

PUB. 171
SAILING DIRECTIONS
(ENROUTE)



EAST AFRICA
AND THE
SOUTH INDIAN OCEAN



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ELEVENTH EDITION

Preface

Pub. 171, Sailing Directions (Enroute) East Africa and the South Indian Ocean, Eleventh Edition, 2013, is issued for use in conjunction with Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean. The companion volumes are Pubs. 172, 173, 174, and 175.

Digital Nautical Chart 18 provides electronic chart coverage for the area covered by this publication.

This publication has been corrected to 1 June 2013, including Notice to Mariners No. 22 of 2013.

Explanatory Remarks

Sailing Directions are published by the National Geospatial-Intelligence Agency (NGA), under the authority of Department of Defense Directive 5105.40, dated 12 December 1988, and pursuant to the authority contained in U. S. Code Title 10, Sections 2791 and 2792 and Title 44, Section 1336. Sailing Directions, covering the harbors, coasts, and waters of the world, provide information that cannot be shown graphically on nautical charts and is not readily available elsewhere.

Sailing Directions (Enroute) include detailed coastal and port approach information which supplements the largest scale chart produced by the National Geospatial-Intelligence Agency. This publication is divided into geographic areas called "Sectors."

Bearings.—Bearings are true, and are expressed in degrees from 000° (north) to 360°, measured clockwise. General bearings are expressed by initial letters of points of the compass (e.g. N, NNE, NE, etc.). Adjective and adverb endings have been discarded. Wherever precise bearings are intended degrees are used.

Charts.—Reference to charts made throughout this publication refer to both the paper chart and the Digital Nautical Chart (DNC).

Coastal Features.—It is assumed that the majority of ships have radar. Available coastal descriptions and views, useful for radar and visual piloting are included in geographic sequence in each Sector.

Corrective Information.—Users should refer corrections, additions, and comments to NGA's Maritime Operations Desk, as follows:

1. Toll free: 1-800-362-6289
2. Commercial: 571-557-5455
3. DSN: 547-5455
4. DNC web site: <http://dnc.nga.mil/NGAPortal/DNC.portal>
5. Maritime Domain web site: <http://msi.nga.mil/NGAPortal/MSI.portal>
6. E-mail: navsafety@nga.mil
7. Mailing address: Maritime Safety Office
National Geospatial-Intelligence Agency
Mail Stop N64-SH
7500 Geoint Drive
Springfield VA 22150-7500

New editions of Sailing Directions are corrected through the

date of the publication shown above. Important information to amend material in the publication is available as a Publication Data Update (PDU) from the NGA Maritime Domain web site.

NGA Maritime Domain Website
<http://msi.nga.mil/NGAPortal/MSI.portal>

Courses.—Courses are true, and are expressed in the same manner as bearings. The directives "steer" and "make good" a course mean, without exception, to proceed from a point of origin along a track having the identical meridional angle as the designated course. Vessels following the directives must allow for every influence tending to cause deviation from such track, and navigate so that the designated course is continuously being made good.

Currents.—Current directions are the true directions toward which currents set.

Dangers.—As a rule outer dangers are fully described, but inner dangers which are well-charted are, for the most part, omitted. Numerous offshore dangers, grouped together, are mentioned only in general terms. Dangers adjacent to a coastal passage or fairway are described.

Distances.—Distances are expressed in nautical miles of 1 minute of latitude. Distances of less than 1 mile are expressed in meters, or tenths of miles.

Geographic Names.—Geographic names are generally those used by the nation having sovereignty. Names in parentheses following another name are alternate names that may appear on some charts. In general, alternate names are quoted only in the principal description of the place. Diacritical marks, such as accents, cedillas, and circumflexes, which are related to specific letters in certain foreign languages, are not used in the interest of typographical simplicity. Geographic names or their spellings do not necessarily reflect recognition of the political status of an area by the United States Government.

Heights.—Heights are referred to the plane of reference used for that purpose on the charts and are expressed in meters.

Index-Gazetteer.—Navigational features and place names are listed alphabetically in the back of the book. The approximate position, along with the Sector and paragraph numbers (e.g. **1.1**), facilitate location in the text.

Internet Links.—This publication provides internet links to web sites concerned with maritime navigational safety, including but not limited to, Federal government sites, foreign Hydrographic Offices, and foreign public/private port facilities. NGA makes no claims, promises, or guarantees concerning the accuracy, completeness, or adequacy of the contents of the web sites and expressly disclaims any liability for errors and omissions of these web sites.

Light and Fog Signals.—Lights and fog signals are not described, and light sectors are not usually defined. The Light Lists should be consulted for complete information.

Ports.—Directions for entering ports are depicted where appropriate by means of chartlets, sketches, and photos, which facilitate positive identification of landmarks and navigational aids. These chartlets and sketches are not always to scale, however, and should be used only as a general informational guide

in conjunction with the best scale chart. Specific port facilities are omitted from the standard format. They are tabulated in Pub. 150, World Port Index.

Radio Navigational Aids.—Radio navigational aids are not described in detail. Publication No. 117 Radio Navigational Aids and NOAA Publication, Selected Worldwide Marine Broadcasts, should be consulted.

Soundings.—Soundings are referred to the datum of the charts and are expressed in meters.

Special Warnings.—A Special Warning may be in force for the geographic area covered by this publication. Special Warnings are printed in the weekly Notice to Mariners upon promulgation and are reprinted annually in Notice to Mariners No. 1. A listing of Special Warnings currently in force is printed in each weekly Notice to Mariners, Section III, Broadcast Warnings, along with the notice number of promulgation. Special Warnings are also available on the Maritime Division web site.

Wind Directions.—Wind directions are the true directions from which winds blow.

Reference List

The principal sources examined in the preparation of this publication were:

British Hydrographic Department Sailing Directions.

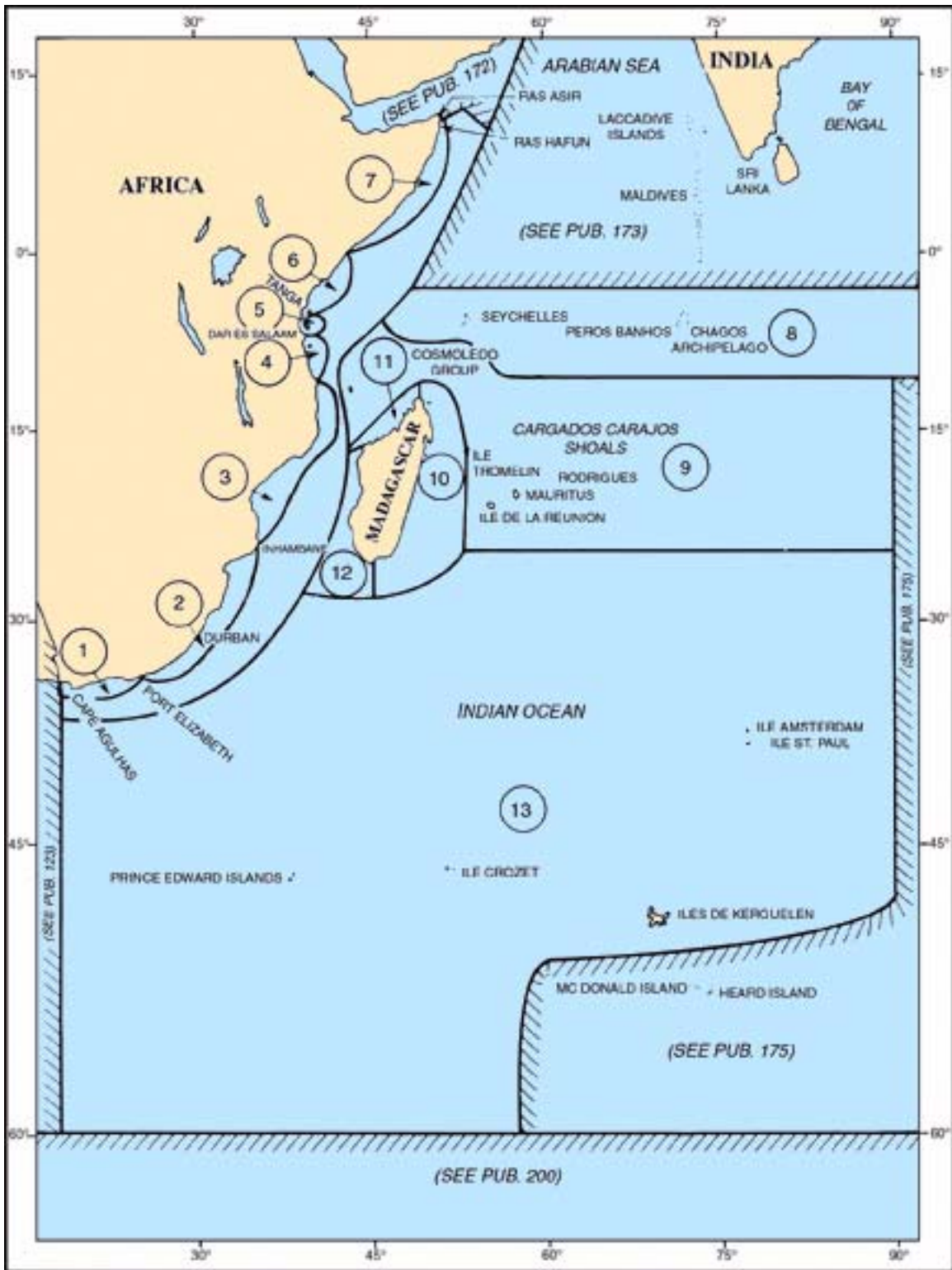
Canadian Hydrographic Service Sailing Directions.

Various port handbooks.

Reports from United States naval and merchant vessels and various shipping companies.

Other U.S. Government publications, reports, and documents.

Charts, light lists, tide and current tables, and other documents in possession of the Agency.



SECTOR LIMITS—PUB. 171

Conversion Tables

Feet to Meters

Feet	0	1	2	3	4	5	6	7	8	9
0	0.00	0.30	0.61	0.91	1.22	1.52	1.83	2.13	2.44	2.74
10	3.05	3.35	3.66	3.96	4.27	4.57	4.88	5.18	5.49	5.79
20	6.10	6.40	6.71	7.01	7.32	7.62	7.92	8.23	8.53	8.84
30	9.14	9.45	9.75	10.06	10.36	10.67	10.97	11.28	11.58	11.89
40	12.19	12.50	12.80	13.11	13.41	13.72	14.02	14.33	14.63	14.93
50	15.24	15.54	15.85	16.15	16.46	16.76	17.07	17.37	17.68	17.98
60	18.29	18.59	18.90	19.20	19.51	19.81	20.12	20.42	20.73	21.03
70	21.34	21.64	21.95	22.25	22.55	22.86	23.16	23.47	23.77	24.08
80	24.38	24.69	24.99	25.30	25.60	25.91	26.21	26.52	26.82	27.13
90	27.43	27.74	28.04	28.35	28.65	28.96	29.26	29.57	29.87	30.17

Fathoms to Meters

Fathoms	0	1	2	3	4	5	6	7	8	9
0	0.00	1.83	3.66	5.49	7.32	9.14	10.97	12.80	14.63	16.46
10	18.29	20.12	21.95	23.77	25.60	27.43	29.26	31.09	32.92	34.75
20	36.58	38.40	40.23	42.06	43.89	45.72	47.55	49.38	51.21	53.03
30	54.86	56.69	58.52	60.35	62.18	64.01	65.84	67.67	69.49	71.32
40	73.15	74.98	76.81	78.64	80.47	82.30	84.12	85.95	87.78	89.61
50	91.44	93.27	95.10	96.93	98.75	100.58	102.41	104.24	106.07	107.90
60	109.73	111.56	113.39	115.21	117.04	118.87	120.70	122.53	124.36	126.19
70	128.02	129.85	131.67	133.50	135.33	137.16	138.99	140.82	142.65	144.47
80	146.30	148.13	149.96	151.79	153.62	155.45	157.28	159.11	160.93	162.76
90	164.59	166.42	168.25	170.08	171.91	173.74	175.56	177.39	179.22	181.05

Meters to Feet

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	3.28	6.56	9.84	13.12	16.40	19.68	22.97	26.25	29.53
10	32.81	36.09	39.37	42.65	45.93	49.21	52.49	55.77	59.06	62.34
20	65.62	68.90	72.18	75.46	78.74	82.02	85.30	88.58	91.86	95.14
30	98.42	101.71	104.99	108.27	111.55	114.83	118.11	121.39	124.67	127.95
40	131.23	134.51	137.80	141.08	144.36	147.64	150.92	154.20	157.48	160.76
50	164.04	167.32	170.60	173.88	177.16	180.45	183.73	187.01	190.29	193.57
60	196.85	200.13	203.41	206.69	209.97	213.25	216.54	219.82	223.10	226.38
70	229.66	232.94	236.22	239.50	242.78	246.06	249.34	252.62	255.90	259.19
80	262.47	265.75	269.03	272.31	275.59	278.87	282.15	285.43	288.71	291.99
90	295.28	298.56	301.84	305.12	308.40	311.68	314.96	318.24	321.52	324.80

Meters to Fathoms

Meters	0	1	2	3	4	5	6	7	8	9
0	0.00	0.55	1.09	1.64	2.19	2.73	3.28	3.83	4.37	4.92
10	5.47	6.01	6.56	7.11	7.66	8.20	8.75	9.30	9.84	10.39
20	10.94	11.48	12.03	12.58	13.12	13.67	14.22	14.76	15.31	15.86
30	16.40	16.95	17.50	18.04	18.59	19.14	19.68	20.23	20.78	21.33
40	21.87	22.42	22.97	23.51	24.06	24.61	25.15	25.70	26.25	26.79
50	27.34	27.89	28.43	28.98	29.53	30.07	30.62	31.17	31.71	32.26
60	32.81	33.36	33.90	34.45	35.00	35.54	36.09	36.64	37.18	37.73
70	38.28	38.82	39.37	39.92	40.46	41.01	41.56	42.10	42.65	43.20
80	43.74	44.29	44.84	45.38	45.93	46.48	47.03	47.57	48.12	48.67
90	49.21	49.76	50.31	50.85	51.40	51.95	52.49	53.04	53.59	54.13

Abbreviations

The following abbreviations may be used in the text:

Units

°C	degree(s) Centigrade	km	kilometer(s)
cm	centimeter(s)	m	meter(s)
cu.m.	cubic meter(s)	mb	millibars
dwt	deadweight tons	MHz	megahertz
FEU	forty-foot equivalent units	mm	millimeter(s)
grt	gross registered tons	nrt	net registered tons
kHz	kilohertz	TEU	twenty-foot equivalent units

Directions

N	north	S	south
NNE	northnortheast	SSW	southsouthwest
NE	northeast	SW	southwest
ENE	eastnortheast	WSW	westsouthwest
E	east	W	west
ESE	eastsoutheast	WNW	westnorthwest
SE	southeast	NW	northwest
SSE	southsoutheast	NNW	northnorthwest

Vessel types

LASH	Lighter Aboard Ship	Ro-Ro	Roll-on Roll-off
LNG	Liquified Natural Gas	ULCC	Ultra Large Crude Carrier
LPG	Liquified Petroleum Gas	VLCC	Very Large Crude Carrier
OBO	Ore/Bulk/Oil	Lo-Lo	Lift-on Lift-off

Time

ETA	estimated time of arrival	GMT	Greenwich Mean Time
ETD	estimated time of departure	UTC	Coordinated Universal Time

Water level

MSL	mean sea level	LWS	low water springs
HW	high water	MHWN	mean high water neaps
LW	low water	MHWS	mean high water springs
MHW	mean high water	MLWN	mean low water neaps
MLW	mean low water	MLWS	mean low water springs
HWN	high water neaps	HAT	highest astronomical tide
HWS	high water springs	LAT	lowest astronomical tide
LWN	low water neaps		

Communications

D/F	direction finder	MF	medium frequency
R/T	radiotelephone	HF	high frequency
GMDSS	Global Maritime Distress and Safety System	VHF	very high frequency
LF	low frequency	UHF	ultra high frequency

Navigation

LANBY	Large Automatic Navigation Buoy	SBM	Single Buoy Mooring
NAVSAT	Navigation Satellite	SPM	Single Point Mooring
ODAS	Ocean Data Acquisition System	TSS	Traffic Separation Scheme
CBM	Conventional Buoy Mooring System	VTC	Vessel Traffic Center
MBM	Multi-Buoy Mooring System	VTS	Vessel Traffic Service

Miscellaneous

AIS	Automatic Identification System	MMSI	Maritime Mobile Service Identity Code
COLREGS	Collision Regulations	No./Nos.	Number/Numbers
IALA	International Association of Lighthouse Authorities	PA	Position approximate
		PD	Position doubtful

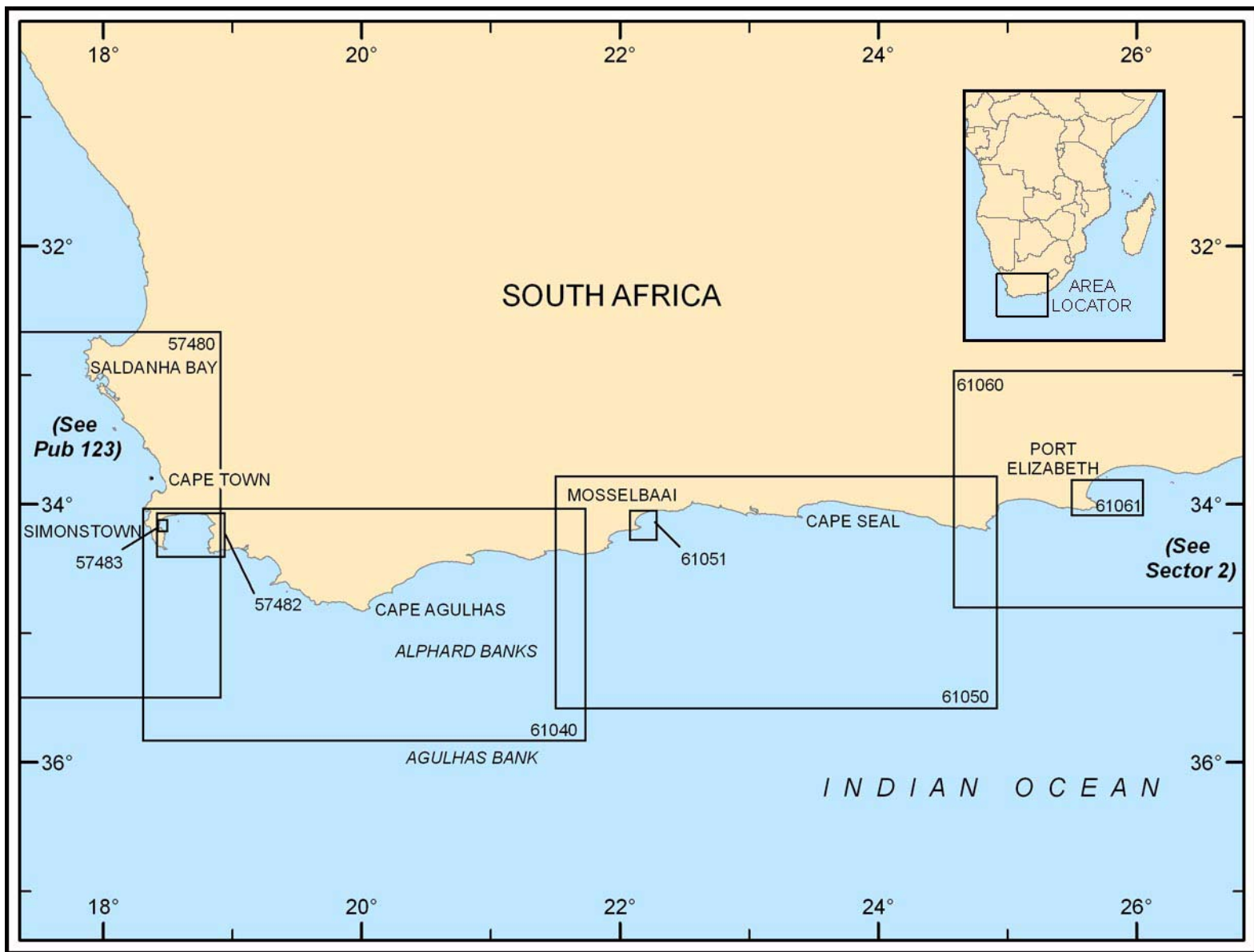
The following abbreviations may be used in the text:

IHO	International Hydrographic Organization
IMO	International Maritime Organization
LOA	length overall

Pub.	Publication
SOLAS	International Convention for Safety of Life at Sea
St./Ste.	Saint/Sainte

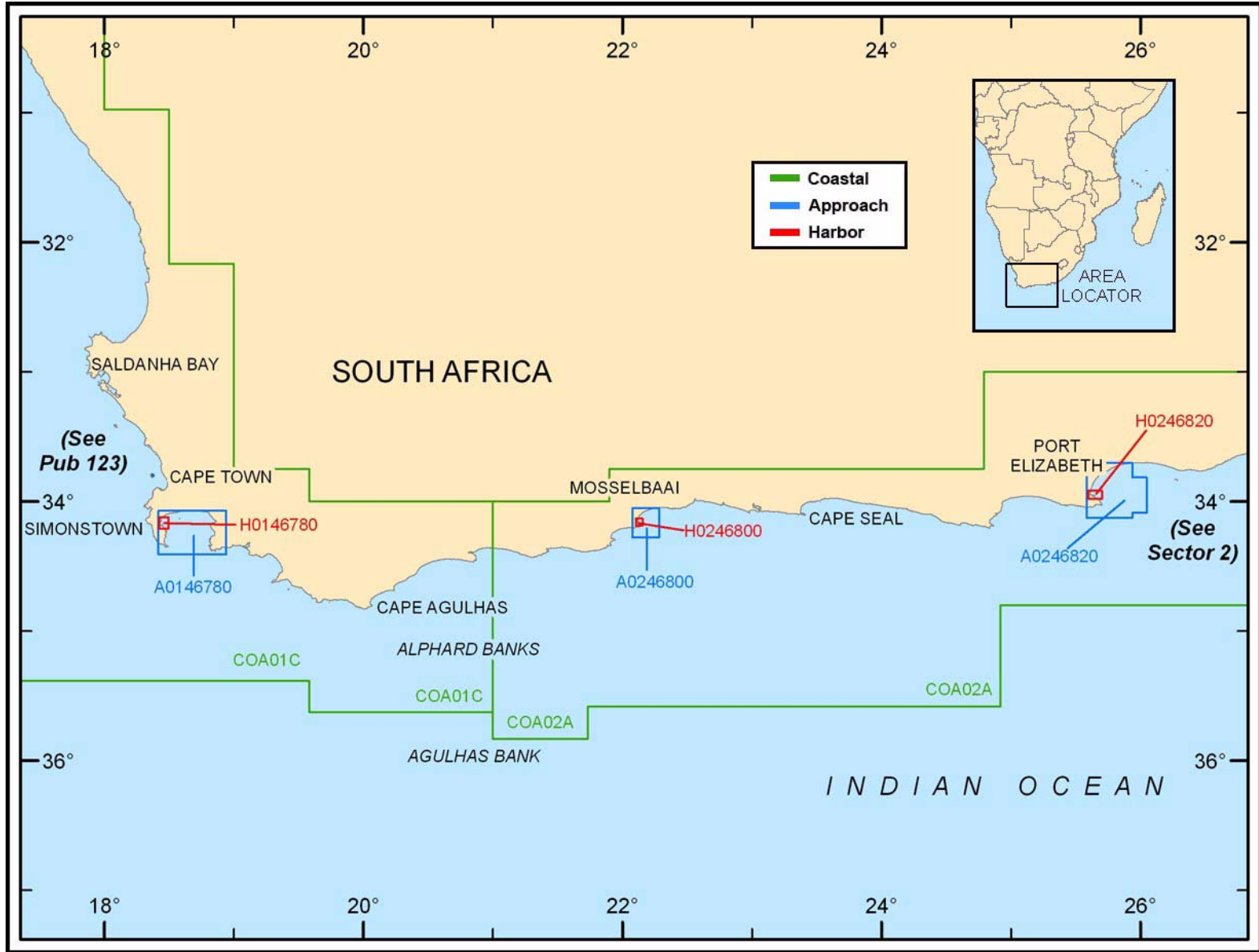
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SECTOR 1 — CHART INFORMATION



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SECTOR 1 — DNC LIBRARY INFORMATION

SECTOR 1

SOUTH AFRICA—THE CAPE OF GOOD HOPE TO CAPE RECIFE

Plan.—This sector describes the S coast of Africa from the Cape of Good Hope ESE to Cape Agulhas, a distance of about 82 miles. From Cape Agulhas, the coast is described ENE to Cape Recife, a further 293 miles.

General Remarks

1.1 Tides—Currents.—Throughout the year, the west-flowing Equatorial Current in this area lying well S of the Equator, (unlike the corresponding flows in the Atlantic and Pacific), passes Cap d'Ambre, the N extremity of Madagascar, and meets the African coast in the region of Cabo Delgado. Here some of the water turns N, the rest flows down the coast in a S or SW direction, and is known as the Mozambique Current as far S as the Baía de Lourenço Marques. From there onwards, it is known as the Agulhas Current, which is somewhat reinforced by the South Equatorial Current flowing past Cap Sainte-Marie at the S end of Madagascar. The S side of the general circulation is formed by the Southern Ocean Current, which sets in NE and E directions.

Between 20°E and 32°E some of the Agulhas Current re-curves SE and so passes into the N part of the Southern Ocean Current just mentioned. The bulk of the Agulhas Current, however, continues to follow the South African coastline and, passing over the Agulhas Bank, enters the Southern Atlantic Ocean, where it contributes to the flow of the Benguela Current of that ocean.

The Equatorial Current divides when it reaches the coast of Africa. The exact point at which this occurs varies from 10° to 11°S, during the boreal (northern) to 9° to 10°S, during the austral (southern) summer. It is now necessary to study the current pattern to the N of this division.

As far as 2°S, the N flow is steady during the whole year. It is known as the East African Coast current. Thereafter a striking reversal takes place. From April to October, the flow N (following the coastline and becoming NE) is maintained as far N as Ras Asir (12°N) but in the months December to February, owing to monsoonal influence, this direction is completely reversed and the flow between Ras Hafun and a point about 2°S becomes roughly SW. The name Somali Current is used by oceanographers for that part of the coastal current that undergoes a seasonal reversal. When the Somali Current is S it turns E at 2°S and passes into the Northwest Equatorial Countercurrent. During the northern summer, the Northeast Somali Current curves away from the African coast near Ras Hafun and becomes virtually indistinguishable from the Equatorial Countercurrent. It should be noted that the reversal of the Somali Current tends to occur a month or so ahead of the change of direction of the monsoon wind.

Mozambique Current.—The island of Madagascar screens the channel from the direct W flow of the Equatorial Current, across the ocean. Currents in the channel are affected by the varying force of those flowing round either end of Madagascar as well as by many local conditions. The Mozambique Current,

flows SW on the W side of the channel, forming the only well defined current in the channel. It extends also into Baía de Sofala, near the shore of which a NE countercurrent is however sometimes found. The great strength, variety, and general uncertainty of the current in all parts of the Mozambique Channel render it necessary for a vessel's position to be constantly verified by observations.

The Mozambique Current is a fairly strong and constant current throughout the year, but attains its greatest strength and constancy from about October to February, the North Monsoon season, particularly between Cabo Delgado and Mozambique. No exact estimate can be formed of the width of this current. Off the more unbroken parts of the coastline, such as that N of Mozambique and also N of **Cabo das Correntes** (24°06'S., 35°30'E.), it is probably 60 to 100 miles wide. The current flows across the mouth of the large Baía de Sofala, but also extends in width to fill a large part of this bight, probably to the 180m curve.

Rates from 1 to 2 knots are frequent in the region of the Mozambique Current, at all times of year, and rates between 2 and 3 knots are not uncommon. Rates exceeding 3 knots may also be experienced, except in May to July, when the current is weakest. Rates of 4 knots, from 90 to 107 miles per day, have occasionally been recorded during the period 1910 to 1934, in the months of September to December inclusive. On the other hand, the greatest rate recorded, during this time period, in the months of May to July, was 64 miles per day.

The predominant directions of set within the Mozambique Current are from S to SW inclusive, but sets in W, WSW, and SSE directions are also relatively frequent. Sets in all other directions, including those between N and NE, in direct opposition to the normal flow of current, may be experienced at times, either in the usual region of the Mozambique Current, or immediately to seaward of it. These variable and reverse sets may attain or exceed the rate of 1 knot.

Near the coast of Baía de Sofala, beginning almost as far S as Cabo das Correntes and extending N beyond **Rio dos Bons Sinais** (18°03'S., 36°59'E.), there is often a countercurrent setting NE and extending a considerable distance offshore, especially off Sofala, during the strength of the South Monsoon. There is little exact information about the frequency and rate of this countercurrent, which is probably weak and intermittent; however, a rate of 35 miles a day has been recorded in May. The prevailing wind appears to have a marked effect on the set of current within a few miles of the coast. Currents setting more or less directly on shore have been recorded in the neighborhood of Beira and elsewhere in the bight; these may attain or exceed the rate of 1 knot at times.

Observations of current off the W coast of Madagascar are scanty. Generally speaking, the extreme variability of direction of currents here was confirmed. Part of the Equatorial Current, flowing past Cap Sainte-Marie, turns N along the SW coast of Madagascar, but gradually weakens, and there is no evidence of a general N current up the W coast of the island. The current

is usually of no great strength; its direction appears to follow that of the wind, being sometimes N and sometimes S. Southerly currents up to a rate of 1.5 knots have been experienced. Off the W coast of the peninsula, of which Cap d'Ambre is the northern extremity, the combined current and tidal currents normally set N at rates up to 2.5 knots. This passes into the main part of the Equatorial Current setting W past Cap d'Ambre.

The Equatorial Current sets westward at an average rate of 1.5 knots between **Saint Lazarus Bank** (12°12'S., 41°24'E.) and Iles Comores. A little NW of this group, in December, it has been found setting nearly due W at a rate from 2 to 3 knots. Iles Comores lie on the southern boundary of the Equatorial Current, which flows past Ile Grande Comore (Comoro). The boundary being about 12°S, this W current is found N of **Ile Anjouan** (12°10'S., 44°29'E.). In the vicinity of Ile Mayotte (Mayotta), the current is variable. Between Ile Mayotte and Ile Anjouan, the current generally sets SW, but at times SE with considerable strength. About the S end of Ile Mayotte an E current is common. Currents in some E directions appear to predominate throughout most of the year S of Ile Comores to 14°S, particularly SE of Ile Mayotte, between 45°E and the NW coast of Madagascar. This E current turns NE as it approaches this coast, and finally passes into, or forms a seaward extension of, the N current off the W coast of the Cap d'Ambre Peninsula, referred to above.

South, from 14°S until past the narrow part of the Mozambique Channel, no dependence can be placed on the direction or rate of the current: it may run 3 knots one way and at times as much another.

In the remaining part of the Mozambique Channel, S of 18°S and E of the Mozambique Current, the currents experienced are variable and may set in any direction, the majority at rates up to one knot, but occasionally attaining or exceeding 2 knots. Currents, with a N component predominate, however, in certain parts of the channel. A N set is thus often experienced immediately E of the Mozambique Current. In the S part of the channel the sea temperature may indicate the presence of this countercurrent. If below 20° it may be concluded that the vessel is certainly E of the S Mozambique Current.

In the middle of the channel, between 20° to 22°S, 38° to 42°E, the predominant current is from N to NE throughout the year, the wind being generally S. Between May and August, the period of the greatest strength of the South Monsoon, a current apparently sets NW from the S extremity of Madagascar past **Ile Europa** (22°20'S., 40°26'E.), as far W as 40° E, and then turns N, but it should not be depended on. Near this island, in November, the current has been found setting NW at a rate from 2 to 2.5 knots, causing strong tide rips, but neither the rate nor direction of these currents may be the same for two consecutive days.

Agulhas Current—Delagoa Bay to 28°E.—This part of the Agulhas Current is stronger and more constant than that W of 28°E. The directions of currents mainly experienced are, in order of frequency, SW, SSW and S, but occasional currents are met from any point of the compass. The axis of the strongest current is on or near the 180m curve.

The current is strongest during February to April, when about 16 per cent of all currents observed exceed the rate of 3 knots. The corresponding proportions for the remainder of the

year are, May to October, 9 per cent, November to January, 13 per cent. The strongest currents observed are from 4 to 5 knots; most of these are recorded between 31.5°S and 33.5°S, at all times of the year, but least frequently in May to July. This short section of the current is therefore the strongest part of the whole course of the Agulhas Current.

As with all other great coastal currents of the world, it is not possible to define a seaward limit, since the preponderance of sets in or near the main direction of the current decreases gradually seaward. The following remarks give information regarding the strength of the current at various distances from the coast.

Observations indicated that the main body of the Agulhas Current was outside the edge of the 180m curve and that outside this edge, a 4 knot current was experienced. Inside the edge of the 180m curve, the current decreased gradually on approaching the coast. The strength of the current varied considerably with the wind.

Observations of the Agulhas Current, between Durban and 34°S, in the months of February to April, resulted in the plotting of mid-positions of 71 observations of current made during the period 1910 to 1930.

Five drifts of 100 miles per day or more were all observed between 31°S and 33°S, within 12 to 16 miles from the coast; the two greatest were at the rate of 120 miles per day. Four out of six drifts of between 90 and 100 miles per day were either on the edge of the 180m curve or a few miles outside it; one was experienced about 32 miles from the coast. A drift of 96 miles per day was observed about 3 miles from the coast, north of the entrance to the Saint John's River, while two of 80 miles per day and one of 58 miles per day, were recorded still nearer the coast. The majority of weaker drifts, less than 2 knots, observed within 30 miles of the coast, were within the edge of the 180m curve.

Inshore Countercurrents.—Between the main current and the coast, countercurrent flowing in a NE direction and following the trend of the coast, are experienced at times, especially at the entrance to the Great Fish River, East London, Cape Morgan to **M'bashe Point** (Bashee Point) (32°15'S., 28°55'E.), Port Saint John's, Durban and the Aliwal Shoal, Port Durnford Point to O'Neill Peak, Zavora to Ponta da Barra, Ponta da Barra Falsa to Cabo Sao Sebastiao, and Mozambique. In general, these countercurrents are probably weak, though in places they have been observed to reach 1 or 1.5 knots, and they are influenced by the wind prevailing at the time. A strong countercurrent generally forecasts a strong SW wind.

Agulhas Current.—In the vicinity of 24°E, the Agulhas Current spreads out and weakens, the main part of it continues over the Agulhas Bank past Cape Agulhas and, entering the South Atlantic Ocean, passes into the Benguela Current of that ocean. The warm water of the Agulhas Current usually fills False Bay, but during long NW gales it is occasionally driven out and replaced by cooler water from the Atlantic Ocean setting E. Agulhas Current water seldom reaches Table Bay, the water of which is normally much cooler than that in False Bay.

Another part of the Agulhas Current sets SW, following the SE edge of the Agulhas Bank and this recurves, turning S and SE into the N part of the E Southern Ocean Current, about 38°S. A similar recurvature takes place from the seaward edge of the Agulhas Current further N. The region of recurvature,

therefore extends from 32°S to the SE side of the Agulhas Bank. This recurvature is not very constant, being subject to considerable variation. It is weakest in May to July when the flow of the Agulhas Current is weakest.

Not all the water flowing down the SE side of the Agulhas Bank recurves; some of it passes over the S part of the bank or round its S edge.

The current set is very variable in this region; while the predominant directions are between WNW and SSW, currents in any other direction may be met. The majority of currents does not exceed the rate of 2 knots, but occasional currents, in the predominant directions are stronger and may reach or exceed 3 knots throughout the year. A current of 4 knots was observed in July, 1914, in position 36°04'S, 22°55'E.

Near the coast, between Cape Hangklip and Cape Agulhas, the current occasionally sets in an ESE direction, or dangerously towards the land, with sometimes, a rate exceeding 1 knot. In this locality, many vessels have been lost through not allowing for this possible set.

Between Cape Agulhas and the entrance to the Kowie River, about 27°E, an inshore current setting E about the same rate is also frequently experienced in fine weather, and, except off the mouths of the rivers, it follows the trend of the coast, extending probably from 1 to 6 miles offshore. Off the coast, between the entrance to the Kowie River, and East London, from observations made during the period April to July, 1938, the countercurrent was found to be generally weak, and extended only a short distance from this part of the coast. Proceeding from East London to Cape Agulhas during strong W winds, no current was experienced at about 7 miles from the coast.

All reports agree that E of Cape Agulhas, there is often an in-draft, which seems to be strongest between January and April, both months inclusive, and a large proportion of the wrecks which have occurred between Cape Agulhas and Cape Infanta have been attributed to it.

Although the S edge of the Agulhas Current has a tendency to set from the land, the N or inner edge has a tendency to set towards it. This is especially apparent W of Algoa Bay, where during and after SE, W, or NW gales, the current is at times deflected from its normal course and turned directly towards the land. This deflection forms a very dangerous element in the navigation of the S coast of Africa.

Southern Ocean Current.—The current which flows S of the Cape of Good Hope, from the South Atlantic Ocean across the South Indian Ocean, forms part of the Southern Ocean Current, which sets generally E round the globe. It is produced by the predominating W winds of the Roaring Forties, and its S limit lies on the average about 66°S, in the longitudes of the South Indian Ocean.

The Southern Ocean Current, in the longitudes of the South Indian Ocean, is not a well-defined or constant current. It is a region of variable current with some predominance of sets having an E component. The variability is greater E of 80°E than in the W half of the ocean. The most constant E flow is found between 38°S and 42°S, 20°E to 60°E, in August to April, and between 40°S and 42°S and the same longitudes in May to July. In this region a moderate proportion of currents, with rates of 1 and 2 knots will be met. Rates exceeding 2 knots are, however, rare. Elsewhere the proportion of currents exceeding 1 knot is smaller, and rates exceeding 2 knots have not been re-

corded.

The mean resultant set, the direction of the drift of water in the long run, is E, between 20°E and 40°E, NE between 40°E and 80°E, and between E and SE when E of 80°E. The predominant flow of current will, therefore, tend towards these directions.

The current has no defined N boundary; the predominance of E sets decreases with decreasing latitude in the central longitudes of the ocean until it merges into the region of variable current S of the Equatorial Current. Some predominance of E set is found as far N as 28°S or 30°S in the central longitudes of the ocean.

Equatorial Current.—A large part of the Equatorial Current flows W past Cap d'Ambre towards the African coast. West of 65°E or 70°E, the current strengthens considerably, during May to October the period of the Southwest Monsoon. Between 8°S and the latitude of Cap d'Ambre, 44°E to 52°E, more than half the currents experienced during this season have rates exceeding 1 knot, and rates exceeding 2 knots are not uncommon. Occasional currents with rates exceeding 3 knots also occur. The predominating directions are NW to SSW, inclusive. The Equatorial Current, W of about 60°E, widens, so that its N limit is in about 4°S. It thus passes over the Seychelles Bank from June to September, inclusive. West of 52°E, and therefore, immediately W of the region where water recurves NE from the Equatorial Current into the countercurrent, W and NW sets are found as far N as 2°S, or even to the Equator, as the Equatorial Current flows, into the East African Coast Current.

During the Northeast Monsoon period, November to January, the current past Cap d'Ambre strengthens slightly, as compared with that in the open ocean, and occasional sets exceeding 2 knots are experienced. The N limit of the current N of Cap d'Ambre is in about 6°S. In February to April there is no such strengthening, and the width of the current N of **Cap d'Ambre** (11°57'S., 49°16'E.) is further reduced, the N limit being about 8° S. North of this the NE sets of the recurvature into the countercurrent are found.

In the region of general W flow from S of Cap Sainte-Marie towards the African coast a high degree of variability of current is to be expected with, at times, almost or quite as many E sets as W ones. A considerable proportion of currents exceeds the rate of 1 knot, irrespective of direction. No offshoot exceeding 2 knots has been recorded from this N flow into Mozambique Channel.

Somali Current.—The periods in which this current set in alternate directions does not entirely correspond to the periods of the two monsoons. The N flow covers the whole of the Southwest Monsoon period but begins before the Southwest Monsoon wind is established in this region about the beginning of May. March is the transition month for the change of current direction. In this month the current runs N from 5°N; in April the whole of the current runs N. These periods are averages and may be subject to some variation from year to year, as the time of the change of the monsoons is not always the same.

The strong NE current, which prevails along the African coast during the Southwest Monsoon, is stronger near the coast and decreases rapidly at a distance of over 50 miles offshore.

Eastward of a line joining positions; equator to 48°E, and 6°N to 54°E, or about 200 miles from the coast, the current is

almost negligible, and may sometimes be going SW.

April to October the current sets N following the trend of the coast, from Cabo Delgado to Ras Asir, and water branches E from the seaward side of this current N of the equator. The main body of the Somali Current turns E away from the coast in 7° to 10°N, and subsequently SE, into the general East Monsoon drift of the North Indian Ocean; the more S part enters the Equatorial Countercurrent. The part continuing past Ras Asir and water branching from this and passing E of Suqutra, enters the Arabian Sea.

The Somali Current during these months is strong and relatively constant, but directions other than those between N and E occur at times. Between Cabo Delgado and **Mombasa** (4°04'S., 39°41'E.), a considerable proportion of the currents experienced on the shipping tracks exceed the rate of 2 knots, with occasional ones exceeding 3 knots, chiefly in May to July. The current runs past the islands and channels of Mafia, Zanzibar, and Pemba at a rate of 2 to 4 knots.

Between Mombasa and 6°N, the sets are mainly between N and NE. A large proportion of the currents exceed the rate of 3 knots in May to July, and occasional ones may attain or exceed 4.5 knots. The strongest current that has been reported in this region is one of 5.5 knots in May, 1915, between Uarsciech and **Ras Assuad** (4°33'N., 48°01'E.). In August to October, while many currents are met with rates of from 2 to 3 knots, the number exceeding 3 knots is considerably smaller than in May to July. Some sets in other directions occur in April to October, chiefly between W and S.

Between 6°N and Ras Asir stronger currents are observed in August to October than in May to July, in which period the rate of 3 knots is seldom exceeded.

The Somali Current, as it branches E into the ocean S of Suqutra, is very strong in July to September, during the height of the Southwest Monsoon. In these months the area of strongest current is between 7.5° and 10.5°N and 51.5° and 54.5°E.

Many currents with rates between 4 and 5.5 knots have been reported, with occasional observations of 6 knots and over, the maximum being one of exactly 7 knots. The rates of 6 knots and over are greater than those known in any other oceanic region. When the current is setting strongly ESE or SE it is athwart the wind and there is often a very heavy confused sea over a considerable area in this locality. In making the coast of Africa from E care should be taken to avoid the strength of the current by keeping well to the S.

In addition to these very strong currents which set between NE and SE, currents in all other directions may be experienced in April to October, but these do not usually exceed 1 knot. In August to October, however, currents setting between N and WNW may attain rates of 2.5 to 3 knots.

The remarks made above about the difficulty of assigning a definite width to the Agulhas Current apply also to the Somali Current, especially N of the Equator, where it branches E. In August, 1964, the U.S. vessel *Argo* found it to be approximately 60 miles wide at 2°S and also at 2°N. In 4°N the British Research ship *Discovery* experienced a 6 knot current 15 miles offshore. Farther off the current decreased to less than 1 knot at 140 miles from the coast but speeds over 3.5 knots have been reported at 130 miles out.

A survey during August and September, 1964, reported the existence of a big current swirl to the S of Suqutra and also an-

other centered near position 6°N, 52°E. It is not certain, however, that these are permanent features. Also found that the greatest rate of flow of the Somali Current in summer, as much as 7 knots, is probably at the point where it first begins to curve away from the coast at 8°N.

November is a transition month for current direction and the currents are more variable. The predominant directions are S or onshore.

From December to February, the Somali Current flows S from about 10°N during these months. North of 10°N, past Ras Hafun to Ras Asir, the current is N throughout the year. The only change on this stretch of coast is that during the Southwest Monsoon period the predominant direction is NE, i.e. away from the coast, while during the Northeast Monsoon period it is NW, towards the coast. During the Southwest Monsoon, however, the current close inshore off **Ras Asir** (11°50'N., 51°17'E.) rounds that cape to the W.

South of 10°N, the current sets S following the trend of the coast, the most frequent directions being from WSW to SSW. The maximum rates of current, between 6°N and 2°S, may reach or exceed 3 knots, with occasional ones at 3.5 to 4 knots. The strongest and most constant section of the current is between 6°N and 2°N, where about one current in eight may be expected to exceed 2 knots. Even in this part of the current, a number of sets in other directions are met, mainly NW and SE.

The meeting of the N and S sets takes place between the island of Lamu and Isolotto Famauali in from 1.5°S to 2.5°S, the opposing sets producing an offset from the coast. The exact place of meeting probably varies with the monsoon, extending a little S when this is particularly strong. Off **Malindi** (3°15'S.), the S current may be found running within the 180m bank, while the N current is flowing outside this edge.

The N current flowing along the coast from the region of Cabo Delgado to the meeting point with the S current sets between NNE and WNW, N being the most frequent direction. A small proportion of current exceeds the rate of 2 knots and a few may exceed 3 knots, northward of 4°S. Occasional currents set in other directions, chiefly between W and S.

South of about 2°N, water branches from the seaward side of the S current to pass into the E setting Equatorial Countercurrent. At the S extremity of the S current, where it meets the N current, the water is similarly diverted so that SE sets may be found seaward of the N coastal current; between about 2°S and 4°S.

March is a transition month for current direction and the currents are more variable. The predominant direction is still southerly S of 5°N, but N of this it is N.

Abnormal Waves.—Under certain weather conditions, abnormal waves, of exceptional height, occasionally occur off the SE coast of South Africa causing severe damage to ships unfortunate enough to encounter them. In 1968, the S.S. *World Glory*, of over 28,000 grt, encountered such a wave and was broken in two, subsequently sinking with loss of life.

These abnormal waves, which may attain a height of 19.8m or more, instead of having the normal sinusoidal wave form have a very steep fronted leading edge preceded by a very deep trough, the wave moving NE at an appreciable speed. These waves are known to occur between the latitudes of Great Fish Point and Durnford Point, mainly just to seaward of the continental shelf, where the Agulhas Current runs at its strongest. A

ship has, however, reported sustaining damage from such a wave 30 miles to seaward of the continental shelf. No encounters with abnormal waves have been reported inside the 180m curve. When heavy seas have been experienced outside the 180m curve, much calmer seas have been experienced closer inshore in depths of 92m.

Abnormal waves are apparently caused by a combination of sea and swell waves moving in a NE direction against the Agulhas Current, combined with the passage of a cold front. Swell waves generated from storms in high latitudes are almost always present off the SE coast of South Africa, generally moving in a NE direction. These are sometimes augmented by other swell waves from a depression in the vicinity of **Marion Island** (46°52'S., 37°45'E.), and by sea waves generated from a local depression also moving in a general NE direction. Thus there may be three and sometimes more wave trains each with widely differing wave lengths all moving in the same general direction. Occasionally the crests of these different wave trains will coincide causing a wave of exceptional height to build up and last for a short time. The extent of this exceptional height will be only for a distance of a few hundred meters, both along the direction the waves are travelling and along the crest of the wave. In the open sea this wave will be sinusoidal in form and a well found ship, properly handled, should ride safely over it. However, when the cold front of a depression moves along the SE coast of South Africa it is preceded by a strong NE wind. If this blows for a sufficient length of time, it will increase the speed of the Agulhas Current to as much as 5 knots. On the passage of the front the wind changes direction abruptly and within 4 hours may be blowing strongly from a SW direction. Under these conditions, sea waves will rapidly build up, moving in a NE direction against the much stronger than usual Agulhas Current. If this occurs when there is already a heavy swell running in a NE direction, the occasional wave of exceptional height, which will build up just to seaward of the edge of the continental shelf, will no longer be sinusoidal but extremely steep fronted and preceded by a very deep trough. On encountering this trough, a ship steaming in a SW direction will find the bow still dropping into the trough with increasing momentum when encountering the steep fronted face of the oncoming wave. The wave will eventually breaking over the fore part of the ship with devastating force. Because of the shape of the wave a ship steaming on a NE course is much less likely to sustain serious damage.

The weather conditions giving rise to the abnormal waves are likely to occur most frequently in the winter months, but will obviously occur at any time of the year if the conditions are right.

Ships proceeding S off the SE coast of South Africa in conditions of heavy swell from a SW direction, and with strong NE winds blowing with a falling barometer, should keep well clear of the seaward edge of the continental shelf if a cold front bringing strong SW winds is forecast.

Laden tankers sailing on voyages only between ports in South Africa are exempted from the above rule but are expected to maintain a minimum distance of 10 miles from all salient points, subject to weather and sea conditions.

Cape Point to Simons Bay

1.2 The Cape Peninsula extends for a distance of about 28 miles in a S direction from Table Bay to the Cape of Good Hope. From the W the peninsula presents a high and rugged appearance from Table Bay as far S as Paulsberg, located 4 miles N of Cape Point (34°21'S., 18°30'E.), which is marked by a light. Between these latter two places the land is high and even, with the exception of two peaks rising near the S extremity which, from a considerable distance, have the appearance of an island, in the form of a saddle.

For a full description of the coast in the area of the Cape of Good Hope, Cape Point, and Cape Maclear, see Pub. 123, Sailing Directions (Enroute) Southwest Coast of Africa.



Courtesy of Simon Baillie-Cooper
Cape Point Light

Directions.—In clear weather, a vessel approaching the **Cape of Good Hope** (34°21'S., 18°29'E.) from the NW, by day, should keep well to seaward of the shoal water off SW Reefs. After passing these shoals course should be altered so as to pass not less than 0.5 mile S of Bellows Rock, and then steer between Rocky Bank and Anvil Rock until clear of the latter. At night, a vessel should keep in soundings of more than 50m while in the red sector of Cape Point Light.

Laden tankers should not approach the coast within a distance of 25 miles.

Vessels approaching the Cape of Good Hope, especially in thick weather or in any doubt of their positions, should never omit the precaution of obtaining soundings in good time.

In clear weather a vessel approaching from W, by night, should sight Cape Point Light at a distance of 23 miles, provided it is not obscured by land, on a bearing of 106° or more, in which case Slangkop Light should be seen at a distance of not less than 17 miles.

In thick weather by day or night, should the land or lights not be seen, a vessel should not approach the coast but should keep SW in depths of more than 100m until such times as the position has been accurately determined.

Vessels bound E along the coast, having passed the coast at a prudent distance, should take careful bearings at the Cape Point Light (Cape of Good Hope Light) as long as it is in sight, and make every allowance for a possible E onshore set in shaping the course to pass Danger Point and Quoin Point. Danger Point should not be approached at night, with a depth less than 60m, and the mariner should bear in mind that Cape Agulhas Light should be kept bearing 095°.

On approaching the land by day or night, the vessel should enter Valsbaai as described above.

Vessels approaching from the E, when Cape Point Light (Cape of Good Hope Light) is in sight vessels standing in toward the land should be guided by frequent bearings of it and of Danger Point Light, to avoid the rocks off the latter. When W of Danger Point, Cape Point Light (Cape of Good Hope Light) should not be brought more W than 285°, which bearing clears all danger off Kapp Hangklip. As Kapp Hangklip and the narrow neck of land connecting it with the shore are very low, great caution is necessary when passing it in hazy weather.

In standing toward any part of this coast, the mariner should not lose sight of Cape Agulhas Light.

Caution.—An extensive bank lies within the 30m contour off the Cape of Good Hope and stretches from positions located about 2 miles W and SW of Cape Maclear (34°21'S., 18°28'E.) to positions about 2 miles S and 1 mile SE of Cape Point. Except during the calmest weather, seas break over the whole area and also break heavily over the various rocks and shoals within it. Vessels should give this bank a wide berth.

Southwest Reefs lie on the above bank about 1 mile SW of Cape Maclear. Anvil Rock, with a depth of 3.9m, lies about 1.2 miles SE of Cape Point Light and does not break unless there is a heavy swell.

Bellows Rock (34°23'S., 18°29'E.), which dries 1m, lies 2 miles SSW of Cape Point Light and the sea always breaks over it. The position of this rock can easily be seen in fine weather and vessels may pass 0.5 mile S of it. However, on moonless nights, during bad weather or with poor visibility, vessels are advised to keep well clear of this danger.

Rocky Bank (34°25'S., 18°36'E.), with a least depth of 22m, is an extensive shoal area lying centered about 6 miles SE of Cape Point Light.

Between 1 November and 30 June intensive crayfishing takes place in the area up to 4 miles offshore between Slangkoppunt (34°09'S., 18°19'E.) and Cape Point, and occasionally over Rocky Bank. Trap buoys are brightly colored and the fishing area is marked by dan buoys with flashing white lights. Mariners are advised to keep at least 5 miles offshore and well clear of Rocky Bank.

1.3 False Bay (Valsbaai) (34°21'S., 18°39'E.) is a large bay entered between Cape Point and Kaap Hangklip; it extends N about the same distance. There are several dangers in the bay but it provides good anchorage except where the bottom is rocky or steep-to. The W and E shores of the bay are generally rocky with a few sandy bays. The N shore is a fine sandy crescent about 17 miles in extent, which is broken by some off-lying rocks and cliffs.

Tides—Currents.—The direction and rate of circulation of the surface water in the bay is somewhat unpredictable being largely wind induced. Currents, which are nearly all of a circulatory nature, seldom exceed 0.5 knot tidal currents, though weak, would appear to affect the general circulation; the ebb flow is S and that on the flood N.

Under certain meteorological conditions abnormal waves are generated in False Bay which, breaking on certain steep-to and rocky stretches of the coast, can cause damage or loss of life.

Commercial vessels are no longer allowed to anchor in False Bay, except in special circumstances.

Foreign vessels may not enter False Bay unless in an emergency without prior permission of the Ministry of Transport, Cape Town.

Caution.—Net fishing operations may take place in False Bay, from **Smitswinkelbaai** (34°16'S., 18°29'E.) to the beach fronting the village of **Macassar** (34°05'S., 18°45'E.). The nets, which may extend up to 600m from shore, are rarely marked. Vessels should navigate with caution in these areas.

A fishing zone, inshore of which the use of purse seine nets is prohibited, is situated in False Bay between a line joining Cape Point Light and Kaap Hungklip Light. The prohibition extends from 1st May to 14th February.

1.4 Buffels Bay (34°19'S., 18°28'E.), 2.7 miles NNW of Cape Point, is a small bight which can be recognized by a white sand patch. There are depths of 7.3 to 9.1m near the shore. Anchorage is prohibited within a cable area, extending about 2 miles ENE from the shore of Buffels Bay.

From Buffels Bay the coast trends in a general NNW direction to Simons Bay, a distance of about 8 miles. The intervening coast is steep-to; the 30m curve lies from 0.1 mile offshore close N of Buffels Bay, to 1.5 miles offshore, at the S entrance to Simons Bay.

Batasa Rock (34°17'S., 18°29'E.) is 1.2m high. A disused ammunition dumping ground is situated about 1 mile NNE of the rock.

Whittle Rock (34°15'S., 18°34'E.) lies well out in the bay, 4.5 miles ENE of Batsata Rock. It has a depth of 3.6m and breaks occasionally.

