with positions from Troubridge Island Lighthouse (disused)):

Clear of McIntosh Bank (8½ miles ESE), thence:
 SE of Tapely Shoal (3 miles NE), with a least depth of 5 m (17 ft) over it. The depth over the shoal varies due to the effect of the strong tidal stream on the sandy bottom. The shoal is steep-to on its E side and the bottom, of sand and weed, can easily be seen in fine weather. A light (white GRP hut on pile structure; 11 m in height) is exhibited from the N end of the shoal. Thence:

- 2 The track continues to lead NE for about 26 miles for which the chart is sufficient guide, to the pilot boarding area about 2 miles W of Port Adelaide Entrance Light-beacon (black triangle on black framework structure; 4 m in height) (34°47'·4S 138°24'·5E).

Useful marks

12.95

- 1 Water tower (34°48'S 138°30'E).
 Hotel (34°49'S 138°29'E) situated near Largs Bay Jetty.
 Glenville water tower (34°50'S 138°29'E).
 (Directions continue at 12.135)

CAPE JERVIS TO PORT ADELAIDE

General information

Chart Aus 780, Aus 781 plan of Approaches to Port Adelaide

Route

12.96

- 1 The route leads from a position WSW of Cape Jervis (35°36'S 138°06'E) about 53 miles NNE to a position W of Port Adelaide Entrance Light-beacon (34°47'S 138°24'E).

Topography

12.97

- 1 The coast for a distance of about 18 miles NE from Cape Jervis is bold, thence to the head of the gulf it is low with sand hummocks.

The coast between Port Stanvac (35°07'S 138°28'E) and Marino Rocks (4 miles NNE) consists of rocky points and sandy beaches, thence mainly sandy beaches backed by the buildings of the NW district of Adelaide continue to Pelican Point, 14 miles farther N.

- 2 The 11m (36 ft) depth contour, close off the coast at Port Stanvac progressively diverges farther from it until opposite Port Adelaide it lies about 4 miles off.

Submarine pipeline

12.98

- 1 A disused oil pipeline extends 1½ miles WNW from the jetty at Port Stanvac. See 1.38.

Winds

12.99

- 1 The coast between Cape Jervis (35°36'S 138°08'E) and Adelaide (50 miles NNE), is exposed to W winds, and a gale from that quarter throws in a heavy sea. On the approach of such a gale, which is indicated by a falling barometer, and the wind freshening from N with a cloudy sky, vessels at anchor off this coast should put to sea and shelter in Eastern Cove (12.76), Kangaroo Island, until the weather moderates.

Principal marks

12.100

- 1 **Landmark:**
Mount Lofty (34°59'S 138°43'E) (12.92)
- Major lights:**
Cape Jervis Light (35°36'3S 138°05'7E) (12.65).
Marino Rocks Light (35°03'3S 138°30'7E) (12.92).
West Torrens Aero Light (34°56'5S 138°31'8E) (12.92).

Directions

(continued from 12.66)

12.101

- 1 From a position WSW of Cape Jervis (35°36'S 138°06'E) the track leads NNE passing (with positions from Snapper Point (35°16'S 138°27'E)):
WNW of Cape Jervis (27 miles SW) (12.66), thence:
WNW of Rapid Head (20½ miles SW), projecting N, thence:
WNW of a wreck (19 miles WSW) with a depth of 4.6 m (15 ft) over it, marked by a light-buoy (isolated danger). Thence
- 2 WNW of Carrickalinga Head (10 miles SW), a bold headland, thence:
WNW of Snapper Point. A drying reef extends 2½ cables NW from Snapper Point and fringes the coast for 7½ cables S and ENE from it. Thence:
WNW of Onkaparinga Head (6 miles N) a cliffy projection; a ledge of underwater rocks extends off the head. Thence:
- 3 WNW of Port Stanvac jetty (10 miles N), from where a light is exhibited, thence:
WNW of a fish haven and a wreck (17½ miles N), marked by a buoy (special), thence:
WNW of a fish haven (21 miles N), marked by a buoy (special), thence:
- 4 WNW of Point Malcolm (25 miles N), the W point of Lefevre Peninsula. An outfall pipe extends 2¼ miles W from the coast close S of the point. Thence:
WNW of a historic wreck (34°49'S 138°25'E), marked by a light-buoy (orange with topmark). See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.
The track continues NNE to the pilot boarding position 2 miles W of Port Adelaide Entrance Light-beacon.

Useful marks

12.102

- 1 Carrickalinga Hill (35°25'S 138°22'E).
Mount Jeffcott (35°23'S 138°25'E).
Black Hill (35°22'S 138°26'E).
Mount Terrible (35°20'S 138°30'E).
Glanville water tower (34°50'S 138°29'E).
Hotel (34°49'S 138°29'E) (12.95).
Water tower (34°48'S 138°30'E).
(Directions continue for Port Adelaide at 12.135)

Bays and harbours

Chart Aus 125 plan of Cape Jervis

Cape Jervis Boat Harbour

12.103

- 1 **Description.** Cape Jervis Boat Harbour is situated within the rocks that extend about 2 cables offshore near Cape Jervis Lighthouse (35°36'S 138°06'E). It is a convenient little harbour, with a jetty protected by a breakwater.

Leading lights:

- Front (35°36'3S 138°05'6E).
Rear (64 m NE of front light).
- 2 The alignment (042°) of these lights leads into the harbour.
- Berth.** There is a jetty about 120 m in length, with a depth alongside of 2.6 m.
- Communications.** A ferry plies from Cape Jervis (35°36'S 138°06'E) to Hogs Bay (10 miles SW).

Chart Aus 780

Rapid Bay

12.104

- 1 **General information.** Rapid Bay (35°31'S 138°11'E) is an open roadstead. Rapid Bay jetty extends 497 m N from the shore about 1 mile E of Rapid Head (12.101). It is no longer used by commercial shipping.
- Berth.** The T-head of the jetty provides a berth 201 m in length on dolphins with a depth alongside of 8.8 m.

Second Valley

12.105

- 1 **Description.** Second Valley Cove (35°31'S 138°13'E) is formed by a slight indentation in the coast 2½ miles ENE of Rapid Head (12.101).
The rocky point on the W side of the cove is steep-to and affords some protection from S winds to small vessels, but the anchorage is exposed. A heavy sea sets in on the approach of W gales and vessels should leave at the first sign of approaching bad weather.
- 2 **Local knowledge** is necessary.
A promenade pier with a depth of 4 m at its head, projects from the W point of the cove.

Charts Aus 780, Aus 125 plan of Wirrina Cove

Yankalilla Bay

12.106

- 1 **Description.** Yankalilla Bay (35°28'S 138°17'E) is situated between Second Valley Cove (35°31'S 138°13'E) (12.105) and Carrickalinga Head (9 miles NE). Bungala River flows into the sea about 2¾ miles SSW of Carrickalinga Head. A marina is situated in Wirrina Cove (35°30'2S 138°14'4E).
Anchorage may be found in depths of 12 to 16 m (42 to 54 ft), 1¼ miles NW of Bungala River.

Chart Aus 780

Aldinga Bay

12.107

- 1 **Description.** Aldinga Bay (35°20'S 138°26'E) is situated between Myponga Jetty (35°22'S 138°23'E) and Snapper Point (6 miles NE) (12.101); it is open to winds from about N to SW, but its S part is safe during S and W winds. Myponga jetty has been abandoned.

Port Willunga

12.108

- 1 **Description.** Port Willunga (35°16'S 138°27'E), which can be identified by its white cliffs, is situated between Snapper Point (35°16'S 138°27'E) (12.101) and Blanche Point (1¼ miles NNE).
A drying reef fringes the coast for 7½ cables S and ENE from Snapper Point. Foul ground with depths of less than 5 m over it extends 2½ cables seaward of the drying reef. The remainder of the coastline, with the exception of a small ledge of rocks 1¼ mile NE of Snapper Point, is formed by a sandy beach.
- 2 An historic wreck, *Star of Greece*, within a protected area lies 4 cables SSW of Blanch Point. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*. The remains of a jetty and associated piping lies close to the wreck.
Three buoys (special) mark the outer limits of an aquatic reserve in the bay; two were reported missing (1989).
- 3 **Anchorage** sheltered from S winds by Snapper Point and the reef that extends from it, may be obtained in good holding ground where the depths exceed 7 m; a heavy sea rolls in at times causing vessels to be uneasy. Vessels should leave the anchorage immediately on the approach of bad weather.

Chart Aus 781 plan of approaches to Port Adelaide

Port Noarlunga

12.109

- 1 **General information.** Port Noarlunga (35°09'S 138°28'E) is a safe and convenient little harbour for small craft that lies between Onkaparinga Head (35°10'S 138°28'E) (12.101) and Witton Bluff (1½ miles N), a bold reddish cliffy projection. A fish haven lies about 1 mile W of Witton Bluff.
The small town of Noarlunga lies on the banks of Onkaparinga River, which flows into the sea, through a bar of shifting sand, close N of Onkaparinga Head.
- 2 Two reefs, which dry 1-2 m in places extend 8½ cables NNW parallel to and about 1 cable off the coast from a position 5½ cables N of Onkaparinga Head. These two reefs are separated by Middle Entrance channel which is ¾ cable wide; a pool with depths of 10 to 14-6 m lies just outside the entrance; inside the port the depths decrease rapidly, to 5 m and less.
There are entrance channels both N and S of the reefs, but their use requires local knowledge.
- 3 During W gales a short sea gets over the reefs at HW. The smoother water is found under the N reef.
Directions. The alignment (076°) of two beacons (black, square) situated on the sandhills E of Middle Entrance channel, leads to and through the entrance.
Pier. A light promenade pier extends about 1 cable W from a position about 3 cables S of Witton Bluff.

Charts Aus 125 plan of Port Stanvac, Aus 781 plan of Approaches to Port Adelaide

Port Stanvac

12.110

- 1 **General information.** Port Stanvac (35°07'S 138°28'E), previously an oil refinery port which ceased commercial operation in 2003, is situated 2½ miles NNE of Witton Bluff (12.109) and consists of an L-shaped jetty extending WNW from the shore. A light is exhibited from its head with an unlit dolphin about 100 m SSW. Entry is prohibited.
A boat harbour, protected by breakwaters each exhibiting a light at its head, is located 5½ cables S of Port Stanvac.
- 2 **Anchorage**, with good holding, may be obtained in depths of 20 m, hard sand, with Marino Rocks Lighthouse (35°03'S 138°31'E) (12.92) bearing 065° distant 3 to 3½ miles.

Chart Aus 125 plan of Glenelg

Holdfast Bay

12.111

- 1 Holdfast Bay (34°59'S 138°30'E) is an open anchorage off the town of Glenelg (34°59'S 138°31'E) and has depths that decrease gradually from 11 m, about 2 miles offshore to 3-7 m about 2½ cables offshore.
- 2 The remains of a breakwater, 2 cables long, which was abandoned before completion, lie parallel with the shore and about 3 cables from it off Glenelg. Lights are exhibited from its N and S ends. A promenade jetty extends 1 cable W from the shore abreast the S end of the breakwater.
SW gales cause a heavy sea in the roadstead, but the holding ground is very good. Holdfast Bay was at one time the anchorage for Adelaide, but is now seldom used.
- 3 **Caution** a buoy (special), moored about 3½ miles W of Glenelg promenade jetty marks an area of wrecks, with a least charted depth of 11.3 m.
Anchorage may be obtained in depths of from 9 to 11 m, clay, on the alignment (087°) of Glenelg church (34°59'S 138°31'E) with Mount Lofty (12.92) (chart Aus 780) about 1½ to 2 miles offshore.

PORT ADELAIDE

General information

Charts Aus 137, Aus 781 plan of Approaches to Port Adelaide

Position

12.112

- 1 Port Adelaide (34°51'S 138°30'E) is the capital port of South Australia.

Function

12.113

- 1 Adelaide is a commercial port with an estimated population (2002) of 1 083 900, handling a range of wet and dry cargoes. A commercial fishing harbour is situated within North Arm, a narrow channel that separates Torrens Island (34°45'S, 138°31'E) from the mainland to the S.

Port Limits

12.114

- 1 The limits of Port Adelaide extend from Point Grey, 3 miles WNW, 3½ miles W, 3½ miles S and then E to North Haven breakwater as shown on the chart.

Approach and entry

12.115

- 1 Port Adelaide Outer Harbour and river are approached from W and entered at Entrance Light-beacon (12.94)



Port Adelaide – Port Control (12.124)

(Photograph – Ian Routledge)

through a dredged channel marked by light-beacons and leading lights.

Inner Harbour is entered from Outer Harbour through a dredged channel marked by Light-beacons to the Birkenhead Bridge, about 5 miles S.

Traffic

12.116

- 1 In 2002 the port was used by 816 vessels totalling 24 051 823 dwt.

Port Authority

12.117

- 1 Flinders Ports Proprietary Ltd, 296 St Vincent Street, Adelaide, S.A. Australia 5015.
Website: www.flindersports.com.au

Limiting conditions

Controlling depths

12.118

- 1 Maintained depths in the channels are as follows:
From Entrance Channel Light-beacon to Outer Harbour 12.2 m.
From the Outer Harbour to Inner Harbour 9.3 m, and limited to vessels of 206 m in length.
Above Hindmarsh Reach to Birkenhead Bridge 8.4 m.
Above Birkenhead Bridge 6.1 m.

Vessels proceeding to Outer Harbour are required to have an underkeel clearance of 10% of draught with a minimum keel clearance of 0.9 m. Vessels proceeding to Inner Harbour are required to have an underkeel clearance of 7.5% of draught and a minimum of 0.3 m at all berths.

Vertical clearances

12.119

- 1 Cables span the river with the following clearances:ss
34°46'9S 138°30'9E 59 m; safe overhead clearance
34°47'5S 138°30'8E 54 m; vertical clearance.

34°48'3S 138°30'8E 54 m; safe overhead clearance
34°49'5S 138°30'5E 53 m; safe overhead clearance

Deepest and longest berth

12.120

- 1 No 6 Container Terminal Wharf (Outer Harbour) (12.139).

Tidal levels

12.121

In the Outer Harbour, mean maximum range about 2.0 m; mean minimum range about 0 m. See *Admiralty Tide Tables Volume 4*.

Density of water

12.122

- 1 1.025 to 1.027 g/cm³.

Maximum size of vessel handled

12.123

- 1 Maximum vessel dimensions are as follows:
Outer Harbour: 288 m LOA.
Inner Harbour: 206 m LOA.
Draught, length and other navigational limits are subject to the Harbour Masters discretion.

Arrival information

Port Operations

12.124

- 1 All movement in the port is controlled from the signal station situated in Outer Harbour at the S end of No 1 berth. The station is fitted with radar. Vessels may berth at any time, but those in excess of 191 m LOA are swung in daylight hours only.

Notice of ETA

12.125

- 1 The ETA should be reported 24 hours and 4 hours in advance, for details see *Admiralty List of Radio Signals Volume 6 (4)*.

Outer anchorage

12.126

- 1 Vessels waiting to enter harbour anchor clear of the channel and navigation aids near the approaches, according to draught.
- 2 Semaphore Anchorage is an open roadstead off the W side of Lefevre Peninsula between Wonga Shoal (34°50'S 138°27'E) and the harbour entrance, where the holding ground is good, hard sand and weed. Largs Bay is situated in the S part of this anchorage and is protected in some measure from SW to S by Wonga Shoal. A good scope of cable should be used, and it is preferable to lie to a single anchor. In the event of dragging the second anchor should be let go since veering more cable is of little use owing to the weed on the seabed.

- 3 The best anchorage for small vessels is NNW of the head of Semaphore Jetty (34°50'·2S 138°28'·5E) and about ¾ to 1½ miles from it, in depths of 6·1 to 7·9 m.

Prohibited anchorage. Vessels are prohibited from anchoring in the approaches to the entrance channel. The limits of the prohibited area are shown on the chart

Anchorage is prohibited within 90 m of the submarine pipe lines shown on the chart and within 60 m of the power cables spanning the river as shown on the chart. Anchorage is also prohibited within 125 m of ASC Wharf.

- 4 **Historic wrecks.** Care should be taken not to anchor near an historic wreck, *Norma*, within a protected area and marked by a light-buoy, lying about 2 miles S of the Entrance Light-beacon.

A historic wreck within a protected area lies about 3 miles E of the Entrance light-beacon. See 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*.

Caution. An obstruction lies approximately 4½ miles W of the Entrance light-beacon.

Submarine cables and pipelines

12.127

- 1 There a number of submarine pipelines and cables within the Inner Harbour as follows:
 - Gas pipeline (34°47'·7S 138°30'·7E)
 - Gas pipeline (34°48'·2S 138°30'·7E)
 - Water pipeline (34°48'·7S 138°30'·8E)
 - Power cable (34°49'·4S 138°30'·6E)
 Anchoring is prohibited in the vicinity of these, see 1.38.

Pilotage and tugs

12.128

- 1 **Pilotage** is compulsory for vessels over 35 m LOA. Pilots board about 2 miles W of Entrance Light-beacon. For details see *Admiralty List of Radio Signals Volume 6 (4)*.
Tugs are available.

Traffic regulations

12.129

- 1 **Speed limits** as follows:

7 kn Between No 6 and No 12 beacons
S of No 27 beacon

- 4 kn Between the Fairway Beacons and Jervois Bridge when:
- (i) abreast of any vessel moored at a wharf or any established mooring place, or within 200 m upstream or downstream of any such area; or
 - (ii) within 200 m of any dredge or marine works.
- In North Arm between No 36 beacon and Grand Trunkway Bridge.

Quarantine

12.130

- 1 Port Adelaide is a first point of entry, see 1.54 and *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

General layout

12.131

- 1 Port Adelaide consists of Semaphore Anchorage (12.126), Outer Harbour situated within the breakwaters at the entrance to Port Adelaide River, with deep-water wharfs intended for the use of larger vessels and the Inner Harbour which extends upstream to the centre of the city of Port Adelaide, a distance of 7 miles, and is mainly intended for the use of the more general cargoes.
- 2 Outer Harbour yacht basin (34°46'·5S 138°29'·3E), situated S of the Container Terminal (12.139) and North Haven (34°47'S 138°29'E), situated S of the entrance to Port Adelaide River, provide marina facilities for small craft. Gawler Reach (34°50'·5S 138°30'·0E) contains a yacht berth and several slipways at the N end of the reach.

Signals

12.132

- 1 Tidal signals (Diagram 12.132) are displayed from the port operations centre (12.134).

Signal	Meaning
	Indicates tide is flooding.
	Indicates tide is ebbing.
	Indicates tide is slack.
Note "slack" period is approximately 15 minutes either side of predicted HW and LW.	
	Indicates channel is blocked.
	
	

Tidal signals – (12.132)

Natural conditions

12.133

- 1 **Tidal streams** set N and S across the entrance to the dredged channel, and turn about 1 hour before the times of HW and LW by the shore. Within the breakwater, and from thence to Port Adelaide, the streams turn at the times of

HW and LW. The stream attains its greatest strength between the entrance and North Arm (34°49'S 138°31'E), but seldom exceeds a rate of 3 kn.

- 2 **Winds.** In the summer land and sea breezes blow regularly, the latter from the SW. In winter it is mainly from between W and N.

The heaviest gales occur in May, June, July and August. Occasionally a depression from the interior of the continent, or the centre of a tropical storm from the W coast of Australia, may reach the S but their winds are seldom destructive.

- 3 **Climatic table** See 1.170 and 1.189.

Landmarks

12.134

- 1 Mount Lofty (34°59'S 138°43'E) (12.92).
Port Operations Centre (34°47'S 138°29'E).
Water tower (34°48'S 138°30'E).
ETSA Power Station Chimney (163 m in height) (34°48'S 138°31'E), marked by red obstruction lights.

Directions

(continued from 12.95 and 12.102)

Outer Harbour Entrance channel

12.135

- 1 From the pilot boarding position (34°47'4S 138°22'1E), the entrance channel is approached passing N of Entrance Light-beacon (34°47'5S 138°24'5'E), thence the track leads ESE:

Leading lights, Set No 1:

Front No 7 Light-beacon (orange triangle, point up, on beacon) (34°47'6S 138°26'9E).

Rear Light-beacon (orange triangle, point down, on beacon) (34°47'6S 138°27'2E).

- 2 The alignment (101¼°) of these lights and the rear ETSA Power Station chimney (3½ miles from the rear light beacon) lead into the dredged channel marked by light-beacons as shown on the chart passing (with positions from the front leading light-beacon):

Between No 5 Light-beacon (orange triangle, point up, on beacon) (2 cables W) and No 2 Light-beacon (port hand) (1½ cables NW).

- 3 From a position about 1 cable W of No 7 Light-beacon, the track leads ENE.

Leading lights, Set No 2:

Front Revetment Mound Head Light beacon (orange triangle point up on beacon) (34°47'4ES 138°28'0E).

Rear Light-beacon (orange triangle point down on beacon) (664 m from front).

- 4 The alignment (077½°) of these lights continues to lead through the channel passing (with positions from the front leading light):

NNW of No 9 Light-beacon (orange triangle on beacon) (4½ cables ENE), thence:

SSE of No 4 Light-beacon (port hand) (6½ cables ENE).

- 5 **Leading lights, Set No 3:**

Front (orange triangle point up on beacon) (34°46'9S 138°28'8E).

Rear (orange triangle point down on beacon) (256 m from front).

- 6 The alignment (060½°) of these lights continue to lead through the channel passing (with positions from the front light):

NNW of Southern Revetment Head Light (7½ cables SW), thence:

SSE of the North West Revetment Mound Head Light (5 cables WSW), thence:

SSE of No 6 Light-beacon (port hand) (3½ cables WSW).

- 7 From a position about 2 cables SW of the front leading light-beacon the track leads NE:

Leading lights, Set No 4:

Front (Orange triangle point up on beacon) (34°45'9S 138°29'3E).

Rear (orange triangle point down) (655 m from front).

- 8 The alignment (030°) of these lights leads towards Outer Harbour berthing area as shown on the chart.

There are also berthing leads to assist vessels into the Container terminal as shown on the chart.

Inner Harbour

12.136

- 1 From a position SE of No 10 Light-beacon (port hand) (34°45'9S 138°29'4E) the track leads ENE, thence E rounding Pelican Point (34°46'S 138°30'E) thence SE rounding Snapper Point (34°46'S 138°31'E) into the marked channel as shown on the chart.

From a position about 1 cable N of No 26 Light-beacon (port hand) (34°46'5S 138°31'0E) the track leads SSW:

- 2 **Leading lights, Set No 10:**

Front (triangle point up) (34°48'2S 138°30'6E).

Rear (triangle point down) (390 m from front).

The alignment (191°) of these lights leads through Lipson Reach, marked by light-beacons (port and starboard) as shown on the chart, passing (with positions from the front light-beacon):

- 3 Between No 26 Light-beacon (port hand) (1¼ miles NNE) and No 27 Light-beacon (starboard hand) (1¼ miles N), thence:

E of ASC Engineering Wharf (9 cables N).

From a position about 1 cable W of No 34 Light-beacon (port hand) (3 cables NNE) the track leads SSE:

- 4 **Leading lights, set No 11:**

Front light (34°48'9S 138°30'9E).

Rear light (430 m from front).

The alignment (172°) of these lights continues to lead through the marked channel as shown on the chart, passing (with positions from the front leading light):

4 Thence:

- 5 Between No 36A Light-beacon (port hand) (3½ cables N), marking the S entrance to North Arm, a narrow channel that separates Torrens Island from the mainland, and No 37 light-beacon (starboard hand) (3½ cables NNW).

From a position about 2½ cables NNW of the front light, the track leads S:

- 6 **Leading lights, Set No 12:**

Front light (34°49'2S 138°30'8E).

Rear light 265 m from front.

The alignment (185°) of these lights continues to lead through the marked channel as shown on the chart.

From a position about 2 cables N of the front leading light, the track leads SSW for about 7 cables passing (with positions from No 39 Light-beacon (starboard hand) (34°49'1S 138°30'6E): Thence:

- 7 E of Birkenhead Wharves — oil and bulk cargoes.

The track continues as requisite to reach the berths at Hindmarsh Reach and Gawler Reach through Birkenhead Bridge (opening) (34°50'6S 138°30'0E).

Leading marks. The alignment (254¼°) of the leading beacons on Musgrave Wharf leads through the central span of Birkenhead Bridge.

Useful marks

12.137

- 1 Chimney (34°46'7S 138°31'2E).
 Pylons (122 m high) (34°47'0S 138°31'1E).
 Pylons (110 m high) (34°47'5S 138°31'0E).
 Pylons (110 m high) (34°48'4S 138°30'5E).

Berths

Anchorage

12.138

- 1 Vessels are not permitted to anchor opposite Outer Harbour Wharf or Container Terminal, or within the river in such a way as to obstruct the channel. Vessels anchoring must keep N of the dredged cutting between No 3 Light-beacon (starboard hand) (34°47'6S 138°25'8E) and Snapper Point (34°46'S 138°31'E).

Vessels anchoring between Snapper Point and the Inner Harbour should keep E of the dredged channel.

Outer Harbour

12.139

- 1 **Outer Harbour** (34°46'5S 138°29'0E) consists of six berths. Berths 1–4 form a continuous wharf with depths alongside between 11.2 and 11.5 m. The Container Terminal, berths 6–7 has depths alongside of 13.2 m.5450.

Inner Harbour

12.140

- 1 Osborne Wharf (34°47'8S 138°30'5E) has two berths, dry and liquid bulk cargoes, with depths alongside of 9.6 and 10.0 m. Penrice Wharf, (1½ cables S), bulk soda ash loading, has a depth alongside of 7.5 m.
 Berth 27 (34°49'6S 138°30'6E), a bulk grain loading wharf, has depths alongside of 10.9 m. Berth 29, 3 cables NNE has a depth alongside of 10.0 m.
- 2 No 3 Dock (34°49'9S 138°30'5E) has one berth with Container and Ro-Ro facilities, 240 m in length, depth alongside of 10.2 m. Ocean Steamers Wharf (34°50'1S 138°30'4E) has three berths, depths alongside of 10 m, with Ro-Ro facilities for cars only.
- 3 Birkenhead wharves-oil products and bulk cargo (34°49'7S 138°30'4E), has four oil berths, the longest M berth 205 m in length, with depth alongside of 9.7 m, and two cement berths, the longest H berth 304 m in length, depth alongside of 11.2 m.
- 4 No 2 Dock (34°50'3S 138°30'5E), has four berths. The longest No 17 berth, 169 m in length, with depth alongside of 9.3 m. Commercial wharf (34°50'4S 138°30'4E) has three berths. The longest are No 11 and No 12 berths, each 159 m in length, depth alongside of 8.7m.
- 5 No 1 Dock (34°50'6S 138°30'5E) has five berths, including No 9 berth with facilities for Ro-Ro vessels.
- 6 McLaren Wharf (34°50'6S 138°30'2E) has three berths, the longest No 1 berth 211 m in length, depth alongside of 8.4 m. Above Birkenhead Bridge, North Parade Wharf is 329 m in length, with a depth alongside 5.1 m and Princes Wharf, a Ro-Ro berth, is 102 m in length, with depth alongside of 4.9 m.



Approaches to Port Adelaide (12.139)

(Photograph – Ian Routledge)



Port Adelaide – Birkenhead Bridge (12.140)

(Photograph – Ian Routledge)

Port Services

12.141

- 1 **Repairs** can be carried out; there are five slipways, the larger capable of lifting vessels of 1500 tons and 76 m in length; two mechanical lift docks, the larger with a lifting capacity of 5 500 tonnes; diving services available.

Other facilities. Deratting and certificates issued; hospital; Compass adjustment carried out in Semaphore Anchorage (12.126). Scale and sludge from tank cleaning; oil, bilge water and sludge from purification of fuel can be accepted ashore; restricted to 10 tonne waste tank.

- 2 **Supplies.** Fuel of all kinds and grades; Fresh water laid on to most berths; Provisions of all kinds in large quantities.

Communications. Adelaide airport is situated at West Beach, 11 km from the port.

Harbour regulations. Vessels should obtain a copy of the harbour regulations on arrival.

Topography

12.143

- 1 The coast between Sultana Point (35°07'S 137°46'E) and Edithburgh (1¼ miles N) is indented by a sandy bay fronted by a drying flat of sand and rocks extending up to 2½ cables offshore.

Between Edithburgh and Giles Point (2½ miles N), the coast forms a bay, the greater part of which is a drying flat of mud and sand. Salt Creek at the head of this bay, dries but the sea has access through to a salt lagoon, at HW.

Tidal streams

12.144

- 1 **Tidal streams**, which set around Sultana Point with rates varying between 3 and 4 kn at springs, turn at about ¾ hour before the times of HW and LW by the shore.

Directions

(continued from 12.42)

12.145

- 1 From a position SE of Marion Reef Light-beacon (35°09'S 137°49'E) (12.41) the track leads NE passing (with positions from the beacon):

SE of Tapley Shoal (¼ miles NE) with a least charted depth of 5.2 m over it, but this varies due to the strong tidal streams on the sandy bottom and depths of less than 5 m have been reported. Tapley Shoal is steep-to on its E side and the bottom of sand and weed, can easily be seen in fine weather. Thence:

- 2 SE of Tapley Shoal Light (9 miles NE) (12.94), situated at the N end of Tapley Shoal.

TROUBRIDGE SHOALS TO MACDONNELL SOUND

General information

Charts Aus 780, Aus 139 plan of MacDonnell Sound

Route

12.142

- 1 The route leads from a position SE of Marion Reef Light-beacon (35°09'S 137°49'E) (12.41) about 15 miles NE then NNW to a position N of Tapley Shoal Light.

The track then leads NNW to pass clear ENE of Tapley Shoal to a position about 1¼ miles N of Tapley Shoal Light.

(Directions for the coastal route continue at 12.161 and for Port Giles at 12.154)

Side channel

12.146

- 1 The entrance to a narrow channel, with a least depth of 3 m lies 1¼ miles SW of Sultana Point (35°07'S 137°46'E) (12.143), and separates the W drying sand bank off Troubridge Shoals (12.41) from Sultana Point.

The E side of the entrance to this channel is marked by a beacon (starboard hand), and the channel is marked by a beacons (lateral).

Local knowledge is essential.

Anchorage and harbours

MacDonnell Sound

12.147

- 1 MacDonnell Sound (35°03'S 137°50'E) is an open roadstead that lies N of Troubridge Shoals, between Tapley Shoals and the coast. It is bordered on the N by a coastal bank, which extends in places up to 7 miles offshore, and fronts the coast N to Rogues Point (34°30'S 137°54'E) (chart Aus 781).

- 2 MacDonnell Sound Light (beacon 5 m in height) marks the S edge of the bank.

Edithburgh (35°05'S 137°45'E) (12.148), Port Giles (35°02'S 137°46'E) (12.150) and Wool Bay (35°00'S 137°45'E) (12.149) are situated within the sound.

Directions. From a position about 1¼ miles N of Tapley Shoal Light (12.94) the track leads WSW on the preferred route as shown on the chart, passing (with positions from Tapley Shoal Light (35°01'8S 137°55'2E)):

- 3 Between Tapley Shoal Light, and MacDonnell Sound Light (2¾ miles W).

Anchorage the best anchorage may be found in depths of 9 to 12 m, fine sand, with Troubridge Island Lighthouse (disused) (12.41) bearing between 185° and 140°, distant 2 to 3 miles.

Edithburgh

12.148

- 1 **Description.** Edithburgh (35°05'S 137°45'E) is a small fishing port situated on the W side of MacDonnell Sound and it is the administrative centre for Port Giles.

The port is no longer used by commercial shipping. There is a jetty extending about 1 cable W from the front of the town. A light (metal column) is exhibited from the head of the jetty.

- 2 A least depth of 4.7 m, lies 1½ miles E of the jetty head. An obstruction (1954) lies 1¼ cables ENE of the head of the jetty.

Tidal levels: see Port Giles (12.151).

Local knowledge is necessary.

Tidal stream. A strong stream flows through the jetty.

Useful mark:

Water tower (35°05'S 137°44'E) standing about 1¼ miles W of the jetty light structure.

- 3 **Berth.** The jetty is 173 m in length; berth 60 m long with a depth alongside of 3.4 m. There are landing steps on each side of the jetty, with depths alongside of 2 m.

Supplies: fresh water available, provisions in small quantities.

Wool Bay

12.149

- 1 **Description.** Wool Bay (35°00'S 137°45'E) lies about 1¼ miles N of Port Giles (12.150) and is about 3 cables in extent, with a high cliffy bank behind its beach.

- 2 **Anchorage** may be found in depths of about 11 to 13 m, with Wool Bay jetty bearing 286° and Giles Point (2¾ miles S) bearing 202°. Smaller vessels anchor about 2½ cables off Wool Bay jetty, in depths of from 3 to 5 m.

Jetty is 180 m in length, with depth of 2.4 m alongside its outer end. The jetty is closed to commercial traffic.

PORT GILES

General information

Chart Aus 139 plans of Port Giles and Macdonnell Sound
12.150

- 1 **Position.** Port Giles is situated in position 35°02'S 137°46'E.

Function. Port Giles is a Commercial port, used solely for the shipment of grain.

Port Limits. The port limits extend about 7 miles offshore, across MacDonnell Sound, as shown on the chart.

Approach. Port Giles is approached through MacDonnell Sound.

- 2 **Traffic.** In 2002 the port was used by 41 vessels totalling 2 055 259 dwt.

Port Authority. Flinders Ports Proprietary Ltd, 296 St Vincent Street, Adelaide, S.A. Australia 5015.

Website: www.flindersports.com.au

Limiting conditions

12.151

- 1 **Controlling Depth.** The approach has a least depth of 11.6 m. Vessels swing around the jetty head and dolphin. The bottom is sand and shell.

Tidal levels. Mean maximum range is about 1.7 m; mean minimum range is about 0.0 m. *See Admiralty Tide Tables Volume 4.*

Density of water is 1.027 g/cm³.

Maximum size of vessel handled: LOA 228 m.

Arrival information

12.152

- 1 **Notice of ETA** should be reported, 24 hours and 4 hours in advance, see *Admiralty List of Radio Signals Volume 6 (4)*.

Anchorage may be obtained in MacDonnell Sound in a position about 7 miles E of the berth. See also 12.147.

- 2 **Pilotage.** Pilotage is compulsory. Pilot boards about 2½ miles E of the jetty; for details see *Admiralty list of Radio Signals Volume 6 (4)*.

Tugs are available from Adelaide.

Port Giles is a first port of entry. See 1.54 and *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

12.153

- 1 **General layout.** The port consists of a jetty extending E from the shore about 1¼ miles N of Giles Point (35°03'S 137°45'E). A light is exhibited from the head of the jetty. Pile beacons (black triangular topmark), stand near 7 m depth contour, 5 and 10 cables respectively N of the jetty head.

Directions*(continued from 12.145)***12.154**

- 1 From a position N of Tapley Shoal Light (35°01'·6S 137°55'·2E) (12.94) the approach to the pilot boarding position and thence to the berth is along the charted preferred route within a corridor in which fishing is prohibited.

Useful marks.

MacDonnell Sound Light-beacon (35°01'·1S 137°52'·0E)

Grain Silos standing at the root of the jetty.

Berth**12.155**

- 1 Port Giles jetty is 617 m in length with a berth on the N side of its outer end 255 m in length, depth alongside 11·7 m.

Port services**12.156**

- 1 **Repairs:** no facilities.

Supplies: fresh water available at the berth. Fuel is not available.

Other facilities: de-ratting can be carried out and de-ratting certificates issued.

MACDONNELL SOUND TO ARDROSSAN**General information**

Charts Aus 780, Aus 781

Route**12.157**

- 1 The route leads from a position off Tapely Shoal Light (35°01'·8S 137°55'·2E) about 33 miles N to a position ESE of Ardrossan.

Topography**12.158**

- 1 This stretch of coast between Wool Bay (35°00'S 137°45'E) and Ardrossan (36 miles N) is generally cliffy, intermixed with sandy beaches, fronted by drying sand flats, and backed by a ridge of highland which approaches the coast near Ardrossan.
- 2 Orontes Bank, with depths of less than 5 m (18 ft) over it extends 15 miles NNE from a position 5 miles E of Beach Point (34°52'S 137°49'E); it consists of two extensive banks, which lie parallel to the coast, about 3 to 5 miles offshore, together with two detached smaller patches.
- 3 On the E side of this waterway, the coast between Port Adelaide (12.112) and Great Sandy Point (21 miles NNW) is low and swampy, fronted by drying sand flats that extend up to 3 miles offshore.