Millers Point (34°14'S., 18°29'E.) is the most prominent

point on the coast between Cape Point and Simon's Town. It slopes gradually from the foot of the Swartkopberge to a series of large boulders, 8 to 9m high, interspersed with sheltered sandy inlets.

Oatland Point, situated 1.5 miles NNW of Millers Point, is the site of a range beacon, which with a beacon 0.9 mile distant bearing 294.5° are the N transit beacons for clearing Whittle Rock. These beacons are difficult to distinguish in adverse light conditions. The S pair of beacons marking Whittle Rock are situated at Buffels Bay; in range they bear 231.75°.

The rear beacon was destroyed by fire (2000) and may not be replaced.

Swartkop, 678m high, is the highest summit of the prominent Swartkopberge range; it lies 0.7 mile SW of Oatland Point. Since it is separated from the main range by a narrow gap it has a distinctive sharp appearance when bearing WNW. Simonsberg, 0.9 mile NW of Swartkop, rises to a height of 547m. It is even more widely separated from the main range than Swartkop.

1.5 Roman Rocks (34°11'S., 18°27'E.), a group of above water, drying, and submerged rocks, lie 1.5 miles N of Oatland Point. They are marked by a light; a racon transmits from the light. An obstruction, with a depth of 1.7m and marked close N by a buoy, lies about 0.4 mile NW of the light marking Roman Rocks.

Noah's Ark (34°12'S., 18°27'E.), a flat-topped rock 6m high, 0.7 mile SSW of Roman Rocks, provides a prominent mark when approaching Simons Bay from the SE.

A degaussing range is established close S of Noah's Ark. Anchoring, fishing, or making fast to buoys marking the range is prohibited.

Simons Bay (Simonsbaai) (34°11'S., 18°26'E.)

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1.6 Simons Bay is situated on the W side of False Bay and consists of three basins. Simons Town, formed on the shores of the bay, derives its name from the bay.

Winds—Weather.—The prevailing winds are SE from November to March and NW from April to October. The SE winds may blow continuously for 5 to 8 days, but more frequently die down toward evening, remain light or moderate during the night, and increase again during the morning. A steeply rising barometer is usually the precursor of strong SE winds. Shortly after such a wind has started, the hills above Muizenberg become capped with white cloud, and should the Hottentots Holland Range, on the E side of False Bay become similarly capped, a violent blow may be expected. When Simonsberg has a misty cloud at its summit, rain may be expected in a short while. During the season of SE winds, they frequently blow strongly from SSE. On these occasions a heavy surf builds up on those beaches that are not in the immediate lee of the breakwaters and the town.

During the season of NW winds, frequent gales, accompanied by rain, may be expected. A falling barometer usually foretells such NW gales, which may be experienced at anytime of the year, and though often violent, seldom last longer than 3 days. As the depression passes to the S of the peninsula the wind nor-

mally backs to the SW, the temperature falls and violent local squalls may sweep down into the bay from the hills making it uncomfortable for ships at anchor. A hot dry N wind, known as the Berg Wind, occurs frequently in the winter and spring, but may be experienced at any time of the year.

Scend is rarely experienced in any of the basins, but hauling off buoys are available at some berths should they be needed.

Depths—Limitations.—The South African Naval Dockyard comprises the East Dockyard, consisting of the Outer Basin, the East Dockyard Basin, and the Inner Basin. These three basins are protected by breakwaters. The West Dockyard, 0.5 mile farther W, is a smaller open dockyard.

The Outer Basin has an entrance 90m wide marked by lights. There are seven lettered berths in this basin, with alongside depths of 13.1 to 16.4m.

The East Dockyard Basin is entered from the SE corner of the Outer Basin through an entrance 88m wide. There are 11 lettered berths, with charted depths of 2.4 to 14.6m alongside.

The Inner Basin, which is entered from the S part of the Outer Basin, has an entrance 30m wide. The seven lettered berths have charted depths of 6.7m alongside.

Selborne Dry Dock is situated at the SW corner of the Inner Basin. The length at floor head is 232m, the breadth at the entrance at the coping is 29m, and the depth below chart datum at the blocks at the entrance is 9.3m

The West Dockyard comprises a number of storehouses, offices, and official residences. Within the yard, a boat landing ramp and a boat camber have been dredged to 1.2m.

Aspect.—From a distance, Else Peak, 2 miles N of the East Dockyard, and Muizenberg, which rises to a height of 507m about 3.2 miles NNE of Else Peak, are notable. The crane at the head of the drydock; Martello Tower, 91m E of the crane; two large yellow buildings, about 0.3 mile S of the basin; and a white house, which is situated about 1 mile NNW of East Dockyard Basin are conspicuous.

Pilotage.—Pilotage is compulsory for merchant and foreign naval vessels. The Naval Harbormaster acts as pilot and boards vessels about 0.9 mile N of Roman Rocks Light. Pilots will not take vessels in at night.

Signals.—A red flag is displayed at a flagstaff on the roof of the Naval Harbormaster's Office at the N end of West Wall when the port is closed. A green flag is displayed when it is open.

Anchorage.—Simons Bay is accessible all the year round, and affords excellent shelter for vessels in heavy SE gales, vessels ride safely, and although the bay is exposed to E and NE winds, these never blow with any strength. Northwesterly winds often blow very hard in the winter and have, on occasions, caused vessels at anchor in the bay to drag.

Merchant vessels may only anchor in False Bay, with the permission of the Naval Officer in Command, Simonstown, in berths allotted to them by the Naval Harbor Master. In general these berths will be situated about 3.5 miles SE of Roman Rocks, clear of all firing danger areas, where the holding ground is good. The anchorage area for small craft is off West Dockyard, between Town Pier and the boat camber. There are several mooring buoys WNW of the outer basin of East Dockyard.

Vessels carrying explosives or other dangerous cargo are required to anchor as directed by the Naval Harbormaster.

A submarine cable extends 0.5 mile ENE from near the N elbow of East Breakwater. Anchoring is prohibited NE of the Northern Spur and East Breakwater as indicated on the chart. Anchoring is also prohibited 1.3 miles N of Roman Rocks Light.

Directions.—By day, after clearing Anvil Rock or Rocky Bank as previously directed, a vessel should steer a course to pass midway between Whittle Rock and the western shore, and when Else Peak and Roman Rocks are in line bearing 326.25°, course should be altered to preserve this transit. Provided Roman Rocks Light does not bear less than 313° or more than 332°, the passage is clear. When the lighthouse is about 1 mile off, course should be altered to pass midway between it and Noah's Ark.

Phoenix Shoal Buoy, 0.3 mile NW of Noah's Ark, can be rounded at a convenient distance and the allotted anchorage steered for.

By night, when E of Anvil Rock, and having passed from the red into the white sector of Cape Point Light, a vessel should preserve a N course until Roman Rocks Light bears 326°, when it may be steered for until East Breakwater Light bears 270°, when course may be altered as necessary to the allotted anchorage.

In thick weather, by day or night, it is advisable to steer for the middle of False Bay, keeping well to the E of Whittle Rock. If so fitted, a vessel should use electronic fixing aids, and the echo sounder should be run continuously. When approaching soundings of 35m the vessel, if unfamiliar with the locality, should anchor and wait for the weather to clear.

False Bay—North Side

1.7 In the N part of the bay there are three dangers which should be noted. Seal Island (34°08'S., 18°35'E.) is a low rocky islet, situated about 6.5 miles ENE of Roman Rocks Light, and is surrounded by submerged rocks, which usually break. The remains of a metal tower stand near the middle of the island.

A detached shoal, with a depth of 15.5m, lies 0.5 mile WNW of the island, and a 16.5m patch lies 0.4 mile SSE.

York Shoal (34°09'S., 18°36'E.), a rocky patch with a least depth of 1.8m lies 1.2 miles SSE of Seal Island; it usually breaks.

East Shoal, lying about 3.2 miles ESE of Seal Island, has general depths of 6.3 to 20m but in one place there is a rock, awash, which always breaks.

In the E part of False Bay there is an isolated patch, with a depth of 11.3m, which breaks in heavy gales.

Vishoekbaai (34°08'S., 18°26'E.), or Fish Hoek Bay, an indentation in the coast close N of Else Peak, provides a reasonable anchorage, in 10m, sandy bottom. It is usually calm except during strong E or SE winds.

Kalk Bay (34°08'S., 18°27'E.), a small harbor protected by breakwaters, has berths with alongside depths of 2.7 to 4.5m.

In certain weather conditions, abnormal waves may occur, without warning, on the shoals seaward of the breakwater.

The head of False Bay is a low sandy beach, with a continuous line of surf fronting it, so that it affords no landing and should in all circumstances be avoided.

Swartklip (34°04'S., 18°41'E.), a bluff headland at the head of the bay, is the E terminus of eroded sandstone cliffs which

extend 2 miles W. These cliffs assume a darkish hue under certain light conditions. Lower cliffs continue 1 mile E of Swartklip.

The village of Macassar stands about 3 miles E of Swartklip. A dangerous wreck lies about 2 miles SSW of the village; vessels should keep clear of the area.

Passage is prohibited, extending 0.7 mile from shore, in a position about 1 mile SE of Macassar. Blinkklip, a rock which breaks, lies within the prohibited area about 3 miles SE of the town.

Strand (34°07'S., 18°49'E.) has a beach frontage of 2 miles; the NW part is sandy and the SE part is fringed with rocky ledges which extend to Gordon's Bay. Within the 5m curve line, S of Strand, the bottom is rocky and foul.

A conspicuous radio tower, stands on a summit 7 miles E of Strand and rises to an elevation of 1,182m. The Dome, a peak rising to a height of 1,137m, is the highest elevation in a mountain range about 5 miles NNE of Strand.

Gordon's Bay is entered between Strand and a rounded headland 4 miles S. The bay is not recommended as an anchorage as it affords little shelter from the SE gales, which sweep into it from the Hottentots Hollandberge escarpment to the SE. There is a small harbor for fishing vessels, on the S side of Gordon's Bay.

False Bay—East Side

1.8 The coastline from Gordon's Bay trends in a S direction to Kaap Hangklip. A mountain range rising to a height of 1,268m backs the coast to a point 1.3 miles of Kaap Hangklip.

The tall red brick building on the NW side of the escarpment, on the S side of Gordon's Bay, when brilliantly lit at night, provides a conspicuous mark.

Kogel Bay is not a good anchorage as the bottom is rocky in many places. It does, however, afford shelter from S and E winds.

Pringle Bay (34°20'S., 18°50'E.) is open to W winds but affords good shelter from SE gales. The anchorage is in a depth of about 20m in the center of the bay, well clear of the rocky and kelp-fringed S shore.

Kaap Hangklip (34°23'S., 18°50'E.) is only about 3m high, but 1.3 miles N of it is Hangklip Berg, 453m high, wedge-shaped, and sometimes known as False Cape; from the S it appears as an island, and from some directions its W face appears to overhang.

A conspicuous sandy patch extends halfway up its SE side. As a heavy sea always breaks on the cape and for some distance outside the off-lying dangers, vessels should give it a berth of at least 1.8 miles when passing.

Kaap Hangklip to Cape Agulhas

1.9 Between Kaap Hanglip and Cape Agulhas, about 62 miles SE of Kaap Hangklip, are three bays. The 30m curve line lies up to 5 miles offshore in this area and the 100m curve line lies 20 miles offshore SSW of Cape Agulhas Light. The only charted offshore danger lying between the 50 to 100m curve lines is Twelve Mile Bank, with a least depth of 29m situated 12 miles SSW of Cape Agulhas.

Tides—Currents.—Mariners are urged to take every pre-



Courtesy of Simon Baillie-Cooper
Kaap Hangklip Light

caution against possible inshore sets between Kaap Hangklip and Cape Agulhas. The time to be more than ordinarily careful is not so much when a strong wind is blowing towards shore, but when the weather is fair and all is apparently plain sailing, when the mariner may be lulled into a false sense of security.

Between Cape Point and Quoin Point, inshore sets may be experienced during all seasons, but rarely during the months of September to November. Between Quoin Point and Cape Agulhas, however, they are most frequent from September to February, and rarely occur during the rest of the year.

1.10 Between Kaap Hangklip and Danger Point are Sandown Bay and Walker Bay, two large sandy bays. At the head of these bays there are sand dunes with low lying valleys behind them; there are a number of rocky points, fronted by reefs, in this area.

Masbaai, formed between Kaap Hangklip and Holbaaipunt (34°23'S., 18°51'E.), about 1 mile E, is a small rocky and foul bay, which has not been closely examined.

Silver Sands Bay is contained between Holbaaipunt and Stony Point. The bay is rocky at its sides but is otherwise clear of outlying rocks. A heavy surf sets into the bay and it is quite unsuitable for anchorage.

Betty's Bay, a slight indentation, is formed between Stony

Point and a point 2 miles ENE.

Sandown Bay extends from the E point of Betty's Bay to Mudge Point (34°25'S., 19°08'E.). This bay has a sandy beach along its whole length; it is clear of obstructions and provides fair anchorage, in depths of 15 to 30m, during periods of very light SE winds and calm weather. A number of small fishing vessels and ski boats operate in Sandown Bay and a careful lookout must be maintained to avoid running them down.

The Palmiet River flows into the NW corner of Sandown Bay; it is a rapid stream in winter, but its entrance is always blocked by sand. Landing from a boat can be made at HW, in fine weather, in a small sandy cove 0.8 mile E of the river's mouth.

Palmietberge, a coastal range of mountains, rises to a summit of 682m, 2 miles NNE of the mouth of the Palmiet River.

Mudge Point is a low rocky projection some 2 miles wide, which has a number of submerged, kelp covered reefs lying off it. The point is backed by conspicuous sand dunes up to 70m high, and behind them a coastal range of mountains ends in a rounded bluff 480m high, approximately 2 miles NE.

Walker Bay (34°30'S., 19°17'E.) is entered between Mudge Point and Danger Point.

1.11 Hermanus (34°25'S., 19°14'E.), a growing seaside resort in the NW side of Walker Bay, has several conspicuous buildings, extending for about 1 mile along the coast. Two breakwaters, the S one marked by a light, form a small harbor.

Hydra Bay, situated in Walker Bay, about 2 miles NNE of Danger Point, may be easily distinguished by a sand patch which marks the face of a hillock behind it.

A reef, with a least depth of 0.6m, extends NW for 0.4 mile offshore in the N part of Hydra Bay. A rock, with a depth of 5.5m, lies 0.3 mile W of the above reef and a 6.4m patch lies 0.4 mile N of the reef.

Anchorage.—The best anchorage in Walker Bay is abreast Hydra Bay, 0.8 mile offshore and 2 miles N of the light on Danger Point, in depths of 22 to 26m. This position is sheltered from SE winds and the swell is less heavy than closer to the head of Walker Bay.

It should be noted that, when approaching the anchorage at Hydra Bay from the S, Danger Point should not be approached nearer than 2 or 3 miles in the day and at least 5 miles at night.

1.12 Danger Point (34°38'S., 19°18'E.) is formed by a tongue of low sand hills, covered with sparse vegetation, which extends for a distance of some 4.5 miles WSW from a peak known as Duifonteinberg. This bluff mountain, 356m high, is conspicuous from all directions when viewed from seaward.

Several detached rocks lie off this point. The most dangerous is **Birkenhead Rock** (34°39'S., 19°17'E.), with a charted depth of 3m situated 1.3 miles SW of the light. The rock is steep-to, and in a moderate swell, the sea breaks continuously and violently over it, but in calm weather it may only break intermittently.

From Danger Point to Quoin Point the coast is brush-covered and generally low-lying, but is backed at distances of 2 to 4 miles by moderately high rugged hills. Sandy beaches, backed by sand dunes, alternate with rocky stretches. A long heavy swell normally sets in to the coast making it inaccessible, though landing is practicable in a few places.

Sandy Point (34°39'S., 19°27'E.) is a group of islets and



Courtesy of Simon Baillie-Cooper
Danger Point Light

rocks, the latter below water and awash, extending 3.5 miles SW of the point. Dyer Island, the largest of the islets, lies 2.5 miles SW of Sandy Point. Geyser Island lies close S of Dyer Island; both islands are low and rocky. These islands and rocks form a natural breakwater where vessels may find shelter in S and SE gales. There is reasonably good holding ground in 21m sand, with some rocky patches, with the extremities of Dyer Island bearing about 128° and 156°, distant 1 mile.

Two shoals, which break heavily when there is any swell, lie close together about 1.5 miles offshore 6 miles ESE of Dyer Island. The W shoal dries and the E one has a least depth of 6.8m.

1.13 Quoin Point (34°47'S., 19°38'E.) is a mass of square hummocky land, fronted by sunken rocks and heavy breakers, extending more than 1 mile from the shore. When seen from the S, it may be recognized by two sand hills near its extremity. The point is marked by a light.

Between Quoin Point and Cape Agulhas, the coast is low and sandy as far as Sandberg (34°48'S., 19°58'E.), which rises to a height of 155m, 1 mile inland about 3 miles NW of Cape Agulhas, except for the coast S of the tableland Zoetanyberg, where it is steep and rocky.

A radio mast, marked by lights, stands at an elevation of 753m, 19 miles NNW of Cape Agulhas.

This entire coastline is exposed to the full force of the ocean swell and landing is impracticable.

Six Mile Bank (34°55'S., 19°54'E.), a tongue of the coastal bank with depths of 22 to 27m along its S edge, extends up to 6.5 miles SSW and 12 miles WSW from Cape Agulhas.

Cape Agulhas (34°50'S., 20°01'E.), the S extremity of Africa, is distinguished from other points in the locality by the features

of the land about it and is marked by a light. From a distance seaward E or W, the N and S elevations or ridges resemble two oblong hummocks, while at a distance from the S they appear as one. A shoal, with a depth of 4.7m, lies 1 mile S of Cape Agulhas Light.

Caution.—Cape Agulhas should be given a wide berth. Several wrecks are believed to be inshore and fishing vessels are often met in the vicinity.

Cape Agulhas to Mosselbaai

1.14 Between Cape Agulhas and Mosselbaai, 115 miles ENE, the coastal plain is backed by mountain ranges. In clear weather the peaks of Langeberg range, which lie 25 to 30 miles inland, provide useful marks. This range forming part of the coastal escarpment extends for about 75 miles, between the meridian of Struis Point (20°15'E.) and that of Ystervark Point (21°45'E.). The E part of this range and the W part of the Outeniqua Mountains form a distinctive background to the foothills, lying about 10 miles inland from Ystervark Point.

Agulhas Bank lies centered in position 35°53'S, 20°57'E. One remarkable fact as to the Agulhas Bank is seen in its quieting effect on the heavy seas, which roll up to it. A vessel may be laboring heavily in a turbulent and irregular sea while in deep water outside the bank, but directly soundings from 110 to 128m are obtained the sea becomes comparatively tranquil.

Alphard Banks (35°02'S., 20°51'E.), lying from 43 to 47 miles ESE of Cape Agulhas, has a least charted depth of 15m. In a heavy swell the sea breaks on the 15m patch at the W end of the banks. Laden tankers and other deep draft vessels should keep well clear of the banks, and shipping in general would be well advised to do so because of the overfalls and rips which occur there.

Owing to the proximity of the main traffic routes and to the lack of aids to navigation, mariners should avoid the area within 6 miles of the shallowest part of Alphard Banks.

Mariners are warned of the existence of an Oil Development Area E of Alphard Banks to a position approximately 40 miles S of Mosselbaai.

Sable Oil Field (35°12'S., 21°19'E.) consists of a storage tanker connected to four wells. Oribi Oil Field and Oryx Oil Field are situated 10 miles E of Sable Oil Field. A submarine pipeline links the Oryx Oil Field, where there is a floating production platform and tanker mooring buoy; a storage tanker is secured to the buoy for the greater part of the year.

The oil fields lie within areas in which anchoring and fishing are prohibited. Lights are exhibited and fog signals sounded from the platform, storage tanker and buoy.

Northumberland Point (34°48'S., 20°04'E.) is low and sandy. A dangerous reef, with rocks awash, extends 1.3 miles E of the point; a rock with less than 2m lies close off the E extremity of the reef.

Caution.—A dangerous wreck lies close S of the above rock.

A shoal, with a least charted depth of 12.8m, and dangerous to deep draft vessels even in moderate swell, lies 3.5 miles ESE of Northumberland Point; less water has been reported. In bad weather, the sea breaks heavily over this shoal.

Deep draft vessels are advised to pass at least 2.5 miles S of the above-mentioned shoal.

Two dangerous wrecks lie 1.7 miles E of Northumberland

Point.

1.15 Struisbaai (Struis Bay), between **Northumberland Point** (34°48'S., 20°04'E.) and Struispunt affords shelter with winds between W and NW, but is wholly unsafe with onshore winds, and should not be approached in any wind from WSW, round by S, to E. With such winds the sea breaks in 12.8m or 14.6m. In 1975, lesser depths than charted were reported in this area.

Anchorage.—There is anchorage in the bay, in 9m, sand, approximately 1 mile NNE of Northumberland Point. Here the bottom is clear, while closer in it is foul. Large vessels anchor farther out, in about 13m.

Struispunt (Struyspunt) (Struis Point) (34°41'S., 20°14'E.) is a low, sandy promontory, fringed with rocks, extending for 1 mile from bare sandhills, 63m high. A little further inland bush-covered dunes attain heights of 73m.



Courtesy of Simon Baillie-Cooper

Cape Agulhas Light

A stone beacon, 10m in height, stands near the extremity of the point; it has been reported that the beacon was falling in disrepair.

A radio mast, marked by red obstruction lights, stands on Struis Point, 1 mile NE of Cape Agulhas Light.

Foul ground, consisting of several detached patches of reef which nearly always break, extends for 2 miles SE of Struispunt.

Outer Blinder Rock, the outermost patch, has a depth of 5.5m. Bulldog Reef, 0.3 mile NW of Outer Blinder Rock, has several rocky heads, with depths less than 2m.

Caution.—Owing to the similarity of the features of Struisbaai and of Marcus Bay, to the E, it may sometimes be difficult to determine whether a vessel is to the E or W of Struispunt. In hazy or foggy weather the high land within Cape Agulhas may not be visible, although the sand hills of Struisbaai and the breakers off Northumberland Point may be distinctly seen. In such circumstances, care is necessary in approaching the land,

but it should be possible to identify Struispunt by its beacon.

When in the vicinity of Struispunt, it is advisable to keep in depths of more than 50m.

1.16 **Marcus Bay** (34°40'S., 20°15'E.) is entered between Struispunt and Hooppunt, about 5 miles NE. The bay has rocky patches in it, but in N and NW winds, it affords shelter similar to that of Struisbaai.

Hooppunt (34°37'S., 20°19'E.), a slight bulge in the sandy coastline, about midway between Struispunt and Marthapunt, may be identified by two bare high and pointed sand hills lying close behind it. Between these two points the bottom is generally foul and there is no recognized anchorage. Within 2 miles of the coast confused and breaking seas occur during bad weather and no vessel should enter the area without local knowledge.

Atlas Reef (34°37'S., 20°21'E.), with a charted depth of 5.5m, lies about 1.8 miles E of Hooppunt.

Cape Infanta (34°28'S., 20°52'E.) is a narrow comparatively-low promontory fringed by rocks, extends some 0.5 mile SE. A small bay, with sandy beaches at their heads, is situated on either side of the cape. A light stands on a point 1.3 miles WSW of Cape Infanta. A radiobeacon transmits from a position close to the light.

Saint Sebastian Bay is entered between Cape Infanta and Cape Barracouta. The W part of the bay affords shelter from all winds, except those from the E and S.

Saint Sebastian Point (34°26'S., 20°52'E.) is a bold headland, 66m high. It is fringed with rocks, extending 0.1 mile offshore, with depths of 15m at a distance of 0.3 mile from the point.

The recommended anchorage is about 0.8 mile N of Saint Sebastian Point, in depths of 14 to 15m, sand.

Cape Barracouta (34°26'S., 21°18'E.) is a rounded point, which may be identified by a prominent reddish-colored sand patch extending between 1 and 2 miles NW of it. From E the cape appears as a low tongue of land extending S; it is not prominent from S or W.

Cape Barracouta should be passed by a distance of at least 3 miles, keeping in depths of 50m or more.

Caution should be exercised, as a depth of 31m was reported in position 34°43.8'S, 20°39.1'E.

1.17 Oribi Oil Field (35°14'S., 21°30'E.), consisting of a floating production platform and a mooring buoy, is best seen on the chart.

Between Cape Barracouta and Leven Point, a prominent bluff 3.5 miles ENE, and then to Morris Point, 3.5 miles farther ENE, the coast is rocky and indented with several small bays. A high reddish-colored sand patch, prominent from SE, extends for 2 miles along the coast between Leven Point and Morris Point.

Stillbaai (34°23'S., 21°26'E.) is entered between Morris Point, a low sandy point fringed with rocks, and a group of rocks 2 miles NE. A reef of rocks, awash and below water, extends 0.7 mile SSE from Morris Point. During the prevailing SW winds of winter there is good anchorage for small craft under the lee of Morris Point and the reef. During the summer, when the SE wind prevails, the anchorage is not safe.

Ystervarkpunt (34°24'S., 21°44'E.), marked by a light, is situated 14.5 miles E of Morris Point. The point is somewhat lower than the coastline to the W of it and is fringed with reefs on which the sea breaks heavily. A rounded hill 210m high, rises 1 mile NNW of Ystervarkpunt, and Aasvoelberg rises to a height of 492m 11 miles NNW.

Kanon Point (Cape Vacca) (34°20'S., 21°55'E.) lies 10 miles ENE of Ystervarkpunt. Care must be taken in rounding this low cape at night, as it is only just within the range of Cape St. Blaize Light, which is not visible when bearing greater than 052° or about 0.5 mile outside Kanon Point. If the light is not seen, keep in depths of 40m or more. An ODAS buoy lies 6.5 miles SE of Kanon Point. This buoy has no navigational significance.

Oil Production Platform FA, marked by a light and a racon, stands 40.5 miles SSE of Kanon Point. Two other lighted platforms stand 9 and 10 miles NW of Platform FA. Submarine gas pipelines connect all three platforms.

Caution.—A submarine gas pipeline runs NNW from

Kanon Point to a point on the coast midway between Vlees Point and Pinnacle Point.

1.18 Veelisbaai (34°19'S., 21°56'E.) is entered between Kanon Point and Vlees Point. The bay affords temporary shelter during NW gales. Vlees Point may be recognized by a flesh colored patch of sand.

Visbaai is entered between Vlees Point and Pinnacle Point. The bay may be used by vessels seeking shelter from NW gales, the best anchorage being in the W part, in 12.8 or 14.6m, with Flesh Point bearing about 157°, distant 1.2 miles and the same distance offshore.

It is advisable for vessels to put to sea as soon as the gale subsides, for then a heavy SW swell sets in and causes a dangerous breaking sea.

Cape St. Blaize (34°11'S., 22°10'E.) is a bluff about 76m high. Just below the bluff is a conspicuous whitewashed rock. West of Cape St. Blaize, vessels should be careful not to shut in the light nor should they stand into a depth less than 46m. Blinder Rock, with a depth of 3.7m, lies about 0.5 mile ESE of Cape St. Blaize.

Mosselbaai (34°11'S., 22°09'E.)

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1.19 Mosselbaai is entered between Cape St. Blaize and the mouth of Groot-Brakrivier. The port consists of a town and a small artificial harbor formed by breakwaters.

Winds—Weather.—Mosselbaai affords excellent shelter to vessels during the winter months, May to October, when heavy NW gales are of frequent occurrence. If the winds veer to W and WSW, it sometimes happens that a heavy SW swell sets into the bay. As ground swells develop quickly, vessels should not anchor in less than 14.6m.

During the summer season, October to May, moderate SW winds are common, but it is the season when SE gales may be expected. When they occur, the bay is exposed to the full effect of the open sea.

Depths—Limitations.—The harbor is protected on the E by a breakwater and a mole which extends for 0.3 mile NNW from the shore and on the W by a mole extending approximately 0.1 mile NE from the shore.

The harbor entrance has been dredged to a depth of 8m over a width of 100m. The outer part of the harbor has been dredged to 7.5m and the inner part to 6m. Quay No. 1 has been dredged to 1.7m, Quay No. 2 has been dredged to 2.7m, and Quay No. 3 has been dredged to 5.5m. Vincent Jetty, with depths of 4m to 6m, projects from the head of the harbor. Quay No. 4, the main commercial quay, is on the SE side of the wide mole and has an alongside depth of 7.5m, with the exception of the mole head. Quay No. 5, with depths of 5m alongside, lies close W of the head of Vincent Jetty.

In the open bay, at the oil terminal, tankers up to 30,000 dwt with a maximum length of 204m, can be accommodated. There are no restrictions at the anchorage.

The offshore oil terminal is situated NE of Seal Island. The seaward end of a submarine pipeline, connected to the shore, is marked by a buoy, moored about 0.6 mile NE of Seal Island. A prohibited area, with a radius of 500m, is centered on the buoy.



Courtesy of Simon Baillie-Cooper

Cape St. Blaize Light

The depths at the berth are from 15 to 18m, sandy bottom. There are five mooring buoys at the terminal. Berthing is normally only carried out by day. Normal seamanlike precautions must be taken at all times as the berth is an open roadstead and strong winds may spring up with little warning.

A lighted SPM, connected to the shore by a submarine oil pipeline, lies about 1.2 miles ENE of Seal Island.

Aspect.—A stadium stands 0.5 mile W of Cape St. Blaize Light. A church spire on a hill stands 0.7 mile WNW of the stadium. A radio mast stands close WNW of Cape St. Blaize Light; a school building stands a little farther WSW of the radio mast. Conspicuous tanks backed by a chimney stand 0.7 mile WNW of Seal Island.

Pilotage.—Pilotage is compulsory for tankers berthing at the offshore oil terminal and for all merchant ships entering Mosselbaai Harbor. A 1-hour notice must be given to the Port Captain by VHF.

The pilot embarks about 1.5 miles ENE of Cape St. Blaize.

Regulations.—Port regulations are furnished to vessels on arrival. The general regulations for the harbors of the Republic of South Africa are in force.

All vessels bound for Mosselbaai must send their ETA 72 hours, 48 hours, 24 hours, and 12 hours in advance.

Tankers bound for the oil terminal give the harbormaster at least a 72-hour notice of their ETA at the terminal. They should, when within range, establish radio contact through Cape St. Blaize Light on VHF channel 16.

Vessels are required to contact the harbormaster on VHF channel 16 when passing the 12-mile reporting line and the 6-mile reporting line. Both lines are circles, with a radius of 12 miles and 6 miles, centered on Mosselbaai Harbor East Breakwater Light (4°01.5'S., 22°08.0'E.).

Contact Information.—Port Control can be contacted (call sign: Mossel Bay Port Control) 24 hours on VHF channels 12 and 16.

The harbormaster can be contacted, as follows:

1. Telephone: 27-44-6046287
2. Facsimile: 27-44-6046278

Anchorage.—Vessels may anchor in Mosselbaai 3.5 miles NNE of Cape St. Blaize.

Anchoring is prohibited in the vicinity of the offshore terminal, as indicated on the chart.

Caution.—A dumping ground is situated S of Seal Island; its limits may be seen on the chart.

Mosselbaai to Knysna Harbor

1.20 The Outeniqua Mountains lie parallel to the coast, about 10 miles inland between Mosselbaai and Knysna. The most prominent of these peaks, providing good marks in clear weather, are:

1. **Engelsberg** (33°52'S., 22°08'E.), rising to a height of 1,522m about 19 miles N of Cape St. Blaize.
2. **Jonkersberg**, a peak 1,449m high, lying 1 mile S of **Skurweberg** (33°53'S., 22°14'E.), 1,466m high.

3. **Cradocksberg** (33°54'S., 22°28'E.), 1,580m high, and Melville Peak, 1,299m high, 4.5 miles ESE of Cradocksberg.

From the mouth of Groot-Brakrivier (34°03'S., 22°15'E.), a sandy beach extends 4 miles E. Rocky ledges front the coast for the first mile, then the beach appears to be free of rocks, but is normally surf bound.

Herold's Bay is a slight indentation in the high cliffs, 7.5 miles E of Groot-Brakrivier.

Between **Herold's Bay** (34°03'S., 22°28'E.) and Victoria Bay, the coast is rugged, with steep cliffs up to 75m high and intersected with narrow ravines.

Victoria Bay (34°00'S., 22°33'E.) is rockbound, except for a small sandy beach at its head, where landing can be effected in calm weather; only small boats should attempt to enter the bay.

Gerickepunt (34°02'S., 22°46'E.) is a prominent bluff, 162m high, at the E end of a ridge of high sandstone cliffs, which have a reddish color. These high cliffs extend about 0.6 mile E of the point and terminate abruptly.

Caution.—A submerged rock, with a depth of 0.9m, lies 3.5 miles ESE of Gerickepunt; another submerged rock, with a depth of 5.2m, lies 0.6 mile farther SE. Rocks, which always break, lie 1.8 miles W of Walker Point. The sea breaks up to 1 mile offshore in some areas of this coast, but not always to the seaward limit of the foul area.

Between Gerickepunt and Walker Point, it is advisable to keep at least 2.5 miles offshore and in depths of more than 40m.

1.21 Walker Point (34°06'S., 22°59'E.), the W entrance point to Buffalo Bay (Buffels Bay), is a low rocky point 0.8 mile long. A chain of above and below water rocks extends 0.3 mile from the extremity of the point, where there is a solitary outcrop 1.5m high.

The land to the N of Walker Point consists of scrub-covered hillocks backed by bare grassy hills rising to heights over 275m.

Dagleish Bank (34°11'S., 22°58'E.) is of coral formation and has a least charted depth of 26m. Deep-draft vessels should pass well S of this steep-to bank.

Buffalo Bay is entered between Walker Point and Castle Rock, a boulder, 10m high close to shore, 2.3 miles NE. The buildings of a hotel and a nearby sand patch situated on the high ground immediately above Castle Rock, are prominent.

During NW winds small craft may obtain sheltered anchorage in Buffalo Bay, 0.6 mile NNE of Walker Point, in 9 to 14m, clay. If the wind backs to S of W it is advisable to put to sea immediately as a heavy swell and breaking sea usually set in.

Between Castle Rock and the entrance to Knysna Harbor, the coast consists of high rocky cliffs, fronted by rocky ledges and backed by a range of bush-covered hills, rising to a height of 200m or more.

1.22 Knysna Harbor (34°05'S., 23°03'E.) is entered between the steep and rocky headlands of Western Head and Eastern Head. The port consists of a town and a small natural harbor.

Tides—Currents.—The time of HW in Knysna Harbor is 3 hours and 30 minutes; spring tides rise 1.9m.

The incoming current sets strongly from the SE toward Nee-

dles Point, then runs directly through the narrows, but the outgoing current, from abreast Green Point, sets directly toward Fountain Point, and the rocks between that point and Inner Obelisk Point, and then follows the channel, but bearing to the E unless there is a strong W current outside, in which case, it sets directly seaward.

With a heavy sea on the bar, near HW and LW, the force of the break drives large quantities of water toward Emu Rock, this setting strongly out again close to the W shore, outside the inner bar. It is therefore advisable, before taking the bar with a breaking sea, that the incoming current should have made at least 2 hours, at which time the current and the break act together, and the drawback is not felt.

Depths—Limitations.—The outer bar at the entrance has a depth of 5.5m and the inner bar has 4.1m, the depth between them being 8.2m. Within the bar the river deepens to 15.5m, the general depths being from 4.5 to 9.1m abreast Steinbok Island, but the width of the anchoring space is only about 0.2 mile, being reduced by a sand bank off the W side of that island. Off Knysna, the depths are from 3 to 7.9m and vessels that can cross the bar can proceed to this anchorage.

Aspect.—The locality may be identified by Spitzkop Mountain, 937m high, and the five passes E of it, which rise about 10 miles NNE of the entrance, and by Krantz Hoek, 279m high, 9 miles E of the entrance and less than 1 mile inland, fronted by a bluff, 169m high, rising steeply from the sea.

There is a large timber factory, with two conspicuous chimneys, on Paarden Island. A radio mast stands 1 mile NW of the harbor entrance.

Pilotage.—There is no pilot service for Knysna Harbor.

Caution.—The entrance is between Needles Point on the W and the dangers lying between the Mewstone and Outer Obelisk Point on the E.

Black Rocks, on which the sea always breaks, form a cluster extending about 0.1 mile from the W entrance point, and 0.4 mile E of these is the Mewstone, a little more than 0.1 mile off the E entrance point. Southeast Rocks form a cluster about 0.4 mile SE of the Mewstone.

Emu Rock, with a depth of 1.2m, and on which the sea does not always break, lies nearly midway between the inner and outer bars in a position about 0.2 mile SW of Inner Obelisk Point.

Knysna Harbor to Cape Recife

1.23 From the entrance to Knysna Harbor to the Noetzie River, the coast consists of rugged red cliffs, from 60 to 75m high, with patches of shingle beach and off-lying rocks extending as much as 0.5 mile from the cliffs in places. Between the Noetzie River and Cape Seal, the coast continues as steep sided cliffs rising to over 120m. Off these cliffs several detached boulders rise from the sea; some are covered with vegetation and some are bare, and some rise as high as the cliffs themselves.

The deep gorge of the Kranzhoek River, which enters the sea 5 miles E of the Noetzie River, is easily identified. The land between the two rivers is heavily wooded, rising from the cliffs to elevations of more than 250m.

Cape Seal (34°06'S., 23°25'E.) is the extremity of a heavily wooded narrow peninsula with rugged cliffs on each side; it projects 2 miles ESE from the coast. A break in the cliffs near

the mainland gives the peninsula the appearance of an island from certain directions.

Whale Rock, a patch of below water rocks with a least depth of 1.2m lies between 0.3 and 0.5 mile E of Cape Seal. The sea nearly always breaks, but on occasions it is deceptively calm.

1.24 Plettenbergbaai (34°05'S., 23°25'E.) is entered between Cape Seal and Komkromma Point. There is no regular tidal current in the bay.

Vessels may obtain shelter in the bay, when the sea is too high for Mosselbaai, but, like other bays on this coast, it is exposed to the full force of SE gales, which blow violently and frequently, from September to March. A vessel should always be prepared to leave this anchorage on any indication of one of these gales.

Anchorage.—The usual anchorage for vessels loading timber is about 0.5 mile SE of the ledge of rocks off the Pisang River. There is good anchorage, in about 46m, with Cape Seal Light bearing 210°, 4 miles distant.

Directions.—There are no dangers in entering or leaving the bay, except for Whale Rock, which should be given a berth of 1 mile. There would be considerable risk in attempting the channel between it and Cape Seal. The S end of the long sandy beach S of the Pisang River, open NE of the peninsula, bearing about 280°, leads N of the rock.

Between Komkromma Point and Cape St. Francis, the coast is dangerous and has been the scene of several wrecks, as the proximity of the mountain chain to the coast, and the prevailing winds occasionally cause dense fogs, and there is an occasional and sometimes unpredictable current, which sets onto the shore.

Aspect.—Along this coast from Kromkromma Point to Cape St. Francis there are several peaks which are well-defined and easily identified. These peaks rise from the mountain ranges, which parallel the coast and lie from 4 to 7 miles inland; they are named from W to E in paragraph 1.25 below.

1.25 Thumb Peak (33°51'S., 23°37'E.), so called from its shape, is 1,407m high and rises about 18.5 miles NNE of Cape Seal. Formosa Peak, 4 miles ESE of Thumb Peak, is 1,674m high.

Grenadierskop (33°55'S., 23°43'E.) rises to a height of 988m about midway between Formosa Peak and the coast; it is another peak, with a descriptive name.

Witelsbos (33°58'S., 24°06'E.) is a pyramidal peak, 1,254m high; it presents a flat top when seen from SE or SW.

Blouberg appears saddle shaped when seen from the S; from other directions it appears to be flat topped. It rises to a height of 923m.

Kruisfontein (33°57'S., 24°41'E.), a double peak, 788m high, lying 17 miles NNW of Cape St. Francis, and Klipfonteinberg, lying 5 miles NNE of Kruisfontein, are the most prominent peaks to the N of Cape St. Francis.

Tsitsikama Point (34°10'S., 24°30'E.) is a low shelving ill-defined point, backed by sandhills; rocks and breakers extend at least 0.8 mile offshore. Because of the nature of the point and the currents which occasionally set onto it, numerous vessels have been wrecked in the vicinity. Deep draft vessels should avoid a 26m coral patch lying about 5.2 miles SW of the point.

Seal Point (34°13'S., 24°50'E.) is low and rocky with both awash and below water rocks close to the extremity of the point. A reef, which nearly always breaks, lies 0.4 mile SE of the point and foul rocky ground extends 0.8 mile farther SE.

1.26 Cape St. Francis (34°12'S., 24°52'E.), 2 miles NE of Seal Point, is a narrow rocky promontory, which can be identified by two bush covered dunes, with a bare sand ridge between them. A ledge of boulders up to 4m high, lies at the extremity of the cape and merges into a reef, with rocks awash and below water. This reef extends 0.3 mile SE and is usually clearly marked by breakers.

Directions.—Vessels traveling E should pass at least 2 miles S of Seal Point in depths of 100m. If traveling W, it is advisable to keep farther offshore in order to take advantage of the current. If rounding Cape St. Francis to enter Krombaai, pass 2 miles off the cape in depths of 30 to 50m.

1.27 From Cape St. Francis, the coast trends in a general ENE direction to Cape Recife. The sandy shores of St. Francis Bay and the rock bound coast W of Cape Recife are backed by sand hills, which for the most part are bush-covered. The mountain ranges, inland, provide a prominent backdrop.

Directions.—Vessels making a transit between these two capes should, by day, keep from 2 to 3 miles offshore; an in-draft often sets towards the coast between Chelsea Point (34°03'S., 25°38'E.) and Cape Recife, 4 miles ENE. It is advisable to pass at least 3 miles S of these points.

At night or in poor visibility keep in depths of more than 80m to Classen Point when a depth of more than 100m should be maintained until E of Cape Recife.

A lighted buoy marks an underwater instrument site 1.2 miles N of Cape St. Francis.

St. Francis Bay, an extensive bay which recedes NW about 10 miles, is entered between Cape St. Francis and Classen Point. There are no known off-lying dangers in this bay, which includes Krombaai and Jeffreys Bay along its W shore and Kabeljousbaai at its NW head.

Sphinx Peak (33°48'S., 25°05'E.) and Brak River Hill, a double peak 10 miles SE of Sphinx Peak, are conspicuous. A conspicuous radio tower stands close E of Brak River Hill's E peak.

1.28 Krombaai (Kromme Bay) (34°10'S., 24°52'E.) is entered between Cape St. Francis and Seekoeipunt. A conspicuous water tower, stands on the coast about 1 mile SW of Seekoeipunt. The bay affords good anchorage, in 16 to 18m, sandy bottom, with Cape St. Francis bearing 180°, distant about 2 miles, and about the same distance off the mouth of the Krom River. The shelter is good in W gales, but the bay is not safe with E winds; SW winds are the worst for swells.

A below water reef extends 0.2 mile E from the head of the bay; the bottom is generally rocky in the N part, between this reef and the Krom River. Shallow water extends, 0.7 mile offshore close S of the mouth of the river.

Seekoeipunt (34°05'S., 24°55'E.) lies at the seaward end of a range of dark, bush-covered sand dunes. A reef, awash in places extends 0.5 mile SE from the point and foul ground, which breaks except in the calmest weather, extends 1.5 miles farther SE. Vessels should pass Seekoeipunt at a distance of 3 miles by



Courtesy of Simon Baillie-Cooper
Cape Recife Light

day, and at night should keep in depths of 30m or more.

Classen Point (34°02'S., 25°26'E.), the E entrance point to St. Francis Bay, may be identified by a few huts backed by bush covered sand dunes. A ledge of rocks extends 0.2 mile SE

of the point.

Between Classen Point and Cape Recife, the bottom is foul and rocky in depths less than 20m.

Lovemore Hill, 210m high, rises 1.7 miles NNW of Classen Point; a large prominent building stands on the summit. A conspicuous radio tower stands 4 miles NNE of Lovemore Hill.

Chelsea Point, 4 miles E of Shoenmakerskop, is low-lying. Drying rocky ledges extend 0.2 mile seaward, and the sea breaks heavily over an extensive below-water reef situated between 0.5 to 0.7 mile ESE of the point.

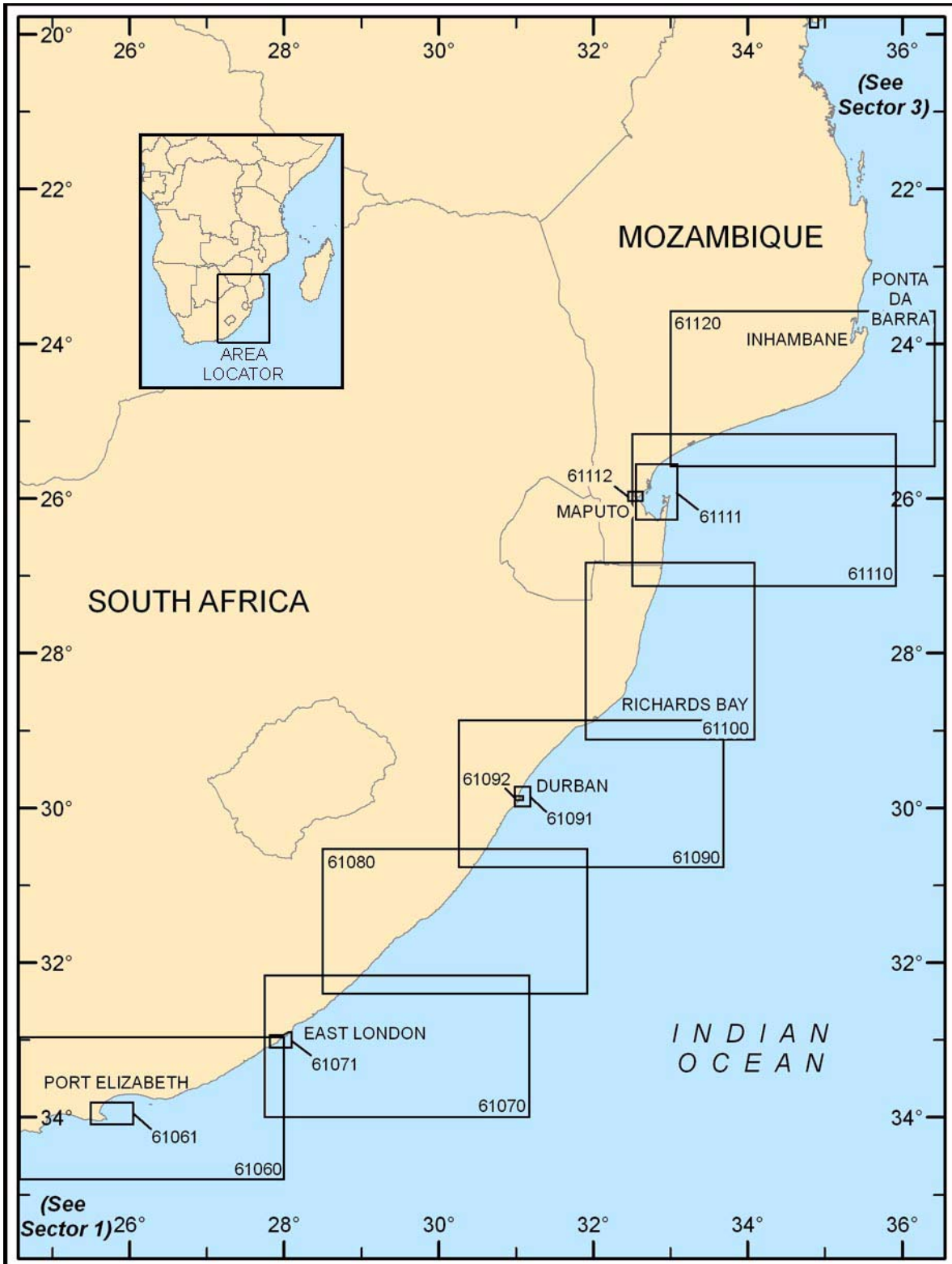
Botha Kop (34°00'S., 25°31'E.) is a sparsely-wooded hill, 282m high; when seen from the E, it has an appearance of a bluff.

1.29 Cape Recife (34°02'S., 25°42'E.) is low, but Recife Hillock, 0.8 mile WNW, rises to a height of 44m, and is often seen before the lighthouse; from a distance the hillock may appear as the termination of the coastline. Cape Recife Light, 28m high, is a major light exhibited at the extremity of Cape Recife.

A conspicuous building situated 2 miles NW of Cape Recife Light is likely to be the first object sighted when approaching the cape from the S by day.

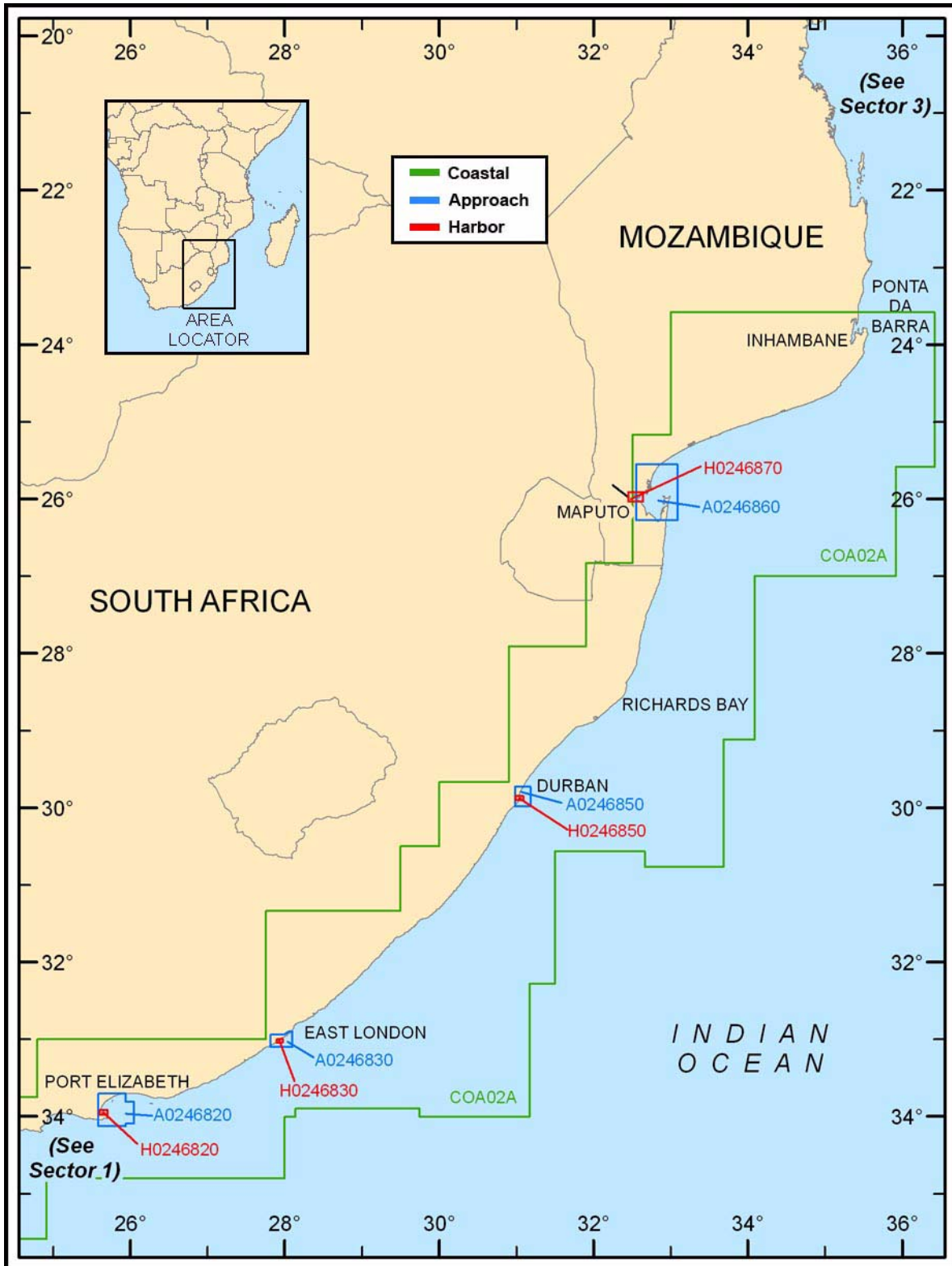
Thunderbolt Reef, a patch of rocks with depths less than 2m, lies 0.8 mile SSW of the light. The sea generally breaks on this reef, which extends up to 0.6 mile SE of Cape Recife.

Caution.—Vessels should not attempt to approach Cape Recife or Thunderbolt Reef within a distance of 2 miles because of the strong set toward them.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 2 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 02 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 2 — DNC LIBRARY INFORMATION

SECTOR 2

SOUTH AFRICA AND MOZAMBIQUE—CAPE RECIFE TO PONTA DA BARRA

Plan.—This sector describes the SE coast of Africa from Cape Recife to Ponta Da Barra, a distance of about 823 miles NE.

General Remarks

2.1 From off the vicinity of Cape Padrone (33°46'S., 26°28'E.), the most conspicuous features are Nanquas Kop (Nankooskop), which is 300m in height, and the high sand hills to the W, toward Woody Cape. Nanquas Kop, when seen from the S, appears flat-topped, but, proceeding E, it assumes a conical form, and is the most conspicuous feature on this part of the coast. It is recommended that vessels give this coast a berth of 4 to 5 miles.

The coast between the port of East London (33°02'S., 27°55'E.) and the Mbashe River (Bashee River) is a succession of rocky points, with sandy beaches between them. In general the coast is rugged and backed by high hills, but in places consists of perpendicular cliffs.

The coast between the Mbashe River and Port St. Johns is backed for the first 35 miles by a coastal ridge, 152 to 213m high, about 1 to 1.5 miles inland.

From Port St. Johns the coast continues being high as far as Waterfall Bluff (31°26'S., 29°48'E.), but NE the land slopes gently from a ridge, about 335 to 366m high, about 2 to 3 miles inland.

Cape Recife to Port Elizabeth

2.2 From **Cape Recife** (34°02'S., 25°42'E.) to Cape Padrone, the coast recedes and forms a large bay. In general, the coast is formed by sand beaches, backed by sand dunes which rise to heights of 175m.

Algoa Bay is entered between Cape Recife and Woody Cape (33°46'S., 26°20'E.). The bay is open to the full force of SE gales, which are frequent between October and March. At the height of these gales, a heavy breaking sea rolls into the anchorage off Port Elizabeth, but vessels with plenty of chain out should ride easily.

Tides—Currents.—To the S of the Bird Islands, the current is constantly SW and strong; a set towards the islands may be

experienced. Within Algoa Bay there is frequently a counter-current, particularly after SE gales, and the result may cause onshore sets. Within Algoa Bay tidal currents are negligible.

Caution.—Projectiles and mustard gas containers were dumped about 14 miles S of Cape Recife. These have spread over a considerable area between Cape St. Francis (34°12'S., 24°52'E.) and the Bird Islands (33°51'S., 25°17'E.) out to depths of 400m.

Riy Bank (34°00'S., 25°53'E.), lying about 9 miles ENE of Cape Recife, is rocky and foul; it has a least depth of 11.6m. All ships, other than fishing vessels, should keep well clear of this bank, which is normally marked by overfalls and broken water.

Unexploded ordnance has been reported to exist in a depth of 117m, about 24 miles ESE of Cape Recife.