Exercise Area**12.159**

- 1 From a beacon standing 3 miles NE of Long Spit Light (34°35'·9S 138°05'·5E) (12.161) a line of beacons extend N to Sandy Point (34°16'S 138°09'E) (12.185) and E to the coast, marking the limits of some firing ranges details of which are published in the *Annual Summary of Australian Notices to Mariners*. The N beacon carries a notice indicating that the area N and E of the beacon is a prohibited area.

Landmark**12.160**

- 1 Mount Lofty (34°59'S 138°43'E) (12.92).

Directions*(Continued from 12.145)***12.161**

- 1 From a position off Tapley Shoal Light the track leads NNE passing (with positions from Tapley Shoal Light (35°01'·8S 137°55'·2E)):
- ESE of Klein Point (8 miles NW), the S point of a small cove, thence:
- 2 ESE of Oyster Point (9 miles NW), a low, sandy point not easily distinguished, but its position is indicated by some huts on a grassy slope inside the point. A dangerous wreck lies about 5 miles ESE of the point. Thence:
- ESE of South Spit Light-beacon (black diamond on triangle) (9½ miles NW), situated at the N extremity of South Spit, noting the beacon (port hand) 2 cables SE. Thence:
- 3 ESE of Surveyor Point (15½ miles NNW), a low sandy point, and of Orontes Bank (12.158) lying off it. Thence:
- E of Orontes Bank Light (white GRP hut on pile tripod; 10 m in height) (17 miles NNE), situated near the E extremity of Orontes Bank.
- 4 The track then leads N passing (with positions from Orontes Bank Light (34°45'·5S 138°00'·5E)):
- E of Black Point (10 miles NW), a low projection from the beach. A fish haven, with least depth of 7·6 m (25 ft) over it lies 3 miles ENE of Black Point. Thence:
- 5 W of Long Spit Light (white GRP hut on wooden pile structure; radar reflector) (10½ miles NE), the depths E of the light are uneven, over a rocky bottom. A beacon stands 3 miles NE of Long Spit Light, see 12.159. Thence:
- W of light-buoys (special) (14 and 15 miles NNE) marking historic wrecks, lying within protected areas: see 1.60, *Australian Seafarers Handbook AHP 20* and *Annual Australian Notices to Mariners*. Thence:
- The track continues N to a position ESE of Ardrossan (20 miles NNW).

Useful marks**12.162**

- 1 Dowcer Bluff (34°45'S 137°52'E), composed of white sand and limestone spots. This bluff and two red cliffs N of it, are prominent from about 7 miles offshore.
- Streak Point (34°45'S 137°52'E), 2½ cables N of Dowcer Bluff, so named on account of a narrow white mark down the face of the cliff.
- Remarkable red cliff (34°33'S 137°53'E).
- (Directions continue at 12.176 and 12.185)*

Bays, Harbours and anchorages

Charts Aus139 plan of Klein Point

Klein Point**12.163**

- 1 **Position and function.** Klein Point (34°58'S 137°46'E) is a single purpose port, for the transfer of limestone, and to which access is restricted.
- Port Authority.** Flinders Ports Proprietary Ltd, 296 St Vincent Street, Adelaide, S.A. Australia 5015.



Klein Point – Farquhar Jetty (12.163)

(Photograph – Ian Routledge)

Website: www.flindersports.com.au

Berth. Farquhar Jetty, 150 m in length with a depth alongside of 6.5 m.

Charts Aus 780, Aus 781

Oyster Bay 12.164

- 1 **Description.** Oyster Bay ($34^{\circ}53'S$ $137^{\circ}49'E$) is situated between South Spit, a sandy spit which dries in patches extending 3 miles NE from Oyster Point ($34^{\circ}55'S$ $137^{\circ}48'E$) and Beach Point (2¾ miles N). The small town of Stansbury is situated in the SW part of the bay.

A disused jetty extends about ¾ cable NE from a position about 2½ cables WNW from Oyster Point.

- 2 **Local knowledge** is necessary.

Useful mark:

Water tower ($34^{\circ}55'S$ $137^{\circ}47'E$).

Anchorage for small vessels sheltered from all winds may be obtained in depths of over 3 m (12 ft) with Oyster Point bearing 202° and Beach Point about 270° .

Caution. Marine farms are located on South Spit and adjacent to the shoreline between Stansbury and Beach Point.

Port Vincent 12.165

- 1 **Description.** Port Vincent ($34^{\circ}46'S$ $137^{\circ}53'E$) is an open roadstead contained between Middle Spit, which dries in patches and upon which is a fish farm, and extends 2½ miles NE from Surveyor Point ($34^{\circ}47'S$ $137^{\circ}52'E$), and

the coast to the N. It is a fishing port. The small town of Port Vincent is situated a short distance N of Surveyor Point. A wharf extends N from the shore near the town.

Local knowledge is necessary.

- 2 **Directions:** A dredged channel leads up to the wharf.

Leading Lights:

Front light ($34^{\circ}46'7S$ $137^{\circ}51'8E$).

Rear light (wooden mast) (53 m SSW from front).

The alignment (206°) of these lights leads through the centre of the dredged channel.

- 3 **Useful marks:**

Middle Spit Light (square tower on piles) ($34^{\circ}45'5S$ $137^{\circ}54'2E$), situated at the N end of Middle Spit.

Tower (170 m)r ($34^{\circ}46'S$ $137^{\circ}51'E$).

Anchorage for small vessels may be found in depths of 4 m (13 ft), with Streak Point ($34^{\circ}45'S$ $137^{\circ}52'E$) (12.162) bearing 326° , and the first cliffy point S of Surveyor Point, and just inside that point bearing 210° .

- 4 **Berth:** wharf with a berth 35 m in length, depth alongside of 3.4 m.

Supplies: fresh water is available.

Chart Aus 139 plan of Ardrossan Harbour Approaches

Port Alfred 12.166

- 1 **Description.** Port Alfred, lies on the N side of Black Point ($34^{\circ}37'S$ $137^{\circ}54'E$) and affords shelter for small craft in depths of about 3 m, mud and sand. A beacon (port hand) marking the extremity of a sand-spit, which dries in places extending NE from Black Point, should be given a wide berth.

ARDROSSAN

General information

Chart 139 plan of Ardrossan Harbour Approaches and plan of Ardrossan Harbour

Position and function

12.167

- 1 Ardrossan (34°26'S 137°55'E) is primarily a bulk dolomite and grain exporting port.

Approach and entry

12.168

- 1 Ardrossan is approached through a dredged channel and entered close S of Ardrossan Light-beacon (34°26'2S 137°55'9E).

Port Operator

12.169

- 1 ABB Grain Ltd, 124–130 South terrace, Adelaide SA 5000

Limiting conditions

12.170

- 1 **Controlling depths.** Loading Jetty approach channel 125 m wide with a maintained depth of 9.2 m.
Town Jetty approach channel dredged to 3.1 m.
Deepest and longest berth. Loading Jetty.
Tidal levels. Mean maximum range is about 2.5 m; mean minimum range is about 0.0 m.
Maximum size of vessel handled. LOA 210 m, beam 30 m.

Arrival information

Notice of ETA

12.171

- 1 ETA should be signalled 24 hours in advance. For details see *Admiralty List of Radio Signals Volume 6 (4)*.

Pilotage and tugs

12.172

- 1 **Pilotage** is not compulsory, however the port operator requires all vessels with an LOA greater than 35 m to use a Pilot; Pilots board 1 mile E of berth.
Tugs available from Port Adelaide, are compulsory for vessels over 150 m LOA (one tug) and 185 m (two tugs), the latter with pilotage approval. Use of tugs for unberthing is dependant on size and draught.

Regulations concerning entry

12.173

- 1 Ships are required to have an underkeel clearance of 10% of maximum draught.

Quarantine

12.174

- 1 Ardrossan is a first point of entry. See 1.54 and *Admiralty List of Radio Signals Volume 1 (2)*.

Harbour

General layout

12.175

- 1 The port of Ardrossan consists of:
Loading Jetty, extending about 850 m ESE, with a T-head, from a position about 7 cables WSW of Ardrossan Light-beacon (5.264).

Town Jetty, extending about 4000 m ESE from a position about 9 cables N of Loading Jetty. A light (metal column) (34°25'7S 137°55'6E) is exhibited from the head of the jetty.

A boat ramp is situated about 1½ cables N of Loading Jetty.

Directions

(continued from 12.162).

To Loading Jetty

12.176

- 1 From a position SE of Ardrossan the track leads NW to the pilot boarding area about 1 mile E of Loading Jetty as shown on the chart. Thence:
The track leads WNW towards the approach channel:
Leading Lights:
Front Light (34°26'5S 137°54'8E).
Rear Light 650 m from front.
- 2 The alignment (247¼°) of these lights leads through the approach channel (12.167) towards Loading Jetty.
The alignment (226°) of two lights situated near the head of the jetty assist the final approach to the berth.
Leading marks
Front mark (35°26'5S 137° 55'4E), dolphin on S end of berth.
- 3 Rear mark: beacon on jetty (triangular topmark, apex down) 1100 m from front.
The alignment (333½°) of these marks assist in manoeuvring S of the berth.

To Town Jetty

12.177

- 1 From the vicinity of the pilot boarding area the track leads as requisite through the dredged channel towards the berth.

To boat ramp

12.178

- 1 **Leading Lights:**
Front Light (34°26'S 137°55'E).
Rear Light 50 m from front.
The alignment (292°) of these lights lead towards the boat ramp.

Useful marks

12.179

- 1 Ardrossan Grain Silos (34°26'S 137°55'E).

Berths

12.180

- 1 Loading Jetty T-head, formed by dolphins provides a berth 409 m in length, with depth alongside of 9.2 m.
Town Jetty has two berths at its head. The N berth is 67 m in length, with depth alongside of from 2.1 to 3.7 m. The S berth is 67 m in length with depths alongside of 3.7 m.

Port services

12.181

- 1 **Repairs:** no facilities.
Other facilities: deratting can be carried out and certificates issued.
Supplies: small quantities of fresh water available by special arrangements. Fuel is not available.

ARDROSSAN TO PORT WAKEFIELD

General information

Chart Aus 781

Route

12.182

- 1 The route leads from a position SE of Ardrossan (34°26'S 137°55'E) about 15 miles NNE to Port Wakefield.

Topography

12.183

- 1 Between Ardrossan (34°26'S 137°55'E) and the head of Gulf of Saint Vincent (19 miles NNE), the coast is low and backed by a level ridge of scrubby hills about 120 m high, that rise gradually to Hummock Mount situated about 7 miles N of the head of the gulf.
- 2 The coast between Great Sandy Point (34°28'S 138°16'E) and Sandy Point (13½ miles NNW), the E entrance point to Port Wakefield, is a continuous low sandy beach. Foul ground extends 3 miles offshore between Great Sandy Point and Sandy Point.

Prohibited area

12.184

- 1 A prohibited area, marked by beacons and light-beacons extends N and E from a point about 3 miles NW of Great Sandy Point, the extent of which may best be seen on the chart. See 12.159.

Directions

(continued from 12.162)

12.185

- 1 From a position ESE of Ardrossan (34°26'S 137°55'E), the track leads NNE between the 5.5 m (18 ft) depth contours which parallel both coasts passing (with positions from Sandy Point (34°16'S 138°09'E)):
 - ESE of Mangrove Point (6 miles W); Will Creek Light (pile) is exhibited from the N extremity of the point. Thence:
- 2 WNW of Bald Spit that extends W from Sandy Point. Thence:
 - WNW of Sandy Point, a low mangrove point, fronted by a drying sand-spit.

Useful marks

12.186

- 1 Ardrossan Grain Silos (34°26'S 137°55'E).
Bald Hill (34°15'S 138°10'E).
Hummock Mount (34°02'S 138°05'E) (12.183).

Anchorage and Harbours

Port Price

12.187

- 1 **Description.** Port Price (34°17'S 138°00'E), at the head of Will Creek, which nearly dries, is situated at the S end

of a shallow indentation on the W side of Gulf of Saint Vincent, between Mangrove Point (34°16'S 138°01'E) and the point 3¾ miles N, on which stands the township of Port Clinton.

- 2 **Berth.** There is a wharf, 80 m in length, depth alongside of 1.5 m, at Will Creek, situated 1 mile within the mangroves. The town of Price lies 7½ cables further W.

Port Wakefield

12.188

- 1 **General information.** Port Wakefield (34°12'S 138°06'E) is entered between Mangrove Point (34°16'S 138°01'E) and Sandy Point (6½ miles E), on the E shore, and forms the head of Gulf of Saint Vincent. Its shores, which are generally swampy, except in the S part on the W coast where there are some red cliffs, is fronted by a flat of mud, sand and weed, which dries about 1.8 m (6ft). Although spacious the port is so obstructed with sand and mud banks, that only a small part is used for shipping. Ross Rock (34°10'S 138°05'E) lies near the head of the gulf.

- 2 Wakefield (34°11'S 138°09'E) a small town and fishing port, is situated at the mouth of Wakefield River, a tidal creek, 4½ miles N of Sandy Point (12.185).

Directions. The creek is approached through a channel which has been dredged through the flats. The entrance to the creek is marked by beacons. The creek and wharf can only be used at HW, when there are depths of from 3.7 to 4.3 m (12 to 14 ft) in the creek.

Leading Lights:

Front light (34°11'3S 138°08'7E).

Rear light 45 m from front.

The alignment (025°) of these lights leads through the dredged channel.

12.189

- 1 **Anchorage** may be obtained in depths of from 7 to 8 m (24 to 27 ft) about 2½ miles WNW of Sandy Point, with Bald Hill bearing about 103°, distant 3½ miles, as shown on the chart.

Anchorage for smaller vessels may be found in a position about 1¾ miles further N, as shown on the chart.

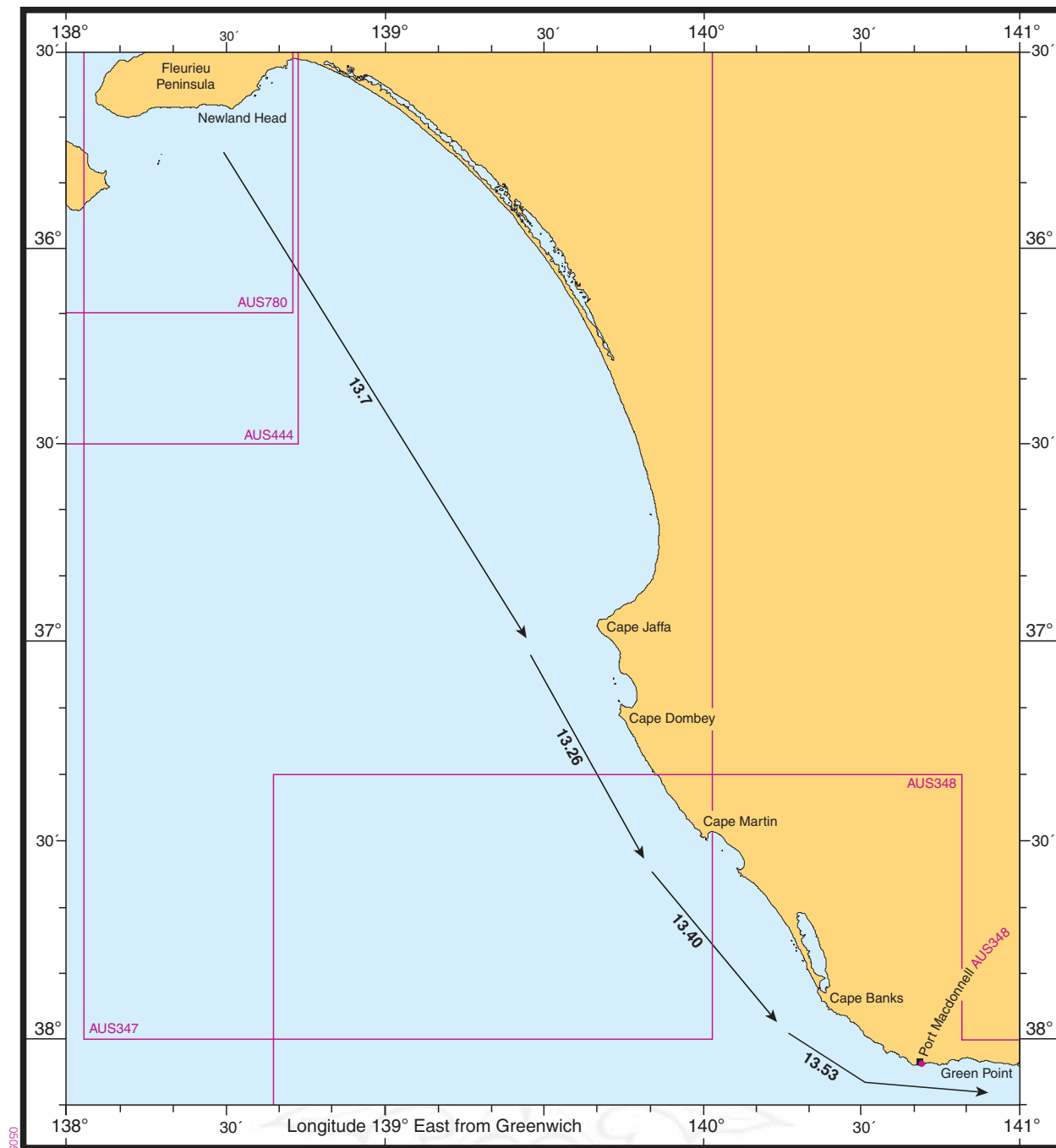
- 2 Should a vessel anchor in such shallow water as to touch ground no damage is likely to occur, if care is taken to keep the vessel clear of her own anchor, as the bottom, composed of sand and mud is soft everywhere and there is no sea.

- 3 **Berth:** wharf 285 m in length, dries at LW. The wharf is closed to commercial traffic.

Facilities: hospital available at Balaclava a distance of 16 miles by road.

Supplies: fresh water is available; provisions can be obtained.

Chapter 13 - Newland Head to Green Point



CHAPTER 13

NEWLAND HEAD TO GREEN POINT

GENERAL INFORMATION

Charts Aus 347, Aus 348

Scope of Chapter**13.1**

- 1 This chapter comprises the following sections:
 Newland Head (35°39'S 138°31'E) to Cape Martin).
 Cape Martin (37°30'S 140°01'E) to Green Point.

Through Route**13.2**

- 1 Vessels on the direct route between Gulf of Saint Vincent or Spencer Gulf, and Bass Strait or Tasmania, pass through Backstairs Passage (35°45'S 138°15'E), and thence 30 to 40 miles off-shore regaining visual contact with the land at about Cape Dombey 100 miles SE of Backstairs Passage.

Bays and Harbours**13.3**

- 1 There are no ports of importance on this stretch of coast. There are however several harbours, anchorages and bays.

Currents**13.4**

- 1 Along this coast the currents are of rather low constancy and mean rate of $\frac{3}{4}$ kn. From about April to September they are predominantly SE and for the rest of the year NW with rates sometimes exceeding 3 kn.

Marine protected areas**13.5**

- 1 A number of locations within the scope of this chapter are designated marine protected areas. See (1.61) and *Annual Australian Notices to Mariners*.

NEWLAND HEAD TO CAPE MARTIN

GENERAL INFORMATION

Scope of section**13.6**

- 1 The area covered by this section comprises:
 Newland Head to Cape Jaffa (13.7).
 Cape Jaffa to Cape Martin (13.26).

NEWLAND HEAD TO CAPE JAFFA

General information

Chart Aus 347

Route**13.7**

- 1 The route leads from a position SE of Newland Head (35°39'S 138°31'E) about 90 miles SE to a position SW of Cape Jaffa.

Topography**13.8**

- 1 Encounter Bay lies between Newland Head and the entrance to Murray River (18 miles ENE).
 The coast between the entrance to Murray River (35°34'S 138°54'E) and Granite Rocks (82 miles SE) is formed by a continuous sandy beach, backed along the whole distance by sandhills, which are so much alike that it is difficult to distinguish one from another, though some of the bare patches might be identified; at a distance of from 6 to 7 miles offshore no marks can be made out.
- 2 Between Granite Rocks (36°40'S 139°51'E) (13.13) and Cape Jaffa (19 miles SSW) lies Lacepede Bay; its shore is formed by a sandy beach backed by sandhills.

Natural conditions**13.9**

- 1 **Tidal streams.** There is an appreciable tidal stream in Lacepede Bay, both inside and outside Margaret Brock

Reef (36°57'S 139°36'E) (13.12), with a strong N set after E winds; this N current, setting NE round Cape Jaffa, causes an indraught towards the reef.

Surf is heavy at all times, and in W and SW gales extends from 3 to 4 miles offshore.

Major light**13.10**

- 1 Robe Light (37°10'S 139°45'E) (13.29).

Other aid to navigation**13.11**

- 1 **Racon.** Robe Light – as above.

Directions

(continued from 12.33 and 12.83)

13.12

- 1 From a position SE of Newland Head (35°39'S 138°31'E) to a position 85 miles SE, NW of Cape Jaffa there are no known dangers and the chart is sufficient guide.

From a position NW of Cape Jaffa the track continues to lead SE passing (with positions from Cape Jaffa (36°57'S 139°40'E)):

SW of North Rock (4 miles WNW) over which the sea breaks at times, thence:

- 2 SW of Margaret Brock Reef (4 miles W), an extensive danger over which the sea often breaks. In bad weather surf extends up to a distance of 5 miles outside the reef breaking with such violence as to jeopardise small, deeply laden vessels. A light (white GRP hut on white pile with platform, 13 m in height) is exhibited from a drying rock near the centre of the reef. An historic wreck, *Margaret Brock*, lies on this reef close N of the light within a protected area. See 1.60 and *Annual Australian Notices to Mariners*. Thence:

- 3 SW of South Breaker (5 miles SW) and Cape Jaffa (13.25), a low sandy point. King's Camp, a group of dwellings, stands 5 cables E of the NW extremity of the cape.

Useful marks

13.13

- 1 Newland Hill (35°35'S 138°35'E).
West Island (35°37'S 138°35'E), steep to on its seaward side, but there is a rocky ledge between it and the coast which generally breaks.
Granite Rocks (36°40'S 139°51'E), two prominent rocks situated on the beach, close to the sea; they show black against the sand behind.
(Directions continue at 13.31)

Harbours, bays and anchorages

Chart Aus 347(see 1.16)

Rosetta Harbor

13.14

- 1 **Description.** Rosetta Head (35°35'S 138°36'E) is a grassy mound, cliffy on its E side, and covered with granite boulders; it is steep-to on its S and E sides.
The coast between Rosetta Head and Freeman Nob, the SW point of Port Elliot (5 miles NE), forms a bay in which are the anchorages of Rosetta Harbor, Davenport (13.15) and Victor Harbor (13.16).
2 **Local knowledge** is necessary.
Anchorage, may be obtained N of Rosetta Head, where there is a small jetty.
Useful mark:
Granite Island Light (round tower) (35°33'9S 138°38'1E), standing on the E end of Granite Island.

Davenport Anchorage

13.15

- 1 **Description.** Davenport Anchorage lies between the W side of Granite Island (35°34'S 138°38'E) and the drying reef and foul ground, over which the sea breaks heavily lying NNE of Wright Island (1½ miles SW).
2 Seal Island a mass of granite boulders, 12 m in height, lies 1 mile SE of Granite Island. Two underwater rocks lie ½ cable SE of Seal Island. A reef, over which the sea breaks heavily, extends 2 cables W from Seal Island; a rocky ledge, with depths of less than 10 m over it, and with less than 5 min places, connects this reef to the foul ground that fronts the coast W of it; the sea breaks heavily over this ledge in places, during SW gales.
3 **Local knowledge** is necessary.
Anchorage is available in depths of 7 to 9 m, but it is not recommended.
Useful mark:
Granite Island Light (13.14).

Victor Harbor

13.16

- 1 **Description.** Victor Harbor is situated immediately N of Granite Island (35°34'S 138°38'E). A causeway connects the N part of Granite Island, with the mainland NNW of it. Hindmarsh River enters the sea 1 mile N of the harbour.
A breakwater extending 1½ cables ENE from the E end of Granite Island affords some protection to the harbour, though not from SE winds. A light (13.14) is exhibited from the E end of the island. A flagstaff stands on the summit of Granite Island.

- 2 **Directions.** Approach rounding Seal Island (35°35'S 138°39'E) at a distance of not less than 5 cables, and of not less than 1 mile in heavy weather. Thence the track leads N to the anchorage.

Seal Island is covered by the red sector of Granite Island Light

Anchorage may be found NE of the harbour in depths of less than 9 m, limestone rock and sand. It is not good.

- 3 **Berth.** A jetty 92 m in length with depth alongside of 4.5 to 5.5 m extends ½ cable NNE from Granite Island, near the root of the breakwater. A light is exhibited from the head of the jetty, which is closed to commercial traffic.

Facilities: hospital available.

Supplies: fresh water and fresh provisions available.

Port Elliot

13.17

- 1 **Description.** Port Elliot is situated at the head of Horseshoe Bay between Freeman Nob (35°33'S 138°41'E) and Commodore Point (3½ cables NE).
The port is used only by boats and local vessels.
2 Pullen Island, a mass of granite boulders, lying 3 cables E of Freeman Nob, affords partial protection to the port from the swell, but the sea breaks outside, occasionally even in quiet weather, and rolls right in through the S entrance to the beach. A small breakwater that extends from Freeman Nob, protects the boat jetty and the W side of the bight.
3 The Twins, a detached shoal with two rocks nearly awash, lies near the middle of the S entrance, 1 cable E of Freeman Nob. A reef of rocks extends from the W side of Pullen Island as far as The Sisters, two above-water rocks lying 1½ cables NNW of Pullen Island.
Caution. The S entrance, between Pullen Island and Freeman Nob, should not be attempted.

Murray River

Chart Aus 347

13.18

- 1 **Description.** Murray River, the largest river in Australia, rises close under Mount Kosciusko (36°28'S 148°17'E) in the Australian Alps; it is part snow fed, and flows in a general W and NW direction as far as Morgan, in South Australia, where it bends sharply S and enters the sea through the large but shallow lagoon of Lake Alexandrina. Its length, until it enters Lake Alexandrina, is 1600 miles and it is navigable by small light-draught craft as far as Albury (36°05'S 146°51'E), in New South Wales.
2 A system of barrages, designed for irrigation purposes but also including locks, provides a 1.8 m navigable channel between Goolwa (35°30'S 138°47'E) (13.22), situated 7 miles within the mouth of the river, and Mildura, a town situated on the river about 300 miles from the mouth.
3 A chain of low islands and islets fronts the NE sides of Sir Richard and Younghusband Peninsulas, in the SW corner of Lake Alexandrina; a system of barrages that extend across the water ways between the islands of the chain link Sir Richard Peninsula, 2 miles SE of Goolwa (35°30'S 138°47'E) with the mainland at Pelican Point 13 miles ESE of Goolwa.
Murray River is no longer used by commercial shipping.
13.19
1 **Local knowledge** is essential, and without it no attempt should be made to cross the bar and enter the river.
The entrance, now but rarely used lies between the SE extremity of Sir Richard Peninsula (35°33'7S 138°53'5E)

and the NW extremity of Younghusband Peninsula (about 2½ cables SE). There is a bar across the mouth of the river that extends 7½ cables seaward of it, with constantly changing depths and position. The surf usually breaks heavily across the entrance except in exceptionally quiet weather. It has been observed that the heaviest rollers break well outside the bar, in depths of from 6 to 8 m, whilst the bar itself is tolerably free from rollers of any considerable height.

13.20

- 1 **Tidal streams.** In the entrance to Murray River, the out-going stream is strongest at LW, and runs at a rate of 3 kn on the surface in the deep part and 4 kn on the bar.
 - 2 If the tide does not rise more than 0.6 m, the out-going stream runs on the surface during the whole of the rising tide, its strength being less than 1 kn at HW. The incoming-stream ordinarily makes from the SE, running below the out-going fresh water on the E side of the bar, and not coming to the surface until it has entered Coorong Channel, between Younghusband Peninsula and Mundoo Island (35°34'S 138°55'E).
 - 3 When the range of the tide is greater than 0.6 m the in-going stream does not generally run on the surface until about 2 hours before the time of HW, except during NW gales when it begins at half flood; the out-going stream commences to make out about 1 hour after the time of HW.
 - 4 In Goolwa Channel, between Hindmarsh Island (35°31'S 138°52'E) and Sir Richard Peninsula the out-going stream runs continuously on the surface when the tide does not rise more than 0.8 m; when the range of the tide is greater than 0.6 m, the tidal stream commences to flow along the bottom at half flood but does not flow on the surface until 1 hour before the time of HW; the out-going stream begins to make 1 hour after the time of HW.
 - 5 In Mundoo Channel, between Hindmarsh Island (35°31'S 138°52'E) and Mundoo Island, the tidal stream turns at about the same time as in Goolwa Channel, except that the sea breeze blows up the channel, and retards the out-going stream on the surface.
- In Coorong Channel, the in-going stream makes underneath directly after LW, but does not flow on the surface at once; the out-going stream commences to make soon after HW.

Directions

13.21

- 1 **Caution.** There has been no recent hydrographic survey of the entrance to Murray River, which is subject to change in form and appearance, following variations in the wind. The best time to pass through the entrance is from 2 hours before to 2 hours after the time of HW. If the surf is too heavy to attempt the bar, proceed to anchorage off Victor Harbor (13.16).
- 2 There is no difficulty in navigating to Goolwa for any small craft not exceeding 1.8 m in draught, that can cross the bar. Information on the state of the bar should be obtained from Goolwa before proceeding to sea.

Goolwa

13.22

- 1 **General information.** Goolwa (35°30'S 138°47'E), is situated on the W side of the bend in the channel about 6 miles within the entrance of Murray River and it is the oldest established port connected with the Murray River trade.

Limiting conditions. Goolwa Lock situated 4½ miles WNW of the river entrance is 16 m wide with depth of 1.8 m over the sills.

- 2 **Directions.** The port is approached through Goolwa channel and entered through Goolwa Lock.

Anchorage: may be obtained off Goolwa, in depths of 4.6 m, at a convenient distance from the wharf.

Caution. A beacon (white; 3.5 m in height) 4 cables NE of Goolwa wharf marks the outer end of a pipeline extending NW between it and the shore; mariners are warned not anchor in its vicinity.

- 3 **Berth:** wharf 33 m in length; closed to commercial traffic.

Supplies: fresh water and provisions available.

Chart Aus 347 (see 1.16)

Lacepede Bay

13.23

- 1 **General information.** Lacepede Bay is situated between Granite Rocks (36°40'S 139°51'E) and Cape Jaffa (19 miles SSW). The shores are formed by a sandy beach and backed by sandhills for a distance of 6½ miles S of Granite Rocks. Kingston (36°50'S 139°51'E) is situated on the S side of the entrance to Maria Creek.
- Tidal streams** See 13.9.
- 2 **Anchorage.** Lacepede Bay, although apparently exposed to the ocean swell, affords safe anchorage in all weathers, there being tolerably smooth water even at the height of a W gale. Safe anchorage according to draught may be found anywhere between Kingston and Cape Jaffa (36°57'S 139°40'E) in depths of less than 9 m. The best position in the S part of the bay is in 8 m sand, with Cape Jaffa bearing 210°, distant nearly 2 miles, and the remarkable white patch (2 miles ENE) on the bank above the beach bearing 146°; small craft may obtain anchorage in depths of 4 m with Cape Jaffa bearing 225° and the white patch 118°.
- 3 **Caution.** There are a number of marine farms in the vicinity of the anchorage. These may be floating or fixed structures, generally marked by buoys or beacons, which may be lit. See also 1.61 and *Annual Australian Notices to Mariners*.

Port Caroline

13.24

- 1 **General information.** Port Caroline (36°48'S 139°48'E) is the name given to the anchorage off the town of Kingston, which is a fishing port. Maria Creek takes the overflow from the swamps behind Kingston; at times it is blocked by seaweed, otherwise it can be used by boats.
- Directions.** Approaching from S, the track leads W of Margaret Brock Reef Light (36°57'·1S 139°35'·6E) (13.12), rounding the reef keeping in depths of more than 28 m to ensure passing more than 2 miles from any part of it.
- Useful marks:**

Kingston Pier Light (round metal tower) (36°49'·5S 139°50'·7E).
- 2 **Anchorage** may be obtained as convenient. The best position is in about 8 m, sand and weed, with Kingston Pier Light bearing 109° distant 1¾ miles. Good anchorage may also be obtained in depths of about 7 m with the light bearing 075° distant 2¾ miles. Anchorage for smaller vessels may be obtained in a depth of 4 m sand and weed, with the light bearing 080° distant 5 cables.

- 3 **Berth.** A jetty, which is no longer used by commercial shipping, extends 2½ cables NW from the shore. Foul ground is found within the red sector of Kingston Pier Light, exhibited from the head of the jetty.

Facilities: hospital available.

Supplies: fresh water and provisions available.

Cape Jaffa

13.25

- 1 **Description.** Rock ledges extend up to 2½ miles from Cape Jaffa (36°57'S 139°40'E), over which the sea breaks, in an irregular and uncertain manner, making it dangerous for boats to pass over them. An obstruction was reported (1958) 3¼ miles WSW of Cape Jaffa.

Berth: a jetty used only by fishing boats with depth alongside of 1.5 m extends 1¼ cables seaward from King's Camp. A light is exhibited from the head of the jetty.

Landing place at Cape Jaffa is situated 1 mile SW of King's Camp.

CAPE JAFFA TO CAPE MARTIN

General information

Chart Aus 347

Route

13.26

- 1 The route leads from a position SW of Cape Jaffa (36°57'S 139°40'E) 38 miles SE to a position SW of Cape Martin.

Topography

13.27

- 1 The coast between Cape Jaffa (13.25) and Cape Dombey (14 miles SSE) consists mainly of a sandy beach and rocky points backed by a low bank; it is indented by Guichen Bay (13.33).

Between Cape Dombey (37°09'S 139°45'E) and Cape Martin (24 miles SSE) the coast consists of alternate rocky points and sandy beaches, backed by sandhills. A number of bare sandhills (37°23'S 139°44'E), that rise above the S stretch of this coast, are very conspicuous from the S.

Fishing areas

13.28

- 1 For details see 1.6. Mariners are requested to plan their passages to pass at least 10 miles off Cape Banks (37°54'S 140°23'E).

Principal marks

13.29

- 1 **Landmarks:**
Mount Benson (37°02'S 139°49'E), the summit of a wooded range.
Rabelais Peak (48 m (157 ft) high) (37°19'S 139°51'E) a prominent pointed sand hill near the coast.
- 2 **Major lights:**
Robe Light (white concrete tower, 19 m in height) (37°10'S 139°45'E).
Glen Point Light, close N of Cape Martin (13.31), (white concrete square tower and lantern; 15 m in height) (37°30'S 140°01'E).

Other aid to navigation

13.30

- 1 **Racon.** Robe Light – as above.

Directions

(continued from 13.13)

13.31

- 1 **Caution.** The depths are irregular for a distance of about 3 miles offshore, abreast the conspicuous sandhills (13.27) and the coast for a distance of 3 miles SE of them, causing high rollers and overfalls when the swell is heavy.

From a position SW of Cape Jaffa (36°57'S 139°40'E) the track leads SE passing (with positions from Cape Dombey (37°09'S 139°45'E)):

- 2 SW of Cape Dombey, the NW extremity of the headland forming the S entrance point of Guichen Bay (13.33). A light is exhibited from the cape; an obelisk (red and white in bands) stands on the W point of the cape. Thence:
SW of Cape Lannes (1½ miles S); a reef extends 1 mile WNW from the cape, thence:
Clear of a wellhead, dangerous to navigation, in position (37°22'0S 139°23'4E); thence
- 3 SW of Cape Rabelais (11 miles SSE) which forms the E side of Nora Creina Bay (13.38). A reef lies parallel with the coast for a distance of 6 miles SE of the cape, which at its greatest distance, is 1½ miles offshore, near its S end. Thence:
- 4 SW of Cape Martin (24½ miles SSE), projecting S from the coast and fringed by a reef. A large detached reef lies from 3 cables SW to 6 cables NW of the cape. A rocky promontory, extends SW from the coast 8 cables NW of the cape. Glen Point Light (13.29) is exhibited from a position about 4 cables N of the S extremity of the cape.
- 5 **Caution.** At night between Guichen Bay (13.33) and Rivoli Bay (13.47) vessels should remain in depths of not less than 37 m keeping at least 5 miles offshore.