Port Elizabeth (33°58'S., 25°37'E.)

World Port Index No. 46820

2.3 Port Elizabeth is located in the SW part of Algoa Bay, about 5 miles NW of Cape Recife. The port comprises an outer anchorage and a harbor enclosed by the S breakwater and the Charl Malan Quay.

The limits of the port are bound on the S by a line drawn for 1 mile E, from Cape Recife, on the N by a line drawn for 1 mile E of extreme point of the N bank of the Zwartkops River, and on the E by line joining the extremities of the above lines. The W boundary is along the foreshore between HW and LW marks from Cape Recife and the point on the N bank of the Zwartkops River including that part of the river that lies on the seaward side of the railway bridge crossing the river.

Winds—Weather.—East and SE gales, the only dangerous winds in Algoa Bay, occur in the months from October to April, the worst weather usually happening at the beginning and close of the season. In the winter months the wind seldom blows from these quarters, except in the rare case, when what is known locally as a Black Southeast comes on; the appearance of the sky and sea give sufficient warning of the rain and thick weather, which follows. The Black Southeast is sometimes violent but does not last long.

Port Elizabeth—Berthing Information			
Berth	Length	Depth Alongside	Remarks
Charl Malan Quay			
No. 101	290m	11.0m	Containers.
No. 102/103	635m	11.0m	Containers.
No. 100 (Ro-ro)	133m	11.0m	General cargo.
No. 2 Quay			
No. 8/9	519m	11.0m	General cargo.

Port Elizabeth—Berthing Information			
Berth	Length	Depth Alongside	Remarks
No. 3 Quay			
No. 10/11	396m	10.0m	General cargo.
No. 12	122m	5.0-5.7m	General cargo.
Bulk Cargo Quay			
No. 13/14	360m	12.2m	Dry bulk cargo.
Oil Tanker Berth			
No. 15	242m	9.6m	Tankers. Vessels up to 39,540 dwt, with a maximum vessel loa of 230m and a maximum draft of 9.1m, can be accommodated.

The approach of summer gales are, to a certain extent, foretold by the irregular oscillation of the barometer which falls before the wind increases. A damp cold air prevails, and there is a constant hazy appearance about the horizon, the upper parts of the sky remain clear. Should the barometer be at 1030 mb, and cirrus clouds appear, a SE gale will set in before 24 hours have elapsed. Or if the hills N of Port Elizabeth are obscured by haze, a gale from the same quarter may be expected. Gales from this quarter rarely occur during the month of April.

With the gale at its height, a heavy and dangerous breaking sea rolls in, but vessels with plenty of chain generally ride easily; and, from the strong E set which prevails near the shore during these gales, it is probable that a powerful undertow assists to relieve the strain.

Tides—Current.—A strong current is often experienced after passing Cape Recife. Allowance should be made for it in passing Roman Rock, about 1.5 miles NNW of Cape Recife Light, and no attempt should be made to pass between the rock and the mainland.

Depths—Limitations.—The approach channel will be kept dredged to a depth of 14.5m from its seaward end, which is about 2 miles NE of the S breakwater light. The entrance between S breakwater and Charl Malan Quay is 0.2 mile wide with a dredged depth of 14m, in 1976.

Berthing details are shown in the accompanying table titled **Port Elizabeth—Berthing Information**.

Aspect.—The red roof of the golf club house, 2 miles NW of Cape Recife Light, is conspicuous when viewed from the E. The large green-painted Holiday Inn, with its distinctive sign, is located about 1 mile NNW of the club house.

A white octagonal tower, 26m high, stands on a hill 1.2 miles WSW from the head of the S breakwater. A conspicuous hospital is situated 2.2 miles WNW of the tower; a prison stands 2.3 miles NNE of the hospital. A conspicuous chimney stands 2.9 miles NW of the S breakwater head; another chimney stands 0.6 mile farther N.

Pilotage.—Pilotage is compulsory, except for vessels exempted by law, and is available during daylight hours.

Inbound vessels should send their ETA and draft 72 hours and 12 hours in advance.

Vessels should confirm the ETA with Port Control when within VHF range and when 16 miles E of the breakwater (for

vessels approaching from the E) or 3.5 miles S of Cape Recife (for vessels approaching from the W).

The pilot boards in position 33°55.6'S, 25°40.9'E, about 2.5 miles NE of South Breakwater Head

Regulations.—Vessels approaching from the W, except those vessels using the Inshore Traffic Zone, should make for a position 4.5 miles E of Cape Recife Light and then follow the TSS shown on the chart leading to the anchorages, the Precautionary Area, and the pilot boarding point.

Vessels approaching from the E, except those vessels using the Inshore Traffic Zone, should join the TSS from a position 10 miles NE of Cape Recife Light.

All VTS regulations that pertain to South African ports are found in Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

Anchorage.—Designated anchorages for differing classes of vessels, best seen on the chart, are as follows.

1. Anchorage No. 1—Small craft.
2. Anchorage No. 2—Non-hazardous cargo vessels.
3. Anchorage No. 3—Hazardous cargo.

Port Elizabeth to Cape Padrone

2.4 The Zwartkops River, about 5.5 miles N of Port Elizabeth, has less than 1m over its bar at LW and the surf is frequently heavy. The river is navigable by small vessels for 8 or 9 miles from its mouth.

Fair anchorage can be taken about 0.3 mile NW of **St. Croix Island** (33°47'S., 25°46'E.), in 18m, sand, with the W peak of that island bearing 140°. In this position the heavy sea caused by E and SE gales is considerably broken, but the extent of sheltered anchorage is confined to a very small space by the shape of the island.

2.5 Port Ngqura (33°48'S., 25°42'E.), which opened in 2009, is a deep-water port situated approximately 9 miles NNE of Port Elizabeth at the mouth of the Coega River. This port is part of the Coega Industrial Development Zone (IDZ). All terminal operations are handled by Transnet Port Terminals (TPT).

Depths—Limitations.—The approach channel is dredged to a depth of 18m. The E side of the port within the harbor comprises one berth and the turning basin, with depths of 18m. Expansion of this terminal to allow for the handling of two



Port Ngqura—Aerial view



Port Ngqura Terminals

305m long vessels at the same time has been completed.

The W side comprises four berths, with depths of 16m alongside. The port can handle container, dry bulk, breakbulk, and liquid bulk cargo. When the port is fully developed there may be as many as 32 berth available. The port can accommodate vessels up to 80,000 dwt, with a maximum draft of 14m.

Aspect.—An E breakwater, 2,700m in length, protects the harbor basin from the E and SE. A secondary W breakwater is 1,125m in length. Salt pans are situated on the NW side of the harbor within the river.

Two sets of range lights lead into the harbor. The first set

leads from the pilot boarding position to the beginning of the dredged channel; the second set leads into the harbor between the breakwaters.

Pilotage.—Pilotage is compulsory; the pilot boards in position 33°52.9'S, 25°42.8'E.

Contact Information.—The Port Manager and Harbor Master can be contacted, as follows:

1. Telephone: 041-507-1900
2. Mobile: 083-280-0871
3. E-mail: neil.chetty@transnet.net

Anchorage.—See Port Elizabeth in paragraph 2.3.

2.6 The Bird Islands afford indifferent anchorage on the N side, where the holding ground is poor and uneven. With SE winds, a vessel can anchor, in 18m or 20m, with the lighthouse seen between Stag Island and Seal Island bearing 146°. This a good spot for shelter, but should the wind shift and become strong from the W, a vessel should anchor more to the E, with Black Rocks in range with Stag Island, about 254°, or a little open on either side of it, in from 14 to 18m, but the holding ground is bad.

Bird Island (33°50'S., 26°17'E.), the largest of the group, is marked by a light on its SE side.

Anchorage is also available about 0.3 mile ENE of Bird Island, in about 6 to 9m.

Directions.—If eastbound from Algoa Bay, in favorable weather, Bird Island Passage is recommended, as it avoids the SW current always running outside. The channel is 3 miles wide and clear of danger, the depths being from 14.6 to 31m.

Vessels using the passage at night are recommended to keep nearer the mainland than to the group, as the land is higher and more readily discerned and the constant roar of the surf more distinctly heard than the breakers on the rocky reefs of the group. With care, the lead will indicate not too near approach to the main shore, and vessels should generally keep in soundings of more than 18m, except off Woody Cape where patches of not less than 15.5m may be encountered as much as 1.5 miles from the cape. A berth of 3 miles should be given to Cape Padrone, off which foul ground extends for about 1.5 miles.

A vessel passing outside the group should not approach within 3 miles of the light, as no advantage is gained by it, and the current, though not generally strong, is uncertain and irregular, both in strength and direction, in the vicinity of the group.

Caution.—In thick weather, a vessel should not approach the Bird Islands in depths of less than 110m.

Cape Padrone (33°46'S., 26°28'E.) is the E extremity of a sandstone cliff, about 1 mile in length and from 10 to 15m high. Foul ground, which breaks heavily in bad weather, extends 1.5 miles S of the cape.

It is advisable for vessels to pass at least 3 miles SE of Cape Padrone, keeping in depths of 75m or more at night or in poor visibility.

Cape Padrone to Port Alfred

2.7 From Cape Padrone, the coast trends in a general ENE direction to Port Alfred. The coast is indented by several coves and several rivers enter the sea. Coastal sand dunes, covered with scrub, lie behind the beach, but they are small in extent and not very high.

In this coastal area, the 15m curve lies from 0.4 mile to 2 miles offshore and the 30m curve lies up to 3.5 miles offshore.

A number of unlit research buoys are established along this part of the coast.

Bokneskop (33°42'S., 26°34'E.), 199m high, is flat-topped and wooded; it rises 6.5 miles NE of Cape Padrone. Though less prominent than Nanquas Kop, 3 miles WSW, it nevertheless provides a useful mark for identifying the locality.

Kwaai Hoek (False Islet) (33°43'S., 26°38'E.) is a dark grass-covered headland, 28m high, situated 8.5 miles ENE of

Cape Padrone. There are drying rocks located close S and E of the point. A cross, 5m high, stands on the point; a water tower stands on the coast about 2 miles WSW of the cross.

Kenton-on-Sea (33°41'S., 26°40'E.) is a resort situated on the high bush-covered land between the Boesmans River and the Kariega River. The resort is not prominent, but at night the lights of the hotel are usually visible from 5 to 6 miles offshore.

Glendower Peak (33°37'S., 26°49'E.), surmounted by a beacon, rises to a height of 193m. This prominent landmark is visible up to 20 miles offshore.

2.8 Port Alfred (33°36'S., 26°54'E.) is situated at the mouth of the Kowie River, which flows out between training walls; a light is exhibited at the head of the S wall. A bridge spans the river, about 0.5 mile within the entrance and is prominent.

Fountain Rocks, a group of drying and below-water rocks, lie between 0.7 and 2.1 miles E of the training wall light. Breakers stretch from the rocks to the shore, about 0.2 and 0.6 mile distant, if there is any swell running.

Jansen's Rock (33°36'S., 26°56'E.) lies, awash, 0.3 mile E of Fountain Rocks, but its position may not be apparent at HW as the sea does not always break over it.

Anchorage is available with the light at Port Alfred, bearing 305°, about 1.5 miles distance, in a depth of 30m, sand. The holding ground is poor and ships at anchor should be prepared to put to sea immediately on the approach of bad weather.

Port Alfred to East London

2.9 Between Port Alfred and Keiskama Point, 34 miles NE, the coastal ridge is faced with sand and rises to heights of 100 to 120m in places. A hill, 149m in height, located 5 miles ENE of Port Alfred, is prominent from SW and E. The hill's summit is wooded.

The hills at Bathurst, 7 miles WNW of Port Alfred, and the range of mountains in the vicinity of Grahamstown, 25 miles NW of Port Alfred, are conspicuous.

Rietpunt (33°34'S., 27°01'E.), a low sandy point, is located 5.7 miles ENE of Port Alfred. A reef of below water rocks, which usually break heavily, extends 0.8 mile SE of the point and there are depths of 10 to 12m, 1.5 miles offshore. Due to the possibility of onshore sets, Rietpunt should be given a berth of at least 4 miles.

Great Fish Point (33°31'S., 27°07'E.), marked by a light, is low, sandy, and fringed with rocks.

The Great Fish River enters the sea 3 miles NE of Great Fish Point; Rocky Point is the E entrance point of the river.

The waters of the Great Fish River are reddish in color and after a rain the sea may be discolored as far as Kowie Point, 16 miles SW.

Maitland Hill (33°26'S., 27°09'E.), 176m high, is the highest of two grassy hills; it is visible from most directions and is a good mark for identifying the locality.

A dangerous rock, with a depth of 2.7m, lies just over 1 mile ENE of Rocky Point; in fine weather the sea seldom breaks over this rock.

Stalwart Point is sandy, with bush-covered sand dunes behind it. It may be identified by Maitland Hill and by a conspic-



Courtesy of Simon Baillie-Cooper
Great Fish Light

uous dark hill, 112m high, lying 1 mile NW. Shoal rocky ground extends up to 0.8 mile seaward of the point, which should be given a wide berth.

A brush-covered hill, 78m high, rises 3.5 miles ENE of Stalwart Point and Skiet Kop, a prominent round-topped grassy hill, 165m high, stands 6.3 miles NE of the same point.

2.10 Madagascar Reef (33°23'S., 27°21'E.) lies 0.5 mile offshore, 7.7 miles ENE of Stalwart Point; the sea always breaks over this reef which dries to 1m.

Keiskama Point (33°18'S., 27°29'E.) is low, sandy, and fringed with rocks. Near its extremity, is a prominent bush covered sand dune, 28m high, which resembles an islet when viewed from the SW. A sand spit, with depths of less than 10m, extends 0.6 mile SE of the point; with a moderate swell the sea breaks heavily over this spit.

Between Keiskama Point and East London the coast consists of sandy beach fringed, intermittently, with rocky ledges; several large rock outcrops also occur. The coastal ridges are usually bush covered except within 5 miles W of Hood Point, where considerable areas have been cleared. Within the coast, the terrain is predominantly high, open grassland, intersected by the ravines of several rivers.

The 15m curve lies up to 0.8 mile off this section of the coast; the 30m curve lies up to 1.5 miles offshore. There are no charted dangers seaward of the 15m curve. A depth of 7.3m is charted in a position 0.5 mile SE of Keiskama Point.

The **Keiskama River** (33°17'S., 27°29'E.), the most prominent one on this coast, flows into the sea, 1 mile NE of Keiskama Point. Other good marks for identifying the area are Patos Kop, rising 9.5 miles NW of Keiskama Point; Hamburg North, a conspicuous hill, 166m high, 3.25 miles WNW of the same point; and Mount Vale (33°10'S., 27°26'E.), a prominent dark bluff, 283m high, situated 8 miles NNW of the mouth of the Keiskama River.

Cove Rock (33°05'S., 27°50'E.) is a conspicuous wedge shaped rock, 26m high, with a deep notch in the middle. It forms the extremity of a sandy spit extending from Bisserton, a conspicuous bushy sand hill, 86m high. From a distance, Cove Rock resembles an islet and makes a good mark for vessels proceeding along the coast.

Hood Point (33°03'S., 27°54'E.) has a conspicuous tower standing about 1.7 miles W of it; a radar tower, 51m high, stands at an elevation of 293m, about 5 miles WNW of the conspicuous tower.



Courtesy of Simon Baillie-Cooper
Hood Point Light

East London (33°02'S., 27°55'E.)

World Port Index No. 46830

2.11 East London, the city, is situated on both banks of the Buffalo River; it is the principal city of the Border District of Cape Province.

The Port of East London comprises an outer anchorage and the harbor within the breakwaters at the mouth of the Buffalo River. The limits of the port are best seen on the chart.

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Winds—Weather.—The prevailing wind direction is NE, the next in order of frequency is from the SW; WNW winds are also frequent. Winds from the N do not blow more than 2 hours in 3 days and winds from SE and adjacent directions are even less frequent. The prevailing winds blow up and down the coast, but neither onshore or offshore.

The annual variation is not very great, but both the NE and SW winds tend to turn more to the N during the colder months, April to August, and then to the S, between October and March. In July, the most frequent directions are from NNE and NW.

The average velocity of the wind is about 17 knots but velocities exceeding 70 knots have been known to occur in each month during the second half of the year.

The weather near East London presents a marked difference to that on any other part of the coast. When the mercury commences to rise, on the wind shifting to the W, the crisis is accompanied by lightning, thunder, and heavy rain. If the wind shifts suddenly SW in a squall, with a rapidly increasing barometric pressure, a fresh gale may be expected, with fine weather, which will continue until the mercury rises to about 1030mb.

If the barometer remains low and steady, a strong gale from WNW may be expected, probably lasting several days; but if the wind shifts slowly to the SW, the barometer rising slowly, with drizzling rain, a strong gale and high sea may be looked for.

In such a case, the wind begins to blow hard from the W, and veers slowly SW until the mercury stands at about 1016mb.

The sky becomes leaden, thick drizzling rain sets in, and the mercury oscillates between 1016 to 1020mb, with the temperature being considerably below the average.

In June, July, and August these much dreaded SW winds often follow unsettled weather, preceded by moderate to fresh E breezes and a falling barometer. They blow with considerable violence and have caused many disasters to shipping in East London Roads.

The prevailing winds present severe pilotage problems to ships of great length with high freeboard. From October to April, E winds are the most prevalent, and SE gales may be expected.

Rollers, seldom setting in during the summer months, are frequent during the winter, and generally break in a depth of about 5.5m, in stormy weather in 9.1m, and sometimes even in 12.8m or 14.6m.

Tides—Currents.—The incoming tidal current sets across the bar and into the river at a velocity of 0.75 knot. The outgoing current, has a velocity of about 1 knot, except during freshets, when it may be stronger. The currents turn at about the time of HW and LW, setting inward on the rising tide.

At the anchorage off East London, the current generally sets SW from 1 to 2.5 knots, but in calm weather or during strong SW winds the surface water is retarded and occasionally sets E at about 0.5 knot or even more.

Inshore, near the edge of the breakers, an eddy current frequently sets E. This current varies in strength, but seldom attains a velocity of 0.5 knot. In the offing, about 15 miles from the coast, the regular Agulhas Current sets steadily SW at velocities from 2 to 4 knots.

Depths—Limitations.—The fairway between the breakwaters is maintained at a depth of 10.7m by dredging. It has been reported that depths of 6.1m may exist up to 0.1 mile E of the S breakwater light.

Berthing details are shown in the accompanying table titled **East London—Berthing Information.**

Aspect.—Among the conspicuous marks in the approach to East London is the tower 3 miles W of the head of the breakwater; a grain elevator 0.6 mile WSW of the same position; a radio mast standing 1.2 miles WSW and a silo 0.2 mile N of the radio mast; and a radio tower. A building, the most prominent of several hotels on the seafront, stands 0.7 mile NNW of the head of the S breakwater.

East London—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Remarks
East Bank			
C	200m	10.0m	Vegetable oil.
F	180m	9.9m	General cargo.
G	180m	10.1m	General cargo.
I	132m	8.5m	General cargo and containers.
K	253m	10.4m	Containers.
L	253m	10.4m	Containers.

East London—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Remarks
West Bank			
Tanker Berth	259m	10.4m	Petroleum products.
T	194m	10.4m	Corn.
S	194m	10.4m	Corn.
N	185m	9.0m	Ro-ro.
O/P	185m	8.5m	Ro-ro.
R/Extension	185m	9.0m	Ro-ro.

The aluminum buildings, 4.5 miles NNW of the head of the S breakwater, shine brilliantly in the sun in the forenoon.

Pilotage.—Pilotage is compulsory for merchant vessels entering, leaving or shifting berths. A 1-hour advance notice to be given to the Port Captain via VHF channel 16; the working frequency is VHF channel 12. All vessels should also report by VHF to port control when passing reporting stations, which are 16 miles SW and 16 miles NE of the port.

The pilot embarks 2.3 miles ENE of the harbor entrance. Except in emergency, vessels can enter the port only during daylight hours. Tankers are handled during daylight hours only.

Signals.—All traffic and weather information is communicated by VHF.

Anchorage.—The recommended anchorage, clear of the harbor entrance, is in a depth of about 30m, fine sand bottom, 0.8 mile E of the S breakwater light. In fine settled weather, ships might anchor closer to the light on the same bearing, but never closer than 0.5 mile or in less water than 25m, and then only if remaining at anchor for a short while.

There is anchorage for small ships, in a position 1 mile NE of the breakwater light and 0.3 mile clear of the range line, in a depth of 15m; this anchorage should only be used in fine weather.

The anchorage is considerably exposed and vessels generally lie broadside to the sea to limit the great extent of roll and strain. Vessels making a short stay may anchor, but any vessels running the risk of lying at the anchorage in bad weather should never be in depths less than 21m.

Directions.—Vessels from SW, having identified Cove Rock and Bisserton, should not approach the coast nearer than 2 miles or in depths less than 65m until close to port. When Hood Point Light, the grain elevator, and the head of S breakwater have been passed abeam, course should be altered to steer for the pilot boarding position.

Vessels from the NE, having identified the conspicuous Black Beacon some 15 miles NE of the port, should keep at least 2.5 miles offshore until Kwelegapunt, 8 miles NE of Nahoon Point, is abeam 2.5 miles distant, when course for the pilot station may be steered for. Vessels awaiting the pilot should heave to, or anchor NE of the pilot station.

East London to Mbashe Point

2.12 Between East London and Mbashe Point, the coast is a succession of rocky points, with sandy beaches between

them. The sea breaks heavily on these beaches and few of them are suitable for landing, even in fine weather.

To distinguish the monotonous coast when viewing East London from the NE, a black wooden pyramidal beacon, 15.9m high, stands on a 96m hill in a position nearly 0.5 mile NW of Reef Point (32°51'S., 28°07'E.).

Cape Morgan (32°42'S., 28°22'E.), marked by a light, appears from seaward as a flat-topped hill covered with bushes. Vessels should give Cape Morgan a berth of at least 2 miles when transiting the coast.

Shelter from NW and W winds may be obtained at from 0.5 to 0.8 mile NE of Cape Morgan and the same distance offshore.

The Great Kei River empties about 2 miles NE of Cape Morgan. The village of Keimouth, close to the W entrance, is conspicuous. Local knowledge is essential when entering the Great Kei River.

Sandy Point rises rapidly to Bowkers Bluff, which has four distinct hills.

Bowkers Bay, NE of Sandy Point, is a bight into which a river flows. There is good anchorage, with shelter from W winds, in 19m, sand, 1 mile off the river; the bay being, under favorable circumstances, appeared to afford the best anchorage on this part of the coast. A drying rocky outcrop, lies 0.5 mile S of the river's mouth.

The Mbashe River flows into the sea in position 32°15'S., 28°54'E. Good anchorage can be obtained, in 20m, sand, ESE of the river entrance.

Rollers set in after a strong W or SW breeze, occasionally breaking in 10.9m or 12.8m, but generally breaking off the mouth of the river, in 6.4m or 7.3m.

Mbashe Point (32°15'S., 28°55'E.) has a light structure standing on the point which appears conspicuous against the dark background. A radiobeacon transmits from the light structure.

Mbashe Point to Port St. Johns

2.13 Between Mbashe Point and **Cape Hermes** (31°38'S., 29°33'E.), the Agulhas current is SW, but is generally much weaker close inshore than 2 to 3 miles to seaward. In the vicinity of Port St. John's, however, the strength of the current is felt closer inshore than off any other part of this coast.

Along this section of the coast the 15m curve lies up to 0.6 mile offshore, and the 30m curve lies up to 1.5 miles offshore.

All charted dangers lie inside the 15m curve.

Rocks, which nearly always break, lie up to 0.8 mile off the mouth of the Nkanya River 4.8 miles NE of Mbashe Point.

Hole in the Wall (32°02'S., 29°07'E.) is formed by two remarkable and prominent rocks which lie at the entrance of the Mpako River, about 10.5 miles NE of the Nkanya River. The SW rock is 44m high, with a flat top, and has a natural archway cut through its base. The NE rock is larger, 64m high, and has a deep wedge-shaped cleft in its summit.

Whale Rock Point (31°56'S., 29°13'E.), 8.5 miles NE of Hole in the Wall, is low and has a sandy beach fringed with a reef. Whale Rock lies on the N part of a below water reef, which extends 0.4 mile SE of the point.

Rame Head (31°48'S., 29°21'E.) is a bold precipitous headland which rises to a height of 123m, 0.6 mile W of its extremity. The headland stands out prominently both N and S.

Ecingweni, a conspicuous hill, 235m high, rises 4.5 miles WSW of Rame Head. Mpotshotshe, 284m high, is a conspicuous dome shaped hill 3.5 miles NNW of Rame Head. It shows up well from the S, but is obscured from the N.

2.14 Brazen Head (31°43'S., 29°23'E.), 5 miles NE of Rame Head, is one of the most conspicuous features on this part of the coast. The cliffs rise vertically from the sea for as much as 150m, in places, then rise steeply to an elevation of 200m, then slope gradually to Ndluzula Hill, 242m high, surmounted by a clump of trees, 0.5 mile inland.

Green Peaks (31°41'S., 29°28'E.) are two remarkable peaks 0.5 mile apart lying 5 miles NE of Brazen Head. The SW peak is 168m high and covered with grass. The NE peak, 199m high, is thickly covered with bushes on its SE side and has a bare top, which looks like a grassy knoll when viewed from NE. Both peaks are prominent when viewed from the NE.

Sugarloaf Rock, a conical rock, 8m high, is connected to the coast, 0.5 mile E of Green Peaks, by a causeway of sand and rocks. It is prominent when viewed from SW or NE, close inshore, but merges with the background from a distance.

Cape Hermes (31°38'S., 29°33'E.) is formed by a round, grass-covered hill, 148m in height. A conspicuous white house with a red roof adjoins the light structure on the cape.

2.15 Port St. Johns (31°38'S., 29°33'E.) lies between Cape Hermes and Bluff Point. The SW part of this indentation is known as Gordon Bay and it is into this bay that the Umzimvubu River flows.

Close inshore, during the incoming tidal current, which runs regularly, a strong current has been found, setting S along the sandy shore inside the breakers, and along the rocky shore in the direction of Cape Hermes.

At the entrance of the river, there is a table mountain, 366m high, which appears to have been cleft to its base, leaving a wedge-shaped gap in the center, through which the river flows.

Anchorage.—Gordon Bay affords fair anchorage, but is exposed to winds from NE through S to WSW. Anchorage can be found, in 18m, sand, good holding ground, about 0.8 mile E of Cape Hermes Light. Caution is necessary, as the depths are liable to constant change. More sheltered anchorage can be found closer in, with Cape Hermes Light, bearing 255°, distant 0.5 mile.

Port St. Johns to North Sand Bluff

2.16 The general trend of the coastline from Port St. Johns to South Sand Bluff is NE. There are coves at the mouths of the many rivers, which empty into the sea in this area. The shore is fronted by bluffs, with few sandy beaches, backed by prominent coastal hills.

The 30m line lies up to 1.3 miles offshore; there are no charted dangers seaward of this line.

Care must be taken to avoid being set into the bight SW of Waterfall Bluff. When in this vicinity, at night, it is advisable to sound continuously and keep in depths of 75m or more.

Waterfall Bluff (31°26'S., 29°48'E.) lies about 17 miles NE of Port St. James. There are two principal waterfalls over the bluff; the W drops sheer into the sea but is not as conspicuous as the E, which is larger and drops in terraces. In the dry season, not much water flows over either falls.

The Mzintlava River, about midway between Port St. John and Waterfall Bluff, flows between steep banks, which are thickly wooded and rise close on the N side to a height of 235m. Manthlonetchwa Hill (31°31'S., 29°40'E.) is a conspicuous bare hill, with two flat summits, which rises to a height of 256m, on the S side of the river, 1 mile inland.

To the N of Waterfall Bluff, the general aspect of the land within the coast changes completely. The mountain ranges can still be seen, but close within the coast the land rises gradually to a ridge 335 to 365m high, lying 2 or 3 miles inland.

2.17 Lambasi Bay (31°23'S., 29°54'E.), 5.8 miles NE of Waterfall Bluff, is a small indentation in the coast formed at the mouth of the Tezana River, which enters the sea through a deep bush covered ravine. On the N side of the bay the houses of Port Grosvenor are noticeable from seaward.

Grosvenor Hill, 3 miles NNW of Lambasi Bay, is 337m high. The hill, which is higher than the adjacent coast, is conspicuous.

South Sand Bluff (31°19'S., 29°29'E.) is a very conspicuous mark. From S, it appears as a dome-shaped hill topped with bushes. A white sand patch, which cannot be seen when bearing less than 270°, covers its lower slopes. From N, it appears as a densely-wooded pyramid. The bluff is marked by a light.

Quoin Hill (31°15'S., 30°02'E.), 5.5 miles NE of South Sand Bluff, is 59m high, and covered with bush. The hill appears dark in comparison with the adjacent coast, which makes it conspicuous.

Red Hill, 4 miles NNE of Quoin Hill, rises to a height of 87m, it is a conspicuous rounded hill, about 0.3 mile inland.

The **Mtamvuna River** (31°05'S., 30°11'E.) enters the sea 9 miles NE of Red Hill. The mouth of the river is spanned by a conspicuous bridge.

North Sand Bluff (31°03'S., 30°14'E.), about 2 miles NE of the mouth of the Mtamvuna River, is an isolated conical hill covered, with dark bushes. This conspicuous hill is 69m high and is especially visible from the NE; it is marked by a light.

North Sand Bluff to Green Point

2.18 Between North Sand Bluff and Margate, the coast consists of rocky ledges and shallow sandy bays. Several rivers flow into the sea along the entire coast. Northeast of Margate

**Green Point Light***Courtesy of Simon Baillie-Cooper*

there are a number of villages and holiday resorts which may be identified.

Inkulu (30°59'S., 30°11'E.), 418m and 421m high, are conspicuous double peaks rising about 4.5 miles NNW of North Sand Bluff.

Evungo, 7 miles WNW of Margate, is a whale-shaped mountain, 550m high, with its NE end apparently terminating in a bold cliff. It is conspicuous from S, but becomes difficult to identify from N of E.

Protea Banks (30°50'S., 30°29'E.), lying offshore about 7 miles NE of Margate, have a least depth of 26m. An isolated patch, with a depth of 14.6m, lies close WSW of the bank, about 2.5 miles offshore.

Margate (30°52'S., 30°22'E.) is a seaside resort with a conspicuous hotel. A radio mast, 412m high, stands 4 miles NW of town.

St. Michael's on Sea, a resort, is situated 3 miles NE of Margate. Beach Terminus, 2.5 miles NE of St. Michael's on Sea, is a resort situated on the S side of the mouth of the Izotsha River, which is the largest of the rivers on this stretch of coast.

Port Shepstone (30°44'S., 30°28'E.) is located on the S, and North Shepstone on the N bank of the Umzimkulu River; they are easily recognized as they are the only large villages in the vicinity. Port Shepstone Light is not very conspicuous. A convent, a large red building, located about 0.4 mile W of the lighthouse, is conspicuous from N and E, but is shut in as a vessel proceeds S. A radio tower stands about 0.5 mile W of

**Port Shepstone Light***Courtesy of Simon Baillie-Cooper*

2.19 Between Port Shepstone and Green Point, 34 miles NE, several rivers flow into the sea, but all their mouths have completely been closed by sand. The coast presents few conspicuous natural features, although the various villages may be readily identified.

The **Umzumbe River** (30°37'S., 30°33'E.) flows into the sea about 8.8 miles NNE of Port Shepstone; a village by the same name stands on the S bank. A conspicuous red brick convent stands on a hill about 0.5 mile S of the village.

A radio tower, showing red obstruction lights, stands about 2.5 miles NNE of the convent. About 4.5 miles NNE of the convent there is a red hill 106m high, in the form of a ridge; about 1.5 miles further NNE there is another red hill, which is dome shaped, that rises to a height of 102m.

The **Mtwalume River** (30°29'S., 30°38'E.) flows into the sea, between steep banks 8.5 miles NE of the Umzumbe River. This is the most noticeable river on this part of the coast, but it is obscured when close inshore. A conspicuous hotel, which is long and low, stands on the S entrance of the river.

At **Sezela** (30°24'S., 30°41'E.), 5 miles NE of the Mtwalume River, there are three conspicuous chimneys of a sugar mill. From May to December, the glare from the mill can be seen at night and forms a useful mark. Umdoni House, standing about 1.5 miles NE of the sugar mill, is the only white house with a red gabled roof in the vicinity and is a conspicuous landmark. A disused whaling station, located about 4 miles NE of Umdoni House, is obscured when viewed from S, but is conspicuous when viewed from elsewhere.

Scottburgh (30°17'S., 30°45'E.) is a small village. Vessels should be careful not to confuse the glare of the sugar mill at Sezela with this village at night. A beacon stands at an elevation of 48m on a hill near the shore at Scottburgh. A radio tower stands about 1 mile WSW of the beacon. A water tower stands near the coast 1 mile N of Scottburgh.

Green Point (30°15'S., 30°47'E.) has a dark wooded hill, rising to an elevation of 110m, 0.6 mile inland from its extremity. Although the lighthouse on Green Point can be seen from a great distance in clear weather, burning of sugarcane and grass takes place at times and may cause a haze over the lighthouse and adjacent coast. A beacon, stands about 0.3 mile ESE of the lighthouse; the lighthouse and beacon, in range 285°, indicate the position of Aliwal Shoal.

Aliwal Shoal (30°15'S., 30°50'E.) is the extremity of a shoal area, known as The Ridge, which extends ESE then NE from Scottburgh. The least depth of Aliwal Shoal, 2.7m, lies 2.8 miles, ESE of the light on Green Point; it lies in the red sector of that light. The sea breaks on the shoal. A wreck, with a depth of 2m over the remains, lies close N of the 2.7m depth.

Currents.—Currents in the Aliwal Shoal area are generally uncertain, but a weak current, setting WSW across the shoal, may be encountered. Occasionally the counter current of the Agulhas Current may be experienced, particularly between the shoal and the coast.

Vessels enroute in this area by day should be able to transit the passage inside Aliwal Shoal, provided that the strength and direction of the current are accurately determined.

At night, vessels are recommended to pass outside the shoal, keeping in depths of 50m or more.

Green Point to Durban

2.20 Between Green Point and Durban, numerous rivers flow into the sea, but with the exception of the Umkomaas River, all have their mouths closed by sand.

The **Umkomaas River** (30°12'S., 30°48'E.) is open at its mouth but, due to its constant surf, it cannot be entered. The river is spanned by a prominent road and rail bridge.

Two hotels in the holiday resort, on the S bank of the Umkomaas River, are conspicuous.

Anchoring is prohibited, within an area 1 mile wide, extending 2 miles ESE, from the mouth of the Umkomaas River.

Illovo Spit (30°09'S., 30°52'E.), a bank with depths from 12.8 to 17.3m, extends 2 miles offshore, about 2.8 miles SSE of the mouth of the Illovo River. A conspicuous water tower stands close SW of the mouth of the Lovu River.

A conspicuous hotel stands on a hill, 101m high, 3 miles NNE of the Lovu River water tower. A conspicuous Y-shaped water tower stands on a hill about 0.6 mile SW of the Lovu River water tower.

Caution.—A dangerous wreck, containing cylinders of chlorine gas, which is extremely hazardous and has a highly toxic effect, lies sunk about 3 miles 111° from the above hotel.

2.21 False Bluff (30°01'S., 30°56'E.) resembles Cape Natal. A hill, about 1 mile NE of False Bluff on the S side of Isipingo Beach, has a broad sand patch running from its foot to near its summit. As this is the only sand visible N of Port Shepstone, it is a very conspicuous landmark.

The **Durban Offshore Oil Berth** (30°00.5'S, 30°58.5'E) is a CALM facility situated about 1.5 miles from shore E of Isipingo Beach. Tankers up to 210,000 dwt can be accommodated at the SBM, which is moored in a depth of 45m. VLCCs must have a 10-ton boom. Pilotage is compulsory and pilots can be contacted on VHF channel 13. Pilots normally board by helicopter 2 miles E of the SBM. Vessels should send their ETA via their agent 10 days in advance with updates sent every 24 hours, as well provide any subsequent changes of 1 hour or greater.

Vessels are prohibited from entering within 1 mile of the SBM. Floating hoses, which are marked by quick flashing lights, extend up to 305m from the SBM.

A prohibited anchorage area lies approximately 2.5 miles to the NE of the above-mentioned terminals. This area can best be seen on the chart.

Caution.—An explosives dumping area is centered in a position about 7 miles SSE of Cape Natal. Another explosives dumping area is centered 33 miles offshore about 39 miles SSE of Cape Natal; the water in this area is about 2,744m deep.

2.22 Cape Natal (29°52'S., 31°04'E.) is a high wooded tongue of land terminating in a conspicuous bluff, 59m high. It is easily identified as the coast to the N recedes and is low for several miles. A signal station is located on the bluff 0.3 mile SW of the extremity of Cape Natal. The signal tower is painted white and has been reported as very conspicuous from seaward.

Caution.—A sewer outfall pipe extends 1.8 miles SE from Cape Natal from a position on shore SE of the signal tower. Anchoring is prohibited within 0.3 mile of the pipeline.

A lighted buoy (special wave recorder) is moored 1.5 miles SE of the Signal Tower within the prohibited anchorage area and another is 1 mile N of the South Breakwater Light.

A spoil ground, rectangular in shape, 2 miles in extent and with a least charted depth of 55m, lies 3 miles E of Cape Natal.

Durban (29°52'S., 31°02'E.)

World Port Index No. 46850

2.23 The Port of Durban, the principal port of the Republic of South Africa, is entered close NW of Cape Natal.

TRANSNET National Ports Authority

<http://www.transnetnationalportsauthority.net>

The harbor comprises an exposed outer anchorage and a landlocked sheltered harbor with extensive quays and facilities for ocean-going vessels. The port is entered between breakwaters. The seaward limits of the port are best seen on chart.

Winds—Weather.—The prevailing wind direction at Durban Harbor, for the greater part of the year, is from NE and S, however, in June and July, NE winds are more frequent. Winds from the NE quadrant alternate at intervals seldom exceeding a few days, with winds from the SW quadrant.

During summer, gales are usually of short duration, rarely exceeding 24 hours, but during winter and spring, NE and SW gales may continue for days.

During May to July, inclusive, the finest months, a light breeze comes in from seaward by day, and a land breeze blows at night. But strong gales from the E and W occur in these months.

From August to October, inclusive, the boisterous months, when the range of the barometer is great, gales alternate between E and W.

Gales from E to SE, 50 to 100 miles offshore, are deflected to ENE to NE upon reaching shore. The resulting swell catches vessels in Durban Road and causes them to ride uneasily.

Tides—Currents.—In the outer anchorage, the tidal current flows N during the rising tide and S during the falling tide.

There is an eddy occurring often off the heads of the breakwaters, flowing S during the flood tide and N during the ebb tide. The position of the dividing line between the two oppos-

ing currents varies and may be met close to the breakwaters. Great care is therefore necessary when approaching the harbor entrance.

In the entrance channel, the incoming tidal current has a maximum rate of 2.5 knots at springs and 0.5 knot at neaps; the outgoing current attains 3.5 knots at springs and 1.5 knots at neaps.

Within the harbor there is a strong set across the NE corner of Salisbury Island at springs, the direction of the set being about 270° on the flood tide and 090° on the ebb. Although this set does not extend for more than about 90m down the line of the main wharf of Salisbury Island, it does cause difficulty for ships proceeding alongside the NE berth.

At T Jetty, due to eddies, there is a slight set on to both the E side and the W side during the flood and ebb.

Caution is necessary to allow for the strong current, generally setting SW at velocities of 2 to 3 knots, beyond a distance of 3 miles from the shore.

Depths—Limitations.—The channel entrance, between the S breakwater and North Pier, has been dredged to a depth of 12.8m, and has a width of 155m, narrowing to about 125m. This narrow part of the channel, though seldom impassable, is occasionally dangerous. It is well-marked on the SE side by two caissons, each exhibiting a light, and on the NW side by two lighted buoys separated by another caisson exhibiting a light.

Berthing details are shown in the accompanying table titled **Durban—Berthing Information**.

Ships in excess of 200m in length and 26m in beam may not enter at night. Ships whose beam exceeds 35m are brought into port only when weather conditions are suitable.

Oil tankers and ships carrying explosives or dangerous cargo are restricted to daytime movements.

Aspect.—The Bluff, at the NE end of a ridge, is heavily-wooded and steep and has heights up to 90m; it forms the SE side of Durban Harbor. Among the conspicuous landmarks are the signal tower about 0.7 mile SSW from the head of S breakwater; the water tower about 1.8 miles farther SSW; two radio towers standing close NW of the water tower; five silos, the tallest being 59m in height, situated at Island View No. 3 Berth; a water tower at Cooper, 5.3 miles SSW of the head of S breakwater; a water tower 1.4 miles NNE of Cooper; and the dome of the college 4 miles W of the breakwater head.

Another conspicuous object is the Anglo-American Building, a 26-story glass and steel office structure with a light located on a tall mast mounted on the roof. It is one of the tallest buildings in the city.

Durban—Berthing Information				
Berth Name	Length	Depth Alongside	Maximum Vessel Draft	Remarks
Point and T Jetty				
C	213m	9.1m	8.8m	General cargo.
D-E	275m	7.9m	7.6m	Vehicles.
F	345m	6.4m	6.1m	Vehicles.
G	346m	7.0m	6.7m	Vehicles.

Durban—Berthing Information				
Berth Name	Length	Depth Alongside	Maximum Vessel Draft	Remarks
N	262m	11.6m	11.3m	Passengers.
O	310m	11.9m	11.6m	Fruit.
P	310m	10.9m	10.6m	Fruit.
Q	183m	10.4m	10.1m	Ro-ro.
R	183m	10.9m	10.6m	Ro-ro.
Bluff				
BCA No. 1	148m	8.9m	8.6m	Coal, coke, minerals, fertilizer, and sulphur.
Bluff No. 2	177m	9.3m	9.0m	Coal, coke, minerals, fertilizer, and sulphur.
Bluff No. 3	180m	9.1m	8.8m	Coal, coke, minerals, fertilizer, and sulphur.
Bluff No. 4	238m	10.3m	10.0m	Coal, coke, minerals, fertilizer, and sulphur.
Maydon Wharf				
No. 1	152m	9.4m	9.1m	Containers.
No. 2	153m	9.9m	9.6m	Sugar.
No. 3	152m	9.0m	8.7m	Edible oils.
No. 4	153m	9.4m	9.1m	Edible oils.
No. 5	200m	9.9m	9.6m	Bulk cargo.
No. 6	154m	9.9m	9.6m	Steel and general cargo.
No. 7	244m	9.5m	9.2m	Containers.
No. 8	172m	9.5m	9.2m	Grain.
No. 9	180m	9.9m	9.6m	Molasses.
No. 10	226m	8.6m	8.3m	Containers.
No. 11	190m	10.2m	9.9m	Containers.
No. 12	275m	5.4m	5.1m	Containers.
No. 13	172m	9.9m	9.6m	Containers.
No. 14	173m	9.9m	9.6m	Soda ash.
No. 15	213m	9.9m	9.6m	Pulp and paper.
Durban Point Multi-purpose Terminal				
A	288m	11.5m	11.2m	Containers and break bulk.
B	329m	9.9m	9.6m	Containers and break bulk.
M	305m	11.4m	11.1m	Containers and break bulk.
No. 100	276m	9.1m	8.8m	Containers and break bulk.
No. 101	229m	12.4m	12.1m	Containers and break bulk.
No. 102	213m	11.0m	10.7m	Containers and break bulk.
No. 103	235m	12.3m	12.0m	Containers and break bulk.
No. 104	351m	12.2m	11.9m	Containers and break bulk.
No. 105	235m	11.7m	11.4m	Containers and break bulk.
No. 106	213m	12.0m	11.7m	Containers and break bulk.
No. 107	238m	12.2m	11.9m	Containers and break bulk.

Durban—Berthing Information				
Berth Name	Length	Depth Alongside	Maximum Vessel Draft	Remarks
Durban Container Terminal				
No. 108	273m	12.1m	11.8m	Containers.
No. 109	272m	12.4m	12.1m	Containers.
No. 200	236m	12.0m	11.7m	Containers.
No. 201	216m	12.2m	11.9m	Containers.
No. 202	216m	12.6m	12.3m	Containers.
No. 203	305m	12.5m	12.2m	Containers
No. 204	305m	11.4m	11.1m	Containers.
No. 205	305m	11.7m	11.4m	Containers
Island View Storage				
No. 1	230m	12.8m	12.5m	—
No. 2	175m	10.3m	10.0m	Chemicals and edible oils. Maximum vessel loa of 220m. Maximum vessel size of 25,000 dwt.
No. 3	165m	11.1m	10.8m	Bulk and edible oils.
No. 4	175m	9.7m	9.4m	Petroleum products and chemicals. Maximum vessel loa of 220m. Maximum vessel size of 22,000 dwt.
Sapref Island View				
No. 5	175m	10.9m	—	Under repair.
No. 6	175m	10.6m	10.3m	Petroleum products. Maximum vessel loa of 185m.
No. 6 Ext.	—	10.6m	10.3m	Petroleum products. Maximum vessel loa of 100m.
No. 7	230m	12.3m	12.0m	Petroleum products. Maximum vessel loa of 185m. Maximum vessel size of 5,000 dwt.
No. 8	230m	12.3m	12.0m	Petroleum products. Maximum vessel loa of 185m. Maximum vessel size of 63,000 dwt.
Durban SPM	—	49.0m	—	Crude oil. Maximum vessel size of 330,000 dwt.
Salisbury Island				
No. 9	106m	12.5m	12.2m	Petroleum products. Maximum vessel loa of 244m. Maximum vessel size of 47,000 dwt.

Pilotage.—Pilotage is compulsory for vessels entering, leaving, or shifting berths within the harbor or in the approaches.

The pilot boards in the vicinity of the fairway approach buoy about 2.5 miles NE of the harbor entrance.

The pilot boats are equipped with VHF; they have black hulls and white superstructure, with the words PILOTS—LOADS in black.

Regulations.—Oil tankers and ships carrying explosives or dangerous goods are restricted to daytime movements.

Other ships in excess of 200m in length and 26m in beam may not enter at night.

All ships whose beam exceeds 35m are brought into port only when weather conditions are suitable.

Vessel Traffic Service.—Durban Port Control has established a Vessel Traffic Service. The VTS system is mandatory for any vessel over 15m long and all passenger vessels. Durban

Port Control VTS monitors VHF channels 9 and 16.

VTS zones are established at the harbor entrance and at 6 mile and 12 mile radii from Fairway Lighted Buoy (29°50' S., 31°06' E.). When arriving, vessels are to contact the VTS 15 minutes before entering the 12-mile reporting zone, at the 12-mile reporting zone, at the 6-mile reporting zone, and at the harbor entrance. Departing vessels are to contact the VTS 15 minutes before leaving berth, then at each reporting zone listed above.

The VTS regulations that pertain to South African ports can be found in Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

Signals.—TA storm signal is shown as a red light exhibited from the top of the Port Office when a gale is forecast and is maintained until the weather moderates.

The signal tower on The Bluff exhibits the following traffic

signals by day and night:

Day	Night	Meaning
Flag I	One green light	Vessel entering harbor.
Flag H	One red light	Vessel leaving harbor.
Flag P	Flashing red light	Port closed. When the bar is dangerous to cross or impassable, the signal is passed by VHF and by flashing red light.

Anchorage.—The best berth in the anchorage area is in 22m, good holding ground, with S breakwater light bearing 197°, and Anchorage Beacon 254°, but there is no shelter during S and E winds, and a heavy swell always sets in along the coast. In a position farther S, the outgoing tidal currents swing vessels broadside on to the swell, causing them to roll heavily.

A vessel arriving in the road during bad weather should radio for instructions before anchoring. Helicopter services are available.

Anchoring is prohibited within 1 mile of the harbor entrance and also within an area, marked on the chart, on either side of the leading line out to a distance of 3 miles from the entrance. Also, anchoring is prohibited on either side of the sewer pipe which leads in a 128° direction 0.8 mile S of the S breakwater light extending 2 miles.

Directions.—Vessels approaching Durban from SW and having passed Aliwal Shoal may steer for the signal station on The Bluff bearing 020° until the light at Cooper bears 270°. At this time a course of 035° should be steered keeping at least 1 mile offshore. When the signal station on The Bluff bears 270°, the course may be shaped for the anchorage. Vessels approaching the anchorage from the N should avoid the foul ground lying 3.2 miles NNE of Cape Natal.

Durban to Richards Bay

2.24 Between Durban and the Tugela River there are no off-lying dangers. Anchoring off this part of the coast is not recommended, but in an emergency the best holding ground will be in depths of 45m; the bottom is chiefly sand or mud, but there are some patches of rocky ground, a few miles SE of the river's mouth.

Between the Tugela River and Richards Bay reefs and shoals extend 2.5 miles offshore in places. Vessels should keep at least 3 miles offshore and in depths of more than 38m in the vicinity of Glenton Reef; Durnford Point should be given a berth of 7 miles.

Inshore currents between Durban and the Tugela River are weak. In depths of less than 90m they are generally influenced by the wind; in greater depths it is more regular and is SW at rates from 0.5 to 1 knot.

Off Durnford Point, in depths greater than 200m, the current is SW at rates from 1 to 2 knots. In depths of less than 200m, a NE counter current with rates from 0.5 to 1 knot will generally be experienced in fine weather. This NE current is influenced by the wind and with fresh NE winds it rapidly changes direction and flows SW at a rate depending on the strength of the

wind; surveys of this coast have shown the maximum rate of this current when SW was found to be 0.8 knot. Currents setting N and NW with rates from 0.5 to 1 knot were occasionally observed up to 20 miles offshore SE of Durnford Point. This onshore current is a serious danger in the vicinity of this point.

Observations made during the months of May, June, and July provided the following information concerning currents off the coast between Durnford Point and Cape St. Lucia:

Between Durnford Point and Cunge the current was found to be generally SW, with rates from 0.5 to 1 knot at 2 to 3 miles offshore and 2 knots at 11 miles off Durnford Point. At 2 to 3 miles offshore, after a few hours of W winds, the current became NE at a rate of 0.5 to 1 knot and on one occasion attained a rate of 1.5 knots; this NE current quickly disappeared with a change of wind, and it was rare that no current was experienced.

Between Cunge (28°40'S., 32°15'E.) and Cape St. Lucia, the current was always SW to WSW; close to the 200m depth contour the rate was about 3.5 knots, but at 1 to 2 miles offshore the rate was reduced to between 1 and 2 knots. The rate was increased by NE winds and reduced by SW winds.

With a smooth sea, a line of ripples was frequently observed close to the edge of the continental shelf, in depths of 200m the current over the shelf running with considerably reduced strength.

Caution.—In 1961, an abnormal variation was reported to exist between Durnford Point and Cape Vidal, particularly in St. Lucia Bay.

During strong S winds heavy seas may be encountered near the edge of the continental shelf, in depths of 200m, between the Tugela River and Durnford Point.

2.25 The Umgeni River (Mgeni River) (29°49'S., 31°02'E.) flows into the sea 3.5 miles NNW from Durban South Breakwater Light. The river is spanned by a conspicuous bridge.

Aspect.—A radio mast stands 2.8 miles N of the mouth of the Umgeni River; a water tower stands 0.4 mile NE of mast. Another conspicuous water tower stands 0.9 mile NNE of the first water tower.

A measured distance of 1,852m is situated close N of the mouth of the Umgeni River. The S limit is marked by two beacons, 0.1 mile apart, at the river entrance, the N limit is marked by a beacon on the shore and a white pillar on a building 0.6 mile inland. The marks in line bear 295°, and the running course is 025°-205°.

Umhlanga Rocks Light (29°44'S., 31°05'E.) is located 5.5 miles NNE of the mouth of the Umgeni River; the light structure is not easy to identify as it is backed by a conspicuous white hotel. Two dish antenna are situated approximately 1.5 miles NNW of the light.

A wreck, with a least depth of 11m, is situated 1 mile SSE of Umhlanga Rock Light.

2.26 Tugela Bluff (29°14'S., 31°30'E.) is 111m high, black in appearance, and covered with trees. The Tugela River enters the sea close NE of Tugela Bluff and Red Hill, 87m high, rises on the N bank of the river. Red Hill is scarred with red and has a peculiar knob on its summit.

Glenton Reef (29°00'S., 31°44'E.) stretches along the coast for a distance of about 5 miles, and is up to 1.5 miles offshore



Courtesy of Simon Baillie-Cooper

Umhlanga Rocks Light

in places; the depths are generally under 4m and vessels should not approach the shore in depths less than 25m in this area. Tenedos Shoal extends 1.3 miles SSW from the coast in a position 5.6 miles ENE of the N end of Glenton Reef. The 15m curve lies 5.3 miles offshore 7.3 miles ESE of Tenedos Shoal.

Vedette Hill (28°57'S., 31°44'E.), 96m high, has a group of buildings in a clump of trees on its summit; it forms a conspicuous landmark.

2.27 Port Durnford (28°55'S., 31°49'E.) is the name now applied to a small settlement in the plains behind the coastal range some 2.5 miles W of Mainhloyami Hill and about 5 miles NE of Vedette Hill.

Mainhloyami Hill is one of the most prominent landmarks on this coast. The hill appears flat-topped when viewed from the E. A dark bush covered summit, surmounted by a round tree, lies close W of the hill. Durnford, marked by a light and a racon, is situated at the mouth of a river, which is usually blocked by sand, 2.3 miles ENE of Mainhloyami Hill.

Anchorage.—Anchorage may be obtained, in depths of 10

to 12m, coral and sand, with the entrance to the river bearing about 338° and Durnford Point bearing 063°.

Durnford Point, is a rounded point although not prominent but may be identified by the conspicuous Pudding Hill (28°53'S., 32°00'E.) close W of it. Pudding Hill, the most prominent mark in this area, is 79m high, and is thickly wooded. The point and the coast for 2.5 miles each side are fringed, with reefs and depths from 4.5 to 9m, extending 2.5 miles offshore in places; these reefs break in bad weather.

Caution.—A dangerous submerged wreck, with a depth of 8.2m and marked by lighted buoys, lies about 7 miles ESE of the light.

Richards Bay (28°48'S., 32°05'E.)

World Port Index No. 46855

2.28 Richards Bay is a man-made harbor, with a deep draft terminal for bulk commodities.

TRANSNET National Ports Authority

<http://www.transnetnationalportsauthority.net>

Winds—Weather.—The predominant wind direction through the year is NNE and NE (combined occurrence of 41 per cent), fairly often attaining a velocity of about 19 knots. The strongest winds, however, are usually SW (annual average occurrence of 11 per cent), which in winter can exceed 35 knots (winter average occurrence of 2 per cent).

Weather in this area is generally moderate throughout the year, with most of the year's rainfall occurring in spring and early summer. However, on occasion, port movements can be hindered by strong to gale force winds described above.

Visibility is almost invariably excellent. Fog is extremely rare in this vicinity; poor visibility, when it occurs, is due to heavy rainfall and squalls. Occasionally, hazy conditions may be caused by dusty offshore breezes.

Tides—Currents.—Spring tides rise 1.8m and neap tides rise 1.2m.

Depth—Limitations.—The harbor is approached by a dredged channel 700m wide at the seaward end, narrowing to 300m wide at the inner end, where it widens into the harbor itself. The entrance channel has a dredged depth of 24m at the seaward end, gently shelving to 19m where it meets the harbor.