Useful marks

13.32

- 1 Robe Point Light (red, triangular topmark) (37°09'8S 139°45'6E).
Bishops Pate (37°14'S 139°48'E), a round bare sandhill.

(Directions continue at 13.45)

Bays and anchorages

Chart Aus 347 (see 1.16)

Guichen Bay

13.33

- 1 **General information.** Guichen Bay (37°07'S 139°45'E) is situated between Cape Thomas (37°05'S 139°54'E) and Cape Dombey (4¾ miles S); it affords anchorage with SE winds which are most frequent from November to April. With NW and W winds, which are frequent from May to October, the bay is open and unsafe. Robe, a small fishing port, is situated on the SW corner of Guichen Bay.
- 2 A rocky point projects S about 7½ cables ESE of Cape Thomas. The E shore of the bay for a distance of 6 miles S of this point consists of a sandy beach. Between the S end of this sandy beach and Cape Dombey the coast is composed of rocky points and sandy bays, with drying rocks extending a short distance from the shore. Heavy breakers may be encountered at times 1½ miles E of Cape Dombey.
- 3 Baudin Rocks, a rugged and broken group of above-water rocks, lie 1¾ miles SW of Cape Thomas. There is foul ground between them and the mainland. The sea breaks over the underwater rocks that lie about 3 cables N of Baudin Rocks.

Snewin Rock (2¼ miles NW of Cape Dombey) lies in the approach to the bay. It breaks only in a high swell, and then seldom, but very heavily.

- 4 South Reef composed of rocks awash, and over which the sea generally breaks, extends for a distance of 6 cables NW of Cape Dombey. As the ocean swell rolls on to it, it should be given a wide berth. There is a boat channel with depth of 5 m) between the reef and the cape for which local knowledge is necessary.

The general depth over the greater part of the bay is from 9 to 11 m.

Directions:

13.34

- 1 **North approach.** The line of bearing 138° of Robe Point Light structure (13.32) or at night the white sector (141°–151°) leads toward the anchorage and clear of dangers. The track on the alignment or within the white sector lead close to or across shoals 8.8 m and 8.2 m lying WNW and WSW respectively of The Black Pigs (37°06'S 139°44'E), a group of dangerous rocks 7 cables S of Baudin Rocks.

13.35

- 1 **South approach.** Vessels should keep at least 2 miles offshore until Cape Dombey bears more than 073°, thence the track leads NE to pass about midway between South Reef and Snewin Rock, having regard to the dangers W to WNW of Cape Dombey, thence on the line of bearing 138° of Robe Point Light-structure to proceed to the anchorage.

13.36

- 1 **Anchorage** may be found in depth of 7 m, fine sand

with Cape Dombey bearing 260°, and Robe Point Light-structure bearing 172°.

On the approach of a NW gale vessels should proceed to sea; the barometer usually gives ample warning. These gales sometimes occur in the early part of the year, as well as in the usual season.

- 2 **Berth.** A jetty, no longer used by commercial shipping, extends ¾ cable ENE from the E side of the headland, 3½ cables ESE of Cape Dombey.

13.37

- 1 **Landing.** A boat haven lies in Lake Butler, a small lake situated NW of Robe town. The lake is entered through a shallow canal; the alignment (264°) of leading marks (beacons) leads towards the approach to the canal entrance, marked on either side by a light.

- 2 A breakwater extends ¾ cable NE from the shore on the NW side of the canal entrance. A light (round metal tower) is exhibited from the head of the breakwater. Anchorage is prohibited in an area extending 2 cables SE of the breakwater.

Berth: jetty 30 m in length with a depth of 3 m alongside.

Supplies: fresh water and provisions available.

Chart Aus 347

Nora Creina Bay

13.38

- 1 Nora Creina Bay (37°20'S 139°51'E) is a small opening in the coast under Rabelais Peak (13.29). A boat may go inside the bay, where there is landing, but the attempt is attended with danger, as the sea sometimes breaks right across the entrance.

CAPE MARTIN TO GREEN POINT

GENERAL INFORMATION

Scope of section

13.39

- 1 The area covered by this section comprises:
Cape Martin to Cape Banks (13.40).
Cape Banks to Green Point (13.53).

CAPE MARTIN TO CAPE BANKS

General information

Chart Aus 348

Route

13.40

- 1 The route leads from a position SW of Cape Martin (37°30'S 140°01'E), about 31 miles SE to a position SW of Cape Banks.

Topography

13.41

- 1 The coast between Cape Martin and Cape Buffon (6 miles SE) is indented by Rivoli Bay (13.47). From Cape

Buffon (37°35'S 140°07'E) for a distance of about 5 miles SE the coast is cliffy, with drying rocks extending about 2½ cables offshore. Thence for a distance of about 8 miles SE the coast is sandy.

- 2 From the S end of this sandy beach to Carpenter Rocks (11 miles farther SE), lying close off Cape Banks, the coast continues sandy with here and there, above-water rocks a short distance offshore; a reef, on which the swell breaks, fronts this beach and extends up to 1 mile offshore in places.

Fishing areas

13.42

- 1 Mariners are requested to plan their passages to pass at least 10 miles off Cape Banks (37°54'S 140°23'E). See 1.6.

Caution

13.43

- 1 Special care and attention are required when navigating along the coast between Cape Buffon (37°35'S 140°07'E) and Cape Northumberland (40 miles SE). In bad weather with S winds soundings should never be neglected. The prevailing wind is SW and a continual swell sets on to the coast, which, together with the uneven bottom, produces an irregular sea. At night vessels should remain in depths of 45 to 50 m, about 5 miles offshore.



S. Australia Cape Banks from NW (13.45)

(Original dated 1986)

(Photograph – Australian HO)

Major lights:**13.44**

- 1 Glen Point Light (37°30'S 140°01'E) (13.29), close N of Cape Martin (13.31).
Carpenter Rocks Point Light (white lantern on orange round tower; 14 m in height) (37°54'S 140°23'E), standing on Cape Banks.

Directions

(continued from 13.32)

13.45

- 1 From a position SW of Cape Martin (37°30'S 140°01'E) the track leads SE passing (with positions from Cape Buffon (37°34'S 140°07'E)):
SW of Ringwood Reef (4 miles NW); the W and S sides of the reef are steep-to. The sea always breaks over part of this reef and in bad weather breaks in 10 m off its W end. Thence:
- 2 SW of Cape Buffon, a cliffy promontory. A light (white metal column, 2 m in height) is exhibited from the cape. There are numerous detached rocks off the W side of Cape Buffon. The Beak (7½ cables SW), a dangerous reef over which the sea breaks heavily, lies outside these rocks. The Beak and other off-lying rocks are covered by the red sector (111°–059°) of Cape Buffon Light. Thence:

3

SW of Carpenter Rocks (23½ miles SSE), two black rocks, lying close off Cape Banks, a rocky point. A light (13.44) is exhibited from the cape.

Useful mark**13.46**

1

Penguin Island Old Lighthouse (white circular stone tower; 11 m in height) (37°30'S 140°01'E) (chart Aus 127) standing on Penguin Island. The islet is cleft from its summit to the waters edge. The cleft which is open to the E and W is a good mark. (Directions continue at 13.58)

Bays and anchorages

Chart Aus 348 (see 1.16)

Rivoli Bay**13.47**

1

General information. Rivoli Bay (37°32'S 140°04'E) lies between Cape Martin (37°31'S 140°01'E) and Cape Buffon (6 miles SE). The uniformity of the coast is such that identification of the bay is difficult.

A field of kelp that rises to the surface from depths of 16 to 18 m extends SSE from Ringwood Reef to a position abreast Cape Buffon.

Caution. The central part of the bay is obstructed by numerous reefs, rocky patches and shoals, and is dangerous to navigation.

- 2 Penguin Island is a rocky islet lying close SE of Cape Martin. A large rock, awash lies 2½ cables SSE of Glen Point, a rocky point situated 5 cables NNE of Cape Martin. The bay that lies between these two points is shallow with rocky patches.

Beachport a small town is situated on the shore N of Glen Point. Grey, a small town, lies at the S end of the bay within the promontory of Cape Buffon.

Local knowledge is necessary.

13.48

- 1 **Currents.** There is little or no current at the S end of Rivoli Bay, but at the N end, a S set of about ½ kn is experienced at times.

Outside the bay the current seems to be influenced by the wind, setting strongly S during and after strong N or NW winds, and vice versa.

13.49

- 1 **Directions – North anchorage.** Approach from the N should be made on the line of bearing 050° of the old lighthouse situated on Penguin Island.

From a position about 2 miles SW of Penguin Island steer to pass 5 cables S of the island and about 4 cables E of Glen Point to the anchorage.

Approach from S should be made on the alignment (007°) of E side of Penguin Island and Glen Point (5 cables N), which leads towards the anchorage passing:

W of Ringwood Reef and West Rock, over which the sea breaks heavily at times.

- 2 From a position W of West Rock the anchorage is approached passing:

Between De Mole Reef (about 1 mile E of Penguin Island), over which the sea breaks in moderate weather, and Beachport Jetty Head.

At night, the white sector (001°–013°) of Beachport Jetty Light, leads clear of all dangers to a position abreast Penguin Island.

13.50

- 1 **Directions – South anchorage.** Approach on the line of bearing 056° of Cape Buffon (37°34'S 140°07'E). From a position about 2 miles SW of Cape Buffon, the track then leads NE passing (with positions from Cape Buffon):

3 cables NW of The Beak (7½ cables SW) (13.45).

And:

SE of a shoal (1¼ miles W) with a depth of 7.4 m over it, thence:

4½ cables NW of Cape Buffon.

- 2 From a position on the line of bearing 140° of Grey Jetty, approach the anchorage as required.

Local knowledge is necessary to pass from one end of the bay to the other inside the reefs.

13.51

- 1 **Anchorage** for vessels with a draught of less than 4.6 m may be found in the N part of the bay in depths of from 5 to 7 m, firm white marl-like clay, good holding, in a pool lying off Beachport about 5 cables offshore.

- 2 Anchorage in the S part of the bay may be found in a depth of 5 m, marl. The best position is with Cape Buffon bearing 231° distant 5 cables on the alignment (175°) of a ruined house with the left fall of a bluff wooded sandhill. In the event of the approach of a W gale, it is advisable to get under way and make for the N end of the bay; these gales are uncertain, but are not frequent in the summer.

13.52

- 1 **Berths.** An iron jetty, with depth alongside of 4 m and closed to commercial shipping, extends 750 m from the beach abreast Beachport. A light (round metal tower) is exhibited from the head of the jetty.

An angled jetty 275 m in length, used only by fishing boats fronts Grey town. A light is exhibited from the head of the jetty.

Facilities: boat slip at Beachport.

Supplies: fresh water and fresh provisions available at Beachport.

CAPE BANKS TO GREEN POINT

General information

Chart Aus 348

Route

13.53

- 1 The route leads from a position SW of Cape Banks (37°54'S 140°23'E), 32 miles SE to a position S of Green Point.

Topography

13.54

- 1 The coast between Cape Banks (37°54'S 140°23'E) and Cape Northumberland (16 miles SE) is low and sandy, fringed in places by detached rocks and reefs.

Between Cape Northumberland (38°04'S 140°40'E) and Green Point (10 miles E), in general the coast is low and sandy indented by several bays and fronted by extensive reefs and rocky ledges which dry.

Kelp

13.55

- 1 Kelp is prevalent between Cape Banks and Cape Northumberland, see 1.3.

Fishing areas

13.56

- 1 Mariners are requested to plan their passages to pass at least 10 miles off Cape Banks (37°54'S 140°23'E). See 1.6.

Principal marks

13.57

- 1 **Landmarks:**

Mount Gambier (189 m high) (37°50'S 140°45'E), a peak with a tableland extending from it.

Mount Schank (37°56'S 140°44'E), a truncated cone.

Both these mounts are extinct volcanoes and form excellent marks.

- 2 **Major lights:**

Carpenter Rocks Point Light (37°54'S 140°23'E) (13.44).

Cape Northumberland Light (white tower, red band, 17 m in height) (38°03'4S 140°40'0E).

Directions

(continued from 13.46)

13.58

- 1 From a position SW of Cape Banks (37°54'S 140°23'E) the track leads SE passing (with positions from Cape Northumberland (38°04'S 140°40'E)):

SW of Pelican Point (14 miles NW) fronted by rocks.

Historic wrecks, *Glenrosa* and *Nene Valley*, within a protected areas lie ¾ miles and 5½ miles SE of Pelican Point. Thence:

SW of Nene Valley Rock (8 miles NW). Thence:

- 2 SW of Douglas Point (4½ miles WNW), a green coloured point, thence:

SW of Cape Northumberland, rugged and cliffy, with a hill rising behind it to an elevation of 41 m. A light (13.57) is exhibited from a position 4 cables NE of the S extremity of the cape. Thence:



S. Australia – Cape Northumberland from NW (13.58)

(Original dated 1986)

(Photograph – Australian HO)

SW of Breaksea Reef (1 mile SE), steep-to on its W side and over which the sea generally breaks with great violence. Thence:

- 3 SW of Stony Point (5 miles E), low and covered with stones, thence:

SW of Danger Point (6½ miles E); a reef extends 1½ miles S from the point. Thence:

S of Green Point (9½ miles E), so named from its verdant appearance.

(Directions continue in Australia Pilot Volume II)

Bay and anchorage

Macdonnell Bay

13.59

- 1 Macdonnell Bay is a small indentation in the coast 2 miles E of Cape Northumberland (38°04'S 140°40'E) and affords shelter from NW and W winds, within Breaksea Reef, to vessels of light draught.

Port Macdonnell

13.60

- 1 **General information.** Port Macdonnell (38°03'S 140°42'E) is a small town situated on the shore of Macdonnell Bay and used by fishing vessels and pleasure

craft with a draught of less than 1.5 m. The port is protected by a curved breakwater extending 5 cables from its shore.

13.61

- 1 **Directions.** Approaching from W, to avoid Breaksea Reef (13.58), keep Cape Northumberland Lighthouse (13.57) bearing more than 330° until the head of Port Macdonnell breakwater bears less than 020° then steer as required to bring the leading lights in line.

Leading lights:

Front light (triangle point up on mast) (38°03'4S 140°42'2E).

- 2 Rear light (triangle point down on SE column of water tower) (1½ cables NW of front light).

The alignment (307)° of these lights leads into the harbour passing (with positions from the front leading light):

Close NE of the breakwater light (5 cables SE) and:
Close SW of Pinchcut Reef (4 cables ESE), which dries.

- 3 The deepest water inside the harbour is W of the leading line.

Berth. A jetty extends 300 m SE from close W of the front leading light.

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.

Port Darwin Naval Waters

Chart Aus 28

Darwin Naval Base. A line bearing 180° from Larrakeyah flagstaff to latitude 12°28'S; thence westward along that parallel to the meridian coincident with the western extremity of Elliot Point; thence northward to the high water line of the same point.

The naval establishment at Port Darwin. All waters of Port Darwin south of a line extending from the high water line at the northern extremity of Talc Head; thence in a 102° direction for 20,200 feet; thence in a 130° direction to Middle Point.

[Middle Point was renamed Wickham Point in 1991]

Cockburn Sound Naval Waters

Chart Aus 117

All those waters within an area commencing at a point where the high water mark on the W face of the causeway abuts to the high water mark of the mainland approximately 106° 235 metres from coordinated station MANGLES at Cape Peron (32°16'3S 115°41'7E) thence proceeding 27 metres along the high water mark in a NW by W direction and bounded thence by lines bearing 014° 360 metres, 284° 125 metres, 014° 1885 metres, 330° 640 metres, 257° 2310 metres, 347° 11 350 metres, 090° 2490 metres, 159° 9600 metres, 211° 1585 metres, 149° 810 metres, 194° 2030 metres and 284°, approximately 150 metres to a point 25 metres from the high water mark on the eastern face of the causeway thence bearing 194°, for approximately 380 metres to the high water mark on the southwestern shore of Mangles Bay, thence proceeding westerly, northerly, southerly and westerly along the high water mark of the mainland and of the causeway to the point of commencement.

Distance table - Adelaide to Weipa via W Coast of Australia

Note: For further information and notes on distances, see *Admiralty Distance Tables, Indian Ocean*.
Tables 1a and 1b and Index Chart 1.

* = via Cape Leeuwin

Adelaide	Albany	Broome	Browse Island	Carnarvon	Dampier	Darwin	Esperance	Fremantle	Geraldton	Leeuwin Cape 20° WSW of	Miner Bay	Port Headland	Port Lincoln	Thevenard	Weipa	Whyalla	Wyndham
1014																	
2497	1507																
2678	1688	279															
1818	828	736	918														
2180	1190	347	560	420													
3126*	2136	716	447	1365	997												
838	211	1700	1881	1021	1383	2329											
1358	368	1189	1371	511	873	1818	561										
1592	539	990	1172	312	674	1619	732	211									
1184	194	1313	1494	634	996	1942	387	174	345								
3695*	2705	1285	1017	1935	1567	712	2898	2388	2856	2511							
2290	1300	258	480	530	133	917	1493	983	1451	1106	1486						
138	943	2426	2607	1747	2109	3055	767	1287	1458	1113	3624	2219					
373	802	2288	2469	1609	1971	2392	612	1149	1320	975	2081	2081	302				
3546*	2826	1407	1138	2056	1688	833	2749	2509	2310	2632	313	1607	3475*	3301			
246	1056	2539	2720	1860	2232	3168	880	1400	1571	1226	2332	2432	141	414	3858*		
3021	2031	611	343	1260	892	235	2224	1713	1514	865	812	2950	2812	986			
																	3063

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Bayu Undan	4.31	Bing Bong Anchorages	2.171	Bombard Shoal	2.169
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Beattie Shoal	2.142	Black Rock: (35°59'S 118°08'E)	9.88	Bougainville, Cape	4.225
Beaufort Inlet	9.92	Black Rock: (22°46'S 113°39'E)	7.24	Bougainville Reef	4.281
Beaufort Cape	10.52	Passage	7.23	Bougainville Peninsula	4.257
Beauty Point	4.254	Black Rock: Cape Catastrophe	11.23	Bouguer, Cape	12.17
Becher Point	8.166	Black Rock: Van Diemen Gulf	3.99	Boulder Hill	9.85
Bedford Harbour	9.103	Black Rock: West Island	9.100	Boullanger Island	7.233
Bedford Islands	5.119	Black Rock: Yampi Sound	5.107	Boullanger, Cape	7.62
Bedout Island	5.327	Black Rock Point	5.309	Bountiful Islands	2.116
Bedout, Cape	12.11	Black Rocks: Avoid Bay	10.119	Bouvard Reefs	8.143
Bedwell Island	5.14	Black Rocks: Bonaparte Archipelago	4.335	Bouvard, Cape	8.143

Bowen Strait	3.57	Buccaneer Archipelago	5.27	Camden Sound	5.44
Bowers Ledge	6.232	Buccaneer Rock: (11°37'S 136°52'E)	2.210	Camel, Mount	10.108
Bowles Rock	5.85	Buccaneer Rock: Broome	5.294	Camp Inlet	5.247
Bowra Shoals	4.153	Buchanan Bay	2.156	Camp Point	3.100
Boxer Island	9.113	Buchanan Island	4.91	Campbell gas platform	6.174
Boxers, The	4.44	Buckingham Bay	2.271	Campbell Reef	3.59
Boyd Bay	2.62	Buckingham River	2.271	Camplin Shoal	6.298
Boyd Point	2.29	Buckland Hill	8.50	Canal, The	5.93
Brace Point	4.71	Directional Light	8.43	Cane River	6.242
Bradshaw, Port	2.291	Buckland Point	5.53	Cannan Reefs	10.35
Brady Rock	2.309	Buckle Head	4.219	Canning Island	9.112
Light	2.309	Buffalo Reef	11.12	Canoe Rock	4.247
Braithwaite Point	3.32	Buffon, Cape	13.45	Cantonment Hill	8.50
Bramble Point	9.71	Bulbarli anchorage	7.43	Cap Island	9.123
Bramble Rock	9.71	Bulbarli Point	7.12	Cape: see proper name.	
Bramble Rocks	3.47	Bullara Rock	4.290	Capps Island	9.112
Bramfield Hill	10.108	Bullo River	4.165	Capstan Island	4.317
Branch Banks	4.230	Bullocky Point	4.111	Cararang Peninsula	7.103
Branch Island	4.317	Bumaga Island	2.244	Carawa Jetty	10.87
Breaksea Island	9.53	Bumpus Island	5.49	Cardabia	7.26
Light	9.53	Bunbury, Port of	8.169	Careening Bay: (15°06'S 125°00'E)	4.330
Breaksea Reef	13.58	Basins and berths	8.194	Careening Bay: Garden Island	8.115
Breakwater, The	5.70	Directions	8.189	Carlisle Head	5.150
Bream Ledge	4.199	General information	8.169	Carnac Island	8.73
Brecknock Harbour	5.47	Harbour	8.185	Carnarvon	7.63
Brecknock Island	4.351	Limiting conditions	8.175	Jetty	7.66
Breeding Patch	5.146	Port services	8.196	Light	7.69
Bremer Bay	9.95	Bundegi Reef	6.298	Carnarvon, Port of	7.63
Bremer Island	2.282	Bungala River	12.106	Carnot Bay	5.249
Bremer Islets	2.282	Bunker Bay	8.199	Carnot Peak	5.238
Bremer, Port	3.60	Bunker Point	8.199	Carnot, Cape	10.126
Bremer River	9.95	Burford Island	3.99	Caroline, Port	13.24
Bremer Rock	2.15	Burge Point	4.98	Carpentaria Shoal	2.14
Brenton Bay	3.84	Burgunngura Island	3.15	Light-buoy	2.11
Brewis Reef	6.232	Burketown	2.96	Carpenter Rocks	13.45
Brewster, Cape	4.332	Burley Shoal	2.310	Point Light	13.44
Bridget Shoal	11.21	Burney Island	2.298	Carrickalinga Head	12.101
Bridgland Islet	2.293	Burney, Cape	7.218	Carrickalinga Hill	12.102
Brigadier Island	6.119	Burns Shoal	2.290	Carronade Island	4.243
Briggs Rocks	7.103	Burr, Cape	11.70	Cartamina Point	5.317
Bristow, Point	3.22	Burraburra Head	3.86	Cartier Islet	4.57
Britomart Shoal	3.47	Burrowes, Point	2.73	Cary Patch	5.259
Brogden Point	3.40	Burru Peninsula	6.90	Cascade Bay	5.178
Broke Inlet	9.20	Burston Bay	2.212	Cascoigne Bay	10.91
Broke Reefs	9.20	Busaco, Point	8.193	Casoars, Ravine de	12.12
Broken Hill	11.188	Bushy Islet	12.74	Cassini Island	4.304
Broken Ridge	1.119	Busselton	8.204	Cassini, Cape	12.55
Brolga Shoal	5.209	Bustard Island	2.309	Castle Hill: Bathurst Island	4.80
Bromby Islet	2.205	Butcher Inlet	6.77	Castle Hill	12.56
Bromby Islets	2.205	Butler, Lake	13.37	Castle Point: Adelaide River	3.133
Brook Shoal	12.43	Butty Harbour	9.112	Castlereagh Bay	3.25
Broome, Port of	5.263	Butty Head	9.112	Casuarina Islets	12.17
Arrival information	5.270	Byam Martin Island	5.44	Casuarina Reef	5.306
Berths	5.289	Byng, Point	3.84	Casuarina Shoal	8.158
Directions	5.284	Bynoe Harbour	4.95	Casuarina, Mount	4.215
General information	5.260	Byron Island	5.129	Casuarina, Point	8.170
Harbour	5.278			Light	8.188
Jetty Leading Lights	5.286			Catamaran Bay	5.190
Port services	5.292			Catastrophe, Cape	10.126
Brothers, The	10.116	Cabbage Patch, The	10.125	Catherine, Point	8.72
Broughton Island	9.124	Cabbage Tree Anchorage	2.154	Causeway Channel	9.113
Broughton, Port	11.139	Cabbage Tree Cove	2.154	Causeway, The: North Peron Island	4.155
Light	11.134	Cadell Strait	3.22	Causeway, The: Esperance	9.110
Brown Islet: Gulf of Carpentaria	2.142	Caesar Channel	5.74	Cave Point	9.38
Brown Point	3.86	Caesar Island	5.74	Cave Shoal	9.40
Brown Reef: (34°26'S 122°01'E)	9.155	Caesar Rock	5.74	Cecilia Islands	5.163
Brown Reef: (16°06'S 123°17'E)	5.124	Caffarelli Island	5.124	Ceduna	10.56
Brown Strait	3.14	Channel East	5.90	Aero Light	10.74
Brown, Mount: Cockburn Sound	8.90	Light	5.124	Jetty Directional Light	10.73
Brown, Mount	11.207	Calca Bluff	10.108	Centipede Hill	6.291
Brown, Point	10.88	Calder Shoal	4.42	Central Hill	2.168
Browne Island	4.336	Caledon Bay	2.292	Centre Channel: Gulf of Carpentaria	2.149
Browse Island	4.64	Caledon, Mount	2.293	Centre Island: Gulf of Carpentaria	2.136
Light	4.64	Calista Channel	8.99	Cervantes Islands	7.259
Brue Reef	5.35	Directions	8.108	Chabjuwardoo Bay	7.25
Bruce Channel	2.145	Callcup Hill	9.11	Chadinda Hill	10.41
Bruen Island	5.80	Calvert River	2.132	Challenger Harbour	8.69
Brunswick Bay	4.333	Cambridge Gulf	4.166	Challenger Passage	8.123
Bubb Point	5.98	Camden Harbour	5.47	Challenger Rock	8.124
		Camden Peninsula	4.351		

Challis Oil Terminal	4.14	Coates Reef	9.113	Corner Break	7.225
Challis Rocks	5.73	Cobbler Hill	10.128	Corner Shoals	6.226
Chambers Bay	3.116	Cobham Bay	3.100	Cornwall Island	9.123
Chambers Island	5.127	Cobourg Peninsula	3.3	Corny Point	11.82
Champagny Islands	4.338	Cobourg Peninsula, South-west side	3.99	Light	11.81
Champion Bay	7.180	Coburg Peninsula	3.3	Coronation Islands	4.328
Champion Rock	8.151	Cockatoo Island	5.92	Corvisart Bay	10.97
Channel Island: Dampier	6.128	Cockburn, Cape	3.40	Cossack Pioneer	6.14
Channel Island: Port Darwin	4.137	Cockburn, Port	4.75	Cossigny, Cape	6.31
Channel Point: Anson Bay	4.155	Cockburn Sound	8.89	Cotterell River	2.19
Channel Point: (34°54'S 118°26'E)	9.86	Directions	8.104	Cotton Island	2.245
Channel Reef: Mermaid Strait	6.159	General information	8.89	Coudic, Cape du	12.11
Channel Reef: Warnbro Sound	8.165	Cockell Bank	5.70	Light	12.9
Channel Rock: Cambridge Gulf	4.202	Cockell Reefs	5.70	Coulomb Point	5.254
Channel Rock: Cockburn Sound	8.124	Cockle Point	3.118	Courtenay Head	6.120
Channel Rock: King Sound	5.174	Cockle Spit	11.180	Light	6.120
Channel Rock: Port Darwin	4.124	Cod Bank	6.155	Courtenay Shoal	6.120
Channel Rock: (18°01'S 122°13'E)	5.266	Cody Bank	2.192	Coutts, Cape	12.85
Channel Rocks: Jurien Bay	7.237	Coffin Bay	10.115	Coventry Reef	8.158
Chapman River: Antechamber Bay	12.85	Peninsula	10.115	Cow and Calf Rocks	9.19
Chapman River: Geraldton	7.196	Coffin Island	9.86	Cow Rock	8.215
Charles Point,	9.99	Coffins, The	7.255	Cowan Creek	5.309
Charles Point: Beagle Gulf	4.80	Colbert Island	4.322	Cowan Patches	4.200
Light	4.83	Colbert, Cape	11.42	Cowaramup Point	8.215
Patches	4.103	Cole Rock	9.13	Cowaramup Reef	8.215
Charles Point: Gulf of Carpentaria	2.142	Collie Head	8.128	Cowell	11.74
Charley Island,	9.112	Collie Ledge	8.128	Cowland Island	3.55
Charts	1.14	Collier Bay	5.68	Cowle oil platform	6.232
Chasm Island	2.187	Collins Cove	5.115	Cox Peninsula	4.95
Chasm Shoal	2.187	Collinson, Point	10.91	Coxon Shoal	5.322
Chateaufort, Cape	4.317	Colpoys Point	8.115	Crab Island	2.1
Chatham Island	9.20	Colvin Point	4.137	Crabbe Island	5.37
Cherrie Cove	4.186	Combe Hill Island	4.315	Craufurd Islet	2.146
Chervil Oilfield	6.260	Combe Reef	6.283	Crawford Bay	5.174
Chester Reef	10.9	Comber Rock	5.109	Crawfords Landing	10.93
Cheyne Bay: Cape Riche,	9.92	Commissariat Point	11.204	Crayfish Bay	7.109
Cheyne Bay: Hammer Head	9.131	Commodore Point	13.17	Crefild Point	2.112
Cheyne Head	9.79	Compton Shoal	3.18	Crocodile Islands	3.26
Cheyne Island	9.87	Conder Point: Gulf of Carpentaria	2.150	Croker Island	3.42
Cheyne Ledge	9.79	Conder Point: Melville Island	3.102	Croker, Cape	3.42
Cheyne Point	9.124	Condillac Island	4.291	Light	3.47
Chile Head	5.250	Condini	5.317	Crystal Head	4.286
Chimney Rocks	5.221	Condon Creek	5.317	Culham Inlet	9.99
Christies Bay	3.78	Cone Bay	5.168	Cull Island	9.112
Christine Reef	3.103	Cone Hill: King Sound	5.168	Cullen Point	2.26
Chudalup, Mount	9.11	Cone Hill: Cambridge Gulf	4.169	Culver Point	10.9
Church Hill: Fremantle	8.50	Cone Mountain	4.244	Cumberland Rock	8.215
Church Hill: Roebuck Bay	5.264	Cone Point	3.39	Cumberland Strait	2.261
Churchill Point	6.185	Cone Rock	5.172	Cumberlege Reef	2.169
Churchill Reef	5.87	Conflict Reef	6.128	Cunningham Channel	3.112
Circular Cove	4.255	Conilurus Island	5.94	Cunningham Island: Rowley Shoals	5.15
Claireault, Cape	8.209	Connexion Channel	2.312	Cunningham Islands	2.244
Clan MacDougall Shoal	11.12	Connexion Island	2.308	Cunningham Point	5.187
Clare Bay	10.43	Light	2.310	Curlew Bay: King Sound	5.185
Clarence Strait	3.117	Conway Island	5.40	Curlew Point: Port Essington	3.72
Clarence, Mount	9.51	Conzinc Island	6.129	Curlew Point	11.211
Claret Islands	5.58	Cook Reef	3.88	Curran Point	4.254
Cleft Island	5.84	Cook Rock	9.150	Curta Rocks	10.129
Cleft Rock	7.60	Cooke Point	5.333	Curtis Haven	3.87
Clerk Island	4.317	Coolgra Point	6.244	Cussen Island	5.173
Clerke Reef	5.14	Coolimba	7.240	Cut, The: Bunbury	8.197
Cliff Island	9.120	Cooper Island	10.9	Cuthbert Point	3.32
Cliff Point: Beagle Bay	5.226	Cooper Shoal	6.298	Cutting, The: Thevenard	10.72
Cliff Point: Garden Island	8.118	Coorong Channel	13.20	Cuvier Basin	1.121
Cliffy Head	9.19	Cootamundra Shoal	4.42	Cuvier Plateau	1.121
Cliffy Point	2.275	Cootes Hill	12.42	Cuvier, Cape	7.10
Cliff Island	4.76	Copeland Island	3.55	Port of	7.35
Climate and weather	1.138	Copeland Ledge	8.165	Cygnat Bay	5.186
Clinton, Port	12.187	Coppermine Creek	5.113	Cygnat Hill	5.187
Clio Bank	7.224	Cora Bank	2.29	Cygnat River	12.75
Cloates, Point	7.10	W Light-beacon	2.54		
Anchorage	7.23	E Light- beacon	2.54		
Hill	7.18	Coral Bay	3.74	D'Aguesseau Island	4.336
Light	7.13	Coral Patches, The	7.136	D'Arcole Islands	4.333
Cloncurry	1.148	Coral Reef	3.74	D'Entrecasteaux, Point	9.9
Cloud Island	9.119	Cormorant Rock	10.9	Light	9.9
Clover Shoal	2.142	Cornambie Point	5.191	D'Entrecasteaux Reef	10.27
Clump Island	4.164	Corneille Island	4.272	D'Estaing, Cape	12.62
Clune, Point	8.155	Cornelisse Shoal	6.33	D'Estree Bay	12.29