Richards Bay—Berthing Information

Berth Name	Length	Depth Alongside	Maximum Vessel Draft	Remarks
Richards Bay Coal Terminal				
No. 301	350m	18.7m	17.5m	Coal.
No. 302	350m	18.7m	17.5m	Coal.
No. 303	350m	18.7m	17.5m	Coal.
No. 304	350m	18.7m	17.5m	Coal.
No. 305	350m	18.7m	17.5m	Coal.

Richards Bay—Berthing Information				
Berth Name	Length	Depth Alongside	Maximum Vessel Draft	Remarks
No. 306	350m	18.7m	17.5m	Coal.
Multi-purpose Terminal				
No. 606	220m	14.2m	13.5m	Break bulk and containers.
No. 607	220m	14.2m	13.5m	Break bulk and containers.
No. 608	204m	14.2m	13.5m	Break bulk, containers and phosphoric acid.
Dry Bulk Terminal				
No. 609	300m	14.5m	14.0m	Bulk and general cargo.
No. 701	240m	14.5m	14.0m	Bulk cargo.
No. 702	300m	19.0m	17.5m	Bulk cargo.
No. 703	240m	19.0m	17.5m	Bulk cargo.
No. 704	240m	19.0m	17.5m	Bulk cargo.
No. 705	232m	19.0m	17.5m	General and bulk cargo.
No. 801	260m	19.0m	17.5m	Bulk and general cargo.
No. 804	260m	19.0m	17.5m	Bulk cargo.
East Multi-purpose Terminal				
No. 706	200m	14.4m	13.5m	Break bulk and containers.
No. 707	200m	14.4m	13.5m	Break bulk and containers.
No. 708	200m	14.4m	13.5m	Break bulk and containers.
No. 12	275m	5.4m	5.1m	Containers.
JBS Tanker Berths				
No. 208	240m	14.0m	12.5m	Chemicals. Maximum vessel loa of 230m. Maximum vessel size of 63,000 dwt. There is a configuration of 3 floating pontoons extending NE from this berth for the prevention of erosion thus protecting the adjacent coastline.
No. 209	240m	13.7m	12.5m	Chemicals and petroleum products. Maximum vessel loa of 225m. Maximum vessel size of 63,000 dwt.

Berthing details are shown in the accompanying table titled **Richards Bay—Berthing Information**.

Aspect.—**Ntogande Hill** (28°43'S., 32°11'E.), 114m high, is prominent when viewed from the E and NE. A hill, 120m high, 0.8 miles SSE of Ntogande Hill, is more prominent than Ntogande when viewed from the S. The Port Control Office, close N of the root of the N breakwater, is conspicuous. A bluff 56m high and lying 0.6 mile NE of the Port Control Office, is prominent.

Pilotage.—Pilotage is compulsory and is available 24 hours.

The pilot meets the vessels in a position bearing 135°, distant 3 miles from the harbor entrance; vessels should not approach closer until contact has been made with Port Control or the pilot boat. A helicopter pilotage service, available 24 hours, is in operation at Richards Bay. Helicopter rendezvous areas for light draft and deep draft vessels will be advised by Port Control.

Regulations.—The “Regulations for the Harbors of the Re-

public of South Africa” are in force within the Port of Richards Bay.

The VTS regulations that pertain to South African ports are found in Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean.

The VTS will advise vessels of other traffic, berthing arrangements, helicopter and launch services, and pilot arrangements.

Passing vessels are to keep clear of the port limits. Deep draft vessels sailing from Richards Bay are restricted in their ability to maneuver for 4 miles from the breakwaters.

Vessels calling on Richards Bay should report their ETA through Durban Coast Radio Station 48 hours and 24 hours in advance and report through radio reporting points which are charted 20 miles ENE and SSW, respectively, of Richards Bay. The latter reports are made to Vessel Traffic Control when passing through these positions. If the ETA falls on Saturday, Sunday, or Monday, notice must be given before 1200 on the

previous Friday.

Signals.—Traffic signals are shown from a bank of lights shown from the Port Control Office, as follows:

Signal	Meaning
Fixed green lights	Vessel entering harbor
Fixed red lights	Vessel leaving harbor
Flashing red lights	Port closed

When the entrance to the harbor is considered dangerous, this information will be passed by VHF in addition to showing the signal for “Port closed.”

Anchorage.—Anchorage may be obtained about 3 to 5 miles SE of the S breakwater. The bottom is sand; in strong SW and NE winds, caution should be exercised.

A prohibited anchorage area extends ESE from the head of the N breakwater for a distance of about 4 miles; a pipeline extends seaward in an ESE direction, within the restricted area, from a position on shore 0.4 mile NNE of the head of the breakwater.

Richards Bay to Levin Point

2.29 The coast between Richards Bay and Cape St. Lucia, 24 miles NE, is a sandy beach lined with breakers. Landing on this stretch of coast is practically impossible.

Cone Point (28°38'S., 32°18'E.) lies 15 miles NNE of Richards Bay. The coast between these two points should be given a wide berth, especially in fine weather, when the sea is not breaking over the dangers.

Nhlabane Rock (28°41'S., 32°16'E.), with a depth of 5.5m, lies about 1 mile offshore, 3 miles SSW of Cone Point. It is the only charted danger seaward of the 15m curve on this section of the coast.

Neill Peak is a conspicuous thickly wooded hill, rising to a height of 107m, about 3 miles SW of Cone Point. A bare sand hill, 108m high, lying 2.3 miles NNE of Cone Point, appears steep and conspicuous from the E.

A water tank at an elevation of 167m stands 6.5 miles NE of Cone Point.

2.30 Cape St. Lucia (28°31'S., 32°24'E.) is low and sandy; it is marked by a light, whose tower is not easy to identify from a distance. A hill, 164m high, rises close within the cape; there is a reddish sand patch on the seaward slope of the hill. Close N of the cape there are some ledges of light, brown rocks and the cape when seen from the E appears as a group of islands.

From Cape St. Lucia, the coastal ridge consists of hills, which are covered with forest and rise to elevations of 180m before terminating in a bluff 6.5 miles N of Cape St. Lucia Light. For 2 miles NNE of St. Lucia Bay the coast is backed by grassy bush topped hills, from 30 to 45m high, then a ridge of forest covered hills, from 60 to 75m high, extend 4.5 miles farther N where the hills become more open and grassy.

Between Cape Vidal and Leven Point the coastal range is thickly wooded for the first 7 miles and presents a series of summits. North of these summits, the coastal range is from 90 to 120m high and is faced with sand, which in places, extends halfway up its seaward slope.

St. Lucia Bay (28°23'S., 32°26'E.) is the slight bight formed at the entrance of St. Lucia Lake 8 miles N of Cape St. Lucia.

Anchorage.—Anchorage may be obtained, in 18m, about 1.3 miles SE of the entrance to St. Lucia Bay. South of this position the bottom is foul, and farther N the S swell is heavier. The bay, exposed to winds from SSW through E to NE, has a sandy bottom, with good holding ground, the depths gradually decreasing to the shore.

Caution.—In 1961, an abnormal magnetic variation was reported in St. Lucia Bay.

2.31 Mount Tabor (28°15'S., 32°30'E.), 133m high, rises 8.5 miles NNE of St. Lucia Bay. A conspicuous lookout tower, 96m high, stands 1 mile SSW of Mount Tabor.

Cape Vidal (28°08'S., 32°24'E.) is conspicuous from all directions; the land close within rises to Bangazi, a peak 149m high. A long triangular patch of sand, visible when bearing less than 270°, extends to the summit of Bangazi; when seen from the S, three reddish patches appear on it.

The sea usually breaks on the below water rocks, which extend about 0.2 mile offshore, about 1 mile S of Cape Vidal. A light stands on the shore W of these rocks.

Mahlonza, situated on the coastal range 2.5 miles N of Cape Vidal, rises to a height of 171m. This hill and King Oscar Hill, 161m high, 2 miles farther N, are prominent.

Leven Point (27°55'S., 32°36'E.), 12 miles N of Cape Vidal, may be recognized by St. Marys Hill, close N of which are two broad sandy strips extending from the base to the summit of a high neck of land. These strips are visible when bearing less than 270° and serve to identify Leven Point from N. From S, Leven Point appears flat and sandy.

Levin Point to Maputo

2.32 Between Leven Point and Red Sand Cliff the coast is backed by wooded hills faced with sand. Gipsy Hill (27°48'S., 32°36'E.), 125m high, situated 8 miles N of Leven Point is the only distinctive feature on this stretch of coast.

Red Sand Cliff (27°43'S., 32°37'E.) forms the seaward face of Ochre Hill, which has an elevation of 115m; the sea in the vicinity is sometimes discolored by red soil eroded from the base of the cliff.

Between Leven Point and Red Sand Cliff, there is a narrow ridge of rock and coral, connected to the coast about 2 miles N of Leven Point, extending 1.3 miles NNE to about 0.6 mile offshore. This ridge is steep-to and has depths from 3.6 to 5.5m. Another shoal with a least depth of 5.5m, lies parallel, with the coast, 0.8 mile offshore, about 6 miles NNE of Leven Point. The sea seldom breaks over these steep-to reefs and it is advisable to keep in depths of more than 55m when off this stretch of coast.

Between Red Sand Cliff and Sordwana Road, there are three distinctive summits. From S to N they are Nkonyane (27°38'S., 32°39'E.), 121m high; Mbumba, 134m high; and Ntabende, 137m high. They lie 48 miles NNE, 6.8 miles NNE and 9 miles NNE, respectively, of Ochre Hill.

Ntabende is a conical hill, with a flat top; there are prominent sand intrusions on either side of it.

From Ntabende, the coastal hills become lower and termi-

nate in a prominent dark bluff, 37m high, covered with trees and bushes, close within Jesser Point.

2.33 Jesser Point (27°33'S., 32°41'E.) is low and fringed with rocks extending 0.4 mile N; the sea breaks heavily on the rocks. A light stands close SSW of Jesser Point.

Sordwana Road (27°33'S., 32°43'E.), open to winds from seaward between NE and SW, lies 2 miles N of Ntabende and is no better than other open anchorages on this coast. The holding ground is not good, being partly rock, and nearer the shore it is worse. There is considerable swell and strong onshore winds render the anchorage untenable.

The point on the S side of the bay has a dark bluff, 46m in height, within it is covered with scrub and is conspicuous from seaward.

Temporary anchorage, about 0.5 mile offshore, in 12m, may be found in the bay NNE of a projecting point which affords slight shelter, with the point bearing 203°, distant about 0.5 mile.

2.34 Sordwana Point (27°26'S., 32°43'E.) is sandy and is backed by a heavily-wooded bluff. Dumile Hill, which is conspicuous from all directions, is dome shaped and rises to a height of 134m, 0.9 mile N of Sordwana Point. A beacon stands on the shore about 0.6 mile SSW of the point.

A below-water reef, which usually breaks, lies 0.2 mile offshore abreast Dumile Hill. A similar reef, also 0.2 mile offshore, lies 1.5 miles farther NNE.

Island Rock (27°17'S., 32°47'E.), which is a black outcrop, drying about 1m, lies close offshore 3.5 miles NNE of Hully Point. Normally the sea breaks heavily over the outcrop and the spray, which can be seen from a distance, will indicate its position.

Black Rock Point (27°08'S., 32°50'E.) is a conspicuous grassy projection 18m high, about 9 miles NNE of Island Rock; it extends 0.15 off the beach. From a distance, the point sometimes has the appearance of a vessel close inshore.

Black Rocks are some remarkable rocks 3.7m high situated on the beach 3.5 miles NNE of Black Rock Point.

The Kosi River discharges 11 miles NNE of Black Rocks. Anchorage, which is no better than other anchorages on this exposed coast, may be taken up off the Kosi River, in 11.9 to 18.3m, but the entrance should not bear N of 250°, the bottom having many rocky patches when S of that line.

Between the Kosi River and Ponta do Ouro, 3 miles NNE, the coast consists of a sandy beach backed by bush topped hills faced with sand, rising to 100m in height.

2.35 Ponta do Ouro (26°51'S., 32°54'E.) is a dark low cliff. Monte do Ouro, close within the point, rises to an elevation of 120m. A light is exhibited at this point.

From Ponta do Ouro, the coast trends in a NNE direction to Cabo da Inhaca. Cabo da Inhaca is the S entrance point to Baía de Maputo. From Ponta do Ouro to a position 7 miles SSW of Cabo da Inhaca, the coastal hills are from 60 to 120m high, and close to the N part of this area they are thickly wooded.

Pico Florenco (26°45'S., 32°54'E.), 118m high, is one of three prominent peaks situated 6 miles N of Ponta do Ouro; a tripod beacon, stands on this peak.

Ponta Dobela, marked by a prominent white beacon, is situated near the coast 13.5 miles N of Pico Florenco.

Baixo de Sao Joao (26°21'S., 32°58'E.), a rocky shoal with, a depth of 9.1m, lies 1.8 miles offshore 10 miles NNE of Ponta Dobela.

Rocha Ulue (26°16'S., 32°57'E.) is a conspicuous mark resembling the hull of a capsized vessel. It is 52m in length and about 15m high.

Dundas Hill rises 75m, and has two diagonal crossing sandy roads on its seaward slope. These roads form a conspicuous landmark for vessels approaching from the S.

2.36 Cabo de Santa Maria (26°05'S., 32°58'E.) is the N extremity of the Peninsula de Santa Maria. A round-topped peak, 87m high, is situated 0.5 mile S of the cape. Baixo de Santa Maria, a rocky shoal with a least depth of 14.6m, lies 2.5 miles ESE of Cabo de Santa Maria.

Ilha da Inhaca (26°00'S., 32°58'E.) lies close N of the Peninsula de Santa Maria on the SE side of the entrance to Baía de Maputo. Ponta Torres, the S extremity of Ilha da Inhaca, is separated from the peninsula by an inlet 0.3 mile wide; the channel lies on the S side. The sea frequently breaks on the bar across the inlet, where there are dangerous rocks. Monte Botelho, 87m high, rises near the coast 2.8 miles NNE of Ponta Torres. Monte Inhaca, 2.3 miles NNE of Monte Botelho, is dome-shaped and wooded; it is surmounted by a beacon.

Cabo da Inhaca (25°58'S., 33°00'E.), the NE extremity of Ilha da Inhaca, is a sandy point, rising to a square-topped sandy hummock, which shows up against the darker land behind it. A light is situated on a sand hill about 0.4 mile SW of Cabo da Inhaca; it has been reported (1991) that haze during the day obscures the light structure. A signal station is located near the light.

Baixo Danae (25°54'S., 33°03'E.) lies about 5 miles NE of Cabo da Inhaca. The sea breaks heavily on the shoal in all types of weather. A current of 1.5 to 2.5 knots sets onto the shoal from SE at all stages of the tide, and especially after strong SW or SE winds.

Maputo (Lourenco Marques) (25°58'S., 32°35'E.)

World Port Index No. 46870

2.37 Maputo is located at the head of Baía de Maputo (Baía de Lourenco Marques), the port consists of a city and a medium-sized natural harbor. Baía de Maputo is entered between Cabo de Inhaca and Ponta da Macaneta (25°52'S., 32°45'E.).

Port Maputo

<http://www.portmaputo.com>

Winds—Weather.—Because of the position of the port, land and sea breezes are quite marked. Land breezes are most noticeable between April and August and are least noticeable in November and December. The breeze usually commences about midnight and dies away between 0900 and 1000. West winds are rare after midday except when the “hot wind” is blowing from NNW, and it is only when N or S winds blow very strongly that it does not veer to the W quadrant during the night.

The “hot wind” is a hot, dry wind from NNW which blows down from the high plateau of central Africa. It usually lasts

only a few hours, giving place to a short calm of 20 minutes duration, when the S wind breaks out with violence, sometimes reaching gale force, bringing dust storms which are less frequent here than in other localities of South Africa.

From October to March, the hottest and dampest months, these winds, alternating with the cold S wind, make the climate unpleasant. There is, however, some relief in the sea breeze and in the rarity of calm. Moderate winds are most frequent, with light breezes at night.

The average wind for the year is force 4 on the Beaufort Scale with the highest wind average from September to November and the least from February to April. The wind reaches its daily peak about 1700 and the least at 0200.

The weather is pleasant from June to October when there are bright sunny days and the temperature in the shade seldom rises about 27°C, except with a “hot wind,” or falls below 16°C but the other half of the year contrasts most unfavorably with this period.

Gales from SW of 36 hours duration are not infrequent, the wind then drawing to the S, and the weather becoming fine at SE, after which the wind draws gradually to NE, continuing fine for a few days. Bad weather always comes on with winds between W and S, improving as the wind draws to E. A gale from S of hurricane force was experienced in the middle of October.

From April to October, the sea breezes blow with less force, calms are more frequent, and rain only falls on from 2 to 6 days in a month, where as in the opposite season it may fall on about 11 days in the same period.

Tides—Currents.—Seaward of the line of shoals fronting the bay the N current or that of the incoming tidal current, with a maximum spring velocity of 2 knots, sets obliquely across Canal do Sul, with a strong indraft; caution must be observed in transit. The outgoing tidal current sets in the opposite direction.

Within the line of shoals the SW current, or incoming tidal current, sets over Xefina Grande Bank, and enters Rio Espirito Santo with maximum rate of from 1 to 3 knots at neaps and springs, respectively, the other current setting in the opposite direction at the same rate.

Depths—Limitations.—The approaches to Maputo are

greatly encumbered by shoals. Though there are several channels between these shoals, only Canal do Sul and Canal do Norte are marked.

Berthing details are shown in the accompanying table titled **Maputo—Berthing Information.**

A channel maintained to 11m has been dredged into the port. The main wharf has alongside depths of 9 to 10.1m and will accommodate 12 vessels. A depth of 3.3m is charted at the SE end of the wharf while a depth of 4.9m is charted close off the NW end. Container and ro-ro facilities are available.

It should be noted that the depth over the bar will govern the draft of vessels permitted to enter the harbor.

Aspect.—The following objects positioned from Ponta Vermelha (25°59'S., 32°36'E.) are prominent:

1. A church, 1 mile NNE.
2. The Cathedral, 1.5 miles NW.
3. The Harbor Office, 1.3 miles WNW.

Pilotage.—Pilotage is compulsory and available 24 hours. The vessel's ETA and draft should be reported up to 48 hours in advance.

Anchorage.—Anchorage may be taken in the approach to Canal do Sul, in depths of 14 to 17m, with Cabo da Inhaca Light bearing 159°, distant about 3 miles. Anchorage is available, in 12m, with Macoma Light (25°41'S., 32°46'E.) bearing 313°, 4 miles distant.

Good anchorage can be had in the port, in 10 to 13m, with the light structure at the entrance of the camber near the offices of the port captain bearing 170°, distant 0.4 mile. Portinho da Inhaca is an anchorage lying off Black Bluff, the NW extremity of Ilha da Inhaca.

Good shelter is afforded, from 10 to 20m, from all winds except those from SW, which raise a sea at the anchorage. The shoals in the vicinity are of a shifting nature, and local knowledge is required when taking a berth at the anchorage.

Machangulo Bay is the SE part of Baía de Maputo. There is anchorage, in about 7m, in a narrow space at the head of the bay.

The explosives anchorage is up the river near the entrance of the Rio Matola.

Maputo—Berthing Information			
Berth Name	Length	Depth Alongside	Remarks
Maputo			
No. 3	225m	4.2-7.2m	Small ro-ro and passengers.
No. 4	225m	4.2-7.2m	Small ro-ro.
No. 5	227m	12.0m	Breakbulk, bulk, and ro-ro.
No. 6	55m	7.6-8.0m	Breakbulk, bulk, and ro-ro.
No. 7	94m	5.8-11.7m	Bulk, molasses, and liquid cargo.
No. 8	46m	11.6-11.8m	Refrigerated cargo.
No. 8	154m	11.6-11.8m	Refrigerated cargo.
No. 10	149m	12.0m	Sugar, break bulk, and bulk cargo.
No. 10	251m	12.0m	Sugar, break bulk, and bulk cargo.

Maputo—Berthing Information			
Berth Name	Length	Depth Alongside	Remarks
No. 11	60m	12.0m	Sugar, break bulk, and bulk cargo.
No. 12	200m	12.0m	Containers and break bulk.
No. 14	253m	12.0m	Containers.
No. 15	185m	12.0m	Bulk and break bulk cargo.
No. 16	172m	12.0m	Break bulk and bulk cargo.
Matola			
TCM	220m	12.0m	Bulk cargo.
Petroleum Terminal	230m	12.0m	Petroleum products.
Aluminum Terminal	210m	14.0m	Aluminum.
Grain Terminal	210m	12.0m	Grain.

A quarantine anchorage lies 0.5 mile S of Ponta Vermelha.

Unless directed by the pilot, anchorage is prohibited in the river to the NW of a line extending 210° from the light on the S side of the entrance of the camber to the opposite shore.

Directions.—The light structure on Black Bluff, marked by Quartel Light in range with Ponta dos Elefantes (Gibao Point), the W extremity of Ilha dos Portugueses, bearing 157°, leads E of Baixo Fawn, Xefina Grande Bank, and Barra do Incomati.

Mariner are advised to take special caution when passing Buoy No. 10 in Canal da Xefina, where vessels have tended to yaw up to 14°. Lights and buoys in Maputo Bay have been reported extinguished and many buoys are not in their charted position or are missing. Other navigational aids have been reported unreliable.

Caution.—A magnetic anomaly in Baía de Maputo causes the variation to change rapidly, giving deflections from -2° to +3° from the normal.

Maputo to Ponta da Barra

2.38 Between **Monte Cutfield** (25°34'S., 32°51'E.), which is marked by a light reported (1991) to be obscured by trees, and Ponta Pajini the coast consists of sandhills and ridges backed by grassy hills, with trees and bushes on them.

Several shoals with depths of 6.7 to 10.4m fringe the coast and lie as much as 7 miles off the coast from Mabjetxine to the sand dune; heavy tide rips, possibly caused by the uneven depths, have been observed.

Baixo da Lagoa (25°25'S., 33°12'E.), a narrow ridge of rock and sand with a least charted depth of 4.6m, lies 4 miles offshore ESE of the conspicuous sand dune.

Ponta Padjini (25°20'S., 33°14'E.) is a dark rocky bluff 75m high. From close inshore it has an irregular and broken appearance; there are several other similar small cliffs in the vicinity. A conspicuous sand dune lies 0.5 mile N of Ponta Padjini.

Between Ponta Padjini and Rio Limpopo the coastal hills are moderately bare; for the first 10 miles they are a light color, but then they become darker and higher.

2.39 Ponta Chiluela (25°17'S., 33°19'E.) is rocky and

projects from the base of the sandhills, close to the HW mark, to form a small cliff 4m high. Three detached rocky shoals, with depths of 10.4, 5.5 and 9.4m, lie 2.7 miles offshore between the above two points.

Rio Limpopo (25°13'S., 33°31'E.) flows into the sea and the entrance is well defined. About 1 mile inland there is a conspicuous red-topped hill. Discharge from the river may extend 3 or 4 miles seaward from the river's entrance, and will be noted by the color.

Between Rio Limpopo and Boa Paz (24°58'S., 34°10'E.) depths of 35m are found at a fairly constant distance of 3 to 4 miles from the coast, except off Boa Paz Light, where these depths are found within 2 miles of the coast from about 5 miles.

Baixos de Inhampura, with depths less than 11m, extend parallel with the coast for 10 miles from a position 4.5 miles E of the mouth of Rio Limpopo. The shallowest part of the shoal, with a depth of 1.5m, lies 9.5 miles ENE of the mouth of the river.

Inland, 4 miles ENE of Rio Limpopo, a conspicuous sand dune considerably higher than the surrounding country, rises to a height of 89m. Kaixaventuane, a summit 112m high, lies 12 miles farther ENE.

A light is exhibited at Boa Paz (24°58'S., 34°10'E.) from a tower, 8m high. The coast at Boa Paz is about 66m high.

2.40 Baixos da Boa Paz (24°57'S., 34°27'E.) are formed by a bank of stones, with depths less than 5.5m, which extends along the coast from the vicinity of Boa Paz for a distance of 15 miles. A 2.7m patch, which breaks, lies 8 miles ENE of Boa Paz, about 0.25 offshore. A 1.7m patch lies 0.8 mile offshore 3 miles farther ENE. This patch is dangerous as the sea does not break on it.

Detached patches, with depths of 16m and 17m lie, respectively, 2.3 miles SE and 4.5 miles E of the 1.7m patch.

Quissico Light (24°45'S., 34°48'E.) is exhibited from a tower, 6m in height, and is situated on a dune 51m high, about 37 miles ENE of Boa Paz. A shoal, with a depth of 8.9m, lies 4 miles S of Quissico Light.

A hill, 173m high, stands 2.2 miles inland, 11.7 miles NE of

Quissico Light.

Ponta Zavora (24°31'S., 35°12'E.), 25 miles NE of Quissico Light, has no conspicuous features, but 1.7 miles to the N there is a remarkable sand cliff nearly 0.5 mile in length. Ponta Zavora is marked by a light and a racon; there is a signal station at the light.

2.41 Cabo Das Correntes lies 30 miles NNE of Ponta Zavora and Ponta da Barra lies about 19 miles farther N. The hills lie 2 to 4 miles inland and rise to heights of over 180m. Heavy breakers have been seen along this coast up to 3 miles distant offshore.

Rocky patches fringe the coast for 8.5 miles NE of Ponta Zavora. A rocky patch with 8.2m lies 3 miles NE of the point, 1.2 miles offshore; another rocky patch, with 3.8m, lies 1 mile offshore 2.7 miles farther NE.

Cabo das Correntes (24°06'S., 35°30'E.) is a rounded sandy

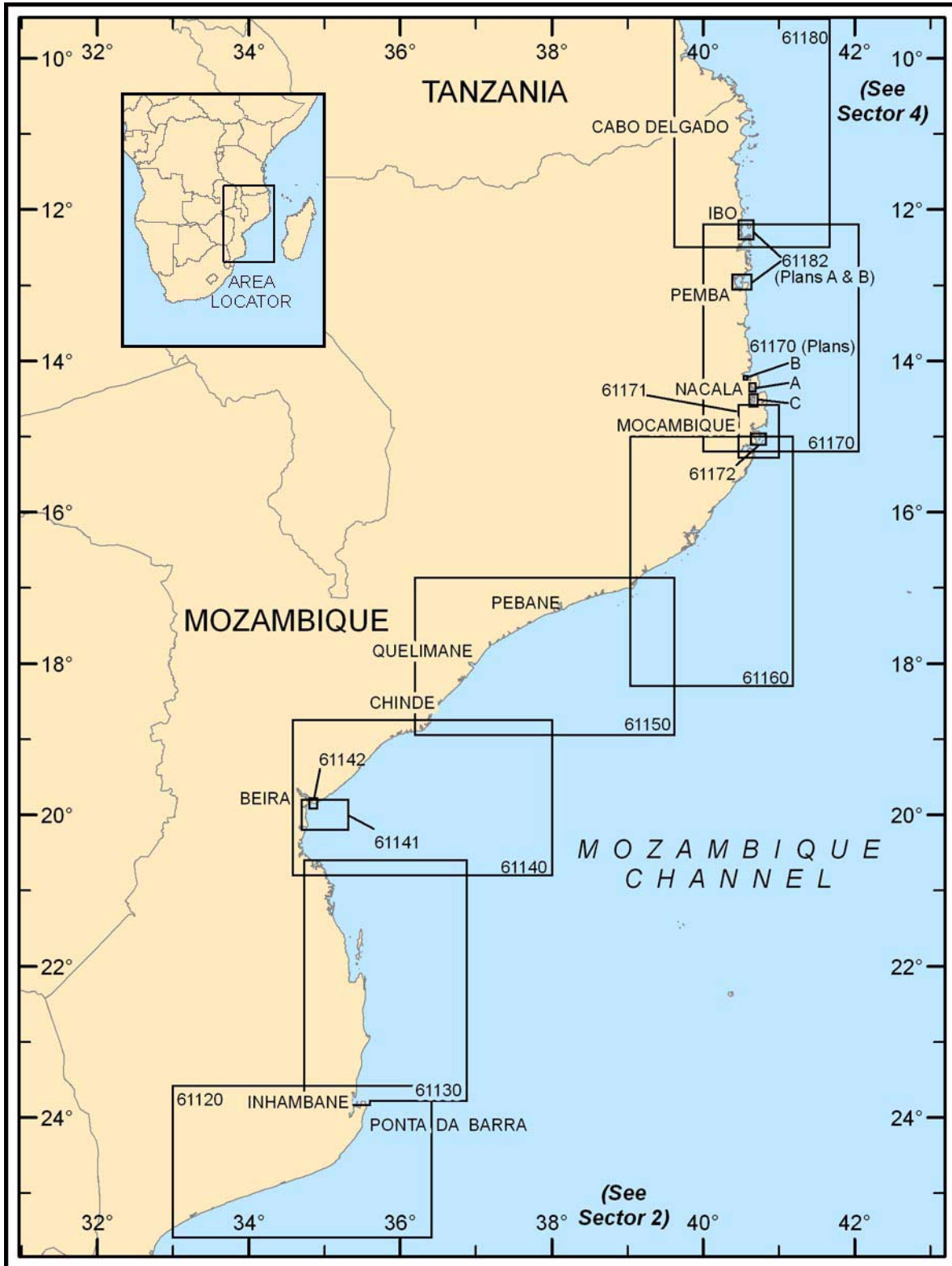
point, which may be identified by a few detached black rocks fringing it; an islet 5m high is situated 2.8miles SSW of the cape and is connected to the coast by a rock reef.

Between Cabo das Correntes and Cabo Inhambane (23°52'S., 35°33'E.) the coast consists of sandhills, when seen from a distance have the appearance of chalky cliffs, they are visible for quite a distance.

Cabo Inhambane is a small rocky point backed by a grassy, conical hill, 61m high.

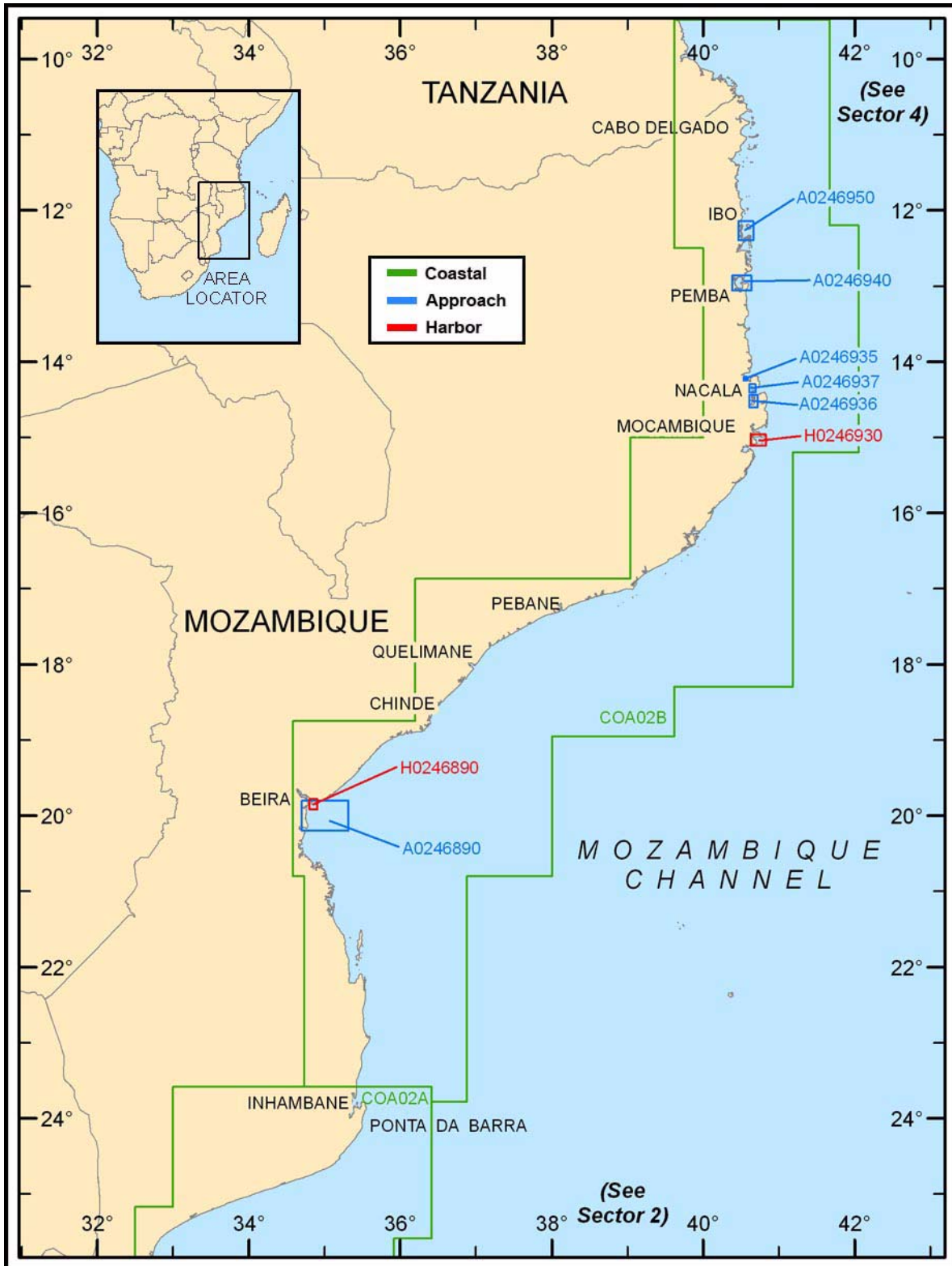
Ponta Tofo, a small rocky point fringed by a reef extending 0.3 offshore, lies 1 mile NNW of Cabo Inhambane.

Ponta da Barra (23°47'S., 35°32'E.), 3.7 miles NNW of Ponta Tofo, is low and is fringed by a reef extending nearly 0.5 mile NE. Within, the point rises to an elevation of 59m, 1 mile SW; this hill has a clump of trees on it which make it easily identified from the N. Ponta da Barra is marked by a light, with a signal station situated near it.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 3 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 02 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 3 — DNC LIBRARY INFORMATION

SECTOR 3

MOZAMBIQUE—BAIA DE INHAMBANE TO CABO DELGADO

Plan.—This sector describes the SE coast of Africa, on the W side of Mozambique Channel, from Baia de Inhambane NNE to Cabo Delgado.

General Remarks

3.1 Between **Ponta Algoa** (23°39'S., 35°26'E.) and Ponta da Barra Falsa the coast has no conspicuous features, but 10 miles to the S of the latter point the Sylvia Ridge, of bare sand, is 114m high; this ridge is of a reddish color.

The coast between Ilha Santa Carolina (21°37'S., 35°20'E.) and Ponta Macovane is little known.

Between the Rio Sofala (20°10'S., 34°45'E.) and the Rio Buzi, the land is low and there are no landmarks.

Between Ponta Macuti (19°51'S., 34°54'E.) and the Rio Sofala (20°10'S., 34°45'E.) and the Rio Sambazo, the coast rises slightly and is bounded by a range of low sand hills. At about mid distance the sandhills are somewhat noticeable, as here there are a number of sharp pointed hills about 61m high, resembling pyramids, and rendered more conspicuous through being without vegetation, as the surrounding country is thick jungle. From the Rio Sambazo to the W entrance to the Rio Zambezi, the land is lower.

Between the Rio Chinde (18°34'S., 36°29'E.) and the Rio dos Bons Sinais, the coast is so low that it is seldom seen from the deck of a vessel from a distance of 7 miles.

Between the Rio Bazar (18°25'S., 36°38'E.) and the Rio Linde, the coast becomes somewhat higher; near the latter are some clumps of trees, while a short distance to the SW of the Rio Linde are some sandy cliffs which are conspicuous with the morning sun.

Caution.—**Vines Bank** (Bank Vines) (18°51'S, 43°00'E.), reported in 1871, dries 0.6m over a diameter of about 13m; depths of 3m to 6.7m exist up to 0.1 mile from this bank.

A bank, with a depth of 44m, is charted in position 18°18'S, 41°41'E, at the S end of Davie Ridge; discolored water and overfalls have been reported in the vicinity, but the existence of the bank is doubtful.

Baia de Inhambane to Beira

3.2 **Baia de Inhambane** (23°44'S., 35°30'E.), entered between Ponta da Barra and Ponta Algoa, is almost completely obstructed by banks and breaking reefs which dry in places.

Porto Inhambane is approached by a channel, which leads close to the W shore of Baia de Inhambane. There are two bars in the channel and both are subject to constant change.

The outer bar lies across the channel 3 miles ESE of Ponta Algoa.

The inner bar, where the navigable channel is very narrow, lies about midway between the outer bar and Inhambane. This bar is formed by a number of shoal patches, with depths less than 3m, lying about 1 mile SE and 2 miles SSE of Ponta da Linga-Linga.

3.3 **Inhambane** (23°52'S., 35°23'E.) (World Port Index No. 46880), at the head of Baia de Inhambane on the E side of the Rio Inhambane, lies 9.7 miles WSW of Ponta da Barra. The port consists of a town and a very small natural harbor

Winds—Weather.—There is always a heavy swell on the outer bar and with winds between N and SE of more than force 3, vessels should cross on the flood tide as near as possible to HW.

Tides—Currents.—Spring tides rise 3.4m and neap tides rise 2.1m. The tidal currents run with a velocity of from 2 to 4 knots on the bar, and from 1.5 to 2 knots at the anchorage abreast the town. At ebb tide, the current sets toward the pier.

Depths—Limitations.—The outer bar, the outer edge of which lies 3.5 miles ESE of Ponta Algoa, is a shifting one, moving considerably N or S as influenced by the wind or other causes. The Rio Inhambane, although forming a good harbor for vessels of moderate draft and having a fairly wide entrance, is scarcely navigable for a vessel beyond the town, about 14 miles from the bar.

Inhambane Pier is T-shaped and projects into the river. Vessels are to berth at the 115m long head of the pier, where there are depths of at least 6.1m alongside.

Aspect.—Ponta Chicique (23°47'S., 35°21'E.) is a conspicuous sandy cliff.

Pilotage.—There is no official pilot, but someone with local knowledge can be made available to assist a vessel entering provided at least 6 hours notice of the time of arrival at the fairway buoy is given to the Port Captain. Local knowledge is essential for entering Inhambane.

Directions.—Local visibility conditions make it advisable that entry should be made on the morning tide.

Caution.—Because of its shifting nature, vessels should not attempt to cross the outer bar without a pilot, unless in possession of the latest local knowledge.

There is always a heavy swell on the bar, and during strong SE winds, the sea often breaks over it, while the ebb tide is running. In such circumstances vessels, with a draft in excess of 3m should await the flood tide before attempting to enter.

3.4 Between **Ponta Algoa** (23°39'S., 35°26'E.) and Ponta da Barra Falsa the coast is backed by hills 130 to 190m high. The only remarkable feature on this part of the coast is a prominent ridge of bare, reddish colored sand, with a fringe of green brush at its base, which lies close to the sea about 10 miles S of Ponta da Barra Falsa.

Baixo Silva (23°06'S., 35°34'E.) is a narrow strip of coral, with depths of 5 to 8.2m. The shoal lies 3 miles off and parallels the shoal for about 3 miles.

Ponta da Barra Falsa (22°55'S., 35°37'E.) is a low point rising to two small conical sandhills, about 29m high. A considerable amount of sand around the high land over the cape makes it conspicuous from the N. Good shelter may be obtained under the cape during S winds. A light is exhibited on the summit within Ponta da Barra Falsa.

Shivala Cliffs (22°45'S., 35°30'E.) are remarkable red cliffs reaching an elevation of 37m. The cliffs extend N for about 3.5 miles and are prominent, especially during the forenoon.

Maxecane (22°31'S., 35°31'E.), a hill 135m high, stands close inland 12 miles N of Shivala Cliffs. The coastal hills in the vicinity are about 100m high and are red; the cliffs on the seaward slope are a darker red.

A remarkable sand spit, partially covered with scraggy trees and bushes, extends 8 miles N from a position 14 miles N of Maxecane.

Sao Sebastiao Light is exhibited from a position near the S extremity of the above sand spit.

3.5 Cabo Sao Sebastiao (22°05'S., 35°28'E.) is a steep bluff, 69m high, which from the S shows a small white sand patch on its upper part, while from the N the face of the cliff shows a considerable amount of red sand from base to summit.

Baixo Zambia (22°46'S., 35°35'E.), a coral bank with a least depth of 5.5m, lies 3.7 miles offshore 9.5 miles N of Ponta da Barra Falsa.

Baixo Africa, with a least depth of 4.8m, lies close within the 20m curve 3.5 miles E of Maxecane.

A rocky shoal, with a depth of 5.1m, lies 1 mile offshore 2 miles SSE of Sao Sebastiao Light.

Ilhas dos Bazarutos are a group of islands and sandy islets lying up to 14 miles offshore between Cabo Sao Sebastiao and Ponta Inhassoro (21°35'S., 35°15'E.), 33 miles NNW.

Drying banks almost completely fill the S part of the area, which has not been fully examined, and extend some miles E of the islands.

The low coast of the mainland is about 12 miles within the line of breakers at the edge of the drying banks and is indistinct from seaward.

The currents run strongly about Ilhas do Bazarutos, especially on the falling tide.

3.6 Ilha Magarique (21°58'S., 35°26'E.) is 53m high; it may be recognized by some red cliffs in the S part.

Ilha do Bazaruto lies with Ponta Dundo (21°48'S., 35°27'E.), its S extremity, about 18 miles N of Cabo Sao Sebastiao. The S extremity of the island rises to a prominent bare hill about 90m high, then it is low for a distance of 4 miles N where it again rises to a bare ridge about 90m high, which extends N for 12 miles before it slopes down to Ponta Dom Carlos.

A light is shown from the N part of Ilha do Bazaruto just S of Ponta Dom Carlos (21°31'S., 35°29'E.).

Caution.—Vessels approaching Beira from S should pass about 10 miles off Ponta Dom Carlos Light before setting course for the lighted sea buoy.

3.7 Baia Do Bazaruto (21°44'S., 35°21'E.) is entered between Ponta Dom Carlos and Ponta Inhassoro (21°35'S., 35°15'E.), on the mainland about 11 miles WSW. Numerous drying banks encumber on considerable part of the bay.

Ilha Santa Carolina (21°37'S., 35°20'E.), marked on its N end by a light, is situated in the SW part of Baia do Bazaruto; it is low, but well wooded and has a sandhill on its NE side.

Anchorage.—Anchorages are available in the bay and are approached between the W edge of the bank, which extends SW from Ponta Dom Carlos and a shoal bank about 3 miles

WSW, the depths in the entrance being from 18.3 to 22m, decreasing to 12.8m and 14.6m at the anchorage about 3.5 miles SW of Ponta Dom Carlos, and to 5.5m and 9.1m at the anchorage lying about 0.3 mile NE of Ilha Santa Carolina.

A pilot may be obtained to take a vessel to the anchorage off Ilha Santa Carolina, and, as the channel is not buoyed, vessels without local knowledge should not attempt to proceed to the anchorage without one.

Anchorage may also be obtained, in more than 18m, about 4.5 miles W of Ponta Dom Carlos.

A vessel found anchorage, sheltered from S winds, on the NE side of Ponta Dom Carlos Spit.

3.8 Between Ponta Dom Carlos and Beira, the 200m curve diverges from 3 miles off Ponta Dom Carlos to more than 70 miles offshore at Beira. Within the 200m curve, the bottom is irregular. Numerous isolated shoal patches, with depths of less than 20m, may be encountered up to 45 miles offshore, and depths of less than 9m may be encountered about 25 miles offshore.

The area between the latitudes of Ponta Dom Carlos and Ponta Macovane (21°10'S., 35°07'E.) should be navigated with great caution on account of the numerous detached shoals which lie within depths of less than 50m. The outermost of these dangers is an 8m patch situated 16 miles NNE of Bazaruto Light, in depths of 30m.

Porto de Bartolomeu Dias (21°10'S., 35°07'E.) is entered between Ponta Macovane and Ponta Mafomene, about 5 miles NNW.

Tides—Currents.—On the ebb tide, a strong SE current sets across the outer range line.

Depths—Limitations.—The channel is encumbered by a bar, with depths of from 4.3 to 5.5m, about 1 mile NW of Ponta Macovane, and narrows to its least width, of 0.2 mile between 5m curve, about 1 mile SSE of the bar.

Local knowledge is required.

Ponta Machanga (20°56'S., 35°07'E.) is the N extremity of Inhanduge, an island in the delta of the Rio Save. The Rio Save flows into the sea from several shallow mouths, which extend over an area of about 7 miles. Inhanduge is the outermost of the islands in this delta.

The depth in the river entrance was reported to be less than 1.2m; the charted spar buoy off the N entrance to Rio Save is no longer in place.

Ponta Ingomaimo (20°42'S., 35°E.) is low and sandy. This point is marked by a light and, since it has no mangroves, it varies from other points in the area. This part of the coast is fronted by shallow ridges, extending nearly 30 miles E. As the land is just visible from the outer edge, care and attention to the soundings must be taken when approaching this locality.

3.9 Porto de Chiloane (20°37'S., 34°53'E.) is entered through North Channel close N of Ilha Chiloane. North Breakwater, a sand bank with a least depth of 1.2m, lying about 4.5 miles NE of Ponta Chingune, is a continuation of the extensive bank which fringes the coast N of Ilha Chiloane.

Tides—Currents.—The HW at full and change at Ilha Chiloane is 4 hours 49 minutes; spring tides rise 5.6m and neap tides rise 3.9m. The tidal currents attain a velocity at times from 3 to 4 knots; they set strongly across North Breakwater

and North Channel.

Depths—Limitations.—North Channel has a least depth of 2.4m on its bar.

Aspect.—As Ilha Chiloane is low and in many places is only a mangrove swamp intersected by creeks. It has no features, which can be identified from SE. The SE extremity of the island appears as a low bluff when seen from NE.

Pilotage.—It is not advisable to enter either North Channel or South Channel without a pilot. Vessels usually embark a pilot at Inhambane.

Local knowledge is required.

Ilha Buene (20°27'S., 34°41'E.) contains an anchorage, known as Port Buene, that is about 3 miles in length by 2 miles in width, with depths from 5 to 8.8m; it is frequently used by small vessels sheltering from bad weather.

Caution.—Vessels should not approach the coast, within a distance of 8 miles between Baia de Sofala (20°11'S., 34°43'E.) and the Rio Buzi, about 20 miles N. Within 50 miles of Beira the bottom is irregular and numerous shoals lie in the tracks of shipping approaching the port from both S and E. Caution is necessary when navigating in the whole of this area.

3.10 Banco de Sofala (20°25'S., 35°27'E.), extending 70 miles E of Baia de Sofala, is an extensive bank which has depths less than 75m; its E edge has not been completely examined.

About 32 miles ENE of Ponta Chingune (20°37'S., 34°53'E.) are isolated shoal depths of 11m; off Ponta Macuti, in the approach to Beira, there are many shoals, with depths less than 10m. A magnetic anomaly has been reported in the vicinity of position 20°00'S, 35°30'E.

Beira (19°50'S., 34°50'E.)

World Port Index No. 46890

3.11 Beira, the second most important port in Mozambique, is located on the E bank of the Rio Pungoe; the port consists of a town and a medium sized natural harbor.

Winds—Weather.—Winds are mainly S or SE in the early morning, but become E or SE in the afternoon throughout the year. Between September and April, strong S winds sometimes cause heavy seas on Banco de Sofala and in the entrance channels. The wet season (October to April or May) is the most uncomfortable, the worst months being April and May, but in the four following months the weather becomes more pleasant.

Tides—Currents.—The mean HW interval at Beira is 4 hours 34 minutes; spring tides rise 6.4m and neap tides rise 4m.

The rise of the river, closely resembling that of the Rio Zambezi, begins in December or January, attaining its maximum height about March, when beginning to fall; it reaches its minimum about the end of August, remaining so until October or November.

The tidal currents are very strong, especially in the wet season, with a high river, when the outgoing tidal current may attain a velocity up to 6 knots at springs and from 2 to 3 knots at neaps. In the dry season when the river is low, the velocity of the outgoing tidal current at springs is 4 knots, and at neaps is from 1.5 to 2 knots. The incoming tidal current has a velocity from 1 to 3 knots. The greatest velocities occur near HW.

During springs, the outgoing tidal currents run from 7 to 8 hours and the incoming tidal current from 4 to 5 hours, with hardly any period of slack water.

Allowance should be made for the effect of the tidal currents when entering or leaving, as they set obliquely across the channels in places; neglect of this precaution often leads to vessels grounding, but as the bottom is soft, they usually get off without damage.

Navigation is considered somewhat difficult because of the shallow water and strong currents. The area adjacent to Pungoe Wharf is subject to countercurrents, depending on the strength and direction of the current in the Rio Pungoe.

Depths—Limitations.—Depths are subject to change. In 1990, the approach channel and Canal do Macuti were reported to be dredged to a depth of 9m. A depth of 4.2m was reported to exist about 0.2 mile E of the Lighted Buoy No. 1, in the center of the approach fairway.

Vessels with a draft up to 4.9m may enter at any stage of the tide. The maximum acceptable fresh water draft is 10m. Vessels with a draft greater than 7m or with a length greater than 140m are not permitted to berth at night.

Berthing details are described in the accompanying table titled **Beira—Berthing Information**.

Beira—Berthing Information			
Berth	Length	Depth Alongside	Remarks
No. 1	184m	8.0m	Fishing vessels only.
No. 2-5	646m	5.0-11.0m	Multi-purpose and containers.
No. 6-10	755m	5.0-7.0m	General cargo and coal.
No. 11	228m	8.5m	Oil terminal. Tankers up to 20,000 dwt.
No. 12	264m	8.0-9.0m	Oil terminal. Tankers up to 56,000 dwt.

Vessels are cautioned that when using Berth No. 11, particular attention should be paid to their moorings as there is a strong current which flows into the stream, from under the jetty, during the ebb. Bow lines are secured to two mooring buoys laid NW of the berth and larger vessels can overgang the berth by up to 60m. Several vessels are reported to have broken off this berth.

Aspect.—The land about the mouth of the Rio Pungoe, being very low, cannot be seen if approaching from the S, until about 11 miles from it, and near the buoys in the approach. North of the river, a series of low sand hills covered with scrub extend along the shore.

Ponta Macuti Light, about 1 mile ENE of the point, is conspicuous, as is the Grand Hotel, about 3.3 miles W of the light structure and the floodlit cathedral, 46m high, about 0.5 mile farther N.

Ponta Macique, on the E side of the entrance of the **Rio Buzi**

(19°53'S., 34°46'E.), has conspicuous mangroves, about 12.2m high on it.

Buoys may be moved as necessary to conform to the channels.

Pilotage.—Pilotage is compulsory for all vessels with the exception of National fishing vessels and coastal vessels with special permission. The pilot boards 1 mile W of Lighted Buoy P. The pilot normally require a minimum clearance of 0.9m under the keel in the channel.

Regulations.—Vessels must send their ETA 48 hours before arrival at the outer channel entrance Approach Lighted Buoy A to the Beira Traffic Control Tower. Vessels whose last port of call was Mozambique or Durban must telex or fax this message to the Beira Traffic Control on departure from that port. Vessels must also send their ETA at Approach Lighted Buoy A to the Beira Port Control Tower on VHF channel 12 or 16, 1 hour before arrival at the outer roads of the sea channel. It is compulsory for vessels to announce their arrival on VHF channel 12, on passing the Approach Lighted Buoy A.

Anchorage.—Vessels awaiting entry to Beira should anchor, clear of the Entrance Channel, between Approach Lighted Buoy A and Lighted Buoy P and as near to the latter as draft permits.

Vessels drawing more than 9.1m should have due regard for the outlying shoals on Banco de Sofala and make for a position about 33 miles ESE of Ponta Macuti Light. Then, according to the chart, with a good fix, vessels should steer 292° for Ponta Macuti Light. A least depth of 9.7m is charted near this track in position 20°00'S, 35°15'E. Caution is advised during periods of heavy swell. Approach should be made after half flood tide. Instructions should be obtained from the pilot boat before proceeding to the Waiting Anchorage in the vicinity of Approach Lighted Buoy A.

Caution.—Depths throughout the entrance channel are liable to change and buoys may be moved accordingly. Depths of up to 1.8m less than charted have been reported (1994) in the entrance.

Beira to Porto de Quelimane

3.12 From Beria, the coast trends in a NE direction to the delta of the Rio Zambezi.

From **Savane** (19°39'S., 35°08'E.), the coast is backed by a line of low sandhills.

From the Rio Mauendeni to the Rio Luaua, the coast is lower and numerous small rivers enter the sea.

Kirk Point (18°58'S., 35°57'E.), a low point, is the W entrance point of the Rio Luaua and Ord Point, the E entrance point 2 miles NE, is thickly wooded and has a range of hummocks near its E bank.

The Rio Luaua does not join the delta of the Rio Zambezi, although it flows within 3 miles of it.

The Rio Zambezi, after a course of more than 1,200 miles, enters the sea through an extensive delta, about 37 miles wide, between the mouths of the Rio Milambe (18°55'S., 36°04'E.) and the Rio Chinde (18°34'S., 36°29'E.). Several rivers flow through the extensive delta; the Rio Chinde, although one of the narrowest and most tortuous, is the deepest and the one now used.

Depths—Limitations.—The various bars should never be

attempted without the assistance of a pilot or previously examining them. The fluctuations in the depth of the river are considerable, therefore, there is no permanence in either the direction or depths of the navigable passages.

Aspect.—The land separating the various entrances is low, the tops of the trees nowhere exceeding from 15 to 24m in height, and the similarity of the appearance of different mouths renders it somewhat difficult to distinguish any particular one. The Rio Cuama, the widest entrance, lying between Ponta Leste (18°53'S., 36°17'E.) and Ponta Cause, about 1.5 miles ENE, two comparatively high and densely wooded points, is perhaps the most easily distinguished on account of its width, the other entrances being mostly narrow.

The large body of water running out of the various mouths during the rainy season, combined with the continuous heavy ocean swell, so alters the positions of the several bars, causing islands to form and to be washed away, that the entrances are never alike for two seasons.

Barra Inhamissengo (18°54'S., 36°08'E.) lies across the mouth of the Rio Mucelo, about 3.5 miles ENE of the Rio Milambe; at springs the outgoing tidal currents run across the bar at rates from 4 to 4.5 knots.

Anchorage.—Anchorage can be taken off Barra Inhamissengo, in 8m, sand, but in fine weather vessels should lie farther out. The current generally sets W, causing vessels at anchor to lie broadside to the usual SE wind; in this condition considerable roll will be experienced.

The Rio Pambane enters the sea about 6.5 miles N of Ilha Timbue Light (18°49'S., 36°21'E.). Anchorage can be taken, in 7m, mud about 3 miles E of the river mouth.

3.13 Vila do Chinde (Porto do Chinde)(18°32'S., 36°30'E.) (World Port Index No. 46900) is the port for the Rio Zambezi, and is located at the mouth of the Rio Chinde. The port consists of a town and a small natural harbor. The spring tides rise 3.8m and the neaps rise 2.6m. Spring currents run at rates from 2.5 to 3.5 knots, respectively, on the incoming and outgoing flow. During neaps there is no perceptible incoming current.