D'Estrees, Cape	10.83	Denham Island	2.90	Douglas, Port	10.116
D'Urville Point	3.59	Denial Bay	10.46	Douglass Patch	9.112
Dailey River	9.130	Denison, Port	7.226	Dover Point	10.9
Dale Point	3.15	Denman Shoal	5.40	Dowcer Bluff	12.162
Dalling, Point	8.207	Denmark	9.33	Downes Island	5.381
Dalmana Islet	3.23	Depuch Island	6.35	Doyle Rock	2.290
Dalrymple Rock	9.155	Anchorage	6.34	Drain, The	5.93
Dalumbu Bay	2.167	Derby	5.201	Draper Island	9.117
Daly Head	11.85	Desaix Islands	4.322	Draytons Reef	3.116
Daly Point	11.85	Desault Bay	5.315	Dreadnoughts, The	10.97
Daly, Port	3.131	Descartes Island	4.290	Driftwood Islands	4.164
Daly River	4.156	Devil's Peak	11.207	Drimmie Peninsula	2.214
Dampier	6.89	Devils Rock	9.112	Driver, Cape	11.71
Archipelago	6.29	Diamantina Fracture Zone	1.119	Drummond Point	10.106
Cargo Wharf Light	6.123	Dice Rock	4.294	Drummond Rock	7.241
Directions	6.113	Dick Island	7.145	Drummond, Mount	10.106
General information	6.89	Dickenson Ridge	5.130	Drysdale Island	3.15
Harbour	6.108	Dickie Rock	5.156	Drysdale River	4.254
Limiting conditions	6.95	Dickson Peak	9.9	Dubbar Point	2.90
Port services	6.135	Dillon Bay	9.94	Ducie River	2.26
Dampier Creek	5.293	Dillon, Point	10.86	Duck Rock	8.155
Dampier Reef	7.83	Dingo Reef	5.24	Duckworth, Mount	8.199
Dampier Rock	9.155	Dingo Rock	5.158	Dudley Peninsula	12.31
Dampier's Monument	5.86	Direction Bank	7.256	Dudly Island	2.295
Dance Head	8.118	Direction Island	6.254	Dudly Shoal	2.290
Danger Point: (38°03'S 140°48'E)	13.58	Dirk Hartog Homestead	7.89	Duffield Ridge	8.150
Danger Point: (11°07'S 132°20'E)	3.60	Dirk Hartog Island	7.77	Dugong Bay	5.78
Danger Rocks	5.244	East coast	7.77	Duke of Orleans Bay	9.130
Dangerous Reef	11.21	West coast	7.124	Dundas Point: Cambridge Gulf	4.204
Light	11.13	Dirk Hartog Ridge	1.121	Dundas Point: Gulf of Carpentaria	2.214
Daphne Rock	10.74	Disappointment Reach	7.118	Dundas Strait	3.90
Darch Island	3.49	Disaster Bay	5.191	Dundas, Mount	2.232
Darling Range	1.100	Disaster Cove	7.62	Dunvert Island	5.131
Darling Shoal	9.122	Disaster Inlet: Gulf of Carpentaria	2.94	Dupuy, Cape	6.171
Dart Reefs	9.113	Disaster Reef	2.148	Durak River	4.213
Dart Shoal	7.148	Disaster Rock	5.284	Dussejour, Cape	4.199
Darwin, Port	4.100	Distress and rescue	1.74	Dutton Bay	11.71
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Limiting conditions	4.106	Dodd Rock	9.130	Dyer Island	8.146
Naval Base	4.131	Dolphin Island	6.44		
Naval waters and arms	4.131	Dombey, Cape: Hyland Bay	4.157		
Port services	4.141	Dombey, Cape: (37°09'S 139°45'E)	13.31		
Dashwood Bay	12.60	Dome Island	9.122	Eagle Bay: Geographe Bay	8.207
Dashwood Rock	10.89	Domett, Cape	4.169	Eagle Bay: Gulf of Carpentaria	2.181
Davenport Anchorage	13.15	Don Island	4.312	Eagle Bluff	7.101
Davenport Creek	10.55	Don Point	3.86	Eagle Island	7.101
Davenport, Point	12.48	Don, Cape	3.103	Eagle Point: Collier Bay	5.69
Shoal	12.41	Light	3.66	Eaglehawk Island	6.156
David Islet	2.142	Dongara	7.232	East Alligator River	3.111
David, Point	3.57	Donington Reef	11.52	East and West Shoals	9.53
Davidson Rock	11.21	Donington Sound	2.243	East Arm: Port Darwin	4.135
Davidsons Point	4.305	Donington, Cape	11.21	East Banks	4.200
Daw Islet	10.9	Light	11.20	East Bay: Port Essington	3.69
De Courcy Head	3.40	Donkins Hill	4.324	East Bremer Islet	2.284
De Freycinet Island	4.310	Dooley Point	4.157	East Channel	8.45
De Grey River	5.317	Dorcherty Island	4.158	East Governor Island	4.243
De Mole Reef	13.49	Doris Island	5.119	East Holothuria Reef	4.235
De Mole, Point	10.88	Dorney Island	5.130	East Hook	5.6
Dean Island	5.154	Dorothy Island	5.127	East Indiaman Ridge	1.121
Deception Bay	5.53	Dorre Island: W side	7.45	East Intercourse Island	6.112
Declaration Rock	5.284	Dorre Island N side	7.62	East Island: Ashmore Reef	4.10
Decres Bay	10.83	Dorrigo, Mount	7.127	East Island: Lacepede Islands	5.233
Deep Bay	4.253	Double Island: Barrow Island	6.181	Light	5.241
Degerando Island	4.310	Light	6.182	East Island: Mary Anne Islands	6.236
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Delaney Hill	6.164	Anchorage	5.66	East Montalivet Island	4.312
Delisser Sands	10.17	Doubtful Island Bay	9.101	East Moore Island	6.35
Dempster Head	9.112	Doubtful Islands	9.99	East Mount Barren	9.98
Microwave Tower	9.149	Doughboy River	2.19	East Point: Port Darwin	4.124
Dempster Inlet	9.99	Douglas Bank	11.208	East Rock:	
Dempster, Point	10.9	Douglas Island: (16°57'S 139°22'E)	2.106	Hampton Harbour Approach	6.139
Denham	7.104	Douglas Island: Esperance Bay	9.117	East Rock: Roebuck Bay	5.285
Channel	7.95	Douglas Point: Cape Banks	13.58	East Roe Island	5.147
Hummock	7.112	Douglas Point: near Port Augusta	11.208	East Sands	11.206
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				East Sunday Island	5.147

East Vernon Island	3.126	Entrance Hill	7.24	Farm Shoal	5.258
Light	3.126	Entrance Island: (15°10'S 129°42'E)	4.164	Farquhar, Cape	7.10
East Wallabi Island	7.134	Entrance Island: (15°17'S 124°37'E)	4.346	Farr Islets	5.174
East Woody Islet	2.234	Entrance Island: Franklin Harbour	11.74	Farwell, Point	3.111
Easter Group	7.135	Entrance Island: Liverpool River	3.29	Faure Flat	7.113
Eastern Bluff	7.117	Entrance Point: (21°40'S 114°58'E)	6.244	Faure Island	7.113
Eastern Cove	12.76	Entrance Point: (32°09'S 115°40'E)	8.92	Favorite Island	7.233
Eastern Group	10.9	Entrance Point: Roebuck Bay	5.264	Fawcett, Point	4.70
Eastern Island: Houtman Abrolhos	7.167	Entrance Rocks: Garden Island	8.158	Fenelon Island: (14°08'S 125°42'E)	4.302
Eastern Islands	7.135	Entrance Shoal	4.199	Fenelon Island: Denial Bay	10.49
Eastern Passage	7.149	Eric Island	4.219	Fenelon Passage	4.290
Eastern Shoal	11.180	Escape Cliff	3.125	Fenris Bank	12.27
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Eba Island	10.93	Escape Pass	5.155	Ferguson, Mount	11.180
Echo Shoals	4.50	Escape Rocks: Roebuck Bay	5.285	Ferret Reef	5.146
Echuca Shoal	4.64	Esperance	9.135	Field Island	3.112
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Eclipse Island	9.39	Limiting conditions	9.141	Finch Shoal	9.122
Light	9.39	Pilotage	9.144	Finger Island	9.118
Eclipse Islands: Vansittart Bay	4.263	S Breakwater	9.150	Finke Bay	3.115
Eclipse Rock	11.97	Esperance Bay	9.110	Finnis, Cape	10.105
Eclipse Shoals	5.241	East inner approach	9.121	Finniss River	4.154
Eddy Point	4.202	East outer approach	9.117	Finucane Island	5.333
Edel Land	7.124	Essington, Port	3.68	Fish Point	7.134
Edeline Islands	5.163	Etheridge Patch	5.146	Fish Reef	4.88
Edith Rock	8.219	ETSA Power Station chimney	12.134	Fish Rocks	8.81
Edithburgh	12.148	ETSA Power Station water tower	12.134	Fisherman Islands	7.225
Edward Island: Gulf of Carpentaria	2.165	Eucla	10.16	Fishermans Bay	11.139
Edward Point	9.32	Roads	10.19	Fitzgerald Bay	11.214
Edwards Island	7.261	Sands	10.22	Fitzgerald Patch	5.146
Edwards Point	3.60	Eugene McDermott Shoal	4.56	Fitzgerald River	9.99
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Palm Bay	3.58	Light	7.142	Porter Hill	5.169
Palmerston Island	4.156	Pelsaert Lagoon	7.157	Porter Rock	11.19
Pancake Pass	5.207	Pender Bay	5.220	Possession Point	9.71
Panton Shoals	5.249	Pender Point	4.202	Post Office Island	7.136
Paradise Bay	2.153	Penguin Bank	6.264	Pot Rock	9.113
Parakeet Bay	8.155	Penguin Deep	4.226	Potter Island	6.166
Parakeet Channel	5.109	Penguin Hill	4.85	Powell Point	9.100
Parfitt Point	2.214	Penguin Island: Warnbro Sound	8.160	Power Station Directional Light	8.191
Parker Point: Mermaid Strait	6.111	Penguin Island: Rivoli Bay	13.46	Powerful Island	5.80
Parker Point: Rottnest Island	8.146	Lighthouse	13.46	Preston Island	6.165
Parker, Point: Gulf of Carpentaria	2.98	Penguin Point	12.47	Preston Spit	6.165
Anchorage	2.111	Penguin Rock	9.117	Preston, Cape	6.151
Parkes Reef	6.285	Penguin Shoal	4.45	Price Island	10.119
Parkin Point	8.91	Pennefather River	2.19	Price Knoll	3.129
Parmelia Bank	8.71	Penneshaw	12.84	Price, Port	12.187
Channel	8.37	Pentecost River	4.213	Prince Frederick Harbour	4.324
Leading Lights	8.52	Pera Channel	2.273	Prince of Wales Channel	2.17
Paroo Shoal	6.232	Pera Head	2.68	Prince Regent River	4.340
Parry Harbour	4.295	Perforated Island	10.106	Princess Royal Harbour	9.75
Parry Island	4.288	Perforated Rocks	10.93	Prior Point	5.45
Parry Shoal	4.44	Perlubie Hill	10.90	Probable Island	2.274
Parting Pool	6.184	Peron Peninsula	7.51	Proper Bay	11.54
Anchorage	6.188	Peron, Cape: Cockburn Sound	8.91	Prospect Hill	12.28
Partney Island	11.66	Peron, Cape: Shark Bay	7.78	Providence Hill	4.160
Pascal Island	4.272	Flats	7.81	Prudhoe Islands	4.317
Pasco Island: (34°04'S 122°06'E)	9.119	Light	7.80	Prudhoe Rocks	4.317
Pasco Island: Cascade Bay	5.179	Peron, Mount	7.222	Pudding Rock	10.40
Pascoe Passage	4.13	Peron North, Cape	7.81	Pueblo Shoal	6.121
Pasley, Cape	10.9	Perpendicular Head	5.222	Pugh Shoal	2.15
Pasley, Mount	10.8	Perth	8.64	Pularumpi	4.75
Passage Islands	6.218	Perth Abyssal Plain	1.119	Pullen Island	13.17
Passage Reefs	9.39	Peter, Point	10.52	Pup Island	6.234
Passage Rock: (32°06'S 115°39'E)	8.88	Petersen Rock	6.165	Puralku	2.275
Passage Rock: Warnbro Sound	8.160	Petit Point	7.113	Purdie Islands	10.40
Patch Point	4.202	Petrel Bay	10.53	Purser Reef	7.255
Patch Shoal	2.237	Phil Point	2.150	Purumpenelli Point	3.88
Paterson, Point	11.217	Phillip Point: Dampier	6.109		
Paterson, Port	11.217	Phillip Point: Rottnest Island	8.153		
Patricia Island	4.312	Phillip Rock	8.153		
Patterson, Port	4.95	Picard Island	6.44		
Patterson Shoals	5.301	Piccaninies The	5.109		
Paxie Shoal	3.29	Pickering Point	4.298		
		Pigface Island	10.90		
				Quagging Island	9.10
				Quail Island	4.95
				Queens Channel	4.165
				Quin Rock	12.17

Quobba, Point	7.59	Protection of wild life	1.61	Rogues Point	12.147
Light	7.59	Quarantine	1.54	Rolling Bay	3.31
Quoin Bluff North	7.60	Queensland	1.50	Rolls Point Light	12.69
Quoin Bluff South	7.77	Submarine cables and pipelines	1.38	Roly Rock	6.154
Quoin Head	7.129	Transfer operations	1.44	Ronsard Bay	7.259
Quoin Island	4.164	Western Australia	1.52	Ronsard Island	6.31
Rabbit Island: Esperance Bay	9.112	Rekala Island	2.274	Ronsard, Cape	7.57
Rabbit Island: Frenchman Bay	9.56	Remarkable, Mount	11.207	Light	7.60
Rabbit Island: (34°36'S 135°59'E)	11.21	Renard Shoals	3.103	Rooper Rock	3.125
Rabbit Islet	10.116	Repulse Point	5.191	Roper River	2.183
Rabelais Peak	13.29	Reveley Island	4.219	Rosalind Shoal	11.12
Rabelais, Cape	13.31	Reyne Shoal	5.70	Rose River	2.165
Racine Island	4.286	Reynolds Point	12.29	Rosella Shoal	5.39
Radar Hill	4.85	Rhino Head	12.41	Rosemary Island	6.119
Radford Point	3.85	Rhodes Point	2.275	Rosetta Harbor	13.14
Radstock, Cape	10.105	Rickaby, Port	11.92	Rosetta Head	13.14
Raffles Bay	3.59	Rice Rocks	5.46	Rosie Creek	2.165
Raft Point: (16°04'S, 124°27'E)	5.60	Riche, Cape	9.87	Rosily Cays	6.229
Raft Point: (17°06'S 139°35'E)	2.109	Riddell Point: King Sound	5.190	Rosily Shoals	6.271
Rainbow Shoals	4.339	Riddell Point: Roebuck Bay	5.285	Ross Point: Gulf of Carpentaria	2.159
Ram Island	9.119	Riley Shoal	11.112	Ross Point: Macquarie Strait	3.34
Rame Head	9.20	Riley, Point	11.82	Ross Rock	12.188
Randall Island	4.291	Rimbija Island	2.203	Rossiter Bay	9.132
Range, Cape	7.10	Ringbolt Rock	9.76	Rothery Reef	4.235
Ranken, Mount	2.298	Ringwood Reef	13.45	Rothsay Water	4.340
Rankin Bank	6.12	Rip Reef	5.181	Rottnest Island	8.145
Ransonnet, Cape	7.107	Rip Rock	5.147	Rottnest Light	8.43
Rantyririty Point	2.165	Ripple Shoals	6.226	Rouge, Cape	12.74
Rapid Bay	12.104	Rippling Shoal	2.280	Round Hill Island	2.298
Rapid Head	12.101	River Annie	4.98	Round Island: (34°06'S 123°53'E)	10.9
Raragala Island	2.244	River Charlotte	4.98	Round Island: (20°59'S 115°52'E)	6.155
Rat Island: Houtman Abrolhos	7.135	Rivoli Bay	13.47	Round Island: (21°39'S 114°39'E)	6.283
Rat Island: King Sound	5.156	Rivoli Islands	6.291	Round Island: Yampi Sound	5.93
Ratcliffe Bay	9.33	Roarers, The	8.88	Rous Head Harbour	8.59
Rattlesnake Shoal	4.305	Rob Island	9.124	Rowley Shoals	5.8
Ravine de Casoars	12.12	Robber Rocks	5.244	Roy Bank	5.301
Razor Islands	5.172	Robe	13.33	Roy Island	9.124
Reabold Hill	8.50	Light	13.29	Royston Head	11.84
Reader Head	6.77	Robe Point	6.219	Ruby Island	3.116
Recherche Rock	9.155	Robe Point Light	13.32	Rulhieres, Cape	4.215
Record Point	3.72	Robe River	6.239	Rushy Point	9.75
Recruit Bay	7.153	Robert Point	8.167	Russell Island	4.202
Red Bluff: (17°04'S 122°19'E)	5.238	Roberts Island	5.37	Russell Rock	9.122
Light	5.239	Robinson, Port	6.80		
Red Bluff: (24°02'S 113°25'E)	7.10	Robinson River: Gulf of Carpentaria	2.133	Sable Island	6.35
Red Bluff: (27°45'S 114°08'E)	7.124	Robroy Reefs	4.310	Saddle Hill: (11°18'S 132°14'E)	3.69
Red Bluff: Gulf of Carpentaria	2.140	Roche Reefs	4.154	Saddle Hill: Roebuck Bay	5.282
Red Bluff: Napier Broome Bay	4.248	Rock Dunder	9.86	Saddle Peak	10.84
Red Cliff Bay	7.117	Rock, Cape	10.126	Sahul Banks	4.9
Red Cliff Point: Yatala Harbour	11.215	Rock Cliff Point	9.33	Sail Rock	9.123
Red Cliff Point: (24°55'S 113°09'E)	7.60	Rocky Bay: Gulf of Carpentaria	2.215	Saifish Reef	6.119
Red Cliff: Anson Bay	4.155	Rocky Creek: Gulf of Carpentaria	2.72	Sailor Rock	9.126
Red Cone Hill	5.65	Rocky Head: (35°02'S 116°44'E)	9.22	Saint Alban, Cape	12.82
Red Head	4.189	Rocky Head: Enderby Island	6.151	Saint Alouarn Islands	9.12
Red Hill: (19°48'S 120°34'E)	5.315	Rocky Island: (34°48'S 134°43'E)	10.104	Saint Andrew Island	4.340
Red Hill: Roebuck Bay	5.282	Rocky Island: Port Victoria	11.98	Saint Asaph Bay	4.74
Red Island: Admiralty Gulf	4.225	Channel	11.98	Saint Cricq, Cape	7.76
Red Island: Bonaparte Archipelago	4.335	Rocky Island: (14°06'S 127°33'E)	4.216	Light	7.84
Red Island: (34°02'S 119°47'E)	9.99	Rocky Island: (15°40'S 136°50'E)	2.150	Saint Davids Bay	2.288
Red Islet: Gulf of Carpentaria	2.156	Rocky Island: (16°16'S 139°16'E)	2.121	Saint Francis Island	10.51
Red Point: Wessel Islands	3.16	Rocky Islet: Groote Eylandt	2.169	Light	10.51
Red Rock	7.255	Rocky Point: (21°44'S 114°51'E)	6.276	Saint George Basin	4.340
Red Rocks Point	10.16	Rocky Point: (18°42'S 121°44'E)	5.309	Saint Lambert, Cape	4.215
Reef Head	12.43	Rocky Point: Bathurst Island	4.70	Saint Mary Bay	10.86
Reef Island	6.31	Rocky Point: Denial Bay	10.40	Saint Mary River	9.99
Reef Point	3.72	Rocky Point: Gove Harbour	2.238	Saint Patrick Island	4.340
Rees Island	5.155	Rocky Point: Gulf of Carpentaria	2.150	Saint Peter Island	10.52
Rees Point	4.210	Rocky River	12.12	Saint Vincent Gulf	12.87
Reevesby Island	11.66	Roe Bank	4.203	Saladin Marine Terminal	6.267
Refuge Bay	3.24	Roe Islands	5.134	Saladin Oilfield	6.267
Refuge Cove	2.157	Roe Point	6.123	Salier Islands	5.119
Regan Shoal	2.295	Roe Reef	8.48	Salisbury Island	9.117
Regnard Bay	6.151	Roe River	4.326	Salt Creek: (35°03'S 137°44'E)	12.143
Regulations	1.38	Roe Rock	9.87	Salt Creek: Arno Bay	11.72
Accident or damage	1.47	Roe, Mount	3.99	Salt Creek: Tumbay Bay	11.67
Environment protection	1.42	Roebourne Gap	6.80	Salt Water Arm	3.132
Explosive	1.53	Roebuck Bay	5.260	Salt, Mount	6.219
Pollution of the seas	1.39	Roebuck Deep	5.261	Salural Island	5.154
		Rogers Strait	4.351		