The entrance is fronted by numerous sand banks which extend seaward about 2.5 miles, and the inner part of which dry from 2.4 to 3m. The sea breaks heavily on these banks. There is a bar across the entrance, lying near the outer edge of the drying banks, and, as changes in the position of, and depths in the channel across the bay are frequent, vessels should not attempt to enter without a pilot.

Pilotage.—Pilotage is compulsory, and pilots must be obtained from Beira or Porto de Quelimane. Local pilots for the river are both numerous and skillful, and vessels should await the pilot near the fairway buoy.

Anchorage.—Vessels may anchor outside the fairway buoy, in 7 to 9m, about 4 miles ESE of Ponta Liberal, but the anchorage is not recommended because of its being open to the prevailing S winds. Good anchorage may be obtained in the river a little more than 1 mile NW of Ponta Liberal, in from 4.6 to 7.3m, good holding ground; vessels should moor. Strong E winds render anchorage close within Ponta Liberal untenable for small vessels, but at such times they can obtain anchorage farther W. Vessels are allotted anchorage berths by the Captain of the Port. A mooring buoy, allocated to the Captain of the

Port, lies in the inner part of the port on the N side of the harbor; anchorage is prohibited in the vicinity of this buoy.

3.14 Between **Ponta Liberal** (18°34'S., 36°28'E.) and the Rio Bazar, the coast is low and seldom visible at a distant of 7 miles offshore, but between the Rio Bazar and Ponta Deia, 15 miles farther NE, it is slightly higher and more visible.

The **Rio Linde** (18°12'S., 36°50'E.) is entered between Ponta Deia and Ponta Sampinguira. A white triangular beacon stands on Ponta Sampinguira. Anchorage can be taken, in 7m, SE of Ponta Deia.

Between the Rio Linde and **Ponta Olinda** (18°03'S., 36°58'E.), the coast is low and covered with vegetation; there are several sand hills and reddish patches. A low, but prominent, bluff is situated 2.5 miles NE of Ponta Sampinguira.

Vilhena Light (18°06'S., 36°55'E.) is exhibited 3.7 miles SSW of Ponta Olinda, the S entrance point to the Rio dos Bons Sinais.

Caution.—Between Vila do Chinde and the Rio dos Bons Sinais shallow water may be expected off the entrances of the rivers, and, as the soundings are few, it is not advisable to close the coast too much when navigating it.

3.15 The Rio dos Bons Sinais is entered between **Ponta Olinda** (18°03'S., 36°58'E.) and Ponta Tangalane. The land near Ponta Olinda is somewhat higher than the low, sandy, jungle covered land on both sides of the entrance.

The bar across the entrance extends from the vicinity of Vilhena Light to a bank extending SSE from Ponta Tangalane. In 1975, there was a depth of 3.3m on the bar at LW springs. However, the bar and banks are subject constant change, especially the bar after SW gales, and no reliance should be placed on the charted depths.

The sea is generally smooth on the bar at HW but is said to be impassable if the sea is running in the offing. At times, particularly at the ebb, solitary waves of great height break on the bar; boats should use great caution in crossing.

Vessels drawing up to 5m may cross the bar at HW springs, and up to 3.5m at HW neaps.

Pilotage.—Pilotage is compulsory for all vessels entering the Rio dos Bons Sinais. Pilots are available 24 hours and, with prior arrangement, will meet vessels at the landfall buoy, about 3.5 miles SE of Vilhena Light.

Porto de Quelimane (17°53'S., 36°53'E.)

World Port Index No. 46910

3.16 Porto de Quelimane is located on the N edge of the Zambezi Delta, about 18 miles up the Rio dos Bons Sinais. The port consists of a town and a very small natural harbor.

Winds—Weather.—The prevailing wind off the river is from SE to S during the greater part of the year, being sometimes to the W of S between January and March. In October, winds from SSE to ESE have been found to blow throughout the night, lulling in the morning, but this is unusual, as a land wind generally springs up at night. Off the town in July, the sea breeze from SSE sets in about noon, with a force of from 1 to 3, but during the night it is usually calm, with the land breeze in the morning.

The worst weather conditions occur in January and February at the height of the rainy season followed by the months when the rains have ceased and the sun is actively drying up the decaying vegetation; November is the hottest month. Early morning mists can be relatively cold with a temperature of 17°C being registered in July.

Tides—Currents.—Outside the bar and along the coast the current generally sets to the SW, at velocities of from 1 to 2 knots, causing vessels at anchor off the bar to lie broadside to the swell and to roll considerably.

The incoming tidal current, after running over the bar when nearing Ponta Tangalane, sets directly onto the banks on the W side, rendering great caution necessary. In the river, the currents attain a velocity of 3 knots.

Depths—Limitations.—The permissible draft for entry are subject to Port Authority and to the depth over the bar. The port accommodates vessels up to 150m and a draft of 5m.

A concrete wharf, with a depth of 5.5m alongside, is situated in the NW part of the port area and can accommodate a vessel up to 280m long.

Aspect.—The land on both sides of the entrance is low, sandy, and covered with trees or jungle growth. The entrance is conspicuous bearing about 328° and, when abreast of it, the river, being wide and having a straight course for some distance, no land will be seen from the deck between the entrance points, although Ilha dos Cavallos Marinhos, 4 miles within the entrance may be seen.

Two radio masts, about 61m high, stand on the NE side of the town and are visible when the light is favorable. The barracks situated in the SE part of town are prominent. The church is a stone building painted yellow and has two spires.

Pilotage.—Pilotage is compulsory and is available during daylight hours only. Pilots board in position 18°04'S, 37°01'E.

Regulations.—Vessels may enter and depart the port only at HW during the port working hours of 0700 to 2300.

The vessel's ETA should be sent 7 days prior to arrival, stating the deepest arrival draft and vessel's last port of call. Further ETAs should be sent 72 hours, 48 hours, 24 hours, and 12 hours in advance, giving the date, time of arrival, and any draft changes.

Anchorage.—Good temporary anchorage can be obtained outside the entrance, in 9m, with Vilhena Light bearing 286°, distant about 5 miles, but if intending to remain for any time, it would be better to anchor farther NE in about the same depth, as here there is said to be less sea and current.

Anchorage, in 9 to 11m, is obtainable N of the E entrance of Canal Militao. There is also anchorage off the town of Quelimane, in 3 to 6m. Vessels can also anchor in almost any part of the river and are designated by the pilot.

Caution.—The positions of the range beacons and buoys are subject to alterations to meet the frequent changes in the channel. It has been reported (1996) that the entrance channel and the approaches to the wharf have silted up.

Porto de Quelimane to Porto Belo

3.17 Between Ponta Tangalane (18°01'S., 36°59'E.) and Ponta Matirre, the coast is low, sandy, and backed by jungle. Several rivers flow into the sea along this stretch of coast. There are dangers along the coast but in general the offshore

depths increase regularly and gradually.

Caution.—Pantaloon Shoals (17°43'S., 38°02'E.) lie about 22.5 miles offshore and extend 8.5 miles in a NE and SW direction. The SW shoal has a least charted depth of 7.8m while the NE shoal has a depth of 8.3m. Acorn Patch has a depth of 7.7m.

David Shoals (17°30'S., 38°27'E.) consists of three patches which have a least depth of 9.8m. Lacerda Shoal, with a depth of 8.2m, lies about 4.5 miles NE of David Shoals.

Porto Belo (17°42'S., 37°11'E.)

World Port Index No. 46920

3.18 Porto Belo is situated 4 miles within the entrance of the Rio Macuse on the N bank. The Rio Macuse is entered between Ponta Namerruma and Ponta da Barra, a slight bluff 2 miles farther NE.

Tides—Currents.—The incoming current sets W on the rising tide and the outgoing current sets E on the falling tide. Caution is necessary to guard against these currents when crossing the bar.

Depths—Limitations.—The bar is subject to frequent changes. Within the bar, the depths increase; at the anchorage abreast a wharf near Porto Belo, there are depths of 11.6m. A depth of 9.4m can be carried as far as Maquival, about 16 miles within the entrance.

The maximum draft allowed over the bar is 5m at springs and 3.5m at neaps.

Aspect.—The navigational marks are moved as necessary to meet changes in the channel.

Pilotage.—Pilotage is compulsory. Pilots must be requested through the Port Authority at Quelimane 24 hours before arrival. Vessels should not attempt to enter without a pilot.

Anchorage.—Anchorage can be obtained in the river abreast a wharf near Porto Belo.

Caution.—The navigational marks are moved as necessary to meet the frequent changes in the channel.

Porto Belo to Porto de Pebane

3.19 From Ponta da Barra the coast trends in an ENE direction to **Ponta Matirre** (17°17'S., 38°11'E.). The 10m curve lies up to 6.5 miles off this part of the coast.

The **Rio Mazemba** (17°19'S., 38°03'E.) is the most important of the rivers along this stretch of coast, excluding the Rio Moniga. The river flows out through a narrow channel. Within the bar there are depths from 6 to 9m for about 4 miles.

Porto de Pebane (17°16'S., 38°09'E.)

World Port Index No. 46925

3.20 The estuary of the Rio Moniga, known as Porto de Pebane, enters the sea 5 miles ENE of the Rio Mazemba. Ilha Quisungo separates the entrances of the Rio Mazemba and the Rio Tejungo.

Depths—Limitations.—The entrance is fronted by extensive banks, and shallow water extends a considerable distance; 3.5 miles off, the depths on the range line are about 9.1m. The

bar lies between banks extending seaward from the entrance points, about 2.5 miles; the depths over the bar change frequently. In 1974, the least depth in the entrance was 1.7m.

Within the bar, the depths increase from 4.9 to 6.1m and in the river there are depths from 10 to 17m.

Extra caution should be exercised when crossing the bar

Aspect.—The S coast of Ilha Quisungo is irregular and somewhat higher than the coast on either side. This feature, together with the bold appearance of Ponta Matirre, renders the entrance to Porto de Pebane easy to distinguish from that of the Rio Mazemba.

A military station on the W bank of the Rio Moniga, above the entrance of the Rio Tejungo, may be easily identified.

Range beacons stand on the W bank of the river about 3 miles within the river in range 327°. In 1992, the landfall buoy was moored 2 miles SSE of Ponta Maverani; the channel across the bar is marked by buoys. Aids to navigation are moved as necessary.

Pilotage.—Pilotage is compulsory. Pilots must be requested through the Port Captain at Quelimane at least 1 day before arrival.

Anchorage.—There is anchorage off the town, in 12m, sand and shells.

Caution.—Vessels should not attempt to cross the bar or enter without local knowledge.

Aids to navigation are moved as necessary.

Porto de Pebane to Ponta Calderia

3.21 Ponta Matirre (17°17'S., 38°11'E.), marked by a light, is a conspicuous bluff composed of yellow cliffs. A signal station is located on the point.

The Rio Melai is entered about 6 miles ENE of Ponta Matirre. Cabo Toco, the NE entrance point, is a conspicuous bluff, formed of red earth cliffs.

Ponta Matirre and Cabo Toco are the most conspicuous points on this section of the coast.

Between Cabo Toco and Ponta M'sulo, 26 miles ENE, there is a well-wooded stretch of coast.

The **Rio Namane** (17°08'S., 38°31'E.), which enters the sea 19 miles ENE of the mouth of the Rio Melai, is the mouth of the delta of the Rio Malela. In 1958 there was a depth of 1.2m on the bar across its entrance.

The tidal current attain rates from 4 to 5 knots in the entrance during springs. The sea over the bar is reported to be smoother during the period of the incoming tidal current, but no vessel should attempt to cross the bar without local knowledge.

3.22 The **Rio Moebaze** (17°05'S., 38°41'E.) (World Port Index No. 46926) is entered between Ponta M'sulo and Ponta Almandia, about 1 mile ESE. The tidal currents in the entrance are at times violent and run in various directions, especially at spring tides with strong W winds. The depths across the bar are subject to frequent changes; in 1958 the depth was 1.5m. Because of the shifting bar all aids to navigation are moved whenever necessary. Pilotage is compulsory; the latest information should be obtained from the Port Captains Office at Quelimane. Vessels should not attempt to cross the bar without local knowledge. Anchorage may be obtained abreast the old village of Moebaze, in 5 to 8m.

Ilhas Primeiras is a group of islets lying in a position 13 miles SSE of Ponta M'sulo and extending NE, roughly parallel to the coast, for a distance of 25 miles.

Ilha Fogo (Ilha do Fogo) (17°14'S., 38°53'E.) is 3m high, with a few trees on its N end, the other parts being covered with shrub. Anchorage may be obtained, in 9 to 10m, 0.5 mile from the beach on the W side, or a vessel may anchor, in 18m, about 0.3 to 0.4 mile from the beach, with the center of the island bearing 156° to 178°.

Ilha Coroa lies NE of Ilha Fogo. A stranded wreck lies on Ilha Coroa and a depth of 10.9m is located 1 mile N of the N extremity of the island.

Ilha Casuarina is covered with casuarina trees, about 24m high, and can be recognized at a considerable distance.

Ilha Epidendron has a few casuarina trees on its N part, but the S part is covered with short shrub; it may be seen from a distance of about 15 miles. Anchorage can be obtained, in 7 to 20m, about 0.3 mile off the NW side of the island. A stranded wreck lies on Ilha Epidendron.

Casuarina Road, between the island of the same name and the mainland, is the best anchorage along this coast. Anchorage, protected from SE winds, may be obtained, in 20m, about 1 mile from the W side of Ilha Casuarina, or in 6m, about 0.5 mile offshore with the center of the island bearing 135°. If entering from the N, Ilha Casuarina should be kept on a bearing of 220° and open W of Ilha de Epidendron in order to pass NW of Baixo Barrco and the reef E of it; then course should be altered to approximately 232° on Ilha Fogo for the anchorage.

Baixo Barraco, a dangerous reef, lies 3 miles NE of Ilha Epidendron.

3.23 From **Ponta Almandia** (17°05'S., 38°42'E.), the E entrance point to the Rio Moebaze, the coast trends ENE to Ponta Macalonga. For a distance of 6.5 miles E of Ponta Almandia, the coast is well wooded, then its aspect gradually changes to sandy hummocks covered with thick clumps of bushes. Farther E, the coast consists of low, bare, sandhills with a few scattered trees.

Two rivers flow into the sea along this coast, but the mouth of each river is closed by a bar, which nearly dries.

A distinct red cliff is located 13 miles E of Ponta Almandia.

Ponta Macalonga (17°01'S., 39°04'E.) is a low sandy point. It is fronted by a bank, with irregular depths that range from 5.5 to 9m. The bank extends 4 miles S of the point.

Mount M'tupe (16°34'S., 39°10'E.), about 27 miles N of Ponta Macalonga and the only mountain seen on this part of the coast, is a conspicuous cone of considerable height. A conspicuous clump of casuarina trees stands about 7 miles N of Ponta Macalonga. The Rio Naburi enters the sea 5.5 miles NE of Ponta Macalonga and the Rio Lingonha enters the sea 2.5 miles farther NNE. These two rivers have no particular importance.

3.24 **Porto de Moma** (16°46'S., 39°14'E.) (World Port Index No. 46927) is entered between Ilha Mutirrane (16°47'S., 39°15'E.) and Ponta Nicota, the N entrance point. Banks extend nearly 2 miles E of each entrance point. In 1983, there was a depth of 1m in the channel over the bar joining the above banks.

Tidal currents run strongly in the entrance channel and are reported to be irregular.

Pilotage is compulsory. The maritime delegate at Porto de Angoche is the pilot. Anchorage may be obtained abreast the village of Nacalaua, 2.5 miles within the entrance, in 7 to 9m.

Ponta Calderia (16°39'S., 39°30'E.) is somewhat higher than the adjoining coast; it is marked by a light.

Off-lying Islets and Dangers

3.25 Ilhas de Angoche are a chain of islets and shoals which lie at distances that vary from 3.5 to 8 miles offshore, near the outer edge of a bank fronting the coast between Porto de Moma and Porto de Angoche, 50 miles NE.

Ilha Moma (16°49'S., 39°31'E.) is the farthest SW of the group. Except on its NW side, the islet is surrounded by reefs which extend up to 1 mile off its E side.

There are two isolated rocky patches situated 6 and 7.5 miles SW of Ilha de Moma; they have depths of 5.4m and 6m, respectively. Other isolated patches lie NW of Ilha Moma; their positions are best seen on the chart.

Ilha Caldeira (16°39'S., 39°43'E.) lies about 12 miles E of Ponta Caldeira. Reefs extend E from the islet for a distant of 1 mile. Moderately good anchorage may be taken 1 mile NW of the islet, in a depth of about 14m, coral, sand, and mud.

Ilha Nejovo, a low sandy islet covered with trees, lies about 6.7 miles NE of Ilha Caldeira. An extensive reef lies off the SE side island. There is anchorage about 0.2 mile off the NW side of the islet, in depths of 11 to 14m; it is protected from S and SE winds.

Ilha Puga-Puga lies 3.2 miles offshore about 5 miles NE of Baixo Miguel; at HW it only shows as a small sandy cay about 1.8 to 2.4m above the sea. Except on its NW side, the islet is surrounded by reefs which extend as much as 1.5 miles SE.

Ilhade Mafamebe (16°21'S., 40°02'E.) is low and sandy, but a group of trees on it may be seen from a distance of 12 to 15 miles; it is also marked by a light.

Anchorage.—Anchorage may be taken SE of the above shoal, in 11m, with Ilha de Mafamede Light bearing 180°, distant 1 mile, or with the light bearing 150°, distant 0.4 mile, in a similar depth.

Caution.—Between Ilha Moma and Ilha Calderia, 15 miles NE, the depths are quite irregular.

Baixo Miguel (16°31'S., 39°53'E.) is a dangerous drying reef which should be given a wide berth.

A shoal, with a least depth of 5.8m, lies 2 miles NW of the light situated on Ilha de Mafamede.

Ponta Masiuane to Porto de Mocambique

3.26 **Ponta Masiuane** (16°24'S., 39°54'E.) is a low projecting white sandy point, on which are a number of small sand hillocks, conspicuous from a considerable distance.

The Rio Quilua, W of Ponta Masiuane, is much frequented by coasting vessels, which find good sheltered anchorage off Menuca, a village within the mouth. The entrance channel, between two sand banks which are well-defined at low water, when there is no difficulty in entering. The least depth in the channel over the bar was 0.9m (1960).

3.27 Porto de Angoche (16°14'S., 39°54'E.) (World Port Index No. 46928), consisting of a town and a small natural harbor, is entered between the E extremity of Ilha do Buzio (16°16'S., 39°56'E.) and Ponta Namacoto, a slight projection on the coast, nearly 4 miles NE. The tidal currents attain a maximum velocity of 4 knots in the anchorage. There are numerous banks and shoals in the approach. The entrance channel is about 11 miles long; the depth over bar was 2m in 1974. The port will accommodate vessels, with a draft of 5m but vessels of this size can enter and leave only at HW.

About 1 mile outside the bar there are some comparatively shallow spots for which a look out should be kept. These shoals are usually marked by breakers and can be avoided.

Pilotage.—Pilotage is compulsory for merchant vessels entering and, if requested, will embark off Ilha de Mafamede. Anchorage can be obtained opposite the town, in a depth of 7.5m, sand and mud.

Caution.—Caution is required if it should be considered necessary to sound the bar, as it is sometimes dangerous to do so.

3.28 Between **Ilha Angoche** (16°20'S., 39°51'E.), at the entrance to Porto de Angoche, and the Rio Sangage the coast consists of sand hills, which attain heights of from 91 to 122m near the river. Several of these hills are marked by patches of red sand. The land in the vicinity of the Rio Sangage is conspicuous, as the sand hills, partly covered with vegetation, and the N point of the river, which is low and sandy, form a striking contrast to two rocky points 4 or 5 miles S of the river.

Ponta Congolone (16°05'S., 40°06'E.), a rocky point NE of Ponta Namacoto, may be identified by a conspicuous yellow sand dune situated on it. Close within the point the land rises to a height of 311m. This point is visible at 15 to 20 miles offshore and, except for the hill on which Sangage Light stands, is the only land visible.

Caution.—**Baixo de Santo Antonio** (16°12'S., 40°08'E.), a steep-to dangerous reef which dries in places, lies in the approach to Porto de Angoche.

Baixo Namuali lies near the S end of a sand spit which extends 5 miles SSE from Ponta Congolone. There is a least charted depth of 2.7m on the shoal and the spit has a least charted depth of 5.8m.

Baixo Nantapa (16°04'S., 40°12'E.), a rocky patch with a depth of 7.6m, lies 6 miles E of Ponta Congolone; **Baixo Sangage**, with a depth of 9.8m, lies 5 miles farther ENE.

3.29 The **Rio Sangage** (15°58'S., 40°08'E.) is entered between Ponta Djuma and Ponta Selela, about 1.2 miles N.

Depths—Limitations.—Both entrance points are fronted by drying banks which extend as far as 2.5 miles E, and are connected by a bar, the position of which, and depths on, are probably subject to considerable change. In 1960, there was a least depth of 1.8m in the channel over the bar, which passed close to the bank fronting Ponta Selela, and then close to the S bank for about 3 miles within the entrance. Within the bar there are depths of from 3 to 7.9m in the narrow channel, which trends in a S direction to the settlement.

Aspect.—Namduma Hills rise from 610 to 914m, about 17 miles NNW of the entrance of the Rio Sangage, and should be conspicuous features from seaward.

Anchorage.—Anchorage can be obtained off the settlement,

about 3 miles within the entrance on the S shore, in 5 to 7m.

Caution.—Local knowledge is essential for crossing the bar.

3.30 Between the Rio Sangage and the Rio Murrioze, the low coast is partly covered with trees and is fringed by a sandy beach.

The **Rio Murrioze** (15°51'S., 40°14'E.) has a narrow entrance; it may be identified by a small bluff on the S bank of the river and by the village of Quinga which is situated near the N entrance point.

Baixo Mussibarinde (15°56'S., 40°18'E.), with a least depth of 6.4m, and **Baixo Quinga** with a least depth of 7.9m, lie 5.5 miles and 9 miles, respectively, SE of the mouth of the Rio Murrioze. The sandy beach continues for a distance of 10 miles NE from the Rio Murrioze and is then fringed with rocks as far as Ponta Namalungo, 7.5 miles NE.

Ponta Namalungo (15°38'S., 40°25'E.) is a wooded sandy bluff marked by a light. The adjacent coast is low and sandy, with a growth of casuarina trees; the distant land behind the point appears high.

Baixo Mecade (15°50'S., 40°23'E.), with a least depth of 2.3m, lies 5 miles offshore 9 miles ENE of Quinga. A shoal area, with depths under 10m, lies 3 miles NNW of Baixo Mecade. **Baixo Namaete**, a reef area, with a least charted depth of 4.9m, lies 7 miles NNE of Mecade.

3.31 From Ponta Namalungo to Ponta Bajone the coast is fronted by a mangrove swamp; a chain of islands, islets, and sand banks lies along the edge of this swamp.

Within 4 miles of the chain of islets, the offshore depths are irregular and the bottom is rocky; there are several dangerous shoals. The sea generally breaks heavily on some of these shoals.

Baixo Mucalanga (15°35'S., 40°32'E.), with a least depth of 1.8m, and **Baixo Chataputa**, with a least depth of 0.6m, are two rocky patches near the edge of a 10m bank, which extends 2 miles off the chain of islets 8 miles NE of Ponta Namalungo; the sea generally breaks on the shoals.

Baixo Infusse (15°32'S., 40°37'E.), a rocky shoal with a least depth of 4.6m, lies 4 miles offshore. **Baixo do Brugi** consists of several shoal patches, which have a least depth of 2.7m. An isolated pinnacle rock, with a depth of 3.8m, lies near the 10m curve 2 miles NNE of the shoalest part of Baixo do Brugi.

Baixo Namezaco (15°22'S., 40°39'E.), a sandy patch which dries, breaks heavily; it lies at the seaward end of a spit, about 2 miles offshore. **Baixos Quanzi** consists of several detached shoal patches, with a least depth of 4m. The sea generally breaks on these shoals.

Ponta Bajone (15°15'S., 40°41'E.) is the E extremity of a low sandy island covered with trees which lies at the NE end of the coastal mangrove swamp.

3.32 **Porto de Mocambo** (15°08'S., 40°33'E.) is entered between Ponta Quissiruaonde and Ponta Fugo.

Aspect.—Muchelia, a hill with three peaks rising about 1.5 miles NW of Ponta Fugo, is the most conspicuous landmark.

Anchorage.—Anchorage may be obtained about 0.3 mile off the N shore, in from 11 to 15m, with Ponta Fugo bearing 120°, distant about 1.5 miles, or about 0.5 mile off the S shore, in 18m, with the drying extremity of Ponta Calajulo bearing 031°, distant about 2 miles, but anchorage may be obtained in

any part of the harbor which is clear of dangers.

Directions.—Vessels should approach the entrance steering for Muchelia, bearing 270°, and when a prominent white building at Lunga bears about 243°, it should be steered for on that bearing, passing about 0.2 mile off Ponta Fugo, which is steep-to, when course may be shaped for the selected anchorage. Care must be taken to avoid Quipua which lies 1.7 miles WNW of Ponta Fugo.

Porto de Mocambique (15°02'S., 40°44'E.)

World Port Index No. 46930

3.33 Porto de Mocambique is entered between Ponta Sancul (15°05'S., 40°43'E.) and Ponta da Cabaceira, a low wooded bluff. Ilha de Mocambique is the site of the town of Mocambique, which nearly covers the entire island. Although parts of the harbor are encumbered with banks and shoals, there is shelter within the island for a large number of vessels.

Winds—Weather.—The prevailing winds on the coast about Mocambique are N from October to April and S during the rest of the year. Land and sea breezes prevail, the former blowing directly out of the harbor at daylight and the latter coming in about 1000 or 1100 from SE to S, shifting toward E in the afternoon.

Cyclones are rarely actually experienced within the harbor, but they once occurred in three consecutive years during the month of January. Cyclones frequently pass through Mozambique Channel within a few miles of the harbor.

The rainy season is from November to March, inclusive.

Tides—Currents.—A current setting SW along the coast is usually experienced off Porto de Mocambique; it reaches a velocity of 4 knots during the strength of the Northeast Monsoon. The outer limits of the current are from 50 to 80 miles offshore.

The mean drift of the Mozambique Current between latitudes 10°S and 20°S is weakest in June and July when they are 8 and 7 miles per day, respectively. At this time, within the port area, the current may be inappreciable, but close inshore a countercurrent may be experienced.

The incoming tidal current sets W on the rising tide and the outgoing tidal current sets E on the falling tide; both incoming and outgoing tidal currents are very strong at springs.

Depths—Limitations.—The charted depth on the range line through North Channel is 9.1m, located about 0.8 mile NE of the NE extremity of Ilha de Goa. There are depths up to 33m within the harbor. Only vessels with a draft less than 9.1m can cross the bar at LW.

Aspect.—For about 10 miles on either side of the harbor the land is low, but Cabo Conducia, about 6 miles N of Ilha de Mocambique, may be identified by its cliffs, 61m high, with reddish colored patches, which stand out clearly from the surrounding dark green vegetation. A conspicuous house is located about 1.2 miles SSW of Cabo Conducia.

Fortaleza de Sao Sebastiao, at the NE extremity of Ilha de Mocambique; the white spire of Sao Paulo Church, about 0.4 mile SW; and the lighthouse on Ilha de Goa, about 3 miles SE of Ilha de Mocambique, are conspicuous.

In clear weather, the harbor may be identified by Monte Pao (14°50'S., 40°25'E.) and Monte Mesa (14°45'S., 40°39'E.), both about 296m high, rising about 23 miles NW and 18 miles

N, respectively, of Ilha de Mocambique. The former, which is not often visible from seaward, resembles a small round-topped hill surmounting a larger one; the latter has a long, flat summit, which rises from a longer flat topped ridge, but, at some distance from it, only its upper part is visible, and it appears as a flat island. A bridge extends from the mainland ESE to the SW end of Ilha de Mocambique.

Pilotage.—Pilotage is compulsory for merchant vessels; they embark at the seaward end of North Channel. A pilot is available at all times. The vessel's ETA should be given to the pilot station as soon as possible.

Anchorage.—Vessels waiting to embark a pilot or by reason of draft unable to cross the bar may anchor 1.5 miles NE of Ilha de Goa, in depths of 1 to 18m, sand and coral.

There is anchorage, in 12 to 14m, with Fortaleza Sao Sebastiao bearing between 282° and 305°, 0.6 to 0.8 mile distant. This anchorage has not been closely examined and several deep holes exist; care is necessary when anchoring.

Inside the entrance are three principal anchorages, as follows:

1. Vessels of 5.5m draft can anchor, in 6 to 8m, between Ilha de Mocambique and Banco Leven.
2. Deep draft vessels can anchor, in 22 to 24m, between Banco Leven and Harshell Sands.
3. There are depths of 9.7 to 12.8m NE of Lumbo Pier, where vessels anchor when discharging for the railroad.

Caution.—Because of the danger of fouling telegraph cables, vessels should not anchor in the channel NE of Ilha de Mocambique or within a radius of 0.6 mile of the N end of Fortaleza Sao Sebastiao.

Porto de Mocambique to Porto de Nacala

3.34 Baia da Conducia is entered between **Cabo da Cabaceira** (15°00'S., 40°46'E.) and Ponta Quifinga.

Depths—Limitations.—The depths in the entrance are irregular, but near the middle of the bay there are depths of from 11 to 22m, the approach being through a channel, about 0.3 mile wide, with depths of from 20.1 to 33m. Westward the depths decrease; there is a least depth of 5.8m near the entrance of the Rio Sanhute, at the head of the bay.

Aspect.—Between Cabo da Cabaceira and the conspicuous cliffs of Cabo Conducia, about 4 miles NNW, the coast is low, sandy, and covered with trees. Ponta Quifinga is the S extremity of Ilha Quitangonha, a narrow coral island about 6.1m high, with steep and overhanging extremities, which is covered with grass and shrubs and ringed with mangroves on its W side.

Anchorage.—Anchorage may be obtained, in depths of 11 to 16m, mud, with Ponta Quifinga in range with the N end of Ilha Sombreiro bearing 072°, from 2.5 to 4.5 miles distant from the islet. Cabo da Cabaceira in range with Cabo Conducia, bearing about 150°, gives a mark for the outer anchorage, and a mark for the inner anchorage is given by the N extremity of Ilha dos Sete Paus in range with Cabo Conducia bearing about 125°.

Vessels of moderate draft may obtain anchorage in the Rio Sanhute, in depths of 6 to 14m, in a narrow area about 1 mile above the entrance; there is a bar across the entrance with a least depth of 3.7m.

Directions.—Vessels approaching from the S pass at least

0.5 mile off Ilha dos Sete Paus and steer for a position with the N extremity of that island bearing 218° 0.8 mile distant. From here make good a course of 320° for a position 1.5 miles S of Ilha Sombriero; a course of 286° will then lead to the anchorage.

From N, keep 2 miles off Ilha Quitangonha (14°52'S., 40°49'E.), then make good a course of 255° for the position 1.5 miles S of Ilha Sombriero, then proceed as above.

3.35 Between Ilha Quintangonha and Porto de Quissimajulo, several coves are available to small coastal vessels.

Between **Ponta Napenja** (14°50'S., 40°50'E.), which projects from the coast, and Ilha Ancuazi, 18 miles N, the coast is backed by hills lying about 2 miles inland.

Along the coast, for a distance of 3 miles N of Ponta Napenja, it is fringed with a series of rocks, with holes in them resembling arches.

Ponta Onlugune (14°41'S., 40°50'E.) is marked by a light. Enseada de Janga is situated between 2 and 5 miles N of Ponta Onlugune; in the N part of the bay there are depths of more than 365m within 0.5 mile of the coast.

Between **Ponta Cumpadji** (14°31'S., 40°50'E.) and Cabo Melamo, the coast is about 90m high; it is fronted by a drying reef of rocks and coral, which extends up to 1 mile offshore.

Baia de Fernao Veloso is entered between Cabo Melamo (14°25'S., 40°48'E.) and Ilha Gomen. Porto de Nacala and Porto Belmore lie, respectively, in the SW and NW parts of the bay.

Ponta Gegi has a projecting rock, with a few casuarina trees on either side of it, rendering it conspicuous. An old military station, consisting of a house with a red roof, stands on the summit of a low hill, about 0.5 mile SE of Ponta Naarenque, and is visible from the entrance of the bay. A conspicuous white house stands about 1.7 miles W of Ponta Naarenque.

On the N side of the bay, the ruins of an old fort may be seen on Ilha Gomen. Between Ilha Gomen and Ponta Utuco, the E entrance point of Porto Belmore there is a moderately-flat topped hill, about 91m high, which rises steeply from the surrounding level land, and when seen from about 15 miles N, resembles a vessel under sail, but, on a closer approach or when seen on a different bearing, it loses that appearance.

At the head of the bay, about 10 miles NW of Ponta Sacamulo, the W entrance point of Porto de Nacala, are some conspicuous saddle-shaped hills and a sugarloaf peak.

Anchorage may be obtained, in 11 to 16m, on a bank which extends about 0.8 mile offshore, from 2 to 4 miles W of Ponta Gegi, but caution is necessary when anchoring on the bank, as the depths increase very rapidly off its edge.

Porto de Nacala (14°32'S., 40°40'E.)

World Port Index No. 46935

3.36 Porto de Nacala is a fine natural harbor entered from the SW corner of Baia de Fernao Veloso. It is situated on the SE side of the harbor, where there are quays for ocean-going vessels.

Tides—Currents.—The maximum tidal range is 3.7m at springs. Currents run strongly in the entrance of Porto de Nacala and also at the anchorage near the military post of Fernao

Veloso; but it does not run at Baie Bengo at the S part of the port area. It was reported (1994) that the maximum current inside the harbor is 1 knot.

Depths—Limitations.—In the narrows SSW of Ponta Naarenque, the entrance is about 0.3 mile wide between the 11m curves; there is good anchorage for any size vessel.

The North Quay has four berths, with a total length of 675m and alongside depths of 7.0 to 9.7m. The container terminal has two berths, with a total length of 372m and alongside depths of 12 to 14m. A tanker berth with a depth alongside of 10m can accommodate a vessel up to 200m long.

The tanker anchorage will accommodate a vessel up to 130,000 dwt, with a maximum draft of 18m.

Aspect.—A conspicuous water tank is located about 0.5 mile SE of Ponta Maiaia; a large chimney stands about 1.7 miles N of the tank.

Pilotage.—Pilotage is compulsory. Pilots embark about 2 miles N of the light situated on Ponta Naarenque; in periods of strong winds, the pilot boards inside the bay, in the area between Ponta Naarenque and Ponta Sacamulo. It was reported (198) that vessels were permitted to proceed to the inner anchorage without a pilot. Good holding, in a depth of 24m, was reported 0.5 mile E of Ponta Namuaxi Light. Pilotage is compulsory for all types of vessels when berthing or shifting berth in the port.

Anchorage.—Good anchorage may be obtained anywhere, sand and mud bottom, within Porto de Nacala, but the anchorages recommended are in Baia Bengo, about 0.3 mile SSW of Ponta Maiaia, or, in 6 to 7m, 0.5 mile ESE of Ponta Miuguri. Small vessels may obtain anchorage, in depths from 5 to 7m, about 0.2 mile SE of the town of Nacala-Velha. Anchorage may also be obtained in a bight close S of Ponta Naarenque, abreast the landing place for the military post, in about 22m.

Directions.—Approach should be made in the intensified sector of Nacala Light. When the light on Ponta Sacamulo bears S, the vessel should head for it on that bearing until the lights S of Ponta Naarenque come in range 155°, when course should be altered to this alignment. As soon as Ponta Sacamulo is abeam, alter course to 197°; with the light off Ponta Namuaxi directly ahead to pass about 0.4 mile W of the light structure on Ponta Zuani, then steer S to the quay or the anchorage.

Porto de Nacala to Pema

3.37 **Porto Belmore** (14°21'S., 40°38'E.) is entered in the NW part of Baia de Fernao Veloso, between Ponta Utuco (14°23'S., 40°41'E.) and a projection about 1.5 miles W. It affords excellent shelter during the cyclone season.

Tides—Currents.—The tidal currents are strong in the entrance of Porto Belmore and, during the rainy season, the water is much discolored and the edge of the reefs are then difficult to distinguish.

Aspect.—Range beacons, in line bearing 333°, lead through the entrance and up the fairway of the port. The front beacon is a pyramid, 6.1m high, standing near the edge of a mangrove swamp at the head of the harbor. The rear beacon is a white rectangle, 7.9m high, standing on a hill about 1.3 miles NNW of the front beacon.

Anchorage.—Anchorage, in 18m, may be obtained off

Nhiendgi, on the E side of the harbor, about 0.7 mile NW of Ponta Utuco, or, in about 12m, off the W side of the harbor, about 2.5 miles within the entrance.

3.38 Between **Ilha Gomen** (14°19'S., 40°44'E.) and Ponta Cogune, 7.5 miles N, the coast is covered with a line of trees all of apparently the same height. Along this area there are several small headlands with occasional patches of sand and reddish colored earth. From Ponta Cogune to Ponta Nangata, 2 miles NW, the coast consists of perpendicular cliffs 25m high; the cliff tops appear to be level.

Monte Dedo (14°21'S., 40°33'E.), about 10 miles W, and Monte Roges (14°14'S., 40°26'E.), about 18 miles WNW, respectively, of Ilha Gomen, are the most distinctive landmarks in this vicinity. Monte Roges maintains much the same appearance from any direction.

Baixo do Pinda (14°13'S., 40°47'E.) is a coral reef fronting the coast between Ilha Gomen and Ponta Nangata; it extends about 5 miles from shore. Pinda Light is exhibited about 0.5 mile W of Ponta Cogune.



Pinda Light

Baia de Memba is entered between Ponta Nangata (14°11'S., 40°41'E.) and Ponta Lulo. Porto do Bocage and Porto de Duarte Pedroso are located in the SW part of the bay. The village of Memba is located at the head of the bay.

Anchorage.—Anchorage may be obtained, about 0.6 mile offshore, E of the village of Memba, in depths of 37 to 55m, but great caution is necessary in anchoring as the depths increase very rapidly seaward of this position.

Porto do Bocage is entered between Ponta Opopuro, about 4.5 miles WSW of Ponta Nangata, and Ponta Sahaja, about 1.5 miles W. The shape of both entrance points is conspicuous, as they resemble the clipper bow of a vessel.

Anchorage may be obtained, in about 18m, about 2 miles within the entrance of Porto do Bocage, between a detached

coral reef and the edge of a rocky bank fringing the W side of the harbor.

Caution.—Vessels without local knowledge are advised to enter Porto do Bocage at low water.

3.39 **Porto de Duarte Pedroso** (14°13'S., 40°33'E.), at the SW corner of Baia de Memba, is entered between Ponta Nauéia, about 1.2 miles WSW of Ponta Mecontene, and Ponta Oxelo, about 0.7 mile farther WSW.

Sheltered anchorage may be obtained by small vessels in either inlets, in depths of 7 to 16m, mud, good holding ground. Vessels are recommended to wait for LW before entering.

Between **Ponta Lulo** (14°09'S., 40°36'E.) and Ponta Serisathe, the aspect of the land is more striking than on other parts of the coast, being low near the sea and increasing to mostly level land about 61m high a short distance within. The Sorisa Range, several craggy peaks having the appearance of the ruins of some great city, rise abruptly from the level land to heights of 610 to 914m, with the peaks assuming every variety of form of sugarloaf, cone, and round or square-topped pillars, and in some cases seeming to overhang their bases. Monte Pilar (13°44'S., 40°19'E.), the highest and most conspicuous of them, is a cone with a pyramidal point, always appearing the same from all bearings.

North of Baia do Lurio, the land is of moderate height and continues so from Ponta Uifundo to Ponta Maunhane.

Ponta Mancome (14°07'S., 40°37'E.) is the S entrance point to Angra do Semedo, whose shores are fronted by drying rocky banks; Ilheu Tebo, 2.5 miles NNE of Ponta Mancome, is the N entrance point of the bay. The point just N of Ilheu Tebo is a steep projection of reddish-colored rock, 33m high; its prominence is enhanced by the trees on its summit.

3.40 Porto Simuco is entered between **Ponta Miasi** (14°00'S., 40°37'E.) and Ponta Quissiquitxi, about 1 mile N. Ilheu Quissindja lies in the S part of the harbor, about 1.2 miles W of Ponta Miasi.

Aspect.—Ponta Miasi is known for a military station on rising ground, while Ponta Quissiquitxi is a rock, appearing as a vessel's stern, which stands out conspicuously from the low land.

Anchorage.—Anchorage, in depths of 10 to 17m, may be obtained in an extensive area in the middle of the harbor.

Monte Sofia, a hill 43m high, rising close within the coast, about 6 miles N of Ponta Quissiquitxi, has some red patches on its N side which make it moderately conspicuous.

Baia Alemeida is entered between **Ponta Maria Luiza** (13°43'S., 40°34'E.) and Ponta Serissa. About 2 miles NW of Ponta Maria Luiza is the mouth of the Rio Missangage. South of the river there is a conspicuous bluff; N of it stands the military station of Chaonde.

Anchorage.—Anchorage may be obtained in the S part of Baia Alemeida, in about 14m, sand, about 1 mile offshore, with Chaonde Light bearing about 206°.

Anchorage, sheltered at low water from N and NE winds, may be obtained in the N part of the bay, in 12m, about 1 mile from the NW shore, but it is exposed to S winds.

3.41 **Ponta Metacaua** (13°33'S., 40°36'E.) is the N extremity of a low peninsula separating Baia Alemeida from Baia

do Lurio.

Baia do Lurio is entered between Ponta Metacaua and Ponta Uifundo, about 10 miles N. During the South Monsoon, sheltered anchorage may be obtained in the S part of the bay, but it is exposed to N winds. Restinga Mancabale projects about 1.5 miles N from Ponta Metacaua.

Close within Ponta Metacaua, there is a conspicuous clump of trees, which, when seen against the higher land in the background, resembles an island. About 5 miles NW of Ponta Metacaua is the entrance of the Rio Lurio; the discharge at times discolors the sea for some miles offshore. On slightly rising ground on the N bank of the river are some whitewashed houses which are conspicuous from seaward.

Anchorage.—Anchorage may be obtained, in about 12.8m, SE of the mouth of the Rio Lurio, about 1.3 miles offshore and about 1 mile from the W edge of the N port of Restinga Mancabale.

Caution.—Vessels from S should approach Baia do Lurio, with the military station on the S bank of the Rio Lurio bearing less than 270°, in order to avoid the N extremity of Restinga Mancabale.

3.42 Between **Ponta Uifundo** (13°23'S., 40°36'E.) and Ponta Maunhane, the coast is fairly high and is fringed with a sandy beach fronted by a coral reef. North of Ponta Mesaolane, situated 15 miles N of Ponta Uifundo, the reef dries and extends 1.5 miles offshore in places. It is advisable to keep in depths greater than 20m along this stretch of coast.

Ponta Maunhane (12°58'S., 40°35'E.) is a bluff point marked by a light; a stranded wreck lies E of the light.

Pema (12°58'S., 40°30'E.)

World Port Index No. 46940

3.43 Pema is located on the NE side of the S part of Baia de Pema. The bay is entered between **Ponta Romero** (12°57'S., 40°30'E.) and Ponta Said-Ali, 1.2 miles NNE. Baia de Pema forms one of the finest harbors on this coast, with sufficient water in most parts for deep-draft vessels and shelter from all winds. Vessels entering the harbor should pass to the S and W of Baixo Indujo; Monte Mutucua bearing more than 256° will clear the S extremity of the reef.

Winds—Weather.—The land breeze generally blows out of the bay until 0700 or 0800. The prevailing winds from May through September are the Southeast Trade Winds. The winds are strongest during June and July, but never reach gale force. From January through April (the rainy season), the prevailing winds are from the NW, and are usually light.

During the North Monsoon, from the middle of October to the middle of March, the weather is hot, damp, and somewhat oppressive, but the temperature is seldom over 36°C, and generally ranges between 28° to 33°C. Rain falls intermittently throughout the monsoon, the average rainfall on the coast for the season is about 800mm. In the opposite monsoon, from April to September, the weather is cool and pleasant and practically no rain falls.

Tides—Currents.—Because of the depth of water in the entrance of the bay and in the port, the effect of the tides on shipping is negligible

Depths—Limitations.—Ocean-going vessels can be accommodated at a quay which has an alongside depth (1994) of 6.3m

Aspect.—When approaching from seaward, Iocola, a conspicuous conical mountain, 694m high, about 30 miles SW of Ponta Maunhane, in range, with the entrance, bearing 234°, forms a useful mark. A concrete water tower, standing about 1 mile SW of Ponta Romero, is conspicuous when approaching from NE, but is not visible S of Ponta Maunhane. A red brick church with a tower, standing about 1.2 miles SSW of Ponta Romero, is conspicuous when viewed from W of that point.

Pilotage.—Pilotage is compulsory for all vessels entering Pema. No pilots are stationed at Pema. Pilots should be ordered 72 hours in advance from Porto de Nacala. Pilots board arriving vessels at Porto de Nacala; southbound departing vessels disembark the pilot at Porto de Nacala. The pilot remains in Pema until the vessel departs.

Vessels from the N should order their pilot from Porto de Nacala.

Anchorage.—Sheltered anchorage may be obtained in the S part of Pema, in about 26m, about 0.2 mile S of the wharf, but the approach within 230m of the wharf must be kept clear for vessels berthing. Anchorage may also be obtained in the N part of the bay, in 16 to 29m, taking care to avoid Pantaloon Shoal. Vessels should not approach Baxio Pinguim (Penguin Shoal) closer than 0.2 mile.

Caution.—The isolated dangers in the harbor are well-charted and may best be seen on the chart.

The Arquipelago de Quirimba

3.44 The Arquipelago de Quirimba (Arquipelago das Querimbas), a chain of islands and reefs, fronts the coast for about 110 miles from Porto da Arimba to about 4 miles S of Cabo Delgado. The islands are generally low, well-wooded, often undulating, and easily seen from seaward. The coast of the mainland abreast the islands is generally low, and can rarely be distinguished when passing outside the outer reefs, and, as the seaward edges of the latter are steep-to, caution is necessary, even by day, when navigating in the vicinity.

Vessels on passage along this coast will gain nothing by using the passages between the islands N of Cabo Pequene (11°51'S., 40°31'E.), but should that be necessary, the most favorable time to make the passages is at LW, with the sun astern of the vessel; constant sounding is necessary.

Tides—Currents.—Within the outer islands, the tidal currents are weak and are greatly influenced by the winds. The W tidal current, or that of the rising tide, is usually the stronger, and enters the archipelago by the various openings between the reefs. The normal S current will be experienced about 10 miles outside the outer reefs, until about 20 miles S of Cabo Delgado.

Pema to Porto do Ibo

3.45 **Ponta do Diabo** (12°45'S., 40°38'E.) is situated 13 miles NNE of Ponta Said-Ali; a light stands on Ponta do Diabo.

Iha Quipaco (12°41'S., 40°37'E.) lies on the S end of a reef about 4 miles NNW of Ponta do Diabo. There are some bare hills, with sand patches on them, on the island.

Baia do Quipaco is entered between the S end of Ilha Quipaco and a point 1 mile SSW. It is advisable to enter the bay at LW, passing close S of the island, and anchoring almost immediately after passing the island.

Ilha Quisiva (12°36'S., 40°37'E.) is a low island situated 5 miles N of Ilha Quipaco; the ruins of a settlement are located on its W side.

Porto da Arimba is entered between **Ponta Nangamba** (12°38'S., 40°36'E.) and Ilha Quisiva, about 1.7 miles N, through a narrow channel, with depths of 3.7m. There is a narrow channel between Ilha Quisiva and Ilha Mefunvo, about 2 miles NNW, with a depth of 5.5m in it. Small vessels may obtain anchorage, in 5m, in a narrow area between the W edge of the reef surrounding Ilha Quisiva and Ilha Mefunvo and the E edge of the bank which fringes the W shore. Vessels are advised to enter Porto da Arimba at LW.

Ilha Mefunvo (12°33'S., 40°36'E.), the highest of all the islands in the vicinity, is covered with thick green scrub. It lies at the extremity of a drying bank which forms the N side of Porto da Arimba.

Massundji-Macula (12°27'S., 40°39'E.) is a group of above-water rocks

Ilha Quilaluia lies about 2 miles N of Ilha Mefunvo. Temporary anchorage may be obtained, in 24m, coral, about 1 mile SE of the S extremity of Ilha Quilaluia, and about 0.3 mile from the edge of a reef.

Porto do Ibo (12°20'S., 40°37'E.)

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3.46 Porto do Ibo is located between Ilha do Ibo and Ilha Matemo on the E and the mainland on the W. The port consists of a town and a very small natural harbor.

Wind—Weather.—The unhealthy season is from the middle of January to the middle of March; during this period there is a considerable rainfall accompanied by thunder and lightning.

Tides—Currents.—The tidal currents run strong in Canal do Sul. In the channel, the incoming tidal current sets toward Baxio de Sao Goncalo and the outgoing tidal current sets toward Mujaca Shoal.

Aspect.—Ilha do Ibo is low and flat, but the lighthouse on Ilha Mujaca shows up well against the dark green vegetation. The coconut palms in the town of Ibo, about 2 miles W of Ilha Mujaca, are conspicuous, as is the white Forte de Sao Joao at the NW end of the town, which presents a long front when seen from NE. Porto do Ibo Light is shown on the W end of Ilha do Ibo, about 0.5 mile S of Forte de Sao Joao.

The land within the coast between Ponta Quissanga and Ponta Quirimisi is moderately high and backed by a range of hills which are visible at a distance of 20 miles. The S end of the range terminates in a bluff, with a conical hill close S of it.

Pilotage.—There are no pilots available. Local knowledge is recommended. Vessels without local knowledge should enter during daylight only.

Signals.—Ibo Light is exhibited on Ilha Mujaca. There is a signal station at the light, which is connected by telephone to the town of Ibo.

Anchorage.—Fair anchorage, although exposed to E winds, may be obtained, in 11 to 24m, about 5 miles WNW of Ilha

Mujaca. Anchorage may be obtained off the NW side of Ilha Matemo, in depths of 9 to 11m, about 0.5 mile SW of Ponta Ucaia (12°12'S., 40°34'E.).

Directions.—No difficulty should be experienced in entering Porto do Ibo if the buoys are in position, but if not, vessels are advised to enter the harbor at or near LW.

Caution.—Baixo de Sao Goncalo, when covered, is marked by breakers or by discolored water.

Porto do Ibo to Cabo Delgado

3.47 Ilha das Rolas (12°09'S., 40°34'E.) affords sheltered anchorage, in depths of 8 to 13m, at a distance of between 1 mile and 2 miles SSW of the SW extremity of Ilha das Rolas.

Caution.—Vessels can approach the anchorage with the S extremity of Ilha das Rolas bearing W and then alter to 240° on a distant peak to pass between that island and Ilha Matemo. Caution is required, however, to avoid the detached shoals off the reef bordering the N side of the latter island.

Between Ponta Quirimisi (12°12'S., 40°31'E.) and Ponta Pangane, the coast is higher than that between Ponta Quirimisi and Ponta Quissanga. The coast between Ponta Pangane and Cabo Delgado is seldom seen outside the islands.

Saint-Lazarus Bank (12°08'S., 41°22'E.) has a least depth of 6.4m at its N end.

Baixo Zala (12°06'S., 40°35'E.), a reef which dries, lies 3 miles NNE of Ilha das Rolas, at the SW end of a rocky bank which is in a depths of 5.5m or less.

Ilha Macaloe (11°59'S., 40°35'E.) is surrounded by an extensive drying reef.

Baia de Medjumbe is entered between Ilha Dejumbe and Baixo Vadias, 5 miles N.

Passagem de Medjumbe, which leads between the reefs extending N from Ilha Dejumbe (11°47'S., 40°38'E.) and S from Baixo Vadias into Baia de Medjumbe, is clear of dangers over a width of 4 miles.

When approaching from seaward, the mainland is in distinct but the high trees on Ilha Dejumbe may be clearly seen; the sides of the pass are marked by heavy surf on the edges of the reefs.

3.48 Ilha Quissanga (11°49'S., 40°34'E.) lies about 2 miles W of Ilha Dejumbe. Good anchorage may be taken at least 0.5 mile W of Ilha Quissanga, in 14.6m, sand and shells, with the islet and the tall trees on Ilha Dejumbe in line bearing 079°. This anchorage may be safely approached either by the channel between Cabo Pequene and Ilha Quissanga, or by Passagem de Medjumbe, but in the latter case, care must be taken to avoid Rocha Gray, about 2.5 miles NNW of Ilha Dejumbe Light.

Anchorage may also be obtained, in depths of 9 to 27m, sand and coral, anywhere in the area within Passagem de Medjumbe.

Passagem de Nameguo (11°33'S., 40°37'E.) lies between Baixo Varuni and Baixo Nameguo. Good anchorage, in depths of 9 to 22m, sand and coral, may be obtained within Passagem de Nameguo; the best berths depend on the monsoon, due to the prevailing strong winds being NE and SE. A good berth, in depths of 12 to 16m, is off the W side of Baixo Nameguo; an-

chorage in similar depths may also be obtained E of the SE extremity of Baixo Magive Cobua.

Passagem de Tambuzi (11°26'S., 40°39'E.) is divided into two parts by Baixo Bower, which may be avoided by not bringing the S extremity of Ilha Mionge (11°25'S., 40°31'E.) between the bearings of 261° and 275°. There is good anchorage about 1.5 miles W of Ilha Tambuzi, in 16m, sand and coral, with the summit of Ilha Mionge bearing 234°.

Pedra Messassari is a very dark and almost square rock, about 0.9m high and conspicuous, which lies about 3 miles NE of Ilha Mionge.

3.49 Baia de Mocimboa da Praia is entered through **Passagem de Mionge** (11°23'S., 40°31'E.), which leads between the reefs extending N from Ilha Mionge and those extending S from Ilha Mechanga, 1 mile N.

The outer approaches to Baia de Mocimboa da Praia are formed between Cabo Ulu (11°24'S., 40°28'E.) and Cabo Messangi. Passagem de Tambuzi is the principal approach, but Passagem de Nameguo is also available for vessels from S.

Passagem de Suna and Passagem de Niuni are available to vessels coming from N. Vessels navigating Passagem de Suna should enter on a mid-channel course. Sand Cay and Ilha Makunga lie on the NE edge of a reef close off the E side of Ilha Metundo (11°10'S., 40°41'E.); a rock on the reef between them is 7m high and very conspicuous.

3.50 Porto de Mocimboa da Praia (11°20'S., 40°20'E.) is located at the mouth of the Rio Muzama at the head of Baia de Mocimboa da Praia. The port consists of a town and a capacious and sheltered harbor.

The best approach for vessels when entering the harbor is through Passagem de Tambuzi.

Approaches can be made through Passagem de Suna and Passagem de Niuni, but it is not advised without local knowledge due to numerous shallow patches.

Tides—Currents.—Within the harbor, the W tidal current on the rising tide is scarcely appreciable, but the E tidal current on the falling tide attains a velocity of from 2 to 3 knots.

Anchorage.—Anchorage may be taken either before entering Passagem de Mionge or inside the passage, in depths of 18 to 22m, mud.

Deep draft vessels should anchor about 3 miles E of Ponta Vermelha, the N entrance point of Mto Mocimboa, a creek at the head of the harbor.

In Baia de Mocimboa da Praia, there is an anchorage area in which there is a least depth of 7.3m.