Sampson Inlet	5.49	Shark Bay: Cobourg Peninsula	3.99	Snag Island	7.241
Sams Creek	6.68	Shark Bay: Gascoyne District	7.51	Snake Bay	3.86
Samson, Point	6.77	Shark Bay: Melville Island	3.88	Snapper Bank	7.167
Anchorage	6.72	Shark Point: Wessel Islands	3.16	Snapper Point: Aldinga Bay	12.101
Sand Island: Admiralty Gulf	4.281	Shark Point: Barrow Island	6.171	Snapper Point: Hog Bay	12.82
Sand Islet	3.28	Shark Rock	4.169	Snapper Point: (32°33'S 137°47'E)	11.217
Sand Point	3.39	Sharp Peak: Admiralty Gulf	4.273	Snapper Shoal: Gulf of Carpentaria	2.233
Sandalwood Peninsula	6.291	Sharp Point	9.41	Snellings Beach	12.58
Sanders Bank	12.27	Shell Bank	5.188	Snewin Rock	13.33
Sanders Point	5.37	Shell Patch	5.306	Snug Cove: Kangaroo Island	12.57
Sanderson Bay	12.20	Shelter Island	9.45	Soldier Point	3.102
Sanderson Point	5.181	Shelter Reef	7.153	Solitary Island	5.318
Sandfly Creek	4.158	Shenton Bluff	5.187	South Alligator River	3.112
Sandland Island	7.234	Shepherd Bluff	2.216	South Bank	10.93
Sandy Bight	9.115	Shepherds Patch	5.34	South Bay: Gulf of Carpentaria	2.303
Sandy Island: (34°52'S 116°02'E)	9.20	Shepparton Shoal	4.84	South Break	7.255
Sandy Island: Depuch Island	6.35	Sherlock River	6.31	South Breaker: Margaret Brock Reef	13.12
Sandy Island: Lacepede Islands	5.233	Shield, Cape	2.288	South Bountiful Island	2.126
Sandy Island: Gulf of Carpentaria	2.165	Shirley Island	5.130	South Channel: Clarence Strait	3.130
Sandy Islet No 1	3.60	Shoal Bay: Clarence Strait	3.120	South Channel: Cockburn Sound	8.127
Sandy Islet No 2	3.60	Shoal Cape	9.100	South Channel: Weipa	2.51
Sandy Islet: Scott Reef	5.5	Shoal Point: (34°46'S 135°30'E)	10.126	South East Island: Montebello Islands	6.185
Sandy Point: (15°27'S 128°06'E)	4.169	Shoal Point: (28°07'S 114°10'E)	7.131	South East Ledge: Hamelin Bay	8.223
Sandy Point: (34°16'S 138°09'E)	12.185	Shoal Reach	4.164	South East Reef	6.161
Sandy Point: Beagle Bay	5.222	Shoalwater Point	5.126	South East Snare	12.17
Sandy Point: Roebuck Bay	5.264	Beacon	11.12	South East Twin Island	5.146
Sandy Point: Shark Bay	7.77	Light	11.10	South Entrance: Brecknock Harbour	5.48
Sansom Head	3.37	Sholl Island	6.155	South Goulburn Island	3.37
Santo Rock	6.282	Shoulder Hill	10.27	South Hummock	7.246
Sarus Towers	5.363	Shoulder, The	12.49	South Island: Mangrove Islands	6.238
Saunders Patch	3.86	Sibsey Islet Light	11.21	South Meda Shoal	5.149
Saunders, Mount	2.214	Signals	1.62	South Muiron Island	6.275
Savage Hill	4.317	Silver Gull Creek	5.116	South Neptunes	11.12
Saville Island	4.202	Silver Mount	9.11	Light	11.10
Seaddan Island	5.74	Sims Island	3.37	South Page	12.33
Scarborough	8.50	Simbad gas platform	6.174	Light	12.32
Scatterbreak Reef	9.124	Sinclair Island	10.40	South Passage Island	6.218
Sceale Bay	10.98	Sinclair, Point	10.40	South Passage: Gage Roads	8.149
Scearcy Bay	10.107	Sir Edward Pellew Group	2.135	South Passage: Houtman Abrolhos	7.143
Schanck, Mount	13.57	Sir Frederick Hills	4.237	South Passage: Shark Bay	7.106
Schofield Shoal	6.307	Sir Frederick Island	5.81	South Patch: Cambridge Gulf	4.200
Scobell Rocks	5.41	Sir George Hope Islands	3.108	South Peron Island	4.155
Scorpion Bight	10.16	Sir Graham Moore Island	4.237	South Point: (34°58'S 118°11'E)	9.82
Scorpion Island	4.241	Sir Isaac, Point	10.115	South Point: Gulf of Carpentaria	2.166
Scorpion Point	4.243	Light	10.115	South Reef: Guichen Bay	13.33
Scott Islet	5.174	Sir Joseph Banks Group	11.58	South Reef: Mermaid strait	6.159
Scott Point: Great Australian Bight	10.40	Sir Richard Island	5.169	South Reef: Scott Reef	5.5
Scott Point: Gulf of Carpentaria	2.190	Sir Richard Peninsula	13.19	South Rock: (35°05'S 136°11'E)	11.21
Scott Reef	5.5	Sir Rodericks Rocks	2.290	South Rock: Hamelin Bay	8.219
Scott Strait	4.316	Sisters, The: Port Elliot	13.17	South Sand	10.87
Scott, Cape	4.153	Sisters, The: Warnbro Sound	8.163	South Sands: Warnbro Sound	8.165
Scott, Mount	7.198	Six mile Island	10.9	South Shell Island	4.135
Sea level and tides	1.131	Skardon River	2.19	South Spit	12.161
Sea Reef	8.124	Skippy Light	9.79	South Spit: Princess Royal Harbour	9.75
Sea water characteristics	1.135	Skirmish Point	3.28	South Twin Peak Island	9.123
Seabird	7.265	Skottowe Shoal	3.127	South Wellesley Islands	2.99
Seaflower Bay	4.268	Skull Island	2.149	South West Bay	3.39
Seagull Island	9.39	Skull Point	2.150	South West Breaker	9.10
Anchorage	9.46	Slade Point: (10°59'S 142°08'E)	2.24	South West Island: (15°44'S 136°40'E)	2.136
Seal Island: Althorpe Island	12.41	Slade Point: (33°04'S 134°10'E)	10.107	South West Island: Eclipse Island	9.39
Seal Island: King George Sound	9.53	Slate Islands	5.49	South West Point: Garden Island	8.128
Seal Islet	9.15	Sleaford Bay	10.128	South West Point: Liverpool River	3.29
Seal Rock: Granite Island	13.15	Slipper Island	9.123	South West Reefs	9.20
Seal Rock: Point Hood	9.101	Slope Island	7.95	South West Regnard Island	6.151
Seaplane Bay	4.223	Sloper Shoal	5.241	South West Rock: Gambier Islands	11.13
Searipple Passage	6.44	Sloping Point	6.44	South West Rock: Hamelin Bay	8.220
Seaward Ledge	7.225	Small Rock	10.9	South West Vernon Island	3.126
Seaward Reef	8.158	Small Saddle	10.22	Light	3.126
Second Valley Cove	12.105	Smith Island	11.25	South-West Rock: Young Rocks	12.15
Secure Bay	5.77	Smith Point: (11°07'S 132°08'E)	3.68	Southern Cross Rocks	2.290
September Point	4.269	Smith Point: Shark Bay	7.62	Southern Flats	8.127
Seringapatam Reef	5.4	Smith, Port	5.312	Southwest Point: (11°27'S 136°28'E)	2.262
Serrurier Island	6.275	Smith Reef	3.129	Souttar Point	11.86
Anchorage	6.284	Smith Rock	9.113	Light	11.87
Shadworth, Mount	9.29	Smiths Bay	12.61	Spalding Cove	11.42
Shag Rocks	5.251	Smoky Bay	10.84	Spear Point	3.72
Shakespeare Hill	4.197	Smoky Point	3.83	Spencer Gulf and Approaches	11.1
Shamrock Bay	3.99	Smooth Island	10.53	Spencer, Cape	12.41
Shark Bay Marine Park	7.7	Smooth Rocks	9.87	Light	11.81

Sphinx Head	2.207	Success Bank	8.71	Taylor Island: Thorny Passage	11.25
Spider Reef	6.283	Channel	8.37	Light	11.23
Spit End	2.190	Leading Lights	8.52	Taylor, Mount	9.55
Spit Patch	5.306	Success Boat Harbour	8.68	Taylor Patches	3.103
Spit Point: (18°42'S 121°38'E)	5.306	Success Strait	5.67	Taylor Street Landing	9.147
Spit Point: (20°02'S 119°00'E)	5.329	Suffren Island	4.322	Teggs Channel	7.72
Split Rock: King Sound	5.173	Sugarloaf Rock	8.209	Temple Bay	3.16
Sponge Rocks	10.93	Sulphur Bay	8.118	Templer Island	3.55
Spray Reef	9.117	Sulphur Reefs	9.117	Tent Island	6.291
Spring Creek	2.94	Sulphur Rock	8.118	Tent Point	6.291
Square Island	7.136	Sultan Reef	6.229	Termination Island	9.155
Square Topped Hill	5.172	Sultana Point	12.143	Tern Island	7.233
Stag Marine Terminal	6.23	Sunday Island: (21°42'S 114°25'E)	6.283	Terrible, Mount	12.102
Stag Rocks	8.124	Sunday Islands: King Sound	5.134	Tessa Shoals	6.64
Stamford Hill	11.49	Sunday Patch	9.112	Thais Island	4.324
Stanley Island	9.28	Sunday Strait	5.147	Thevenard	10.56
Stanley Pool	7.34	Sunk Rocks	9.112	Thevenard, Cape	10.56
Stansbury	12.164	Sunken Rock	10.9	Thevenard Island	6.211
Stanvac, Port	12.110	Sunrise Bank	4.49	Thirsty Point	7.259
Star Rock	6.125	Sunset Shoal	4.49	Thistle Island	11.12
Starvation Boat Harbour	9.103	Surf Point	7.107	Anchorage	11.27
Station Hill: Roebuck Bay	5.264	Surfleet Point	11.42	Thistle Rock	9.120
Station Island	9.124	Surprise Reef	5.241	Thomas Bay	5.250
Station Reef	5.73	Surveyor Point	12.161	Thomas Island	9.113
Steamboat Island	6.165	Suzanne Shoal	11.82	Thomas, Cape	13.33
Steamer Rock	4.237	Swamp Point	4.162	Thompson Bay	2.190
Steep Head Island	4.287	Swan Island	5.154	Thomson Bay: Rottneest Island	8.156
Steep Head: (16°18'S 123°31'E)	5.131	Swan Lake	9.14	Thornbury Reef	5.124
Steep Head: Cambridge Gulf	4.188	Swan Point	5.134	Thorne Reef	5.70
Steep Island	5.65	Swan River	8.64	Thorny Passage	11.24
Steep Point	7.131	Sweeney Patches	5.41	Thouin, Cape	6.31
Steep Rocks	9.120	Sweers Island	2.99	Three Fathom Bank	8.124
Stenhouse Bay	12.46	Swell Rocks,	9.112	Three Hummocks Point	2.137
Stephens Bank	3.126	Swift Bay	4.313	Three Hummocks, islets	2.290
Stephens, Point	3.126	Swires Bluff	4.139	Threshold Bank	12.33
Stevens Channel	4.206	Swirl Rock	5.273	Thrings Channel	4.97
Stevens Island	3.15	Swirl Shoal	5.208	Thumb Point	3.21
Light	3.19	Sydney Island	2.122	Thurburn Bluff	4.215
Stevens Rock: Port Darwin	4.140	Sykes Shoal	2.15	Thurlan	5.134
Stevens Rocks	2.142	Symonds Bluff	2.158	Thyssen Rock	9.20
Stewart Island	6.155			Tickerra Bay	11.138
Stewart Islands	4.219	Table Head: Port Essington	3.72	Tide Rip Islands	5.119
Stewart Point	3.60	Table Hill	4.162	Tidepole Hill	4.249
Stewart Rocks	6.155	Table Island: Duke of Orleans Bay	9.130	Tidepole Island	6.122
Stewart Shoal	6.298	Table Island: (21°36'S 114°43'E)	6.283	Tiffany Reef	5.172
Stewart, Cape	3.28	Table Rock: Forestier Islands	6.35	Tilbata Creek	5.251
Still Bay	4.189	Table Topped Hill: Ballast Harbour	12.56	Timber Point	2.106
Stirling Channel	8.99	Tagon Bay	9.128	Time Rock	9.120
Directional Light	8.107	Tagon Point	9.128	Timor	1.119
Stirling Range	9.85	Tagon Reef	9.128	Sea	1.119
Stokes Bank	9.118	Taillefer Isthmus	7.120	Tineline Point	12.28
Stokes Bay: (35°37'S 137°13'E)	12.59	Tait Bank	4.231	Tiparra Bay	11.103
Stokes Bay: King Sound	5.183	Taiyuan Shoal	3.103	Tiparra Reef	11.12
Stokes Point: Gulf of Carpentaria	2.96	Talbot Bay	5.78	Light	11.82
Stokes Point: Port Darwin	4.137	Talbot, Cape	4.237	Tizard Island,	9.123
Stony Hill	9.41	Talboys Island	5.207	Tjipripu River	3.87
Stony Island	9.39	Talboys Point	5.206	Tod River	11.64
Stony Point: Discovery Bay	13.58	Talboys Rock	5.256	Tongue Sand	8.165
Stony Point: Port Bonython	11.163	Talc Head	4.119	Tongue Shoals	6.282
Storr Island	5.67	Talia Hill	10.108	Toolbrunup Peak	9.85
Storry Hill	5.184	Tallon Island	5.155	Topgallant Islands	10.105
Straggler Channel	8.87	Tamworth Hill	8.160	Tor	3.34
Straggler Reefs	8.73	Tancred Bank	4.284	Torbay	9.42
Straggler Rocks: Fremantle	8.73	Tancred Island	4.313	Torbay Head	9.39
Strath Sands	3.86	Tangier Shoals	5.249	Torment Spit	5.199
Strath Shoal	3.18	Tanner Island	5.80	Torment, Point	5.194
Strawbridge Point	12.77	Light	5.85	Torrens Island	12.113
Streak Point	12.162	Tapely Shoal	12.94	Torrens, Cape: (14°59'S 125°05'E)	4.324
Streaky Bay	10.87	Light	12.94	Torrens, Cape: (35°42'S 136°47'E)	12.55
Dashwood Channel	10.89	Tapp Rock	4.97	Torres Strait	2.17
South Channel	10.90	Tappers Inlet	5.252	Tortoise Island	6.287
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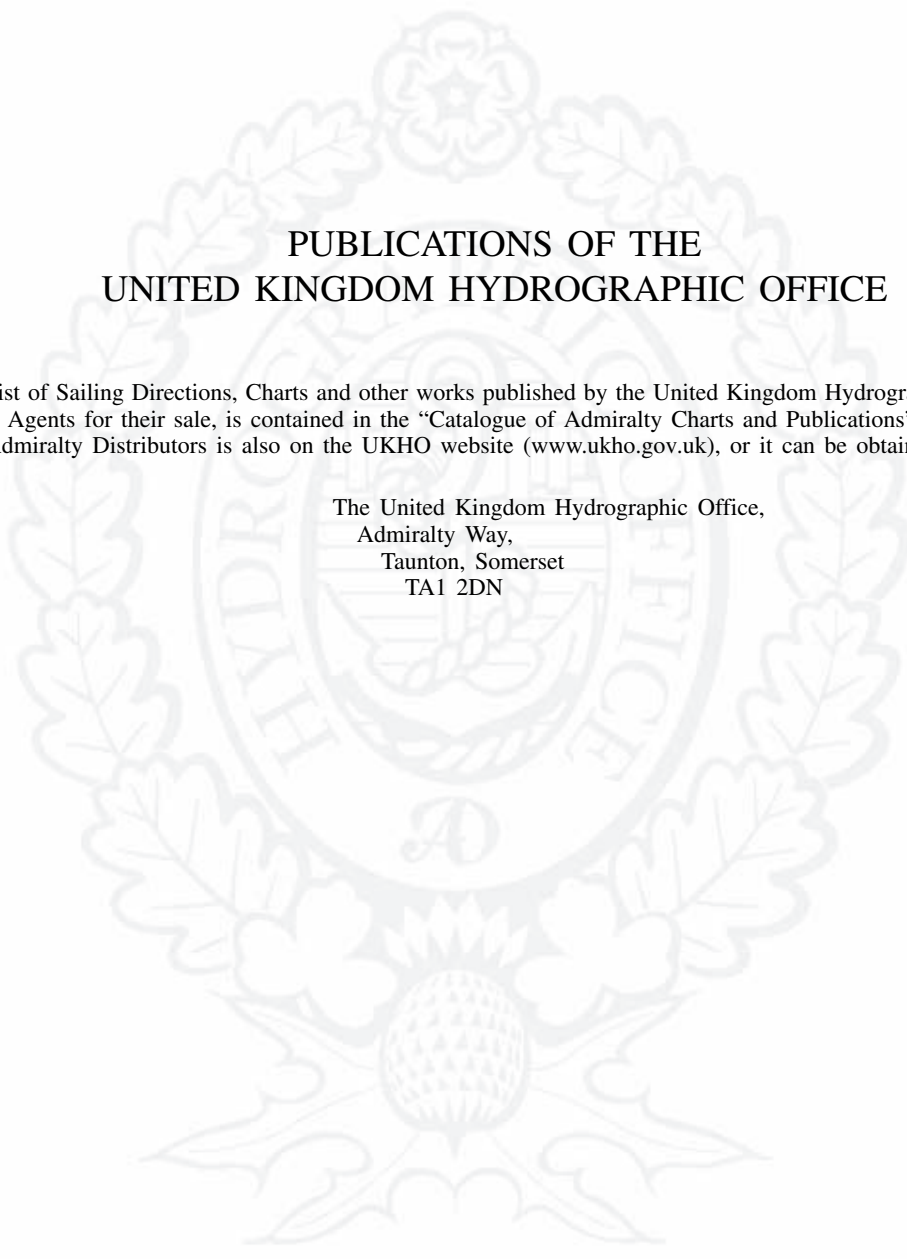
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