A 1.5m shoal lies in the anchorage, about 5.5 miles NW of a beacon that marks a rock off the W side of Ilha Mechanga; a 5.5m patch has been reported to lie close to it.

Caution.—Navigational aids are reported (1995) to be unreliable; they may be missing, unlit, or out of position.

3.51 Cabo Messangi (11°12'S., 40°31'E.), the N entrance point of Baia de Mocimboa da Praia, is a well-marked point, 14.3m high. It may be recognized by a clump of casuarina trees, 29m high, the most conspicuous object on this part of the coast. Anchorage can be taken, in 14m, about 4 miles E of Cabo Messangi.

Between Cabo Messangi and Cabo Nondo, 10.5 miles NNE,

the coast is low and wooded, with an occasional small village surrounded by coconut palms. A sand bank fronts the coast and landing is impracticable except at HW.

Cabo Nondo (11°02'S., 40°34'E.) may be easily recognized from the S by a group of casuarina trees, about 24m high.

Passagem de Metundo is entered between Ilha Metundo and Ilha Vamizi. A light is shown from a conspicuous white circular tower on the E end of Ilha Vamizi.

Ilha Vamizi, about 7 miles long in an E-W direction, is 28m high at its E end, wooded, and slightly lower at its W end, which lies 2 miles E of Cabo Nondo. Ilha Vamizi is surrounded by a reef, which extends for about 1 mile from its S side.

The outer part of Passagem de Metundo has depths over 183m, but the depths decrease very rapidly, and there are numerous reefs and shoals on the S side of the entrance and a short distance within the entrance.

Baixo Pinguim (11°05'S., 40°39'E.) lies 6.2 miles SE of Cabo Nondo. The channel between Baixo Pinguim and Ilha Vamizi has depths from 10 to 23m; it may be used by larger vessels seeking anchorage in Passagem de Metundo. Other channels may be used by small craft with local knowledge.

3.52 Baia de Maiapa (10°57'S., 40°34'E.) is entered between Cabo Nondo and Cabo Afungi. The shores of the bay are bordered by extensive sand flats, which with Baixo Mepanga-Panga (10°59'S., 40°37'E.), Ilha Queramimbi, and its surrounding reef, together with numerous deep holes of 37m to 55m, limit the anchorage to a comparatively small area, suitable for small vessels with local knowledge.

Baia de Maiapa is approached through Passagem de Vamizi between Ilha Vamizi and Ilha Rongui. Within the bay, tidal currents set SW on the rising tide and NE on the falling tide at rates of 1 to 2 knots at springs.

Anchorage.—Anchorage, in a depth of 16.5m, sand and coral, may be obtained about 1 mile N of Baixo Mepanga-Panga; the SW side of the bank is marked by a beacon.

Ilha Rongui (10°52'S., 40°40'E.) and Ilha Tekomadji lie, respectively, 2.2 miles ESE and 2.7 miles NE of Cabo Afungi. When approaching these islands from seaward, the only distinguishing features are clumps of trees, 29m high, on the NE part of Ilha Rongui; when within 6 miles, trees may be seen on the E shore of Ilha Tekomadji.

3.53 Baia de Tungue is entered between **Cabo Afungi** (10°49'S., 40°37'E.) and Cabo Delgado.

Winds—Weather.—Northeast winds from December to March became lighter as the season progressed and were varied, occasionally, by heavy squalls of wind and rain from NW, accompanied by vivid lightning and heavy thunder.

The change of monsoon takes place in April; heavy squalls then frequently occur from S and SW, but by the beginning of May, the steady South Monsoon has set in, the wind generally freshening in the afternoon to a strong breeze, and from this month the force gradually lessens and the wind veers to the E.

By October, very light E winds prevail, with the change to the Northeast Monsoon taking place gradually in the early part of November and accompanied by a few light showers.

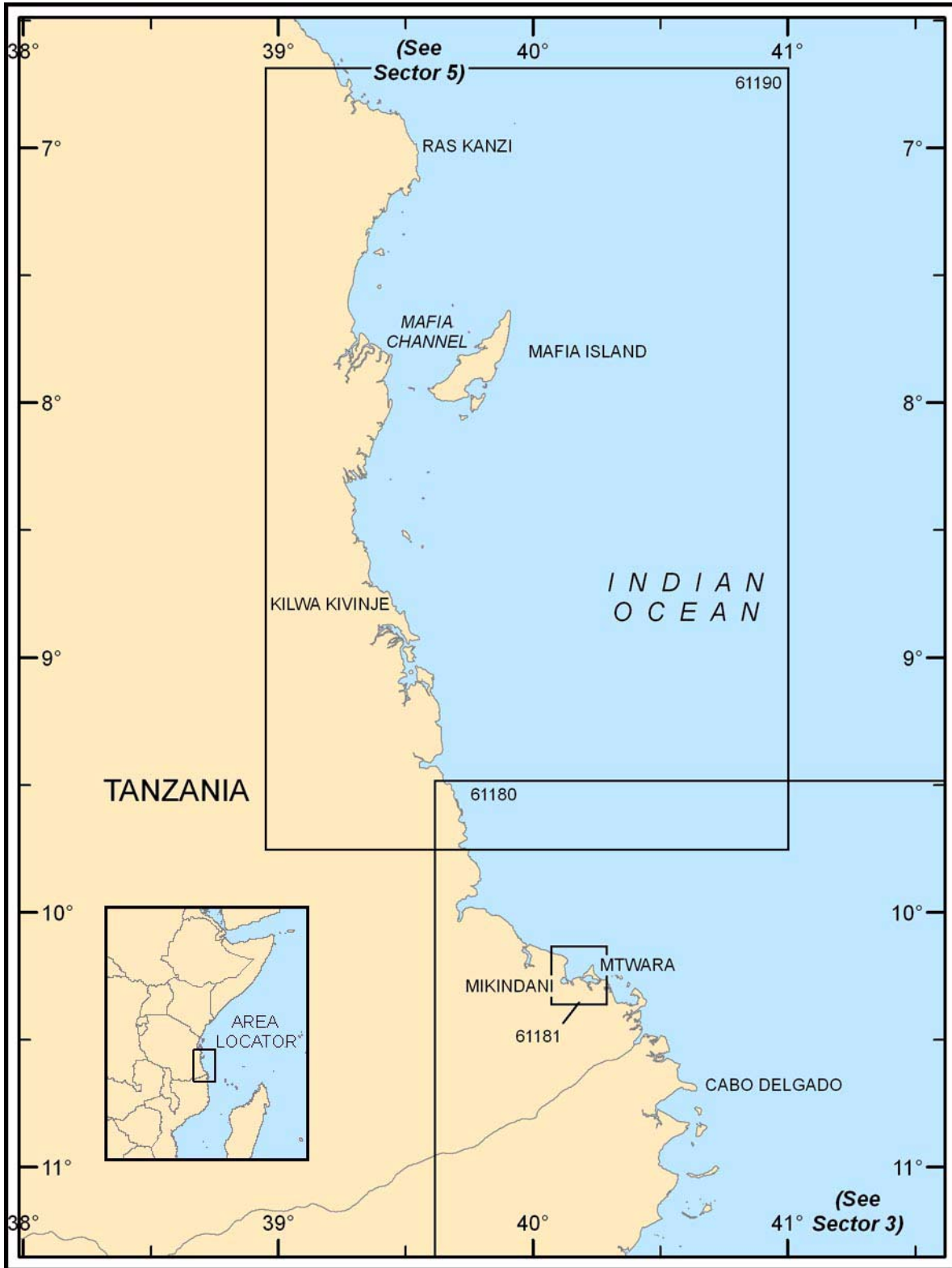
Between the islands and the mainland, sea and land breezes prevail; the former, which occur during May and June, blow very fresh.

Tides—Currents.—In Baia de Tungue, the tidal current of the rising tide sets SSW, and that of the falling tide sets N by E, at velocities of from 1 to 2 knots.

Aspect.—The head of the bay is backed by a wooded ridge, which forms the highest ground in the vicinity. The land within the S shore of the bay is low and flat, but adjoining the N shore it rises to elevations of between 24 and 61m.

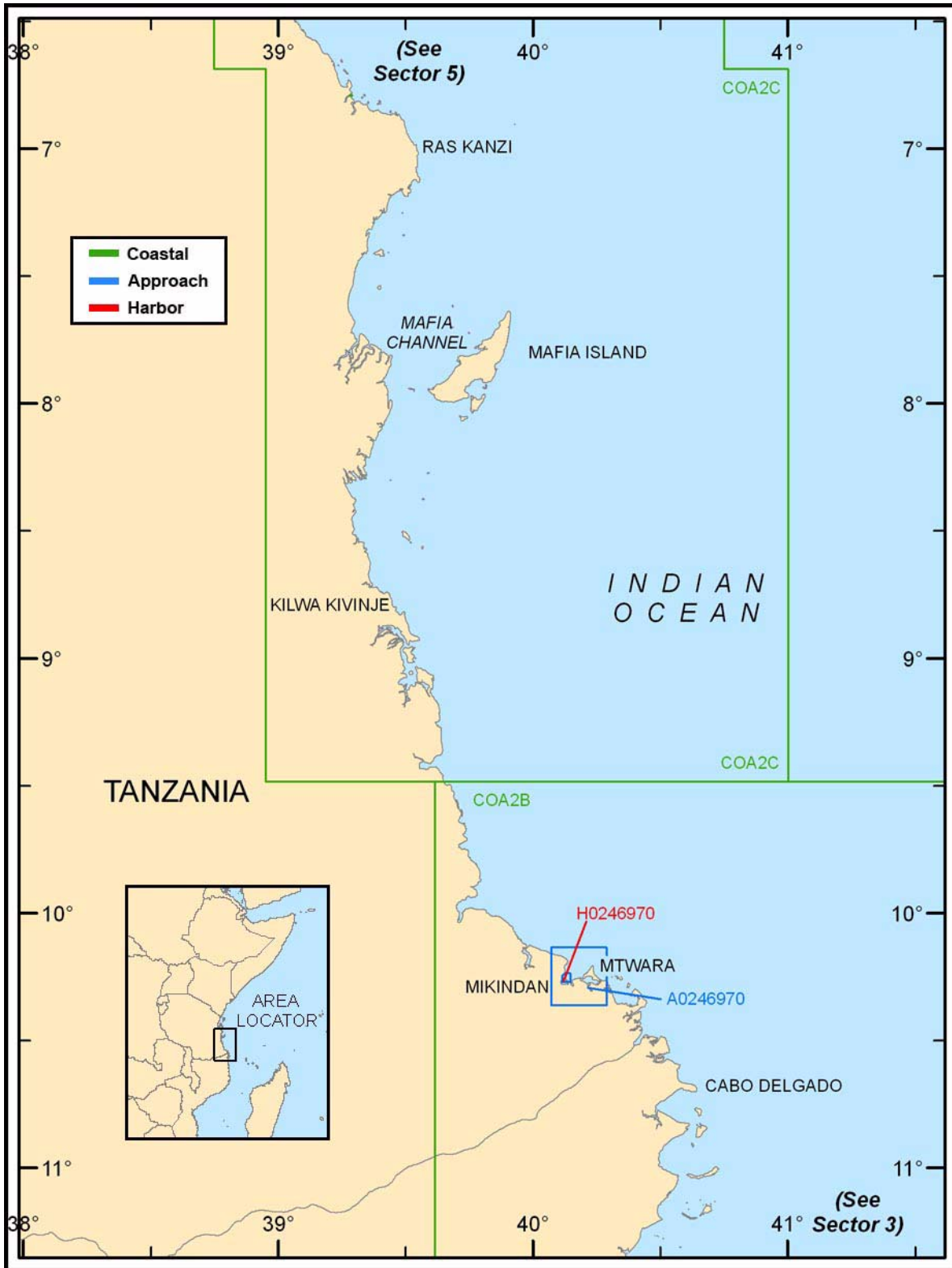
Anchorage.—Good anchorage can be found, in about 18m, with an even bottom, with the flagstaff at Palma bearing 260°, distant 3.5 miles. Small vessels can anchor, in 7m, about 1.2 miles W of the westernmost point of Ilha Tekomadji.

3.54 Cabo Delgado (10°41'S., 40°38'E.) is described in paragraph 4.2.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 4 — CHART INFORMATION



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SECTOR 4 — DNC LIBRARY INFORMATION

SECTOR 4

TANZANIA—CABO DELGADO TO RAS KANZI

Plan.—This sector describes the SE coast of Africa from Cabo Delgado N to Ras Kanzi (7°01'S., 39°33'E.), a distance of about 230 miles.

General Remarks

4.1 From Cabo Delgado, the coast trends in a general NNW direction to Ras Kanzi. The coast is low without any outstanding landmarks or points of significance. Many rivers flow into the sea along this coast and it is indented by numerous coves and bays. Mafia Island lies about 10 miles offshore, about 40 miles SSE of Ras Kanzi.

The coasts of the island are generally low and devoid of conspicuous features; however, the E coast is cliffy.

Cabo Delgado to Mtwara

4.2 Cabo Delgado (10°41'S., 40°38'E.) is marked by a light that consists of a white hexagonal concrete tower and dwelling, 36m high. The peninsula is low, but close N of the cape there is a hill with an elevation of 26m. A drying reef fringes the cape, extending over 1 mile SE; it is steep-to and is usually marked by surf. About 2 miles S of Cabo Delgado lies an isolated rock, 0.9m high.

Between Cabo Delgado and Cabo Suafo, the coast is low, thickly wooded, and fronted by reefs. The sea generally breaks heavily on these reefs, rendering them visible from some distance seaward.

Cabo Massungu (10°36'S., 40°36'E.) is low but it may be recognized by the number of detached rocks off it.

Baia de Quionga is entered between Cabo Massungu and Cabo Samadudo. The HW interval at full and change in Baia de Quionga is 4 hours 10 minutes; spring tides rise 3.6m. The S shore of the bay is fringed with a coastal bank extending nearly 0.8 mile offshore. Outside this bank, the depths are irregular and increase rapidly in places, leaving little room for anchorage.

Cabo Suafo (10°29'S., 40°32'E.) is low and thickly wooded, with a small conical hillock, 24m high, 0.3 mile inland. This hillock is conspicuous when near the land.

Between Baia de Quionga and Cabo Suafo, the tidal currents run strongly along the edge of the steep-to coastal bank, making a wide berth necessary.

4.3 Ruvuma Bay (10°25'S., 40°27'E.) is entered between Cabo Suafo and Ras Matunda (10°21'S., 40°27'E.). The bay is open to the ocean swell and heavy breaking rollers at all times.

Tides—Currents.—The HW interval at full and change in Ruvuma Bay is 4 hours 10 minutes; spring tides rise 3.6m.

Aspect.—About 2 miles N of the entrance of the Rio Ruvuma, close to the shore, there is a conspicuous square clump of trees, and 1.3 miles farther N is a group of three tall trees, which from seaward form one of the most conspicuous features in Ruvuma Bay.

Anchorage.—There is good anchorage in the S part of Ruvuma Bay, in 18m, mud. Less swell is experienced here than in other parts of the bay. Good anchorage may also be obtained on the N side of the bay, in 18m, mud.

4.4 Between Ras Matunda and Ras Masamgamku, the coast is fronted by a reef which extends 5 miles offshore in places. The reef is broken at the entrance to Mnazi Bay. The reef is steep-to; the 200m curve lies 0.3 mile off in places.

Mana Hawanja Island (10°17'S., 40°22'E.), 25m high, lies on the coral reef 5.3 miles NW of Ras Matunda. Mongo Island, 24m high, lies on the reef 1.3 miles farther NW.

Mnazi Bay (10°20'S., 40°21'E.) is entered between **Ras Ruvura** (10°18'S., 40°24'E.) and Ras Masangamkuu.

Tides—Currents.—The HW interval at full and change in Mnazi Bay is 4 hours; spring tides rise 3.3m.

The tidal current in Msimbati Channel runs at velocities of from 4 to 5 knots at springs, with heavy overfalls off the point of reef extending SE from Mana Hawanja Island. There is very little tidal current within the bay. Outside, the current following the direction of the coast, running NW and SE and attaining velocities of from 2 to 3 knots at springs, are strongest near the reefs, the SE current being that of the rising tide.

Aspect.—Mongo Island is thickly wooded and has a number of tall trees near its NW end which show up well from the N.

Mariners are advised to be on constant alert for shoal areas, and to obtain local knowledge. Because of the imperfect nature of the survey, great care must be exercised when in this vicinity. The channel is marked by buoys.

4.5 Mikindani Bay (10°13'S., 40°09'E.) is entered between **Ras Masangamkuu** (10°12'S., 40°14'E.) and Cape Paman. The bay forms the approach to Mtwara Bay, Misete Creek, and Mikindani Harbor.

Cape Paman (10°11'S., 40°08'E.), the W entrance point of the bay, is fringed by Hull Rocks, a dense cluster covered with brushwood, which are easily identified.

The shores of the bay are fringed with drying coral reefs, extending as much as 1.3 miles offshore in places and broken only by the channels leading into the various harbors.

Pilotage is compulsory S of a line drawn in a 270° direction from Ras Masangamkuu to the W shore of Mikindani Bay. The pilot embarks about 1 mile NNW of Mwamba Shangani and is available from 0600 to 1800.

The pilot is based at Dar es Salaam; requests should be made to the Harbormaster at Dar es Salaam stating the vessel's ETA, giving as much time as possible. Vessels from N may be requested to embark a pilot at Dar es Salaam.

There is no safe anchorage in Mikindani Bay.

Vessels arriving off Mikindani Bay during darkness and waiting to enter are advised to keep a good offing as the currents are strong and set onshore.

Mwamba Shangani (10°13'S., 40°12'E.), with a least charted depth of 4m, lies 1.3 miles offshore in a position 3 miles

WSW from the light on Ras Mangamkuu. This shoal lies on the approach range to Mtwara Bay. Lulu Shal lies close E of the approach range 0.3 mile SE of Mwamba Shangani.

Misete Creek (10°16'S., 40°09'E.) is approached between Mwamba Shangani and Mwamba Dadi, two coral reefs which dry in places. The creek affords shelter to small craft in depths from 3.7 to 5.5m, sand and pebbles, in a basin at its head.

Mtwara (10°16'S., 40°12'E.)

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4.6 Mtwara is located on the W shore of Mtwara Bay on the SE side of Mikindani Bay. The port consists of a town and a natural, spacious, and well-sheltered harbor.

Mtwara Bay is entered between Ras Lichamelelo and Msemu Spit, a low sandspit 0.4 mile SSE; a beacon stands on the SW extremity of the spit.

Tanzania Ports Authority

<http://www.tanzaniaports.com>

Tides—Currents.—The tidal currents in the entrance channel E of Ras Lichamelelo follow the channel, attaining a velocity of 1.25 knots at springs.

The tidal currents run sharply round Msemu Spit and allowance should be made when rounding the spit. If entering with the flood current, keep to the E side of the channel and round the spit close to; if the ebb current is running, keep close to the town of Mtwara to allow for turning into the harbor.

Depths—Limitations.—There is a least depth of 20m charted in the entrance channel; there is a least width of 160m W of Msemu Spit. The main quay is 380m long, with a depth alongside of 9.8m. It has been reported a narrow channel dredged to 8.5m leads to the NW end of the deep water quay.

Aspect.—Both sides of Mikindani Bay are low and thickly wooded, while at the head, over Mikindani Harbor, the hills rise from 91 to 188m above the sea level; about 2 miles SW of Ras Msangamkuu is a conspicuous high tree.

Mikindani Bay may be readily identified from seaward by Milima Mjoho, a conspicuous conical hill, 188m high, and wooded, about 10 miles SW of the middle of the entrance. Also, if within 7 miles of the entrance, by Hull Rocks, 16.4m and 18.9m high, close E of Cape Paman, which forms a mass of conglomerate coral covered with brushwood.

A large church is located about 0.6 mile S of the signal station on Ras Lichamelelo. It has a conspicuous white cross, which is sometimes illuminated at night.

Pilotage.—Pilotage is compulsory.

Signals.—There is a signal station situated on Ras Lichamelelo; it may be contacted on VHF channels 12 and 16.

Anchorage.—The harbor provides good anchorage, in 12 to 33m, with a general holding ground of mud. Swinging space is considerably restricted by shoals. Good shelter is afforded from all winds and tidal currents except near Msemu Spit, about 0.4 mile S of Ras Lichamelelo.

Directions.—Vessels entering Mtwara Harbor should pass SW of Mwamba Shangani, which is marked NW by a red and white checkered buoy. Approach with the lights in range 154°

and 189°, respectively. When nearly abeam of Ras Lichamelelo course should be altered as necessary for rounding Msemu Spit, a low sand spit about 0.8 mile SE of Ras Lichamelelo. The harbor is clearly defined by the color of the water.

4.7 Mikindani (10°16'S., 40°08'E.) (World Port Index No. 46970) is located at the SW corner of Mikindani Bay and is entered between Mwamba Dadi and the edge of the reef fringing the W shore of Mikindani Bay. The port consists of the village and a small natural harbor. There is a least charted depth of 9.1m in the entrance channel, which is about 90m wide in places. The tidal currents in the harbor are hardly perceptible. At the head of the harbor is Bismarck Hill, 106m high; about halfway up the hill there is a white house with a tower visible from a considerable distance seaward. The low white customs house, flanked by two small towers, stands at the SW corner of the harbor.

Pilotage is compulsory. The harbor affords sheltered anchorage, in 12m, mud, but as a port, Mikindani has been abandoned in favor of Mtwara.

Caution.—Vessels should approach the entrance of Mikindani Harbor from a position about 1 mile E of Ras Managumba, nearly 1.3 miles N of Pemba Point (10°15'S., 40°08'E.). No exact marks for passing between the reefs can be given, but care is necessary because of the heavy swell which sets into the channel.

Mtwara to Ras Shuka

4.8 From **Cape Paman** (10°11'S., 40°08'E.) to Ras Mkya, the coast is low and fringed by a reef extending 1.3 miles offshore in places. From Ras Myka to Ras Shuka, the low coast continues to be fringed by a reef; there is an opening in the reef NW of Ras Mkya. About 4.3 miles NW of Ras Myka, an islet covered with dark trees lies close to the coast; it is conspicuous.

Mto Sudi is a narrow creek entered between **Ras Mkya** (10°07'S., 39°59'E.) and Ras Wambi. Both entrance points are fringed with reefs which contract the width of the channel to less than 0.2 mile in places.

Tides—Currents.—Outside the entrance of Mto Sudi, the incoming tidal current or that of the rising tide, sets N, and the outgoing tidal current, or that of the falling tide, sets SE. During the South Monsoon, the N tidal current is the stronger.

Depths—Limitations.—There are depths of from 9.1 to 27m for about 3 miles within the entrance.

Nymphe Shoal, with a least depth of 4.5m, lies in the fairway of the approach to the entrance channel, about 1.3 miles NE of Madjovi Rocks; the latter lies about 0.4 mile ENE of Ras Wambi.

Fungu Chosan and Fungu Gomani, the coral reefs fringing Ras Mkya and Ras Wambi, respectively, extend over 1 mile seaward of the entrance; a bank, on which the depths are less than 5.5m and on which there are several drying coral patches, extends as much as 0.3 mile seaward of the edges of these reefs.

A sand spit, the inner part of which dries, extends about 0.3 mile W of Ras Swa-swa, a projection on the E shore about 1.8 miles SW of Ras Mkya.

A bank, on which there are detached drying patches from 0.2

to 0.3 mile offshore, fringes the W shore S of Ras Swa-swa.

Aspect.—From NE, the entrance may be readily identified by a gap in the hills, and also by Madjovi Rocks, the highest of which is 4.6m high. A conspicuous tomb stands at the SW end of Mkya Village, nearly 0.8 mile W of Ras Mkya. The larger village of Mwanja is located about 0.2 mile SW of Mkya Village. A beacon stands on the W shore at Dodongi Village, about 0.3 mile SSW of Ras Wambi.

A small buoy, surmounted by a flag, is moored off the N edge of the bank extending W from Ras Swa-swa.

Anchorage.—Temporary anchorage may be obtained SW of Nympe Shoal, in 16.5m, sand and coral, with the highest Madjovi Rock bearing 215°, distant about 1 mile.

A convenient anchorage is in mid-channel, in 16.5m, abreast Mwanja Village, with the beacon at Dodongi Village bearing 332°, distant 2.5 miles. There is also anchorage between Ras Swa-swa and Sudi Village, in depths of 11 to 14m, mud.

Directions.—When approaching Mto Sudi, do not close the coast within 2.5 miles until the white custom house at the W extremity of the beach at Sudi is well open, and bringing it in range with a gap in the distant hills, bearing 201°, which leads W of Nympe Shoal.

When Madjovi High Rock bears 224°, edge to the E until the old Custom House is open about its own width of the sand spit of Ras Swa-swa, which will lead in mid-channel to the anchorage off Mwanja.

If bound to the anchorage above Ras Swa-swa until nearly abreast the mouth of Mto Bukaro, about 0.4 mile NW of Ras Swa-swa, course may gradually be altered S, and then round the spit extending about 0.3 mile W of Ras Swa-swa. With a good lookout, the reefs on both sides of the channel can be made out clearly, and when the sun is behind, a vessel can enter at slack water.

Ras Shuka to Ras Mbemkuru

4.9 Ras Shuka (9°59'S., 39°49'E.), a low point, is marked by a light; the coastal reef extends about 0.8 mile NE from the point and the 180m curve lies 1.3 miles off the shore.

Lindi Bay is entered between Ras Shuka and Ras Mbanura (9°55'S., 39°47'E.), a low cliffy point, about 3.8 miles NW. The Lindi River flows into the SW corner of the bay and the town of Lindi stands on its W entrance point, about 6 miles SW of Ras Mbanura. Vessels that can cross the bar may obtain sheltered anchorage in a narrow area in the river abreast the town.

4.10 Lindi (10°00'S., 39°43'E.) (World Port Index No. 46980) is located at the mouth of the Lindi River, which is entered between Ras Rungi and Ras Nando, 1.8 miles SW. The port consists of a town and a small natural harbor.

Tides—Currents.—Mean spring tides rise 3m. The currents at the anchorage during spring tides run at 3.5 knots; at other times a rate of 2 to 3 knots may be expected. During the rainy season, the current is strong; a vessel seldom swings to a contrary tide.

Depths—Limitations.—There is a charted depth of 4.2m on the outer range line in a position about 0.5 mile W of Ras Rungi. Within the bar there are depths from 12.8 to 18.3m.

Coasters up to 52m long, with a maximum draft of 3.8m, can berth at the jetty face at all stages of the tide, but there are no

facilities for ocean-going vessels. BA NP 3, Supp No. 10

Aspect.—The hills over the W shore, rising to a height of 297m, are well-wooded and cultivated in patches.

Mlima Mdemba is 289m high and about 7 miles W of Ras Mbanura. Mlima Atu and Mlima Nuni rise 213m and 223m, respectively, about 5 miles SSW of the entrance.

Anchorage.—Temporary anchorage may be obtained outside the bar, in about 9m, mud, with Ras Rungi bearing about 190°, distant 0.6 mile, but the best anchorage as regards holding ground, shelter and convenience, for vessels of moderate size, is abreast the town, in about 16m, sand and mud, about 0.5 mile SE of Ras Nando, the W entrance point of the Lindi River.

Vessels should use this anchorage with caution, as the swinging space, although greater than at the anchorage abreast the town, is restricted and vessels may swing across the river under the influence of wind and tide. It is reported that working cargo in the outer anchorage is not recommended, as the prevailing wind sets up a heavy swell.

Directions.—Vessels with a draft in excess of 5m should not attempt to cross the bar before taking soundings. To leave the inner harbor, vessels must stem the tide as there is no room to turn under power.

4.11 Between Ras Kibungwe (9°52'S., 39°48'E.), a point 15m high located 4 miles NNE of Ras Mbanura, and Ras Mzinga, about 7.5 miles NNW, the only notable feature on the coast is Ras Kera, a bold point fringed with mangroves. Mto Mbanga, about 3 miles N of Lindi, flows into the sea from a large gap in the hills.

Mchinga Bay (9°43'S., 39°46'E.) is entered between Ras Mzinga and Ras Rocumbi.

Aspect.—The bay may be recognized by the gap caused by Mto Namgaru at its head and by the mangrove islets on the fringing reefs extending from the entrance points.

Caution.—Vessels should approach Mchinga Bay with the entrance to Mto Namgaru bearing between 250° and 260° and should sound constantly. When the depths suddenly decrease from about 92m to 18.3m, vessels should anchor as convenient.

4.12 From Ras Rocumbi (9°42'S., 39°45'E.) to Ras Mawedithe, the coast is fringed with reefs which are steep-to. There are reef-fringed indentations on this section of the coast and numerous small islets on the reef fringing the coast.

The chimney of a sisal factory, which stands 11 miles NNW of Ras Rocumbi, on the seaward slope of a hill 2 miles inland, is conspicuous.

Msungu Bay (9°29'S., 39°40'E.) does not afford much shelter. Fair anchorage may be obtained in the S part of the bay, with Ras Mbemkuru bearing 331° and the middle of Jiwe la Mzungu bearing 211°, in a depth of 16m, sand and coral. The Mbwemburu River discharges into the bay and during the rainy season the discolored water may be seen 1 mile to seaward.

Ras Mbemkuru to Ras Ngumbe Sukani

4.13 From Ras Mbemkuru (9°27'S., 39°39'E.) to Ras Ngumbe Sukani, the coast is indented by Kiswere Haven and Roango Bay. The coast is fringed by a steep-to reef which extends up to 0.2 mile offshore; there are numerous islands on the

reef. The coast is low and backed by low hills, nearly all of an equal height.

Kiswere Haven (9°25'S., 39°38'E.) is approached between Ras Mbemkuru and Ras Fugio, about 4.7 miles N. The harbor is entered between Ras Bobare, about 3.2 miles NW of Ras Mbemkuru, and Ras Berikiti, about 0.7 mile N.

Aspect.—At a short distance outside the entrance, the hills backing the harbor appear to be moderately high, with a tableland N, rising from an elevation of 61m to one of 91m, and, on a closer approach, Pandawi Cliff, a square cliff 21m high, rising W of the entrance at the head of the harbor, is conspicuous.

The most distinctive features in the approach to Kiswere Harbor are Mlima Mamba, a conical wooded hill, 128m high, rising about 1.2 miles within the head of the harbor, and Mlima Ruhaha, 126m high, about 2 miles N of Mlima Mamba.

Anchorage.—When Mlima Ruhaha is seen between the entrance points of Mto Nanga, in the NW corner of the harbor, or, when a conspicuous sand patch on the N shore bears 002°, a vessel may anchor, in 7m, stiff mud, good holding ground; this is probably the best anchorage in either monsoon.

Directions.—When approaching Kiswere Harbor, if toward LW, the sea will probably be observed breaking on the bank inside and on the coral reef off Ras Berikiti, which, when recognized, may be rounded as close as convenient.

Coming from the S, steer into the bay, with Pandawi Cliff bearing 264°, until abreast of Ras Berikiti; alter course to 247° until Mlima Ruhaha is seen between the entrance points of Mto Nanga, or, until the remarkable sand patch on the N shore bears 002°, when a vessel may anchor, in 7m, stiff mud, and good holding ground, this being probably the best anchorage in either monsoon. Deep-draft vessels must anchor farther out, in about 21m, where they are more exposed.

Ras Mombi (9°16'S., 39°39'E.) is the S entrance point of Roango Bay, a wide indentation in the coast which is not distinguishable as a bay from a distance of more than 3 miles; it affords no anchorage.

Ras Ngumbe Sukani (9°10'S., 39°38'E.) is the highest point in the vicinity. Two islets, each 6.1m high, are situated on the coastal reef about 0.2 mile N of the point; they help identify it. When approached during the morning, a white patch will be seen on the upper part of the point.

Ras Ngumbe Sukani to Kilwa Kivinje

4.14 Between Ras Ngumbe Sukani and **Ras Matuso** (8°55'S., 39°33'E.), the coast is fronted by Songa Mnara Island and Kilwa Kisiwani Island. Sangarungu Haven and Kilwa Kisiwani Harbor lie between these islands and the mainland.

The current off this part of the coast is continuously N, frequently setting toward the coast. It is strongest and most regular during the South Monsoon, when at times it attains a rate of 4 knots.

Songa Mnara Island (9°04'S., 39°35'E.) may be known by a conspicuous break in one of the projecting cliffs at its S end, which, when seen from the S, appears like an island. The sea, when there is much swell, breaks through this cleft with great violence, throwing the spray to a considerable height and giving the appearance of white smoke rising from the land.

Sangarungu Haven (9°01'S., 39°34'E.) is entered between Ras Sangarungu and Ras Mchangamra; the S part is named

Port Nisus and the N part is named Port Pactolus. The harbor has strong tidal currents, and the swell reaches far in, so that a vessel would have to go some distance in for a secure berth. The water in Sangarungu Haven is very thick and muddy; consequently, dangers cannot be seen.

4.15 Kilwa Kisiwani Harbor is entered between **Ras Kipanoki** (8°57'S., 39°32'E.), the NE extremity of Kilwa Kisiwani Island, and Ras Matuso about 2 miles NE.

Tides—Currents.—Currents are strong and at the inner anchorage there is often an eddy, but as the bottom is tenacious mud a vessel can lie with a short scope of chain and the anchor will be kept clear.

Directions.—At LW no other guide but the eye is necessary for entering the harbor, but at HW only the outer parts break, and Balozi Spit does not show even by a ripple, but the beacon on its N extremity marks its position. Avoid entering with the strength of the incoming tidal current and with the sun ahead, and with the outgoing tidal current running, the rush of water sometimes raises a sea between the outer points of the reefs, which at springs, is dangerous for boats, and makes it difficult to realize that there are over 55m of water, where the overfalls take place.

To enter from N, run along about 0.5 mile distant from the SE edge of Mwamba Rukyira, using the trees on Balozi Spit Beacon, and the Arab Castle for bearings until on the range bearing 285°, which will lead in the middle of the fairway between the reefs and N of Balozi Spit Beacon.

When Balozi Split Beacon is passed, steer SW, using the Arab Castle, either beacon of the range, and Balozi Spit Beacon as bearings until clear of Ras Rongozi, when the course for the anchorage can be set. While steering the above courses, the set of the tidal current should be watched.

From the S, Ras Matuso should be approached bearing about 296° and the above directions followed. No reliance should be placed on positions obtained by bearings of points, formed by mangrove bushes, as the growth of these may have considerably altered the points

Aspect.—**Mpara Hill** (8°51'S., 39°26'E.), 140m high, rises 8.2 miles NW of Ras Matuso and should be seen from 20 miles N or S in clear weather; it is the only hill in the immediate area but it has been reported that it could not be identified.

The two islets with trees situated on the E side of Mwamba Rukyira make a useful mark in the approach. Ras Matuso is fairly conspicuous, either from N or S, and the reef off it will be seen for 3 miles either dry or breaking.

Mso Bay, about 2 miles W of Ras Matuso, has a sandy shore terminating abruptly S in low rocky cliffs, showing in one part a yellow face.

The ancient Arab Castle, standing among the ruins at the NW part of Kilwa Kisiwani Island, is a tall conspicuous fortress and may be seen from seaward in the morning sun.

A square water tower, painted white, is located close N of the rear range beacon on Ras Rongozi.

Pilotage.—Pilotage is available but not compulsory.

Anchorage.—There is temporary outer anchorage during the Northeast Monsoon, about 0.6 mile S of Ras Matuso and about 0.2 mile from the S edge of Mwamba Rukyira, in about 18.3m, sand, abreast of the large mangrove bush on that reef; the farther E the better, to be out of the rush of the tidal cur-

rents.

The anchorage N of Kilwa Kisiwani Village, in depths of 16 to 28m, is open to the sea breeze, but completely protected by the projecting points of reef from the heavy swell that almost invariably beats on the outer shore. A good berth, in 22m, is with Castle Islet, about 0.2 mile N of Arab Castle, bearing 241°; the castle bearing 202°; and Ras Kipakoni bearing 090°.

Good anchorage, in depths of 28 to 37m, mud, can be found off the pier near Kilwa Masoko, which is located on the N side of the estuary opposite Kilwa Kisiwani Village. A four to one scope of chain is recommended as ample, as the current does not run strongly in this deepwater reach of the estuary.

Port Beaver has ample width and for a distance of 5 or 6 miles affords sheltered anchorage for vessels of deep draft.

4.16 Between Ras Matuso and **Ras Tikwiri** (8°49'S., 39°29'E.) the coast is flat and the land is covered with dense jungle.

Between Ras Tikwiri and Ras Miramba, a low mangrove covered point, the coast is bordered by a thin belt of mangroves and is fronted by a drying bank of sand and mud.

Singino Hill (8°48'S., 39°23'E.), 142m high, rises 4.7 miles SW of Ras Miramba. Nunguruku, 146m high, is situated 2.2 miles NW of Singino Hill. Farther W, the country is generally flat without any distinctive features.

Mwanankaya (8°43'S., 39°31'E.), a reef which forms the S entrance to Kilwa Main Pass, lies with its S end 5 miles ENE of Ras Miramba. The main part of the reef dries about 1m and on its SW part there is a sandbank which dries 4m. Amana, a reef marked by a beacon, is situated 1.7 miles W of Mwanankaya; its W end dries about 2m.

Luala Reef (8°37'S., 39°31'E.) is situated on the N side of Kilwa Main Pass. A sandbank on the NW side of the reef dries 2m; the reef is marked on its SW side by a beacon.

Jewe is a reef situated 2 miles W of Luala Reef. A long narrow strip of sand, marked on its W end by a beacon, is situated on the reef; the sand strip dries 3m.

Kilwa Main Pass (8°40'S., 39°32'E.) is a deep channel through a break in the reefs which leads to the anchorage off Kilwa Kivinje. When approaching the pass Mpara Hill and Singino Hill should be seen from some distance, but no land will be seen S of Mpara Hill except in clear weather when the hills of Mchinga range may be seen. To the N of the pass, Fanjove Island and Songo Songo Island should be seen at a considerable distance.

Directions.—Steer to pass 5 miles S of **Fanjove Island** (8°34'S., 39°34'E.), and when the breakers on the reef extending S of that island come into view the eye will be the best guide, but the bank extending WSW of the S extremity of the reef should be given a berth of at least 0.2 mile.

4.17 Kilwa Kivinje (8°44'S., 39°23'E.) (World Port Index No. 47000), consisting of a town surrounded by coconut palms, is situated on the shores of a small bay 1 mile W of Ras Miramba. The station house, a white stone building with a high red roof resembling a tower, and a large white house on the beach in front of the town are prominent.

When approaching the anchorage off Kilwa Kivinje keep in depths of 9m or more. A good berth, in 8m, may be obtained by steering for the station house on a bearing of 198° until

Nunguruku bears about 224°. The tidal currents at the anchorage are negligible.

Kilwa Kivinje to Mafia Island

4.18 Between Ras Miramba and **Ras Pombwe** (8°17'S., 39°19'E.) the coast is fronted by a mass of islands and reefs which extend as much as 18 miles offshore in places. The outer islands and reefs are more or less continuous between Kilwa Main Pass and South Mafia Channel, but within the outer reefs there is an inner channel.

Northbound vessels will gain nothing by using this inner channel, as the current outside the outer reefs is favorable to them. For southbound vessels of moderate draft and low power, the inner channel may be of considerable advantage hence the description of the islands and dangers will be described contrary to the rest of the publication.

The coast of the delta is low, and of uniform outline when seen from seaward. Within the swampy mangrove belt there is a broad flat plain covered with long grass and a few trees. The coast of the delta is broken by several large river mouths.

Ras Samanga Fungu (8°25'S., 39°19'E.) is a point of high mangroves conspicuous when seen from the N and when near the coast.

Simaya Island (8°18'S., 39°26'E.), 6.7 miles ESE of Ras Pombwe, lies on a drying reef on the W side of the inner channel at its N end. The island is sandy and covered with high trees, which are visible at a considerable distance.

Membeuso, a reef with a sand bank which uncovers 2.4m, is situated on the W side of the channel 4 miles SSW of Simaya Island, it is marked on its SE side by a beacon. Banda, a reef which dries 2.4m, lies on the E side of the channel 2.2 miles SE of Membeuso.

4.19 Chocha (8°24'S., 39°23'E.), a reef on the W side of the channel 2.7 miles SSW of Membeuso, is marked on its E side with a beacon. A shoal spit generally indicated by the green cover of water, extends about 0.2 mile SE of the beacon. A detached reef, which dries, lies 1.2 miles SW of the beacon.

Machangi (8°25'S., 39°27'E.) is a group of reefs lying on the E side of the channel, 1.2 miles E of Chocha Beacon.

Songo Songo Island (8°31'S., 39°30'E.) lies 5 miles SSE of Machangi on the E side of the inner channel. Poiasi, which uncovers 3.4m and Pwajuu Reef which uncovers 2.4m lie in the fairway 3.2 miles W and 3.2 miles SW, respectively, from Songo Songo Island.

Val Rock, with 2m or less lies on the E side of the inner channel 2 miles SW of Songo Songo Island; the sea does not break over the rock and it should be given a wide berth. An isolated 9.1m patch lies 0.7 mile SSW of the rock.

An isolated reef lies on the E side of the inner channel 1 mile N of Jewe Reef; it may best be seen on the chart.

Directions.—The inner channel is best navigated when the sun is in a favorable position for seeing the reefs; these directions are written for S bound vessels.

From a position 1.2 miles E of Simaya Island steer 193° to pass between Membeuso and Banda, and then between Chocha and Machangi; this leg of the track passes close W of the 10m curve.

After passing between Chocha and Machangi, vessels may

pass either E or W of Poiasi and Pwajuu, and if proceeding to Kilwa Kivinje they should pass W of Jewe. Vessels proceeding to sea via Kilwa Main Pass, should, when S of Pwajuu, steer to pass E of Jewe taking care to avoid a 9.1m isolated shoal situated nearly 2 miles N of the NE extremity of Jewe.

Pumbavu Islet (8°30'S., 39°29'E.), which is sandy and has a few trees on it, is situated on the NW extremity of the reef surrounding Songo Songo Island; it is connected to the island by a ridge of sand which dries 2m.

Anchorage.—Anchorage may be obtained, in a depth of 11m, at a distance of 0.3 to 0.5 mile W of Pumbavu Islet.

Small craft may obtain more sheltered anchorage in a pocket between Songo Songo Island and the reefs extending S of Pumbavu Islet, in a depth of 7m. The anchorage is approached over a sand bank, with a least depth of 3.7m, close S of the islet.

During the South Monsoon, vessels of moderate draft may obtain sheltered anchorage of the NE side of Songo Songo island with the N extremity of the island bearing 285° and the S extremity bearing 202°; the charted depth is 9.1m.

Okuza Island (8°16'S., 39°36'E.) is a small sandy island covered with casaurina. The trees on the island are about 27m high and may be seen from a considerable distance.

There is anchorage W of the reef surrounding Okuza, in depths of 13 to 22m. In the Northeast Monsoon, a berth well to the SW should be taken to avoid the swell but care should be taken to avoid the 5.5m patch which lies about 2.7 miles SW of Okuza Island.

4.20 Between **Ras Pombwe** (8°17'S., 39°19'E.) and the N entrance point to Kikunya Mouth the coast is a maze of low and swampy mangrove-covered islands, intersected by creeks, comprising the delta of the Rufiji River. Some of these creeks do not communicate with the principal rivers of the delta, but during the rainy season in the interior, December to February, the whole of the delta is frequently inundated.

The coast of the delta projects E of the general coastline and is about 50 miles in length; it is low and of uniform outline when seen from seaward and in nearly all places it is fringed by mangroves. The N part of the delta is fronted by Mafia Island and the numerous islets and reefs which lie in the intervening channel.

Ras Twana (7°48'S., 39°27'E.), the NE extremity of the delta, is low, mangrove covered and fronted by a drying bank of mud and sand which extends 3.2 miles E; the outer edge of this bank is moderately steep-to and is generally only visible when the sea is breaking over it.

Simba Uranga Mouth (7°46'S., 39°22'E.) is used by coastal vessels engaged in the timber trade. There is no definable bar at the entrance but a bank with depths less than 5m extends 6 or 7 miles offshore. Depths on the bank decrease as the entrance is approached and several mudbanks which nearly dry lie between 2 and 4 miles NE of the E entrance point. It has been reported that a least depth of 2.4m has been carried over the bank but the depths probably vary from year to year.

Sunigara arm, which forms the principal approach to the Rufiji River, is entered close within the E entrance point to Simba Uranga Mouth; it has depths of 4.5 to 9m as far as Salale, about 4 miles within the entrance.

Kikunya Mouth (7°42'S., 39°20'E.), the farthest N of the

mouths forming the delta of the Rufiji River, is entered between Ras Simba Uranga, 3 miles NNW of Simba Uranga Mouth, and a point 3 miles NNW.

A buoy is moored 6.7 miles NNE of Ras Simba Uranga. There is no bar and by approaching with the center of the entrance bearing 223°, ahead, a least depth of 1.8m will be obtained. Kikunya Mouth is only connected to the Rufiji River by branches leading to Simba Uranga arm.

Mafia Island

4.21 Mafia Island (7°50'S., 39°48'E.), a large coral island separated from the N part of the Rufiji River delta by Mafia Channel, lies with its SW extremity 11.2 miles SE of Ras Twana. The coasts of the island are fringed with reefs and are generally low with no remarkable features.

Winds—Weather.—The seasons at Mafia Island are similar to those at Zanzibar and, like them, very changeable, but the wind in the Mafia Channel is steadier during the day than in Zanzibar Channel. The rainfall is greater in the vicinity of Ras Kisimani (7°57'S., 39°35'E.) than in other parts of Mafia Island.

4.22 Mafia Island—South side.—Ras Kisimani (7°57'S., 39°35'E.), the W extremity of the island, is low and sandy and has a clump of coconut palms, in the shape of a fan, near its extremity. Red cliffs about 2.7 miles SE of Ras Kisimani are prominent.

Okuto, extending 3 miles offshore from the vicinity of the red cliffs, is the largest projection of an extensive reef which fronts the coast and which dries. Mange, a detached reef which uncovers 3.7m lies 1.5 miles farther offshore; its N end is marked by a beacon.

An extensive detached reef, 12.5 miles long, which dries 2m in places, lies close off the SE side of Mafia Island. Jibondo Island and Juani Island are situated on this reef. A small islet 6m high lies 1.2 miles WSW of Jibondo Island.

Tutia (8°07'S., 39°39'E.), a detached reef lying 5 miles SW of Jibondo Island, dries 3.7m in its N part. The sea always breaks heavily on the S edge of this reef; it is the farthest danger S of Mafia Island.

Anchorage.—A good anchorage may be taken W of Ras Kisimani, in depths of 16 to 22m. Good anchorage, sheltered from all swell, may be taken about 4.5 miles WSW of Jibondo Island, in 10m, sand and mud, with the S islet of Jibondo Island bearing 088° and the NW end of Tutia bearing 183°.

Vessels approaching the above anchorage from the E should give Tutia a good berth, until well clear to the W.

Caution.—A dangerous rock is charted about 0.7 mile SE of the above anchorage.

4.23 Chole Bay (7°56'S., 39°47'E.) is situated at the SE corner of Mafia Island; the bay has not been completely examined, but there are depths from 7 to 14m in the deeper parts.

There are two entrances to the bay. The SW entrance is approached from Jibondo Anchorage, the channel passing NW of Jibondo Island, Juani Island, and Chole Island. Vessels drawing up to 3m are able to enter at HW, and boats may use the channel at all times except at LW springs.

Kinasi Pass, the E entrance, lies between the edges of the

reefs extending from Juani Island and Jina Island (Miewi Island), 1.2 miles N. There are depths of 11 to 20m in this entrance, but the tidal currents run through at rates up to 5 knots and it would be unsafe for any vessel to attempt to enter unless the channel were well marked. During the period of the outgoing tidal current, the sea breaks right across the entrance and would swamp a small boat. Within the bay, the tidal current is S at rates up to 2 knots on the rising tide, and N at about 1.2 knots on the falling tide.

Chole, the principal village and trading place of Mafia, is situated on Chole Island.

4.24 Mafia Island—East side.—Between Kinasi Pass and Ras Mkumbi, the coast consists of cliffs from 3 to 5m high and is fringed with a narrow steep-to reef.

Ras Mkumbi (7°38'S., 39°54'E.), the N extremity of Mafia Island, is formed by a coral cliff 4.6m high; the point is backed by land rising to about 24m high which is covered with small bushes and trees. A light stands on Ras Mkumbi.

A 3.7m patch lies 1.2 miles NE of the light; the point should be given a berth at least 2 miles.

Irregular depths extend about 5 miles NW of Ras Mkumbi, and vessels should navigate with caution in this area. A least depth of 16.5m is charted in this area but disturbed water, as though caused by shoals, is created by the current can be seen in places where the depths are more than 35m.

The sea nearly always breaks on the fringing reef, which extends 0.7 mile N of Ras Mkumbi.

4.25 Mafia Island—Northwest side.—The NW coast of Mafia Island forms the SE side of Mafia Channel. The dangers, which lie adjacent to the track are described with the channel.

Tirene Bay is formed between Ras Kisimani and Ras Mbisi (7°49'S., 39°43'E.). The village of Kilindoni, containing the Government station for Mafia Island, is situated 5 miles NE of Ras Kisimani.

Tirene Reef, 6 miles NE of Ras Kisimani, lies, awash, on the S part of a coral bank with a least known depth of 1.8m which extends 0.8 mile N of the reef.

Tides—Currents.—The current of the rising tide sets somewhat strongly from the NW extremity of Salim Bank into Tirene Bay. At the anchorage it has been observed that the current sets to the N at a velocity of 0.5 knot at 3 hours after, and to the S at a similar velocity at the same time before HW.

Aspect.—Ngombeni Shamba, a clump of mango trees, 53m high shows more conspicuously than other lower clumps.

Palm Hill is covered with coconut palms, forming a conical summit 52m high, whose shape is more marked at a distance, when it is more easily identified.

The Residency at Kilindoni, located near the coast, about 1 mile SW of Palm Hill, is conspicuous. There is a flagstaff W of the Residency.

Anchorage.—Anchorage can be obtained off Tirene, in 10m, sheltered by the outer banks, with Ras Mbisi bearing 040° and the Residency at Kilindoni bearing about 140°.

Caution.—Salim Bank (7°52'S., 39°38'E.), an extensive shoal of sand and coral, with a least depth of 1.8m, lies with its NW extremity 6.5 miles N of Ras Kisimani.

Mafia Channel

4.26 Mafia Channel, between the mainland on the W and Mafia Island on the E, is easily navigated by day. It may be of considerable advantage to low powered vessels of moderate draft proceeding to the S against the South Monsoon, but vessels bound to the N gain nothing by using it as the current is favorable outside Mafia Island.

Tides—Currents.—South of Ras Kisimani, the current of the rising tide sets NW and the current of the falling tide sets SE, but to the N of Ras Kisimani, the currents are nearly reversed, the former being a S current and the latter N, although the tidal currents are frequently overpowered by the permanent N current, especially during neaps.

The alteration in the direction of the tidal currents depends considerably on the wind, as if that should be strong from SE, unless at spring tides, it is almost certain that a strong N current will be experienced in Mafia Channel, at any time of tide.

Between Mange and Sefo Reefs the currents generally follow the direction of the channel, but a NE set may be experienced, on passing Al Hadjiri, with a falling tide.

4.27 South Mafia Channel (8°11'S., 39°39'E.) is the passage between Okuza Island (8°16'S., 39°36'E.) and Tutia; it joins Kisimani Channel about 8 miles SSW of Ras Kisimani.

Kisimani Channel (8°02'S., 39°34'E.) leads from a position 8 miles S of Ras Kisimani to a position 6 miles NNW of that point.

Mange (8°03'S., 39°36'E.), marked by a beacon, is situated on the E side of the channel and Fungu Marima, a reef which dries 1.2m in places, lies 4 miles W of Mange.

Fungu Kauri (8°00'S., 39°33'E.), a reef which dries 2m in places, lies on the W side of the channel. In 1940, a reef was reported about 0.8 mile E of Fungu Kauri.

The E side of the channel, between Ras Kisimani and a position about 2 miles S, is formed by a bank with a least known depth of 0.9 which extends 1.5 miles offshore in places; its W edge is marked by a buoy.

4.28 Belami (7°57'S., 39°33'E.) is a reef on the W side of the channel 1.7 miles SW of Ras Kisimani; its N part, which is awash, is marked by a beacon.

Bwejuu Island, which lies on an extensive reef 2.5 miles W of Ras Kisimani, is covered with casuarina that have a height of about 27m. The N edge of the reef surrounding the island terminates in a spit 4.2 miles N; the least known depth on the reef to the N is 3.7m.

Maduvi (7°55'S., 39°33'E.), on the W side of the channel, is a small sand bank, which dries 4m. A narrow spit, with a least known depth of 3.7m extends 4 miles N of Maduvi; this spit parallels the spit extending N from Bwejuu Island. Al Hadjiri, marked by a beacon, is a reef lying on the E side of the channel 3.5 miles NNW of Ras Kisimani. A sand bank, which dries 1.8m, lies on the reef, and when covered is generally indicated by discolored water; a shoal, with a depth of 5.5m extends 0.5 mile SW of the sand bank toward the channel.

Sefo (7°50'S., 39°34'E.) is a reef lying at the N end of Kisimani Channel. A sand bank, which dries 3.7m and is usually visible, lies on the reef and its W end is marked by a beacon.

Msala Channel (7°50'S., 39°32'E.) lies W of Bwejuu Island

and its surrounding shoals. The channel is not buoyed and is encumbered by numerous reefs, especially in its S part, between Ras Dima (8°00'S., 39°26'E.) and Fungu Marima, where its is almost filled with shoals.

4.29 Mafia Channel.—From the junction of Msala Channel and Kisimani Channel W of Sefo, Mafia Channel leads to a position W of Niororo Island (7°37'S., 39°41'E.).

Wumi (7°45'S., 39°36'E.), a reef, on the W side of the track 5.7 miles NNE of Sefo, dries 0.6m. As there is no sand on this reef it is not easily distinguished at high water. A shoal, with a depth of 3.7m, lies 1 mile WSW of Wumi. A reef, awash, lies 3.2 miles ESE of Wumi.

Shungumbili Island (7°42'S., 39°41'E.), with some high trees on it, is situated on the E side of the track 5.5 miles NE of Wumi. The island lies on the S end of a drying reef and is surrounded by a bank with depths less than 3.7m. A rocky bank extends 2.7 miles SSW of Shungumbili Island and terminates in a 3.7m patch.

Fili (7°40'S., 39°37'E.), a small isolated reef which dries 0.3m, lies on the W side of the track 3 miles WNW of Shungumbili Island; the reef is not easily seen at HW.

Niororo Island is covered with bushes; a tree which stands on the island is conspicuous and when it is viewed from the N at a distance it resembles a plume of smoke. The island lies on the W edge of an extensive reef, that has a sandbank on its NW extremity which dries 1.5m. This part of the reef deflects the tidal current NW causing tide rips which often make the reef appear to extend farther NW than is actually so. Anchorage, in 16.5m, sand, can be obtained off the NW end of the island.

North Mafia Channel extends about 16 miles N of Niororo Island.

Dira (7°34'S., 39°35'E.) is a reef situated on the W side of the channel. A sand bank, which dries 3m, lies on the W side of the reef. Dira can generally be seen and the sea always breaks on it.

Gordon Reef (7°34'S., 39°42'E.), on the E side of the channel, is a below-water reef with depths of less than 2m. An isolated patch, with a charted depth of 7.3m, lies 1.7 miles N of Gordon Reef, and Vulture Bank, with a least charted depth of 3.7m lies 2.7 miles NE of the reef.

Fawn Bank (7°30'S., 39°41'E.) consists of several patches, with depths of 9 to 18m, lying across the channel.

Mafia Island to Ras Kanzi

4.30 Between **Ras Simba Uranga** (7°38'S., 39°20'E.) and Ras Pembamnasi, the coast is chiefly sandy with no marked projections.

Between Ras Buyuni (7°08'S., 39°33'E.) and Ras Kanzi, the coast is low for the first 3 miles, but then rises to cliffs, about 24m high, at Puna Point, about 1 mile farther N.

Kanoge (7°42'S., 39°10'E.) rises to 213m at the S end of the Mtoti Hills, a flat-topped range, about 6 miles inland and parallel with the coast.

Binga, an isolated flat-topped hill, 162m high, rises 16 miles WSW of Ras Pembamnasi; it is the most prominent feature on the N part of the coast.

Kisiju (7°25'S., 39°20'E.), situated within the mouth of a river, is the most important of the numerous villages along this thickly-populated stretch of coast.

Koma Island (7°32'S., 39°24'E.) is the farthest S of several small islands lying off the coast between Kikuuyu Mouth and Ras Pembamnasi. There are trees on the island and its N and E sides are fringed with mangroves. Pemba-Juu Island stands on the N part of the reef extending 1.7 miles NNE of Koma Island.

Good anchorage in either monsoon may be taken, in 10 to 12m, mud, with Pemba-Juu Island bearing 094°, distant about 0.7 mile.

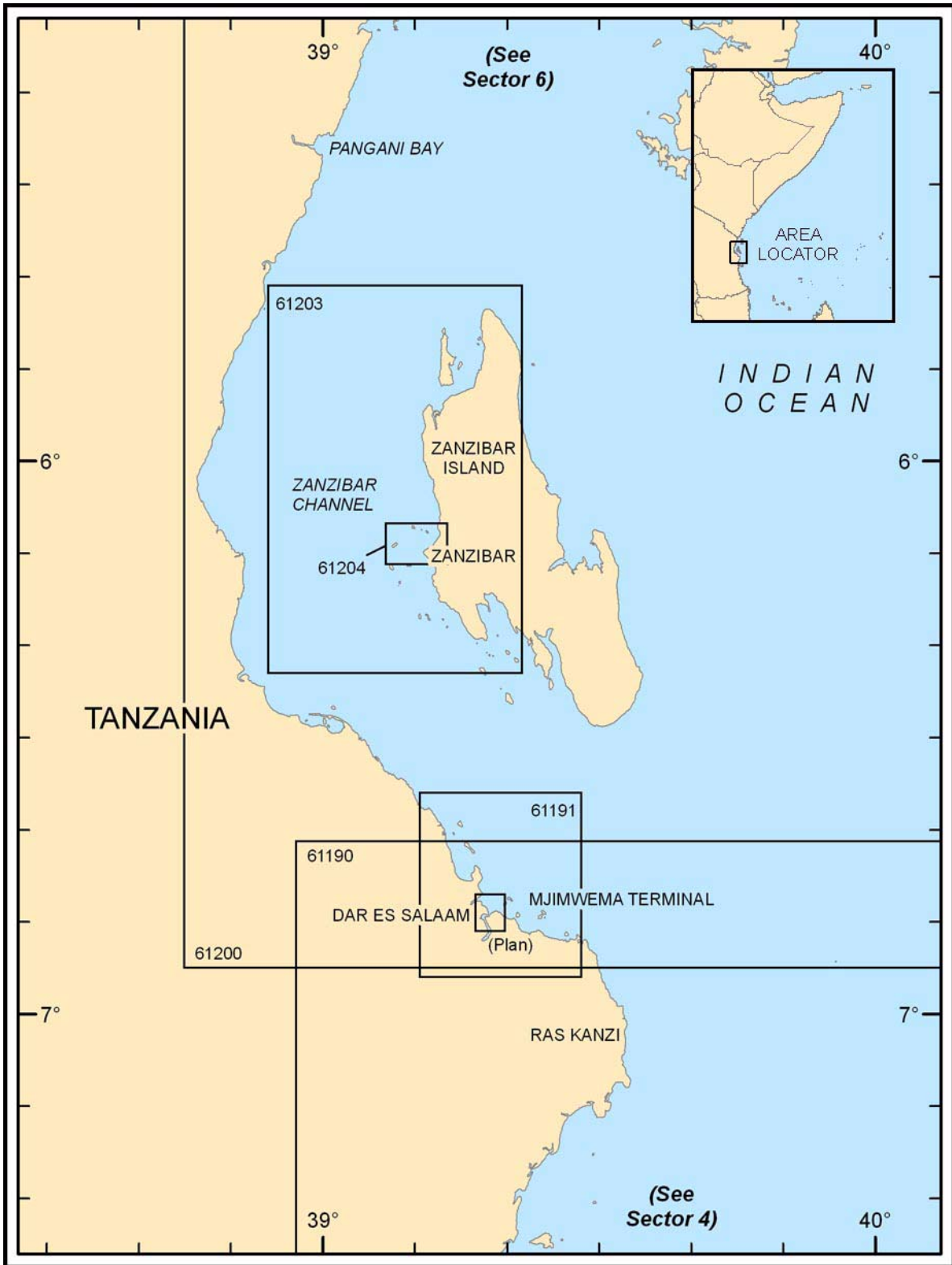
Kwale Reefs consists of a number of reefs lying from 5 to 15 miles offshore. Due to the muddiness of the water, most of these reefs are only visible at LW. Field Patch (7°21'S., 39°38'E.) lies on the NE edge of these reefs.

4.31 Sukuti Reef (7°15'S., 39°29'E.), the farthest N of Kwale Reefs, is an extensive group of reefs lying about 5 miles S of Ras Pembamnasi. The sea always breaks heavily on the outer edges of these reefs. Good anchorage in either monsoon for small vessels may be taken W of these reefs, in depths of 5.5 to 7.3m.

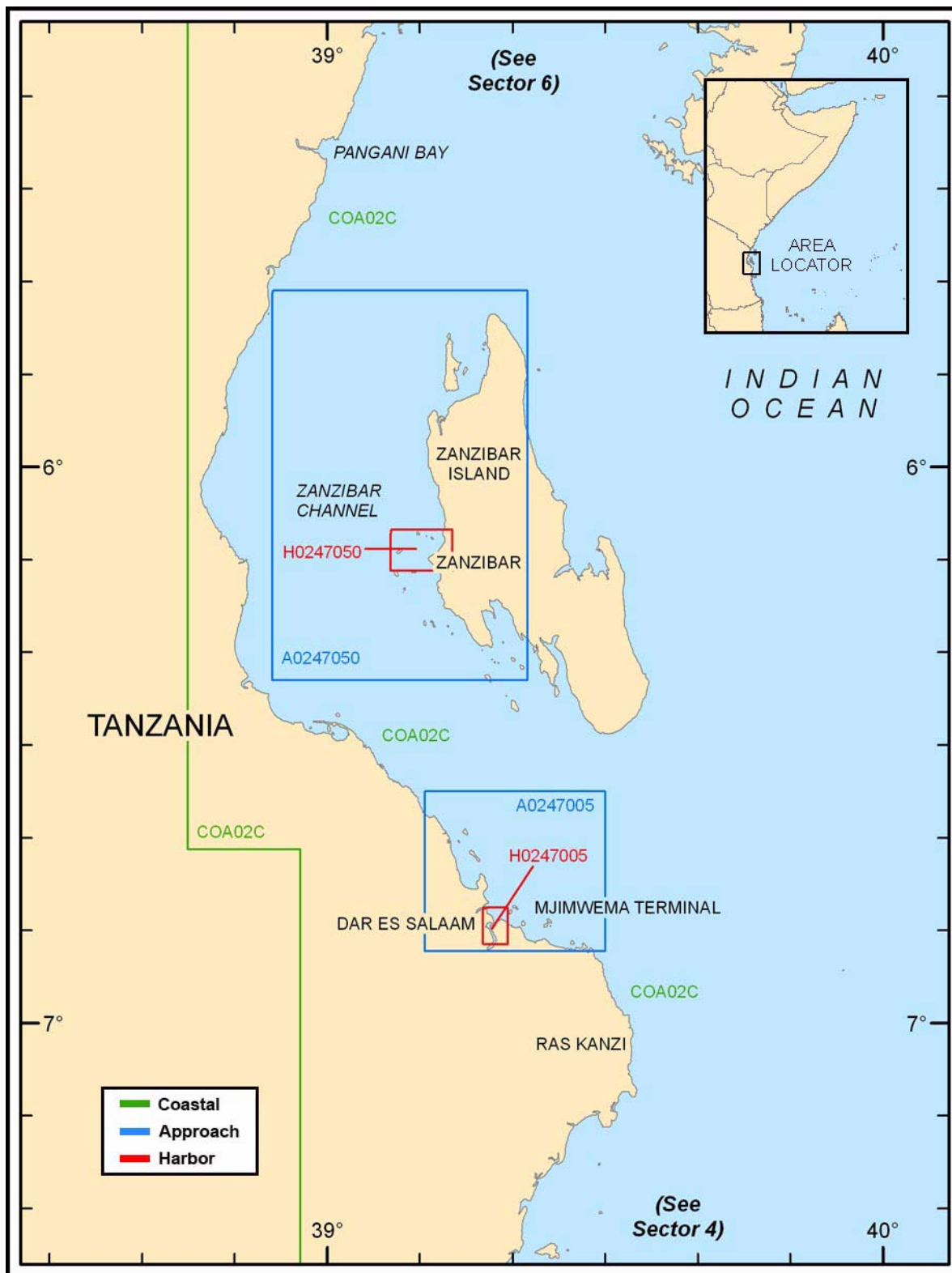
Buyuni Bay is entered between Ras Pembamnasi (7°09'S., 39°32'E.) and Ras Buyuni, about 4.2 miles NE. A drying reef extends 1 mile S of Ras Buyuni, and a 3.7m spit projects 2 miles S of the reef. Some red cliffs, a little S of the village of Buyuni, show up well with the sun in the E.

From **Ras Buyuni** (7°08'S., 39°33'E.), coast is low and swampy for the first 3 miles, but rises to cliffs, 25m high, about 1 mile farther N.

Ras Kanzi (7°01'S., 39°33'E.) is described in paragraph 5.1.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).
SECTOR 5 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNC 02 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 5 — DNC LIBRARY INFORMATION

SECTOR 5

TANZANIA—RAS KANZI TO PANGANI BAY, INCLUDING ZANZIBAR ISLAND

Plan.—This sector describes the SE coast of Africa from Ras Kanzi to Pangani Bay, including the island of Zanzibar and off-lying dangers.

Ras Kanzi to Dar es Salaam

5.1 Ras Kanzi (7°01'S., 39°33'E.) may be distinguished by the number of palmyra palms near it, which are not seen elsewhere on this coast, and by Puna Hill, which rises about 4.5 miles SW. The hill is especially conspicuous when seen from the S. The point is marked by a light.

Ras Kimbiji (6°59'S., 39°33'E.), is a low projection 2 miles N of Ras Kanzi; the coast near the point is the highest land in the vicinity. A rounded hill, 46m high, is remarkable due to its isolation; it helps to identify Ras Kimbiji.

Between Ras Kimbiji and Ras Dege, 8 miles NNW, the coast consists of white sandy beaches varied by reddish cliffs, about 20m high, 3 miles N of Ras Kimbiji, and other red cliffs 3 miles farther N. This part of the coast is fronted by reefs which extend 0.7 mile offshore.

Fungu Miza (6°55'S., 39°32'E.), awash, is located 3.5 miles NNW of Ras Kimbiji, 1.5 miles offshore. The reef lies on the S end of a narrow coral bank, which has depths from 5.5 to 7.3m, a rock, in the N part of the reef has less than 2m.

Temporary anchorage, in 26m, can be obtained about 1 mile offshore anywhere along this shore when the monsoon is light, except in the vicinity of Fungu Miza. Care must be taken to approach the anchorage slowly as the depths decrease suddenly from 64 to 28m, and from that again to much shallower water.

5.2 Latham Island (Fungu Kizimkazi) (6°54'S., 39°56'E.) is a low, dangerous coral island lying in the approach to Zanzibar Channel. The surface of the island shines white in the sun, but it is difficult to see with a bad light or at night.

Tides—Currents.—The current over the bank is variable, but in the deep water on each side of it the current is constantly N, with varying strength. At a distant 5 miles W of Latham Island the current becomes much weaker. The current off this part of the coast depends greatly on the direction and strength of the wind, and in the Southwest Monsoon it sets strongly NW past Mbwakuni, but nearer the shore it is not so strong. In the Northeast Monsoon, if the wind is fresh, the N set is only experienced with a rising tide, but at this season the current is very variable.

The current of the rising tide sets to the N in the S part of Zanzibar Channel, and in a contrary direction at the N end, thus meeting at HW at a point near the center, the position of which depends much upon the direction and strength of the wind; the other tidal current sets in the reverse way from the central point of meeting, toward the N and S ends of the island. During the Northeast Monsoon, the tidal currents are weak.

The direction of the tidal currents at the anchorage of Zanzibar is extremely variable, as they meet near there. In the Southwest Monsoon, off Ras Shangani, the tidal current runs chiefly

N at all times of tide, but a vessel anchored under the lee of the point lies in the eddy, and may swing in any direction.

Anchorage.—The greater part of the bank on which the island lies has depths of 9.1 to 18.3m, over sand, interspersed with large lumps of coral. The water is so clear that the bottom has been plainly seen by moonlight when in a depth of 18.3m.

Anchorage may be taken up to the N or S of the island, depending on the monsoon. The cross swell on the bank renders the anchorage uneasy.

5.3 Ras Dege (6°52'S., 39°28'E.) is formed of cliffs 3m high, which quickly rises to a height of 9m close W; it is backed by some rounded hills.

Between Ras Dege and Ras Rongoni the coast is fronted by islands and reefs, which skirt the coast.

Mwamba Kikwero, a reef lying 3 miles NW of Ras Dege, is steep-to and dries 0.3m in places.

Outer Sinda (6°49'S., 39°24'E.), an island, 15m high, lies 5 miles NW of Ras Dege. Inner Sinda, 12m high, lies 0.5 mile SW of Outer Sinda. There is white sand at the N and S extremities of the island. A chain of small islets lie on the E edge of the drying reef, which surrounds these two islands.

Millard Bank (6°48'S., 39°24'E.,) with a least charted depth of 5.5m near its N extremity, and its S part about 0.5 mile N of Outer Sinba; the bank can not be distinguished until close to.

Outer Makatumbe (6°47'S., 39°20'E.) is an island, 12m high, lying 3.5 miles WNW of Outer Sinba; a light stands in the NW part of the island. Hammond Rock, 2m high, lies 0.5 mile NW of the light near the extremity of the reef, which encircles Outer Makatumbe and Inner Makatumbe.

Inner Makatumbe, 15m high, lies on the reef 0.5 mile SW of Outer Makatumbe; a quarantine station is situated close within the SW extremity of the island.

5.4 Mbwanaji Harbor (6°51'S., 39°22'E.) (World Port Index No. 47005) lies between the reef which surrounds Inner Sinda and Outer Sinda and the coast between Ras Koronjo (6°51'S., 39°23'E.) and Ras Mjimwema; this harbor lies within the harbor limits of Dar es Salaam.

Tides—Currents.—The tidal currents at the anchorage are strong, and toward HW, especially in the Northeast Monsoon; the current runs rapidly E, and causes a vessel to swing to the swell in a most unpleasant manner.

Anchorage.—The best anchorage during the Southwest Monsoon is, in 18m, sand and mud, with the SW sandy point of Inner Sinda Island bearing 141°, and the N extremity of Outer Sinda Island bearing 054°.

The best anchorage in the Northeast Monsoon, in 10m, sand, is with the SW extremity of Inner Sinda Island bearing 015°, distant about 0.2 mile.

5.5 Mjimwema Oil Terminal (6°49'S., 39°22'E.), consisting of an SPM, is situated 1.5 miles NE of Ras Mjimwema; a submarine pipeline lies between the point and the buoy.

Depths—Limitations.—The oil terminal lies within the jurisdiction of the port of Dar es Salaam; it can accommodate tankers up to 100,000 dwt with a draft of 16.7m. Berthing is carried out in daylight only, but vessels may leave the mooring at any time.

Pilotage.—Pilotage is compulsory. The ETA messages should be sent within 6 hours of clearing the loading port and 72 hours and 36 hours in advance of arrival at the pilot station. When within 20 miles off the Dar es Salaam signal station, call the station on VHF channel 12 or 16. The pilot, who also acts as mooring master, embarks 2 miles N of the oil terminal.

Anchorage.—It is generally advisable to remain underway if awaiting the pilot, however, it has been reported that in good weather tankers may obtain temporary anchorage, in a depth of 18m, with Outer Makatambe Light bearing 250°, distant about 1.3 miles.

5.6 Dar es Salaam Bay (6°47'N., 39°18'E.), the outer anchorage for the port of Dar es Salaam, is entered between Outer Makatambe and Ras Kankadya (6°44'S., 39°17'E.), 5 miles NW.

The E side of the bay is formed by an extensive bank with depths of less than 5m, which fronts the coast between Ras Mjimwema and Ras Rongoni, a rocky point with red cliffs, on which stands a green obelisk, 2 miles WNW.

The W side of the bay consists of low cliffs and sandy beaches terminating in Ras Kankadya, a rocky peninsula forming the W entrance point of the bay; from the NE the peninsula appears as an island.

The red cliffs of Ras Chokir and Ras Upanga lie at the head of the bay 1 and 2 miles NW, respectively, of Ras Rongoni.

Tides—Currents.—In the approaches to Dar es Salaam Bay, the general direction of the tidal current is NW on the rising tide and SE on the falling tide; among the off-lying islands and reefs these directions are often reversed.

Depths—Limitations.—Daphne Reefs, consisting of three groups of reefs with depths from 3.2 to 5.5m, lie on the NW side of the entrance to Dar es Salaam; the outermost group lies 2.5 miles SE of Ras Kankadya. A dangerous wreck lies on the reefs between the middle and innermost groups. The outermost group is marked by a lighted buoy, moored near its SE end.

Pilotage.—Pilotage is compulsory S of a line drawn 270° from Outer Makatambe Light for all vessels over 200 grt. The pilot boat meets vessels about 1.5 miles NW of Outer Makatambe Light on request. Vessels should send their ETA 72 hours and 36 hours in advance.

Anchorage.—The following designated anchorages are located in Dar es Salaam Bay:

1. Anchorage Nos. 1 to 6—Large vessels, in depths of 20 to 27m.
2. Anchorage No. 7—Tankers, in depths of 20 to 27m
3. Anchorage Nos. 8 though 13—Small vessels, in depths of 8 to 13m.

These anchorages are sheltered during the Southwest Monsoon, but during the Northeast Monsoon a considerable swell sets in with strong winds. Anchorage with good holding ground may be obtained within an area bound on the NW by the alignment of Kidandoni Range Lights, on the E by the alignment of Ras Rongoni Range Lights, and on the S by a line drawn 282° from Outer Makatambe Light. Ships should not

anchor on the range lines or S of a line drawn 270° from Outer Makatambe Light.

Directions.—Vessels approaching Dar es Salaam Bay from the SE should steer for Ras Kankadya on a bearing of 287°, which will lead about 1.5 miles N of Millard Bank. When the lights on Ras Kidandoni come in range 247°, steer on that heading to pass S of Daphne Reefs.

When Daphne Outer Buoy bears 008°, steer for the range lights on Ras Rongoni on a heading of 188°, then proceed to the entrance channel of Dar es Salaam harbor.

If the vessel is anchoring in the bay, course may be shaped for the anchorage when Outer Makatambe Light bears 118°.

Vessels approaching from the N steer with Outer Makatambe Light bearing not less than 180° and then alter course when Ras Kidandoni Range Lights come in line bearing 247° and proceed as previously directed.

Caution.—Kankadya Patch (6°44'S., 39°19'E.), with a least depth of 9m, lies in the N approach to Dar es Salaam Bay.

Several acts of piracy have been reported to have taken place against vessels at anchor off Dar es Salaam.

Dar es Salaam (6°49'S., 39°18'E.)

World Port Index No. 47010

5.7 Dar es Salaam, the principal port for Tanzania, is approached from Dar es Salaam Bay between East Ferry Point and West Ferry Point, 0.2 mile W; both of these points are low and sandy. The harbor is sheltered and consists of a medium-sized city.

Tanzania Port Authority

<http://www.tanzaniaports.com>

Winds—Weather.—During the Southwest Monsoon, Dar es Salaam Bay is well-protected but during the Northeast Monsoon, a considerable swell sets in.

The weather is humid and there is little diurnal variation of temperature.

Tides—Currents.—In the approach to Dar es Salaam Bay, the flood current sets in a general NW direction, and the ebb sets SE, but among the islands and reefs lying off the coast in this vicinity, these currents in some cases set in the reverse directions.

The monsoonal currents, however, acting in conjunction with or in opposition to the tidal currents, cause the direction of the resultant currents to be variable and uncertain, which affects navigation.

During springs, the current is strong in the channel, especially toward or after LW, as it is then confined to the channel itself, the strongest current being generally about 2 hours after LW. The ebb current sets straight across the shallow water toward Inner Makatambe Island, and, when North Reef is submerged, caution is also necessary, as at such times the current sets across the reef.

High water slack occurs at about the time of HW, but the time varies considerably with astronomical and meteorological conditions. During the rainy season, the duration of the flood current is reduced and the duration of the ebb current is corre-



Dar es Salaam—Aerial



Dar es Salaam—Entrance Fairway



Dar es Salaam—Fish Market



Dar es Salaam—Harbor Approach with Vessel Traffic Control Tower



Dar es Salaam—Terminals



Dar es Salaam—Inner Harbor Anchorage



Dar es Salaam—Berths 1 through 3



Dar es Salaam—Berths 4 and 5



Dar es Salaam Harbor—Berths 5 through 7



Dar es Salaam Harbor—Kurasini Oil Jetty



Tanzanian Pilot Boat

spondingly increased. At neaps during the rainy season the flood current may be hardly perceptible at the surface. Local authorities should be consulted regarding the time of slack water on any particular day.

In a vessel that can cross the bar the best time to enter the harbor is at LW, when the reefs on either side can generally be seen, but a vessel of deeper draft should enter at HW, and in no case should entering be attempted during the full strength of the incoming nor leaving with a similar condition of outgoing current.

At spring tides vessels should stem the tide. It is not advisable to use the channel during the full strength of the tide, that is, between 2 and 4 hours on either side of HW or LW.

At neap tides it is safe for a vessel to enter or leave the harbor at any time, irrespective of the direction of the tide.

Care should be exercised when the ebb current is running, especially by an outbound vessel, to keep the range beacons in

line as the ebb current sets across the E bank.

Depths—Limitations.—Dar es Salaam harbor is approached through a dredged channel, with a depth of 10.2m, from a position 0.9 mile N of Ras Rongoni. The channel is marked by lighted buoys. The channel entrance width is 140m and allows access to vessels up to 234m long with an underkeel clearance of 0.7m at all times. There are some sharp bends in the channel, which has a least width of 90m between East Ferry Point and West Ferry Point.

The harbor may be entered by twin screw vessels up to 183m in length and a draft of 10.1m at MHWS and a draft of 9.1m at MHWN. Single screw vessels with a length not exceeding 175m may enter; larger vessels may enter with the permission of port management.

The general cargo terminal has eight berths with depths alongside between 9.1 and 12.2m. Berths 2 and 3 are used as ro-ro berths. The container terminal has a total length of 550m with a depth alongside of 12.2m.

Kurasini Oil Jetty is located to the S of the main quay and can accommodate vessels with a maximum draft of 11.5m and up to 45,000 dwt. There is also an offshore SPM that can accommodate tankers up to 275m long with a maximum draft of 16.7m and up to 120,000 dwt.

Aspect.—The shore of Dar es Salaam is broken and indented and presents to the eye a low outline, nearly uniform in height, but much diversified by alternating sand beaches and cliffs. About 12 miles inland a chain of mountains, rising to a height of 366 to 457m, extends SW and terminates abruptly. When seen from the NE, the Kankadya Peninsula appears as an island; a sandy patch about 0.7 mile within its extremity is conspicuous with the sun in the E.

Ras Chokir (6°49'S., 39°10'E.) is about 1 mile SE of Ras Upanga; its cliffs are red and about 9.1m high. On the former point is a large two story hospital which can be seen from a long distance. Other conspicuous objects are the Government House, nearly midway between the red cliffs and West Ferry Point and a flare situated about 1.5 miles SSW of Ras Rongoni. A conspicuous black flagstaff stands close E of Ras Makabe.

Pilotage.—Pilotage is compulsory for vessels over 200 nrt. Pilots board about 2.2 miles NNW of Ras Rongoni and are available during daylight hours only. Pilots can be contacted on VHF channel 12 or 16.

Signals.—A conspicuous signal station, with a tower and a red roof, stands on East Ferry Point.

The following signals are displayed from the signal station:

1. A black flag at the mast head by day or three red lights, vertically disposed, by night—Entry prohibited.
2. A black ball by day or three lights, white, red, white, vertically disposed, by night—Departure prohibited.

The following distant signals are displayed:

1. A black square on a white background—Entry prohibited.
2. A white ball on a black background—Departure prohibited.

Contact Information.—The Port Authority can be contacted, as follows:

1. Telephone: 255-22-2113642
2. Facsimile: 255-22-2110401
3. E-mail: pmdsm@tanzaniaports.com

Anchorage.—The inner harbor will accommodate up to

nine vessels of moderate size at mooring buoys and anchorages. Vessels are required to moor with two anchors.

Directions.—Vessels approaching Dar es Salaam Bay from the S will first sight the Sinda Islands, the outer island should be given a berth of 2.5 miles to clear Millard Bank by keeping Gunja Peak in range with Ras Kankakya, bearing 287°, and steering on this range until the range lights on the W shore of the bay bear 247°. The latter range should then be followed, passing between the reef extending N from Hammond Rock and Daphne Reefs, until the lighted range bearing 193° is picked up and so on into the harbor using the ranges shown on the chart.

When approaching the bay from the N, Mbudya Patches and Kankadya Patch must be avoided, and the entrance approached with Makatumbe Light bearing not less than 180°.

If intending to anchor in the bay, the selected anchorage can be steered for after Outer Makatumbe Light has been brought to bear 118°.

Zanzibar Channel

5.8 Zanzibar Channel separates Zanzibar Island from the mainland; its S entrance lies between Ras Dege (6°52'S., 39°29'E.) and Ras Kizimkazi, the S extremity of Zanzibar Island; its N entrance lies between Ras Kikogwe, the S entrance point of Pangani Bay, about 90 miles NNW of Ras Dege, and Ras Nungwi, the N extremity of Zanzibar Island, about 24 miles SE of Ras Kikogwe.

Caution.—On the mainland side, the reefs are sometimes not easily distinguished because of the discolored water caused by the alluvium of the rivers, but on the island side the water is generally clear, so that the reefs can be plainly seen. The positions of the sand heads on the coral reefs usually change with the monsoons. Submarine cables are laid across Zanzibar Channel between Dar es Salaam and Zanzibar Island and the mainland N.

Zanzibar Island

5.9 **Zanzibar Island** (6°07'S., 39°21'E.) is the largest and most important of the many coral-lined islands lying off the E coast of Africa. The island is undulating with ranges of hills generally running N and S with plains between them.

The coast in most places consists of low, steep cliffs. The island is surrounded by a coral reef which is, in general, steep to except in the inlets. The reef dries about 0.5m and is flat, except its outer edge is somewhat higher than its average level. The off-lying reefs are similar.

Winds—Weather.—The Southwest Monsoon, known as the Masika season, sets in about March, bringing the heaviest of the rains, and is strong for two months or more, rain being always prevalent, but by July or August the wind settles down to a steady breeze and the rain clears off, and this continues until October, when the SW wind gets fitful and uncertain, and rain and squalls may again be expected.

By the end of November the Northeast Monsoon sets in, sometimes quietly, sometimes with a burst, and after an interval of a fortnight, blows steadily until February when it begins to die away, but these seasons are so uncertain and subject to such variation that any description can be only an approxima-

tion.

Near the land, the monsoon does not blow steadily in one direction. During the Southwest Monsoon, and especially in Zanzibar Channel, it is usual in the morning for the wind to be from W to SW, freshening up to 1000. After that it falls higher for a time, but, hauling around to the S, freshens up again about 1300, finishing in the evening at SE; when this takes place the weather is usually fine. If the wind does not commence at W in the morning and yet veers to the S, there is more chance of rain but squalls and occasionally rainy days may be expected all the year round.

After the Northeast Monsoon is well-established, the wind in the morning is generally NNE, veering to ENE about 1400.

Cyclones are unrecorded prior to 1872, but in April of that year one swept over the island from the NE, destroying everything in its path, but leaving the S end untouched.

At Leven Bank, in the Southwest Monsoon, the current always runs to the NNW from 1.5 to 3 knots, during the Northeast Monsoon it decreases to about half that rate.

As a rule the current of the rising tide sets to the S and the other current in a contrary direction, but both currents are much influenced by the wind. In the Southwest Monsoon, at neaps, there is a continuous N current and during this season the greatest irregularity in the tides prevail. The currents are strongest off Ras Mwanda.

The tidal wave coming from the E makes the times of HW at full and change nearly identical for all this coast, only varying a little on either side of 4 hours 00 minutes. In Zanzibar Channel, the great difference between neap and spring ranges, the latter being generally 4.0 or 4.2m and the former about 2.7m, makes a considerable difference in the appearance of the reefs and shores both of the mainland and island, especially in the case of the large area of coral banks in the vicinity of Zanzibar town, and this should be constantly remembered, and any passages new to the navigator should be taken, if possible, at LW. The HW interval at full and change at the S end of Zanzibar Channel is 3 hours 55 minutes; spring rise 8.2m and neaps rise 1.8m.

Zanzibar Island—East Coast

5.10 From Ras Kizimkazi (6°28'S., 39°30'E.), the SW extremity of Zanzibar, the coast trends in a general NE direction to Ras Makunduchi. A light is situated on the coast about 3 miles SSW of Ras Makunduchi.

Kizimkazi Patch (6°28'S., 39°33'E.), with a least charted depth of 10.9m, lies about 1.5 miles offshore, 2 miles SSE of the light.

Ras Michamvi (6°07'S., 39°30'E.) lies 16 miles NNW of Ras Makunduchi; the point should not be rounded too closely.

Chwaka Bay is entered between Ras Michamvi and Ras Uroa. The tidal currents set strongly and regularly in and out of the bay.

Mnemba Island (5°49'S., 39°23'E.) is small and sandy, with tall casuarina trees which may be seen at a distant of 10 miles. The islet is surrounded by a reef, which extends 3.3 miles N and 2.3 miles E

Zanzibar Island—Southwest Coast

5.11 Ras Kizimkazi appears as a long low wooded hill and is so rounded that the appearance of the land alters with every change of the vessel's position. In a position 2 miles NW of Ras Kizimkazi, there is a small sandy bay with some tall coconut trees which show up well from certain directions.

A steep-to drying reef fringes the coast adjacent to Ras Kizimkazi; it breaks heavily.

Between Ras Kizimkazi and **Ras Mkita** (6°19'S., 39°18'E.,) the E side of Zanzibar Channel is fronted by numerous islands and dangers.

Bedford Break (6°31'S., 39°25'E.) has a least charted depth of 9.1m; it is the farthest S of Pungume Patches. A least depth of 5.5m lies on the patches about 7.7 miles W of Ras Kizimkazi. The bottom is plainly visible when nearing Pungume Patches, but their vicinity should be avoided by deep draft vessels.

Pungume (6°26'S., 39°20'E.), a wooded islet about 12m high, is situated on the S part of a drying reef about 10 miles WNW of Ras Kizimkazi. A light is situated on the SW extremity of Pungume.

5.12 Kwale (6°23'S., 39°17'E.), a wooded island 9.1m high, stands on a drying reef 3 miles NNW of Pungume. A sand cay 0.3m high, is situated on the drying reef about 0.7 mile N of Kwale.

Kipwa Gini, a small coral head, lies in the position 6°22'S, 39°16'E and is not easily seen.

Menai Bay is entered between **Ras Masoni** (6°25'S., 39°25'E.) and Pungume Island. The chain of islets and reefs extending S to Pungume Island shelter the outer part of Menai Bay; good holding ground, in depths of 22 to 28m, may be found anywhere in this part, but in the strength of the Southwest Monsoon sheltered anchorage can only be obtained N of Pungume Island or between Niamembe and Miwi Islets to the ENE. A small vessel may proceed still higher up the bay, and anchor off the small islet of Sume, in about 10m, but at this location the bay begins to shoal, and the navigation becomes intricate, so that the eye and chart must be the guide.

There is convenient night anchorage for small vessels, especially during the Northeast Monsoon, on Pungume Patches.

A submarine power cable passes close NW of Kwale. Vessels should avoid anchoring in the vicinity.

5.13 Ras Mkita (6°19'S., 39°18'E.) is the SE extremity of a flat peninsula about 12m high.

Ras Fumba (6°19'S., 39°17'E.), 0.8 mile WNW of Ras Mkita, is a low rocky point. Nguruwe Island, 18.3m high to the tops of the trees, lies on a drying bank 0.2 mile S of Ras Fumba.

The coast from Ras Fumba to Ras Buyu, 5.7 miles NW, consists of cliffs alternating with white sandy bays. From Ras Buyu to Ras Chukwani, about 1 mile farther N, the cliffs are the highest and most extensive on this coast.

The coast between Ras Chukwani and Ras Mbweni (6°12'S., 39°12'E.) 2 miles NNW is low, but near the latter point are some red cliffs, owing to their brighter color, are more remarkable than those SE of Ras Chukwani.

Mwamba Ukombe (6°19'S., 39°14'E.) extends NW for about 4.5 miles from a position about 3 miles WSW of Ras Mkita. This reef dries only in places at LW springs.

Tele Islet, 7.3m high, with some off-lying rocks, lies on the reef 3.5 miles WNW of Ras Fumba. Ukombe Islet, 3m high, lies on the NW part of Mwamba Ukombe, 1 mile NNW of Tele Islet.

Chumbe Island (6°17'S., 39°10'E.), marked by a light, is a small wooded island on the NW part of Mwamba Chumbe, an extensive reef which dries in patches.

Zanzibar Island—Southern Pass

5.14 Southern Pass.—Southern Pass is entered between Chumbe Island (6°17'S., 39°10'E.) and Pwakuu, an extensive reef 4.5 miles WNW; a sandbank on the W part of the reef dries 3m.

Nyange, another extensive reef, lies with its SE part 2.7 miles NW of Chumbe Island; a sandbank, which dries 2.4m lies on the N part of the reef.

Ariadne Bank (6°20'S., 39°10'E.), a small bank with a least depth of 2.4m, lies in the S approach to Southern Pass, about 3.5 miles S of Chumbe Island.

Boribu (6°20'S., 39°05'E.), a reef which dries 2.4m, lies 5.2 miles W of Ariadne Bank. Outer Boribu, with a least depth of 9.1m, lies 1.7 miles WNW of Boribu, it can be seen under favorable conditions.

Tambare (6°17'S., 39°04'E.), a coral reef, is comparatively steep-to. A sand bank on the NW end of the reef dries 2.1m. Outer Tambare, with a least depth of 2.1m, lies 1.5 miles W of the NW end of Tambare; it can always be seen.

5.15 Inner part.—**Mtwana** (6°14'S., 39°11'E.), 2 miles SW of Ras Mbweni, consists of three shoals with a least depth of 1.8m; it is marked on its NW side by a lighted buoy.

Kisiki, a reef which dries 0.9m, lies 1.5 miles W of Ras Mbweni. Southern Pass is about 0.4 mile wide between the two above shoal areas; it is referred to as "the narrows."

Within "the narrows" the E side of Southern Pass is formed by the coast between Ras Mbweni and Ras Shangani 2.5 miles NNW. Some white cliffs from 18 to 24m high, extend over 1 mile N of Ras Mbweni.

A chain of reefs and shoals extends NW from Kisiki to Zanzibar Harbor and forms the W side of Southern Pass.

A sand spit, with a depth of 1.5m, extends 0.6 mile N from Kisiki.

Pange (6°11'S., 30°09'E.) lies within the Zanzibar harbor limits, 1.5 miles NW of Kisiki. A large sand bank, which dries 1.8m, is located on this reef. Shoal ground, with a least depth of 2.7m near the outer extremity, extends 0.5 mile N of Pange.

Fungu Chawamba (6°10'S., 39°09'E.), a reef which dries 0.9m, lies about 2 miles WSW of Ras Shangani; it is steep-to and can generally be identified. Several detached coral patches lie within 1.2 miles of the reef.

5.16 North approach—Yambwa Ngome (6°00'S., 39°07'E.) are two flat reefs located 3.5 miles offshore, 10 miles NNW of Ras Shangani; they may be easily identified by the discolored water over them.

Fawatu, an extensive reef which dries, is located on the W side of the approach 1.5 miles S of Yambwa Ngome. The reef

is easily distinguished but must be approached with caution.

Jiddawi Shoal (6°04'S., 39°11'E.), a coral pinnacle with a depth of 8.5m, lies in the approach to English Pass.

Seagull Shoal (6°05'S., 39°11'E.), a small shoal with a least depth of 2.7m, lies in the fairway of English Pass 1.7 miles SSE of Jiddawi Shoal; it is marked on its SE side by a lighted buoy.

Chapani (6°08'S., 39°11'E.), Kibandiko, and Changa are three islands that lie on an extensive reef which extend about 3 miles WNW from a position 2.2 miles NNE of Ras Shangani; the E end of the reef is marked by a lighted buoy. These islands lie within Zanzibar harbor limits.

English Pass (6°08'S., 39°12'E.), the pass generally used by vessels approaching Zanzibar from N, lies between the coast and the shoal extending E of Chapani. It has a least depth of 11.3m and a least width of 0.2 mile between the 10m curve.

Range lights, in line bearing 168°, lead from the N to "the narrows" ESE of Chapani, and lights, astern, bearing 042° lead farther into the harbor area.

Zanzibar (6°10'S., 39°11'E.)

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5.17 The harbor at Zanzibar is an open roadstead located off **Ras Shangani** (6°10'S., 39°11'E.), on the W side of the island. The harbor limits are indicated on the chart.

Tides—Currents.—MHWN tides rise 2.7m and MHWS tides rise 3.9m. Tidal currents in South Pass run NNW and are stronger on the flood than on the ebb. In English Pass, tidal currents run N and are stronger on the ebb than on the rising tide. Vessels may enter or leave at any state of the tide.

Depths—Limitations.—A least charted depth of 11m is located in the designated anchorage N of Ras Shangani.

The Malindi Wharf is 240m long, with depths alongside of 6 to 9m; vessels up to 10,000 dwt can be accommodated. The North Wharf is 113m long and has a depth alongside of 6m.

Numerous depths less than charted exist within the harbor.

Aspect.—The white buildings of the town are visible for a considerable distance. The following objects, with their position relative to Ras Shangani, are conspicuous:

1. The former British Residency, a white building with a red roof and with a tower and a flagstaff at its S end—0.3 mile SE.
2. A radio mast, 64m high—0.5 mile ESE.
3. A clock tower on the government building—0.2 mile NE.
4. A chimney, 29m high—0.7 mile NE.
5. Livingstone House—1 mile ENE.

Pilotage.—Pilotage is compulsory and 24 hours advance notice should be given. Pilots may be contacted by VHF 24 hours. Pilots embark southbound vessels off Seagull Shoal and northbound vessels off Mtwana (6°14'S., 39°11'E.). Vessels awaiting pilots anchor in the vicinity of boarding places. The suggested entry time is between 0600 and 1800.

Anchorage.—Good anchorage can be obtained, in 12 to 22m, either N or S of Ras Shangani, in any position with the exception of the prohibited anchorage area. Naval vessels anchor or moor in any position reserved for them by the port officer. Mooring buoys, some belonging to the government and



Zanzibar Harbor



Zanzibar—North Wharf

others to lines of vessels calling at the port, are moored in various positions close N of the town.

Directions.—The principal approaches to the port of Zanzibar are through Southern Pass and through English Pass.

Zanzibar Island—Northwest Coast

5.18 Bet el Ras (6°07'S., 39°07'E.), on the E side of English Channel, is a low rocky point; the ruins of a large white castellated palace are situated on the point.

Between Bet el Ras and Ras Uso wa Membe the 10m curve is only about 0.3 mile off the coast, so that vessels can keep near it and thus avoid the off-lying dangers.

Between Ras Uso wa Membe (5°54'S., 39°12'E.) and Ras Nungwi, the N extremity of Zanzibar 12 miles NNE, the coast is fronted by an extensive drying reef. Tumbatu Island is locat-

ed on this reef and Mkokotoni Harbor lies within the reef.

Pale Hill (5°54'S., 39°15'E.) is conspicuous and lies at the NW end of a ridge with a steep W face extending S; the ridge rises gradually on its E side. The tops of the coconut palms and other trees on Pale Hill rise to a height of 87m. Donge Hills, 119m high and covered with coconut palms, reach their summit 2.5 miles S of Pale Hill and are the highest part of the N end of Zanzibar.

Tumbatu Island (5°49'S., 39°13'E.), with its S extremity 2.2 miles NNE of Ras Uso wa Membe, is low and flat, rising slightly to the SW. The tops of the trees are from 18 to 30m high, and the coast, except for a portion of the E side, is formed of low and often overhanging cliffs from 3 to 18m high.

5.19 Ras Bwechano (5°51'S., 39°13'E.), the W extremity of Tumbatu Island, is located about 1 mile NNW of Ras Kiyomoni, the S extremity of the island.

Ras Kinunduni, 4.5 miles NNE of Ras Bwechano, is the N extremity of Tumbatu Island. Shoal water with a depth of 2.1m at its extremity, extends 1.5 miles NNE from Ras Kinunduni.

Mwana Wa Mwana (5°46'S., 39°13'E.), a coral islet covered with dense scrub, lies on the reef extending N from Ras Kinunduni; a light is situated on the NW extremity of the islet.

Glenday Patches (5°55'S., 39°10'E.), comprised of numerous pinnacles of rock and sand, lie with the NW patch 2 miles WSW of Ras Uso wa Membe. A lighted buoy marks the NW extremity of Glenday Patches.

Shearwater Patches consists of numerous pinnacles, on a bank 10 miles in length, lying 4 miles offshore between Ras Uso wa Membe and Mwama wa Mwama.

Langdon Rocks (5°53'S., 39°07'E.), two rocks, with a depth of 0.9m, lie 0.7 mile apart at the S extremity of Shearwater Patches, 5 miles W of Ras Uso wa Membe.

Wright Rock, with a depth of 0.9m, lies 5 miles SW of the light on Mwama wa Mwama. An isolated patch, with a depth of 4.3m, lies 1.2 miles NE of Wright Rock. A dangerous wreck lies between Wright Rock and the 4.3m patch.

Dalrymple Shoal (5°47'S., 39°06'E.), with a depth of 4.9m, lies about 6.5 miles WSW of Mwama wa Mwama, at the N end of a detached bank extending N from Shearwater Patches.

Nankivell Rock (5°43'S., 39°14'E.), with a depth of 5.5m, lies 2.5 miles NNE of the light on Mwama wa Mwama.

Ras Nungwi (5°43'S., 39°18'E.), the N extremity of Zanzibar, is a low sandy point covered with dense scrub; the land rises gradually inland. Coconut palms grow in profusion on the point.

Leven Bank (5°38'S., 39°18'E.) lies with its shallowest part about 5.2 miles N of the light on Ras Nungwi. It affords good temporary anchorage, in a least depth of 21m, when the winds are light.

5.20 Mkokotoni Harbor (5°50'S., 39°16'E.) can be entered from N or S. The S entrance lies between Ras Uso wa Membe and Tumbatu Island; the N entrance lies between the reef fringing the coast S of Ras Nungwi and that extending from Mwana wa Mwana.

Tides—Currents.—In Mkokotoni Harbor, the general direction of the tidal current of the rising tide is S, and that of the falling tide, N, but both tidal currents are much influenced by

the winds, and during the Southwest Monsoon, there is, at neaps, a continuous N current. The tidal currents are strongest off Ras Mwanda (5°53'S., 39°13'E.).

Anchorage.—In the Southwest Monsoon, there is good anchorage W of Ras Nungwi, in the N approach to Mkokotoni Harbor, in 18m, over sand, with the light on the point bearing 068°, distant nearly 3 miles.

An anchorage for a small vessel in the harbor, in 8m, mud, is off Mkokotoni Village, with the S tangent of Tumbatu Island bearing 283° and the E tangent of Popo Island bearing 008°.

For a large vessel a better berth is farther N, in 14.6m, mud, with the S extremity of Tumbatu Island bearing 238° and the NE tangent of Popo Island bearing 340°; here the tidal current is not so strong.

Directions.—To enter Mkokotoni from the S channel, if the buoys are in position, it is only necessary to pass between those marking the bar, otherwise the eye and the chart are the guides, as there are no ranges. After passing the bar bring the conspicuous Pale Hill, which is located about 2 miles ESE of Ras Mwanda to bear 104° and steer for it, passing the sandbank on Mmawali Sand at a distance of 0.4 mile. When Popo Island begins to open off Tumbatu, the center reef will be on the port beam, in which case round it by eye, giving the visible part a good berth, as it deepens very gradually; if the buoys are in position pass between them. After passing the red barrel buoy alter course to the ENE until Kigunguli Hill bears 043°, this course then leads to the anchorage. Care must be taken to avoid the reef that extends about 1 mile SSW of Makutani Islet.

The water is thick, concealing any shoal with more than 3.6m on it, and as the current is strong, care must be taken. There is no swell and the bottom is generally soft.

To enter Mkokotoni Harbor from the N, from about 1.5 miles off Ras Nungwi, steer for the lighthouse on Mwana Wa Mwana on a bearing of 228° until Pale Hill, well open E of Popo Island, bears 182°. From this position, which is about 1 mile E of Nankivell Rock, alter course for Pale Hill on that bearing and maintain it until Kigunguli Hill bears 115°. A good lookout should be maintained for the reef which extends from the coast S of Ras Nungwi, and which can generally be seen. Course should then be altered to 165°, keeping a sharp lookout for the reef and spit extending NNE of Popo, which is not easily seen and is marked by a buoy.

When Pale Hill, in line with the district officer's house situated on the S shore of the harbor, bears about 183°, steer for it on that range which is said to lead through the narrow channel abreast the N end of Popo Island.

When the E extremities of Popo open off each other, alter course to pass about 0.3 mile from it and when the center of Popo is abeam, all dangers have been passed and anchorage can be chosen as desired. There is considerable swell at times N of Popo, but it does not fetch home through the narrows to the harbor.

As the tides in this harbor on the ebb and the flood do not always follow the channel, caution should be observed when entering or leaving Mkokotoni Harbor.

Dar es Salaam to Ras Nunge

5.21 From **Ras Kankadya** (6°44'S., 39°17'E.) to Ras Mbe-gani, 25 miles NW, the coast is chiefly sandy, indented by

creeks, and is backed by mangrove swamps or dense bush.

Numerous islands and dangers front this stretch of coast and lie up to 6 miles offshore.

Bongoyo Island (6°42'S., 39°16'E.), located 1.2 miles N of Ras Kankadya, presents a uniform appearance of stunted trees on cliffs 12m high. A sandy bay on its NE side appears white and distinctive in the morning. Pangavini Island (6°40'S., 39°14'E.), is a small rocky islet located on a coral reef 1.5 miles NW of Bongoyo Island; the reef surrounding the islet dries 0.5m.

Mbudya Island, about 1 mile NE of Pangavini Island, is 18m high, lies on the NW part of an extensive drying reef; the W side of the reef is moderately steep-to, but the E side has numerous off-lying patches and is dangerous to approach. Mbudya Spit, with a least charted depth of 5.5m extends about 2 miles SE of the island.

Mbudya Patches, a number of small patches with depths of 5.5 to 9.1m, lie between 3 miles E and 3 miles NE of Mbudya Island; these patches should be avoided.

Fungu Mkadya, with a least depth of 0.5m, lies about 1 mile NW of Mbudya Island. A spit, with a dangerous rock on it extends 0.8 mile NW from the reef.

Fungu Yasin (6°36'S., 39°14'E.) is an extensive drying coral reef, with a sandy islet on its NW extremity, located 1.5 miles NNW of Fungu Mkadya. A ridge, with a least known depth of 5.5m, extends ESE to Mbudya Patches.

Msasani Bay is entered between Ras Kankadya (6°44'S., 39°16'E.) and the SE extremity of Bongoyo Island, about 1.2 miles N. The bay affords good anchorage during either monsoon and is safe and easy of access from the SE.

Anchorage.—In the Northeast Monsoon, the best anchorage is, in 14m, sand, W of the middle of Bongoyo Island, with its NW extremity bearing 348°, distant about 0.8 mile.

During the Southwest Monsoon, an anchorage more to the N, about 0.5 mile off the NW extremity of Bongoyo Island, should be taken, or if preferred, in the S part of the bay, in about 10m, with Ras Kankadya bearing 086°.

5.22 Kunduchi Harbor (6°40'S., 39°14'E.), the anchorage SW of Mbudya Island, affords shelter during the Northeast Monsoon for a vessel requiring temporary anchorage, although that within Msasani Bay is preferable.

Anchorage.—Anchorage may be obtained during the Southwest Monsoon to the N of a 5.5m patch, in about 18m, with the N extremity of Mbudya Island bearing 085° and the middle of Pangavini Island 178°. Anchorage may also be taken up in a similar depth with the W end of Mbudya Island bearing 020° and the N end of Pangavini Island bearing 219°.

There is good anchorage SW of Fungu Yasin during either monsoon, in 29m, opposite the middle of the reef, with the beacon bearing about 031°, distant 0.5 mile. The safest approach to the anchorage is around the N end of the reef.

5.23 Mbwani Village (6°35'S., 39°08'E.) is rendered conspicuous by some white tombs and large mango trees.

Ukatani Reef (6°35'S., 39°11'E.), 2 miles W of the beacon situated on Fungu Yasin, has a depth less than 2m.

Kitapumbe Reefs are two drying reefs about 1 mile apart located 3.2 miles NW of Ukatani Reef.

Mshingwi (6°27'S., 39°01'E.), a small coral reef, which dries 3.3m, lies 6.5 miles NW of Kitapumbe Reefs. There are

depths of 16m close around the reef, and the sea always breaks when the reef is covered.

Ras Lwale (6°27'S., 38°59'E.) is the W extremity of a spit, 4 miles in length, which parallels the coast. The spit is comprised of sand and coral and is covered with brush.

Ras Mbegani is a low mangrove point located 1 mile W of Ras Lwale.

Bagamoyo Roadstead (6°25'S., 38°55'E.) is entered between Ras Mbegani and Ras Nunge. The roadstead is shallow for some distance from shore, but affords anchorage, in 7m to 9m.

Aspect.—The most conspicuous object at Bagamoyo is a long white building, with a red roof and a tower at each end, situated in the S part of the town, about 2.5 miles S of Ras Nunge. A mission, surrounded by trees, is situated about 1 mile NW of the white building and makes a good mark from seaward.

Anchorage.—Vessels of moderate draft should anchor, in 9m. There is a heavy swell in the anchorage during both monsoons.

Ras Nunge to Pangani Bay

5.24 Ras Nunge (6°24'S., 38°54'E.) is a mangrove-covered point projecting well out from the coast.

From Ras Nunge to Ras Machuisi the coast trends in a NNW. Ras Utondwe, a low sandy spit may be identified from N by its light-colored sand.

Wami enters the sea 3.7 miles NNW of Ras Utondwe, through a mangrove swamp. Between this river and Ras Machuisi the coast is low and swampy; mangroves fringe the mouths of the numerous rivers and creeks, which enter the sea along this stretch of coast.

Mbwakuni (6°22'S., 38°59'E.) is a drying reef lying 5.5 miles NE of Bagamoyo on the direct route from Zanzibar Harbor; the reef is steep-to.

Fungu Miko (6°15'S., 38°58'E.) are two reefs lying between 5.7 and 6.7 miles NNW of Mbwakuni. The sea generally breaks on these reefs, which dry about 2m.

Winde Patches are two flat coral reefs, which usually break, lying about 2.2 miles NW of Fungu Miko. The S reef, marked by a buoy, dries 2m; the N reef dries 1m.

Wami Patches (6°06'S., 38°56'E.), consisting of eight separate coral patches, lie 6 miles N of Winde Patches; some of the patches are awash and all are steep-to. These patches are dangerous, as the outflow from Wami and other rivers make the water so thick that at high tide they cannot be distinguished.

The S extremity of Udoe Hill (6°10'S., 38°35'E.), bearing 264°, leads 1 mile S of Wami Patches.

5.25 Ras Machuisi (5°57'S., 38°59'E.) is only a slight projection but it may be identified by a dense grove of trees standing on it. A reef, awash at LWS, lies near the edge of the

coastal bank between 1 and 2 miles ENE of Ras Machuisi.

Pangani lies about 32 miles NNE of Ras Machuisi. The intervening coast is sandy to a position about 3 miles SSW of Pangani where it becomes rocky with low cliffs.

Genda Genda (5°34'S., 38°39'E.) is a prominent isolated mountain, 701m high, which is easily identified by its two sharp peaks.

Mwamba Buiuni (5°53'S., 38°52'E.), close within the 10m curve, dries 2.4m; it lies 5 miles NE of Ras Machuisi. Buiuni Mdogo, 1.75 NE of Mwamba Buiuni, is an isolated reef, with a rock, awash, at its W end; it is steep-to.

Mkwaja Patches (5°49'S., 38°55'E.), four small steep-to coral reefs marked on the SE side by a buoy, lie 10 miles NE of Ras Machuisi. The sea rarely breaks on these patches and they are difficult to see. Mwamba Alek, with a least charted depth of 1.8m, lies 2 miles NE of Mkwaja Patches.

Kipumbwe Reefs lie with their S extremity about 14 miles S of Pangani Bay. There is a deep navigable channel between the outer and inner Kipumbwe Reefs, and farther N between the reefs and the shore, it has smooth water, even in a strong monsoon. It is useful to coasting vessels when the reefs can be plainly seen.

Fungu Datcha (5°33'S., 39°04'E.), a coral reef which always breaks heavily when it is not awash, lies 6.5 miles SSE of Pangani Bay. A patch, with a least charted depth of 1.8m, lies 0.4 mile SW of Fungu Datcha.

Maziwi Island (5°30'S., 39°04'E.) is small, sandy, and covered with conspicuous casuarina trees.

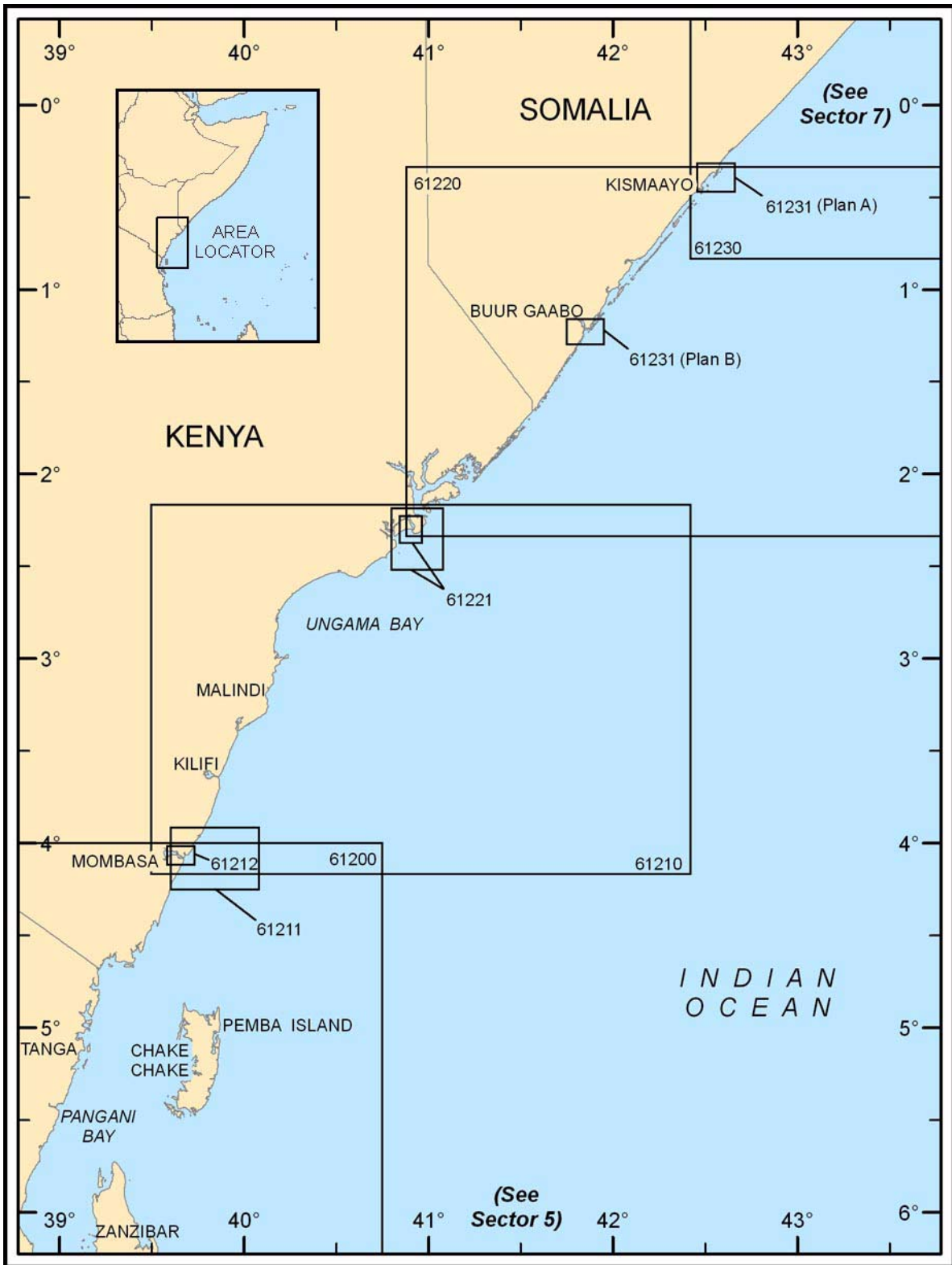
There is fair anchorage W of Maziwi Island during either monsoon, with more protection than in Pangani Bay. The water is deep, but care must be taken not to anchor too close, as the reef is very steep. In the Southwest Monsoon, a good berth is in 28m, sand, with the N edge of the reef bearing 055°, and Maziwi Island 090°. In the Northeast Monsoon, a better berth is farther S, in 31m, sand, with Maziwi Island bearing 058°.

5.26 Mwamba Mawe (5°26'S., 39°05'E.), a coral reef which dries 1m, is located nearly 4 miles N of Maziwi in the approach to Pangani Bay. The reef is moderately steep-to and the sea generally breaks on it at half tide; when not breaking its position is generally indicated by the green color of the water over it.

A shoal, with a depth of 3.7m, lies 0.5 mile N of Mwamba Mawe; it seldom breaks.

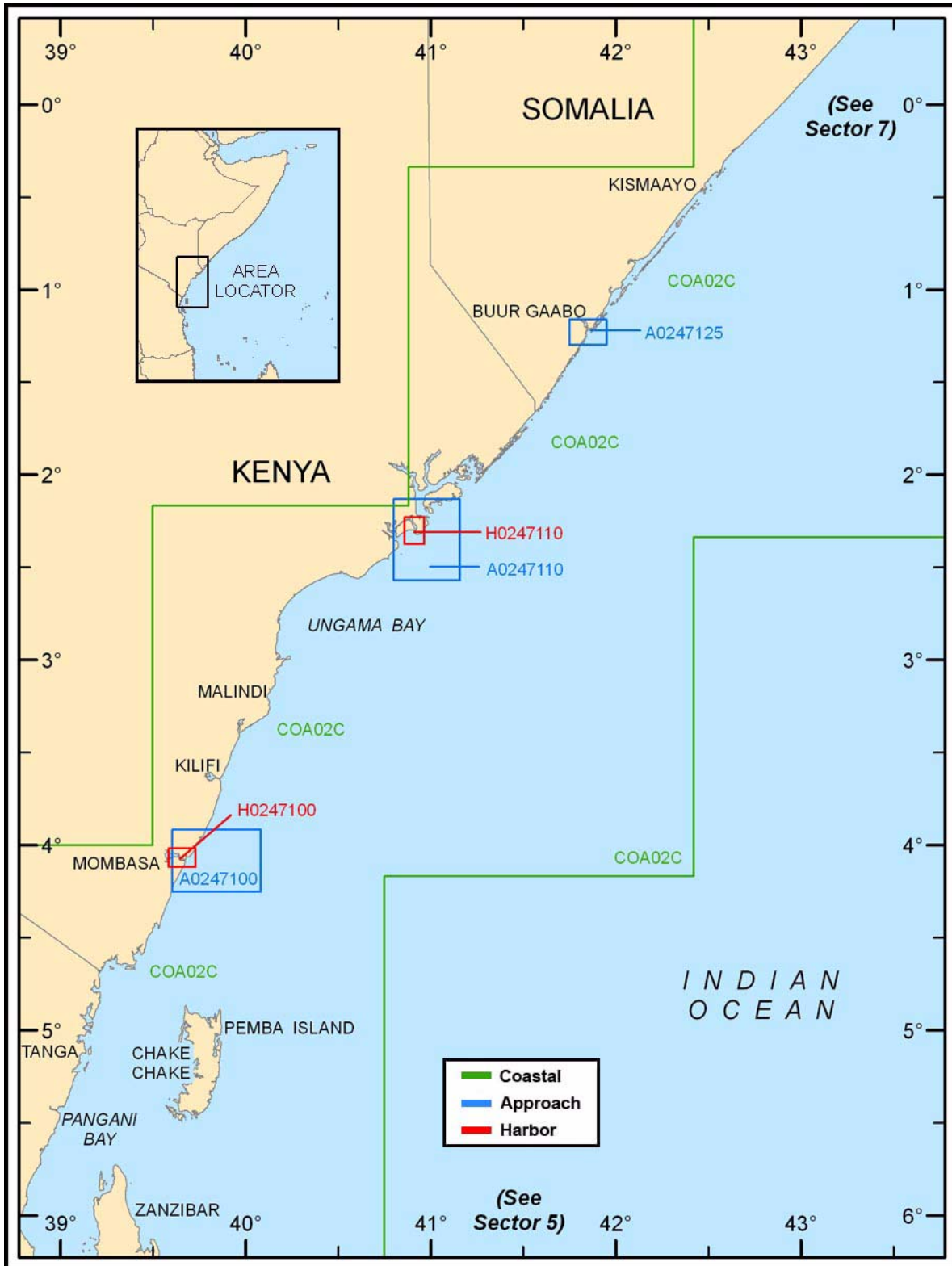
Pangani (5°26'S., 38°59'E.) is located at the mouth of the Pangani River, which flows into the head of Pangani Bay. The port consists of a town and a very small, shallow, natural harbor.

The largest vessel that has entered the harbor was 76m long, with a beam of 12.2m, and a draft of 3m. As a rule, a vessel with a length of more than 70m and a draft of more than 3.9m should not enter the river.



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SECTOR 6 — CHART INFORMATION



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SECTOR 6

KENYA AND SOMALIA—PANGANI BAY TO QOORIGA KISMAAYO, INCLUDING PEMBA

Plan.—This sector describes Pemba Channel, Pemba, and the SE coast of Africa from Pangani Bay N to Qooriga Kismaayo, a distance of about 368 miles.

Pemba Channel

6.1 Pemba Channel (5°06'S., 39°21'E.) lies between Pemba and the reefs and islets that front the mainland shore of Africa. The channel has a least width of 18 miles between Ras Kigomasha (4°53'S., 39°41'E.) and the mainland NW; the channel is deep throughout.

Tides—Currents.—The N coastal current divides and follows the E and W shores of Pemba Island with a velocity that varies from about 1 knot in the Northeast Monsoon to 3 knots in the Southwest Monsoon. Heavy tide rips occur where the current divides, especially when the ebb current runs out of Upembe Passage. Tide rips and occasionally overfalls occur off Matumbe Makupa (off the SW side of the island) and for a distance of 2 miles N. The tidal currents run strongly in practically all the gaps that form entrances to the harbors.

There is a constant N current in Pemba Channel. In mid channel its direction is that of the axis of the channel and its velocity varies from 2 to 4 knots in the Southwest Monsoon to 0 to 3 knots in the Northeast Monsoon. Near Pemba Island there is less current than in mid-channel, and the current, when at its greatest strength, frequently causes ripples that resemble breakers. The prevailing current is influenced by the tidal current, but it is only near the NW coast of Pemba Island that it is overcome and reversed by the S flood current. Off Uvinje Island, near the middle of the W coast of Pemba Island, the tidal currents meet and cause a confused sea that is sometimes dangerous to boats.

The current is very slightly felt inside the reefs and along the shore, but is sufficiently strong to accelerate the E tidal current through the Wasin Channel to velocities between 1.5 and 2.5 knots at springs, while the opposite tidal current, which is that of the rising tide, either neutralizes or slightly overcomes it.

Strong tide rips are encountered off the outlying islands and reefs.

About 10 miles offshore, from Mombasa to the Kilifi River, the current runs NE at rates from 2 to 4 knots during the Southwest Monsoon, and from 1 to 2 knots in the Northeast Monsoon, but with less strength inshore near the reef.

In the vicinity of Ras Chiambone, or between it and Lamu the NE and SW currents generally meet during the Northeast Monsoon, and produce a current setting to SE. The limits of the place of meeting depend on the state of the monsoon and other circumstances.

The alternate monsoons are strong in the neighborhood of the Juba Islands and Kismaayo, and the currents run with them. From November to April, NE winds prevail and there is then a SW current of 2 knots, usually at its strongest in January and February.

Observations in January, 1895 extending over a week

showed that at 22 miles E of Kismasay Island the current had continuous velocities of 3.5 to 4 knots in a 250° direction.

From April to November the winds and current are reversed, the latter running NE, or nearly parallel with the trend of the coast, with a velocity of 2 to 3.5 knots.

Directions.—The E side of the channel is safer than the W side, as the reefs extend but a short distance from Pemba Island, less current is experienced, and the land is nearer as a guide to the navigator. On the other hand, Pemba Island is frequently enveloped in rain squalls and clouds when the W side of the channel is clear.

A vessel approaching from the N and being able to make Pemba Island by daylight is advised to steer for Ras Kigomasha, the NW extremity, and to keep along the Pemba shore as far as Mesali Island about 23 miles S of Ras Kigomasha. Then make good a course to pass 1 mile W of Mwana wa Mwana Island, allowing leeway according to the monsoon.

With the aid of Ras Kigomasha Light there is nothing to prevent a vessel approaching from the N from passing through Pemba Channel by night if the weather is tolerably clear. Even should the light not be seen when expected, the island may be approached from that direction at a moderate speed, sounding continuously, though it may be more prudent under such circumstances to keep well outside for the night and run in at daylight.

A steamer proceeding N from Zanzibar through Pemba Channel should shape a course direct for Ras Kigomasha from abreast of Mwana wa Mwana Island, this allows for the strong N current and leads clear through this channel.

Pemba

6.2 Pemba (5°10'S., 39°46'E.) lies 23 miles NNE of Zanzibar Island and 21 miles E of the African mainland. The numerous hills do not exceed 91m in height and are covered with luxuriant vegetation.

Caution.—A good lookout should be kept when entering any of the anchorages in Pemba Island, as it is possible that small uncharted dangers may exist. The best time for entering is when the sun is in a favorable position; but the water is sometimes muddy, and the shoals under such conditions are not always discernible. The bearings of mangrove points must be used with caution, as the points themselves are liable to extend outward over time.

Pemba—East Coast

6.3 The E side of Pemba Island is rather low, and should be approached with care at night, but there does not appear to be any danger beyond the fringing coast reef, which is steep-to and nowhere extends so much as 1 mile offshore. At 2 miles from the shore no soundings have anywhere been obtained with the hand lead.

Ras Upembe (5°28'S., 39°43'E.), the SE extremity of Pemba

Island, is a bold, cliffy point. It is clear of bushes near its extremity and rises from an elevation of 4.5 to 6.1m near the sea to 22m at a distance of about 0.2 mile inland. A small sand beach on its W side is conspicuous from the SW. Between Ras Upembe and Mtangani, a narrow inlet 7 miles NE, the coast consists of overhanging coral cliffs 5m high, thickly covered with trees; the sea always breaks on the coastal reef.

Mchengangazi (5°06'S., 39°52'E.) is an inlet 17 miles N of Mtangani. The coast consists of low overhanging coral cliffs covered with trees and bushes to within a few meters of their edges; numerous small creeks flow into the sea along this area.

Ras Kiuyu (4°53'S., 39°52'E.), the NE extremity of Pemba, is a rocky promontory covered with bush about 6m high. Rocky ground, with coral heads, extend about 1 mile offshore 1.2 miles SE of the point. These coral heads do not break and it is advisable to give the area a berth of at least 1.5 miles.

Pemba—South and West Coasts

6.4 Between Ras Upembe and **Mkoani** (5°22'S., 39°39'E.), a village situated near the coast 8 miles NW, the SW coast of Pemba is fronted by an extensive detached reef, which dries in places; the sea always breaks on the outer edge of this steep-to reef.

Panza (5°28'S., 39°38'E.) is the largest and farthest SE of a group of islands, located on the reef described above.

Ras Miugani, the S extremity of Panza, is a bold coral cliff 12m high, lying 0.1 mile within the edge of the reef; there is a remarkable white sand beach on its W side.

Matumbe Makupa (5°24'S., 39°34'E.), marked by a light, is situated 6.7 miles NW of Ras Miugani; it is the farthest W of the group of islands on the above drying reef.

6.5 Port Mkoani (5°21'S., 39°39'E.) is situated abreast the village of that name. The port contains a small natural harbor.

Tides—Currents.—A current of less than 1 knot sets N during the Southwest Monsoon, and S during the Northeast Monsoon. Tidal currents set S on the flood and N on the ebb, attaining a maximum velocity of about 1 knot.

Depths—Limitations.—Vessels up to 6,000 dwt can be accommodated, but there is a limiting draft of 4.9m in the fairway. The main wharf is on the S side of the jetty with a maintained depth of 8m along its whole length. The secondary wharf is on the N side of the jetty with a maintained depth alongside of 8m. It has been reported (1992) that a long causeway, with a dredged depth of 9.5m alongside its head, has been constructed here.

Aspect.—The village of Mkoani is conspicuous from seaward. A red beacon, stands on a rock with a least depth of 1.8m, about 0.3 mile NW of the front range light.

Pilotage.—Pilots are available from, and boarded in, Unguja, Zanzibar. Vessels without local knowledge are advised to use a pilot as the aids to navigation are unreliable.

Anchorage.—Vessels can anchor seaward of the jetty, in a depth of 12m, sand. There is room for only one vessel. This anchorage obstructs the approach to the jetty and is exposed to N and NW winds.

Vessels can also anchor S of the outer limits of the channel, in the vicinity of the fairway lighted buoy.

6.6 Kingoji Bay is entered between a point 2.2 miles NNE of Mkoani, and Ras Kingoji (5°17'S., 39°40'E.) 2 miles farther N. Numerous dangers encumber the bay and its approaches and restrict the space available for anchoring.

Mtipe (5°19'S., 39°38'E.), a coral reef which dries 0.3m, lies 2 miles SW of Ras Kingoji.

As there are no definite marks available, the best time to enter Kingoji Bay is in the afternoon with the sun astern.

Large vessels may anchor in the entrance to the bay, about 0.7 mile SSW of Ras Kingoji, in depths of 20 to 22m. Smaller vessels may anchor farther SE, in depths of 11 to 13m; local knowledge, or prior examination by boat, is essential for taking up berth in this inner anchorage.

Between Ras Kingoji and **Njao Gap** (4°58'S., 39°40'E.), the W coast of Pemba is fronted by an almost continuous chain of islands on drying reefs, broken only by a few narrow, deep gaps in the reefs. The W coast of these islands lie on the outer edges of the reefs and as the reefs are steep-to they may be closely approached in safety in clear weather.

The islands, in general, are low, flat, covered with trees and bushes, and are without any conspicuous features. The larger islands are partly under cultivation.

Within the chain of islands and reefs the coast is irregular and is indented, with numerous islets, reefs, and shoals, but there are several harbors which provide sheltered anchorages. The harbors are connected between the inner islands and reefs, but the anchorages farther N are better approached through the gaps in the outer reefs.

The tidal currents run strongly in all the gaps between the islands except in the vicinity of Mesali Gap (5°14'S., 39°36'E.) where the main tidal current flows S of Mesali Island.

6.7 Chake Chake (5°15'S., 39°46'E.) (World Port Index No. 47020) is situated at the head of Chake Chake Bay. The port consists of a town and a small natural harbor.

The approach may be made through Owen Channel or through the passage between Mesali Island and Ras Kingoji. There are general depths of 18 to 40m in the approach, however, there are patches of 4.5m and less.

Vessels of all sizes may enter Chake Chake Bay. A stone jetty which can be used by boats at high water, projects from shore at the S side of town. Lighters are available for loading and unloading cargo in the anchorage. The stone causeway has collapsed at its seaward end.

Chake Chake Bay is encumbered by numerous reefs and shoals, however, there are large clear areas which provide good anchorage.

Landmarks in the approach are Ras Tundaua (5°15'S., 39°41'E.) 3 miles N of Ras Kingoji which has a large white house and flagstaff on its E side; a large bungalow stands 0.1 mile inland. A monument stands on a low point 2.5 miles E of Ras Rundaua.

Mesali Island is covered with dense jungle; it shows out well from the land in the background when seen from any direction.

The Mkumbuu Peninsula, forming the N side of Chake Chake Bay, is of uniform height. On its S side is Dongo Kundu, a conspicuous projection that is wedge shaped and formed of bright red sandstone. A patch of red cliffs, 0.5 mile NW of Dongo Kundu, is conspicuous in some lights.

In calm weather or during the Northeast Monsoon, tempo-

rary anchorage may be taken on the bank about 1.2 miles S of Mesali Island, in depths of 10 to 14m.

There is anchorage in Ngelema Bay with Ras Kingoji bearing 230° and the W summit of Ngelema, 30m high, bearing 125°, in a depth of 14.6m.

There is anchorage, in 29m, about 1.2 miles NW of Ras Tundaua and, in depths of 12 to 18m, 1.5 miles N of the same point.

Pilotage is not compulsory for Chake Chake Bay; entry is restricted to daylight only. Pilots can only be embarked at Zanzibar.

6.8 Port Cockburn (5°12'S., 39°43'E.), a spacious and sheltered harbor considerably encumbered with reefs and shoals, affords good anchorage in some of its indentations. It may be entered from S by Owen Channel, running between the W extremity of the Mkumbuu Peninsula and Uta wa Limani, a reef extending about 5.2 miles N from Mesali Gap; from W by Kokota Gap, lying between the N extremity of Uta wa Limani and Kokota Island, about 0.5 mile NW; and from N by Funzi Channel, lying between Kokota Island and Funzi Island, about 1 mile E.

Range beacons situated on the W side of Kokota Island, in line bearing 091°, lead through the center of the gap in the outer reef. Another range is situated on the E side of Kokota Island and when in range 341° leads through the S part of Funzi Channel.

Port George (5°06'S., 39°40'E.), similar to Port Cockburn, is a sheltered harbor considerably encumbered with reefs and shoals. It affords good anchorage for vessels of moderate draft. The white house of the Provincial Commissioner on a bluff is conspicuous.

Port George may be entered from S by Funzi Channel; from W by Uvinje Gap, running through the outer reef and N of Kokota Island; and from N by a channel running S from Port Kish Kash.

Port Kish Kash is entered from W through the outer reef by Fundo Gap, situated about 8 miles N of Uvinje Gap. The passage running S to Port George is not recommended.

6.9 Wete (5°04'S., 39°43'E.) (World Port Index No. 47025), the small port area of Wete Harbor in the NE corner of Port George, is contained NE of a line joining Ras Ukenjwi (5°02'S., 39°40'E.) and Ras Bundani, about 2.7 miles SSE. The town of Wete is situated about 0.5 mile within the N shore of the harbor. A pier projects from the shore abreast the town.

Depths—Limitations.—The maximum size vessel that can be accommodated is 73m in length with a draft of 7.6m. Entrance and departure is restricted to daylight only. The approach channel via Uvinje Gap narrows to about 0.1 mile in width.

Aspect.—A light is shown from a concrete column, black and white bands, on the head of the pier.

A red conical buoy is moored about 1.5 miles W of Ras Tungwe, and marks the SE side of the channel leading to Wete Harbor.

Anchorage beacons are situated about 0.5 mile E of Ras Tungwe. The front beacon, with a white cross topmark, is in range 163° with the rear beacon, surmounted by a white triangular topmark. The range may be obscured by bushes.

Port Kish Kash (5°02'S., 39°40'E.), available only to small vessels with local knowledge, is a small harbor greatly obstructed by reefs but affords anchorage in its SE part.

Port Kiuyu (4°58'S., 39°41'E.) has ample depths and is a more convenient harbor than Port Kish Kash. Port Kiuyu is entered from W through the outer reef by Njao Gap, situated about 2.7 miles N of Fundo Gap. Anchorage may be taken 0.7 mile SE of the NE extremity of Njao, in a depth of 22m.

Pemba—North Coast

6.10 The N coast of Pemba is low and wooded and presents a uniform outline. Ras Kigomasha (4°53'S., 39°41'E.) the N extremity of the island, is the only point that can be recognized. The point is rocky and, in addition to the lighthouse, has a clump of trees about 18.3m high on it.

Foul ground, with depths of 7.3m near its outer extremity, extends 9 miles offshore in places and a bank with depths less than 100m extends as much as 13 miles N of the coast; little current is felt on this bank.

Pemba Knolls, consisting of numerous reefs, lies on the foul ground fronting the N coast of Pemba; some of these reefs dry.

Funguni (4°51'S., 39°46'E.), about 4.5 miles ENE of Ras Kigomasha, is a large sand bank which dries 2m; it is one of the reefs on Pemba Knolls.

Kundeni, which dries 1m, and Punga-Punge, which dries, lie 1.5 miles NW and 1.5 miles NE, respectively, from Funguni.

Msuka Bay (4°54'S., 39°43'E.) is a deep indentation in the coastal reef 2 miles E of Ras Kigomasha. The best time to enter is at LW when the reefs and shoals are visible.

Good anchorage may be obtained in Msuka Bay, even during the Northeast Monsoon, with Ras Kigomasha Light bearing 285° distant 2.2 miles, in a depth of 11m. If the anchorage is approached from the SW, course should not be altered to round Ras Kigomasha until Ras Kiuyu bears 112°.

Ras Kiuyu (4°53'S., 39°52'E.), the NE extremity of Pemba Island, was previously described in paragraph 6.3.

Kenya—Pangani Bay to Tanga

6.11 Between Pangani Bay (5°26'S., 39°01'E.) and Ras Nyamaku, the coast of the mainland is sandy, with occasional small coral cliffs; the land inland is well wooded. The coastal reef is fronted by a chain of large reefs which lie up to 4 miles offshore.

Between Ras Nyamaku (5°07'S., 39°08'E.) and Ras Kazone, 4 miles NNW, the coast is fringed by mangroves.

Ras Kazone (5°04'S., 39°08'E.), the S entrance point to Tanga Bay, is cliffy and covered with vegetation.

Briton Shoal (5°23'S., 39°06'E.) lies 3.2 miles offshore and has a least known depth of 7.3m.

South Head Reef, a narrow reef of sand and coral, which partially dries, lies with its S extremity about 1 mile N of Briton Shoal. The reef extends 4 miles NNE and are parallel with the shore.

Fungu Tongone (5°17'S., 39°08'E.) is a reef which dries in its N part. A shoal spit, which dries in places, extends 1.7 miles S from Tongone and connects it to South Head Reef. A sandy islet, 6m high, is located on the W edge of the N part of Fungu Tongone.

The Karange Islands are a chain of narrow islands lying on an extensive drying reef which on its E side is steep-to; the S extremity of this reef lies 1.5 miles NNE of the sandy islet on Fungu Tongone.

Yambe Island (5°07'S., 39°10'E.) 2.5 miles N of the N island of the Karange Islands, lies about 0.7 mile offshore; it is encircled by a reef.

Tanga (5°05'S., 39°07'E.)

World Port Index No. 47030

6.12 Tanga, situated on the S side of Tanga Bay, is the second principal port of Tanzania. It comprises a deep water jetty for bulk carriers, an outer anchorage in Tanga Bay and an inner anchorage abreast the town. The town of Tanga, the administrative center of the District of Tanga, is situated about 1 mile SW of Ras Kazone.

Depths—Limitations.—Tanga Bay may be entered by Southern Channel, which is formed between Yambe Island and Niule Reef; it has a least depth of 7.9m, and is available for vessels of moderate draft. Ship Channel, between Niule Reef and Fungu Nyama, is the principal entrance to Tanga Bay; it has depths of more 18.3m. A buoy is moored on the S extremity of the shoal water extending S from Funga Nyama.

An L-shaped deep-water jetty projects 0.3 mile ENE from the shore, 0.3 mile SE of Ras Kazone. It will accommodate vessels of 30,000 dwt, with lengths up to 200m and drafts of 10m. It has been reported (1994) that this jetty is in an extreme state of disrepair and should not be used. Within the harbor are two lighterage wharves, with depths alongside from 2.4 to 3m. Ro-ro vessels, with a maximum draft of 4m, may berth at the new lighterage quay in the E end of the harbor.

Aspect.—The coast in the vicinity of Tanga is low, but if the weather is clear, the Bondei Mountains, about 23 miles inland, will be conspicuous. Mlinga, the most conspicuous of them, is a three peaked hill, the middle and highest peak of which is 1,068m above the sea.



Tanga Harbor

Mhinduro, a double-peaked mountain 1,033m, in height is also conspicuous in certain lights, and some of the distant

peaks of this range must be nearly 3,048m high. During the Southwest Monsoon, the mountains are frequently obscured by haze, or perhaps only the easternmost of them will be dimly seen, but during the Northeast Monsoon they are generally clear.

At 17 miles N of Tanga and about 6 miles inland are three rounded hills, nearly always visible from seaward; Kilulu, the northernmost, is 267m high. Farther to the N are two isolated conical mountains 15 miles NW of Wasin. Jombo, the more distant, is 470m high; Mrima is truncated and 321m high. Both are visible from Pemba.

The land elsewhere is low and flat, with the exception of the Amboni Hills, about 4 miles NW of Tanga, which serves well to mark its position. These hills, 151m high and densely wooded, are rounded and present no defined summit, but there is a well marked saddle between the two southernmost and highest points, which serves as one of the range marks for entering.

The several low and densely wooded islands off this part of the coast are sometimes difficult to distinguish from the mainland, but with any haze over the land, they stand out well and distinct.

Ras Kazone is cliffy and covered with vegetation. About 0.5 mile to the S of the point a patch of red cliff shows very distinctly with the sun in the E.

A conspicuous house stands on Ras Kazone. A conspicuous hospital is situated about 0.8 mile SW of Ras Kazone. A Post Office Tower, marked by an obstruction light, is situated 0.5 mile SW of the hospital.

A fertilizer plant, with a conspicuous chimney, is situated close SW of the foot of the jetty.

Pilotage.—Pilotage is compulsory. Deep draft vessels are met at the entrance to Ship Channel, other vessels are met 1 mile SE of Ulenge Beacon. A pilot ladder is required on the port side during the Northeast Monsoon, and on the starboard side during the Southwest Monsoon.

Ships should report their ETA through Mombasa Coast Radio Station. Entry into the inner harbor is permitted during daylight hours except at the discretion of the pilot.

Signals.—A signal station is situated immediately below Ras Kazone Rear Range Light Structure. Signals are exhibited to indicate if the inner channel to the harbor is clear. Ras Kazone Signal Station keeps a 24-hour VHF watch on VHF channel 16; the working channel is VHF channel 12.

The following is a schedule of traffic signals displayed at the signal station on Ras Kazone:

1. A black flag by day or three red lights, vertically disposed, by night—entry prohibited.
2. A black ball by day or three lights, white, red, white, vertically disposed, by night—departure prohibited.

Anchorage.—Vessels of all classes may anchor in Tanga Bay, in depths of 11 to 18m. The inner harbor provides safe anchorage for vessels up to 180m in length and a draft of 8.2m.

Directions.—The port should if possible be made in the morning as in the afternoon the sun causes inconvenience and the range marks are not conspicuous. Bring Ulenge Light to bear 319° and then follow this range until the Ras Kazone light structures are in range 266°. Follow the latter range until clear of Ulenge Reef, when anchorage may be taken as convenient. If going into the harbor, from S of Ulenge Reef, steer about 285°, with Kwawa Reef Light ahead until clear of the shoals E

of Ras Kazzone, then steer W to pass about 0.2 mile S of Kwawa Reef Light and on to the ranges for the inner harbor.

Caution.—A prohibited area extends about 0.3 mile ENE from the head of the inner harbor. No craft may enter the area except with the written permission of the Harbor Authority.

Kenya—Tanga to Mombasa

6.13 Between Ras Kwawa (5°00'S., 39°10'E.), the N entrance point of Tanga Bay, and Ras Rashid, the coast is fronted by reefs and islands which lie up to 11 miles offshore. The coast is indented by several inlets and a number of streams flow into the sea in this area.

Mwamba Wamba (4°58'S., 39°15'E.), which partially dries, lies 6 miles NE of Ras Kwawa; its E side is steep-to.

Mwamba Shundo, a reef 0.5 mile NNE of Mwamba Wamba, is moderately steep-to; its N part dries 0.3m. An area of foul ground about 1 mile in extent, lies 0.5 mile N of Mwamba Shundo.

Kwale Bay (5°00'S., 39°09'E.), formed close N of Ras Kwawa, provides well sheltered anchorage, in depths of 9 to 22m. Kwale Island, consisting mostly of mangrove swamps, forms the NE side of Kwale Bay. A rocky islet and some 2m high rocks, lie on a reef extending 0.35 mile S of Kwale Island.

Manza Bay, entered between the NE extremity of Kwale Island and the S extremity of the Boma Peninsula, 1 mile N, has depths from 9 to 20m. The depths in the entrance of the bay are from 10.4 to 12.8m, over a width of 0.2 mile.

Kwale Bay and Manza Bay may be approached from Tanga Bay, by passing inland of Fungu Nyama and Mwamba Wamba. A N approach to these bays may be made by passing N of Mwamba Kitugamue, and then W of this reef.

Ras Kilifi (4°47'S., 39°13'E.) is situated 13 miles NNE of Ras Kwawa. Some prominent mountains are located W of Ras Kilifi and are the first to be seen from seaward in clear weather.

Mount Jombo (4°26'S., 39°12'E.) and **Mount Mrima** (4°28'S., 39°16'E.) are isolated conical mountains rising to 468m and 303m high, respectively. Mount Jombo is very sharp when bearing N of 286°; S of this bearing it becomes flat and not clearly defined. Mount Mrima is more truncated.

From Ras Kilifi to Ras Rashid, the coast is low and well-wooded, consisting of low rocky cliffs alternating with sandy beaches bordered by mangroves and fringing reefs.

The coast in this area recedes to form a bay, which is encumbered with numerous islands, reefs, and shoal patches.

6.14 Wasin Island (4°40'S., 39°22'E.) is the largest of the islands in the above mentioned bay. Pungutiayu, marked by a light, is located 2 miles S from the SE extremity of Wasin; it stands out prominently against the land when seen from S. Tide rips and overfalls form off the reefs E of Pungutiayu, causing large and confused seas during strong winds.

Ship Shoal (4°39'S., 39°27'E.), with a least known depth of 5.5m, consists of several shoals lying about 2.7 miles ENE of the SE extremity of Wasin Island. A depth of 2.7m is charted 1.5 miles SW of Ship Shoal.

Wasin Channel is formed between Wasin Island and the mainland between Ras Wasin (4°39'S., 39°24'E.) and Kisimani 3 miles W.

Shimoni is located midway between Ras Wasin and Kisi-

mani; a flagstaff fronts the town. Pilotage is compulsory at Shimoni for vessels of 61m in length and over. Pilots should be ordered in advance and are normally picked up at Mombasa.

The recommended anchorage, in a depth of 13m, lies about 0.4 mile offshore, with the town of Wasin, on Wasin Island, bearing about 200°. To the E of this position, the swell is felt during the Southwest Monsoon.

Ras Rashid (4°37'S., 39°24'E.), the S entrance point to Funzi Bay, is located about 1.5 miles NNE of Ras Wasin; the point is fronted by a reef.

6.15 Funzi Bay (4°36'S., 39°25'E.) is entered between Ras Rashid and Ras Kanda, about 3 miles NNE. Ras Kanda is marked by a conspicuous clump of trees 38m high. The shores of the bay are bordered with mangroves and a mangrove swamp fills its head. The bay is in large part occupied by a bank with less than 5.5m. M'dua, a detached reef which dries 0.6m, lies in the SW part of the bay, about 0.6 mile NNE of Ras Rashid. M'Kame, a reef which dries from 0.6 to 0.9m, lies about 1.7 miles SW of Ras Kanda. Sheltered anchorage may be obtained, in about 8.2m, sand, between M'dua and M'kame. Anchorage can also be obtained farther out, in 10 to 12m, about 1 mile ENE of Ras Rashid.

At the time of flood, the current enters Funzi Bay with force.

Between Ras Kanda (4°35'S., 39°26'E.) and Chale Point, 10 miles NNE, the coast is rocky and fringed with reefs.

A white beacon stands on the coast 6.7 miles NNE of Ras Kanda; a hospital comprised of a group of white buildings with red roofs lies W of the beacon.

Wimbi Reefs (4°32'S., 39°30'E.) extend NNE for a distance of 2.7 miles from a position 3.2 miles NNE of Ras Kanda. The reefs comprise four detached patches with depths of less than 2m. These reefs lie parallel to the coast.

Chale Island (4°27'S., 39°32'E.), attached to Chale Point, close N, by a reef, is remarkable because of its high trees. A light marks the S end of the island.

Chale Reef, which dries 1.2m, extends 1.7 miles SSE of Chale Island.

6.16 From Chale Point, the coast extends NNE 23 miles to Ras Mwa Kisengo, the S entrance point to the port of Mombasa. The intervening coast is, in general, low and wooded with overhanging cliffs, coral points and sandy beaches.

A detached drying reef fronts the coast and lies from 0.5 to 0.9 mile offshore; it extends NNE for a distance of 11.7 miles from a position E of Chale Point. A boat passage lies within this narrow reef.

A radio tower, 23m high and marked by obstruction lights, stands near the coast 8.2 miles NNE of Chale Point. Seven conspicuous evenly-separated beach hotels stand along the coastline on each side of the radio tower, between 7.5 and 10 miles distant from Chale Point.

Black Cliff Point (4°11'S., 39°38'E.), a slight projection, has a prominent cliff face 8m high. The point lies at the foot of a hill, which is 32m high to the top of the bushes; a beacon stands on the summit of the hill.

Shimba Hills lie about 10 miles inland between Chale Point and Ras Mwa Kisengo; they rise to a height of 449m.

Mombasa Gap (4°04'S., 39°41'E.) separates Shimba Hills from a flat range to the N. The gap does not open until it bears

less than 265° when it becomes a conspicuous landmark.

Tanglia (4°09'S., 39°35'E.), 129m high, is the highest summit of a range of hills lying about midway between Shimba Hills and the coast. A beacon stands at an elevation of 106m on the NE side of Tanglia and is visible when bearing less than 280°.

A detached rounded summit 104m high lies nearly 1.2 miles N of Tanglia; this summit is a good mark when visibility makes distant objects difficult to identify.

Mombasa (4°04'S., 39°41'E.)

World Port Index No. 47100

6.17 Mombasa, the principal port of Kenya, is also the main sea outlet for Uganda. The port is entered between a break in the reef between Ras Mwa Kisenge and Ras Mkuungombe, 2.5 miles NE. The port comprises Kilindini Harbor, Port Reitz and Mombasa Harbor, Port Tudor, and all the tidal waters around Mombasa Island. The port limit on the seaward side is bounded by a circle with a radius of 3 miles from the Ras Serani rear range light.

Plans are in the works for a new terminal W of Kipevu. This terminal will supposedly double the port's handling capability. Phase I should be operational by 2013. There is also a plan to construct an additional berth, to be designated as Berth No. 19, at the main container terminal at Kipevu.

Port Authority Kenya

www.kpa.co.ke

Winds—Weather.—The Northeast Monsoon prevails during the months of December to March and the Southwest Monsoon during the months of May to September. During the intervening months the wind gradually changes through E.

Weather conditions rarely interfere with port operations, however, during the monsoon seasons, with strong winds, boat traffic and lighter operations may be inconvenienced. It has been reported (1994) that strong NE winds may make it difficult for vessels to leave the mooring buoys.

Tides—Currents.—In Kilindini Harbor, the MHWN are 2.4m and in Mombasa Harbor MHWN are 2.3m.

The tidal currents set obliquely across the entrance channel, but within the entrance, they follow the direction of the channel. In the inner part of the harbor, between Ras Kilindini and Ras Kikaangoni, it is reported that various eddies exist at certain stages of the tide.

In the E arm, both incoming and outgoing tidal currents attain a velocity of from 2.5 to 3 knots at springs and have about an equal duration.

The incoming current in Port Kilindini has a velocity of 3 to 4 knots at springs and 2.5 knots at neaps; the outgoing current varies from 3 knots at springs to 1.5 knots at neaps.

In Port Reitz, both currents run about 1.5 knots at springs and 1 knot at neaps.

During the Southwest Monsoon, a N current of up to 5 knots may be experienced at the harbor entrance.

Depths—Limitations.—The approach channel through to, and including the turning basin in Kilindini Harbor was dredged to a depth of 15m in 1994.

The old port area of Mombasa is located E of Mombasa Island. This area is now only used by dhows; coastal vessels up to 53m long; and bulk cement vessels up to 145m long, with a maximum draft of 7.9m.

The Nyali Bridge, which connects the E side of Mombasa Island with Ras Kisauni, has a vertical clearance of 11m at its highest point.

Berthing information for Kilindini Harbor and Port Reitz is given in accompanying table titled **Mombasa—Berthing Information**.

Mombasa—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Remarks
No. 1	173m	9.7m	General cargo, passengers, and ro-ro.
No. 2	166m	9.7m	General cargo and passengers. Maximum vessel loa of 300m.
No. 3	166m	10.0m	General cargo.
No. 4	190m	10.0m	General cargo.
No. 5	178m	10.0m	General cargo.
No. 7	208m	9.7m	General cargo.
No. 8	170m	9.7m	General cargo.
No. 9	179m	10.3m	General cargo, bulk soda, and molasses.
No. 10	204m	9.7m	General cargo.
No. 11	184m	9.4m	General cargo and containers.
No. 12	182m	9.7m	General cargo.
No. 13	174m	9.7m	General cargo and containers.
No. 14	181m	9.4m	General cargo, ro-ro, and containers.

Mombasa—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Remarks
No. 16	177m	10.3m	Containers.
No. 17	182m	10.3m	Containers.
No. 18	239m	10.3m	Containers
No. 19	—	—	Under construction.
Mbaraki Wharf	315m	—	Cement, edible oils, petroleum products, and molasses. Maximum vessel loa of 198m. Maximum draft of 9.75m. Maximum size 50,000 dwt.
Shimanzi Oil Terminal	—	11.25m	Edible oils and petroleum products. Maximum vessel loa of 198m. Maximum draft of 9.75m. Maximum size 50,000 dwt.
Kiepvu Oil Terminal	68m	15.7m	Petroleum products. Maximum vessel loa of 259m. Maximum draft of 13.25m. Maximum size of 110,000 dwt.



Mombasa

In 1986, less water than shown was reported to exist in the approach channel; also 0.3 mile SSE of the light off Ras Kikaangoni and off Kiepvu Oil Terminal. A depth of 10.5m lies close S of the range line, 1.3 miles distant ESE from Ras Serani front range light.

An underkeel clearance of 2.4m is required during the

Southwest Monsoon and 1.8m during the Northeast Monsoon.

Tankers with drafts of 12.8m may enter harbor at HW; vessels drawing up to 13.4m can be accommodated during ideal conditions.

Aspect.—The Shimba Hills which rise to over 305m in height, are about 10 miles inland of the coast S of Mombasa.



Mombasa—Mbaraki Quay



Mombasa—Kilindini Harbor

On the S shoulder of the range is a conspicuous tree, not visible, however, when bearing less than 265° . Mombasa Gap separates the Shimba Hills from the flat range that rises to the N. In the middle of the gap, or dip, is a cluster of trees. The gap does not appear open until bearing S of 265° , when it becomes a conspicuous mark for making Mombasa.

Between the Shimba Hills and the coast is a range of hills about 122m high. Tangila ($4^\circ 09'S.$, $39^\circ 35'E.$), the highest summit of the latter range, is 129m high and rises nearly 3.5 miles NW of Black Cliff Point; to the NE of this peak there is a triangular target beacon which stands at an elevation of 105m and is visible when bearing less than 280° . Approximately 1.2 miles NNW of Tangila there is a detached rounded summit, 104m high, which is a good landmark when visibility makes objects difficult to identify.

Coroa Mombasa ($3^\circ 59'S.$, $39^\circ 41'E.$), or the hummocks of

Mombasa, form one of the best landmarks for making Mombasa from the offing. They are three low hillocks about 5 miles N of the port; the middle hillock, about 122m high and with a clump of trees on its summit, is the highest. From the NE they appear close together.

An orange-colored gas flare, which has been reported visible up to 30 miles from seaward, is situated about 6 miles NW of the harbor entrance.

Conspicuous objects in the approach to Mombasa are the white factory situated about 1 mile NW of Ras Iwatine, which shows prominently from the N and E and is usually brilliantly-lighted at night; a hotel standing near the coast 1 mile SW of the point; the hotel on high ground 0.8 mile WSW from Ras Serani; Bima Tower, situated 1 mile NW of the same point; and a school 0.8 mile NNE of Bima Tower.

Pilotage.—Pilotage is compulsory for all vessels, except those exempt by the Port Authority, and is available 24 hours. For tankers, vessels carrying other dangerous cargo or constrained in any way, and/or vessels over 200m in length, pilotage is available only during daylight hours. Pilots board in position $4^\circ 06.9'S.$, $39^\circ 44.2'E.$

Vessels may not enter the harbor until a pilot has been embarked. In the event of bad weather or other circumstances making boarding by a pilot impracticable, vessels concerned must comply with instructions received through Ras Serani Signal Station. Pilots may be contacted on VHF channels 16 and 12. The pilot boat has an orange hull with a white house; the word "PILOTS" is written across the house.

Regulations.—"The East African Harbours Regulations 1970" are in force within the port of Mombasa. Copies of the regulations may be obtained from the port authorities.

Vessels send their request for pilotage and their ETA, via their agent, 48 hours in advance.

Vessels are required to maintain a listening watch, on VHF channel 12, 3 hours prior to arrival and 3 hours prior to departure.

A restricted area surrounds the Kipevu Oil Terminal out to a distance of 150m; vessels not engaged in business with the terminal shall not enter this area. A second restricted area, best seen on chart, has the Kipevu Bridge as the N boundary and surrounds the Shimanzi Oil Terminal to the S.

A circular prohibited area for all vessel traffic, with a radius of 244m, is centered on Fort Jesus in Old Mombasa.

Signals.—When entry to the port is prohibited, the following signals are shown from the signal station on Ras Serani:

1. Day signal—Black flag.
2. Night signal—Three red lights, vertically disposed.

The following signals shown from the signal station on Ras Mahanganwe indicate that a vessel is arriving in Port Kilindini or Port Reitz and vessel departures are prohibited:

1. Day signal—Black ball.
2. Night signal—One red light between two white lights, vertically disposed.

Anchorage.—Anchorage is available within the harbor, as assigned. Temporary anchorage may be taken, in 35m, with Ras Serani rear light bearing 322° , distant 2.5 miles.

Anchoring in the outer approaches is not recommended, particularly in the Southwest Monsoon. Anchoring and fishing are prohibited in a large area of Mombasa; the limits may best be seen on the chart.

Caution.—The range lights on Ras Serani have been reported (1993) to be difficult to distinguish.

Mariners are cautioned that a strong N current may be experienced off the entrance to Mombasa and that at the height of the Southwest Monsoon, a N set of up to 5 knots may be experienced.

Kenya—Mombasa to Kilifi Creek

6.18 From Mombasa, the coast trends in a NNE direction to Ras Kitoka (3°38'S., 39°52'E.), the S entrance point to Kilifi Creek, a distance of about 26 miles.

The Rabai Range, about 10 miles inland, runs nearly parallel with the coast for 10 miles NNE of Mombasa. Jidana (3°50'S., 39°40'E.), 313m high, is the farthest N and highest of five distinct summits within the Rabai Range. Kinagoni, a peak about 1.5 miles SW of Jidana, has a clearly defined dome-shaped summit and is remarkable.

The Senawe Range, separated from Rabai Range by a low hill, continues N. Simba (3°44'S., 39°41'E.), 352m, is the farthest S of the Senawe Range. Kauma, 329m high, lies 3 miles N of Simba.

A coastal range commences 13 miles NNE of Mombasa and extends about 11 miles NNE to the vicinity of Blowing Point (3°42'S., 39°52'E.). The highest hill of the coastal range rises to a height of 198m, 9.5 miles SW of Blowing Point. Mkomani, 139m high, is located 5 miles SSW of Blowing Point; each of these hills have a clump of trees on their summit.

From a position on the coast 4 miles NNE of Mombasa to Mtwapa Creek (3°58'S., 39°46'E.), 4 miles farther NNE, the coast consists of sandy beaches with overhanging cliffs. From the break in the coastline formed by Mtwapa Creek, the sandy beaches and overhanging cliffs continue to Blowing Point. A prominent patch of white sand is located on the cliffs 2 miles S of Blowing Point.

A barrier reef fronts the coast to a position about 5 miles S of Blowing Point. The outer edge of the reef is steep-to and there are no known off-lying dangers between Mtwapa Creek and Blowing Point.

Cannon Point (3°58'S., 39°46'E.), the S entrance point to Mtwapa Creek, is marked by a light; there is a break in the barrier reef E of the point.

Kilifi Creek (3°38'S., 39°52'E.)

World Port Index No. 47105

6.19 Kilifi Creek is a small natural harbor which provides shelter for small vessels in the inner harbor and berths for larger vessels in the outer anchorage.

The port comprises the area within 3 miles seaward of Ras Kitoka and includes Takaungu Creek and Kilifi Creek.

Kenya Ports Authority Mombasa directs the port.

Tides—Currents.—The tidal current set directly across the channels through the off-lying reefs; the flood current is to the N and the ebb current sets S. In the creek the currents have a velocity of 0.75 to 1.5 knots.

Depths—Limitations.—Takaungu Pass, formed between South Reef and Middle Reef, has depths of over 18m over a width of 0.1 mile.

North Pass, formed between Middle Reef and North Reef, is the most direct approach to Kilifi Creek, but depths of 9m or more exist over a width of only about 0.7 mile; a depth of 4.3m lies close N of the entrance range line.

Kilifi Creek, entered between Ras Kitoka and a similar bluff 0.3 mile NNE, has a narrow entrance, with a least depth of 3m. The depths within the harbor are over 22m but the channel is winding and not suitable for large vessels to enter.

An overhead power cable, with a vertical clearance of 15.2m, spans the creek 0.7 mile W of Kilifi Creek range lights. A bridge has been constructed across the creek. The span has a vertical clearance in the center of 20m.

Pilotage.—Pilotage is compulsory for vessels 61m long and over. Pilots should be ordered in advance and picked up in Mombasa.

Anchorage.—Anchorage may be obtained off the entrance to Kilifi Creek, in depths of 15 to 18m, sand, about 0.5 mile E of North Pass front range light. There is anchorage, in a depth of 12m, close within Takaungu Pass.

Vessels that can pass under the power cable may anchor in mid-channel about 0.1 mile W of the cable, in depths of 28 to 37m.

Kenya—Kilifi Creek to Malindi

6.20 Between Kilifi Creek and **Mida Creek** (3°23'S., 39°59'E.), the coast is similar to that S of Kilifi, consisting of sandy beaches and low overhanging coral cliffs backed with thick scrub and bushes. A flat range of hills from 180 to 240m high lies about 6 miles inland.

Red sand cliffs are located on the coast about 9 miles NNE of Kilifi; a short distance farther NNE is a white patch of sand, 9m high.

Caution.—A 2.5 mile long band of tide rips was reported (1994) in the vicinity of position 3°33.0'S, 40°22.1'E.

6.21 Mount Mangea (3°15'S., 39°43'E.) has a fairly well-defined summit with gradually sloping sides. It stands alone 17 miles WNW of the entrance to Mida Creek and makes a good landmark in clear weather.

Between Mida Creek and Malindi Point, 11 miles NE, the coast is thickly wooded. On the N bank of Mida Creek are patches of red sand cliffs.

Caution.—Malindi Marine National Park, whose limits include Barracouta Passage, North Reef, and Stork Passage, is marked on its NE and SE extremities by can buoys. The buoys are moored 1.5 miles NE and ESE of Casuarina Point (3°15'S., 40°08'E.). Fishing is prohibited in these areas and no shells or coral may be taken from the park.

Watamu Marine National Park covers an area which includes the entrance to Mida Creek and extends to the NE for approximately 4 miles. Both of these parks are part of the Malindi Marine National Reserve. Contact the local authorities for more information about restrictions and entrance into these areas.

6.22 Malindi Point (3°15'S., 40°07'E.) is a rounded coral cliff, 6m high. The point is rendered noticeable by Sail Rock, which is undercut and resembles a dhow sail, lying close E.

Malindi Reef, which dries in patches and generally breaks,

extends about 1.5 miles offshore and fronts the coastal reef for about 3 miles SW of Malindi Point.

Malindi Bank extends about 7 miles SSE of Malindi Point. Overfalls occur over the outer part of the bank where there are depths from 15 to 30m.

Leopard Point (3°15'S., 40°08'E.), about 2.2 miles NNE of Malindi Point, is 19.5m high, it is white and sandy.

Leopard Reef, lying 1.2 miles E of Leopard Point, dries from 0.3 to 1.2m and is surrounded by foul ground.

A wreck lies on the E side of the reef; a sand cay, which is prominent at LW, dries 3.7m and lies on the NW part.

Vasco da Gama's Pillar, near the extremity of the cliffy point about 1.7 miles N of Leopard Point, is of white masonry, 5.5m high, and has a cross on it.



Vasco da Gama's Pillar

Griffon Patches, formed of coral and with a least known depth of 4.7m, extend 2.7 miles N from the foul ground lying off the E side of Leopard Reef. Single-Tree Hill, in range with the guardhouse on the N bank of the Galana River, bearing 323°, leads NE of all the patches.

Malindi (3°13'S., 40°08'E.)

World Port Index No. 47107

6.23 Malindi is situated at the head of Malindi Bay and is the headquarters for the District of Malindi. The port consists of the town and a small natural harbor.

Tides—Currents.—Off Malindi, within the 180m curve, a nearly constant current of 0.75 knot to the S has been experienced in the months of November and December. Outside the 180m curve the current is constantly N at a rate of 1 knot during the Northeast Monsoon and at a rate of 3 knots during the Southwest Monsoon.

Aspect.—**Goji** (3°12'S., 40°00'E.), a wooded hill, 116m high, is a good mark for a vessel approaching the anchorage from the E. Single-Tree Hill is a round-topped hill, 169m high, with a single tree on its summit, rising about 9 miles NE of Goji Hill. A conspicuous minaret stands about 0.6 mile NW of

Vasco da Gama's Pillar. A tall building and a water tower 1 mile N of the minaret make good marks.

Pilotage.—Pilotage is compulsory for vessels 61m in length and over. Pilots should be ordered in advance and are normally picked up in Mombasa.

Regulations.—“The East African Harbours Regulations 1970” are in force within Malinda.

Anchorage.—Anchorage may be taken about 0.7 mile from the front range light, on the range, in a depth of 11m, mud; this anchorage is protected from the Southwest Monsoon. Vessels should not anchor farther in. Large vessels are recommended to anchor outside the depths of 18.3m in a position 1 mile ENE of the light on Pillar Reef.

Directions.—To enter by the North Pass, steer in with the lighted beacons on the cliff 1 mile S of Ras Kitoka in range bearing 274° until within 0.5 mile of the shore, when course may be altered for the anchorage or for the river entrance.

The beacons on the N side of the river entrance, in range bearing 330°, lead into the river, but vessels of considerable draft should steer first to the W of the range and then to the E of it in order to keep the axis of the channel. When Ras Nkoma is in range with point E of it on the N bank, bearing 288°, round into the river, keeping in mid-channel. The reef off the N shore just within the entrance should be given a safe berth.

Vessels with a draft greater than 2.7m must not proceed above the ferry crossing without permission from the Port Authority.

Kenya—Malindi to Lamu

6.24 Malindi Bay indents the coast between the town of Malinda and the mouth of the Galana River 3 miles N. The shore of the bay is bordered by a sandy beach with occasional coral outcrops, which cover and uncover depending on the monsoon prevailing.

A prominent white sand hill, 50m high, rises 0.7 mile N of the mouth of the Galana River near the S end of a coastal range which stretches to Mambui Point.

Mambui Point (3°06'S., 40°10'E.) lies 2.7 miles NE of the Galana River. Mambui is situated on the N side of the point and is dominated by a prominent mosque.

Magarini rises to a height of 169m; a single tree stands on its summit. Between this hill and the coast the country is flat.

Ras Ngomeni (2°59'S., 40°14'E.) is the extremity of a peninsula projecting 3 miles ENE from the coast. The point is bold and steep-to with overhanging coral cliffs 5m high. An isolated hill 28m high lies close within the point and a ridge extends W from this hill to a more prominent hill 51m high, 2 miles W.

Ungama Bay (2°45'S., 40°20'E.), also known as Formosa Bay, is entered between Ras Ngomeni and Ras Mwana.

Between Ras Ngomeni and Mto Kilifi, the shore of the bay consists of a sandy beach with numerous creeks and swamps within. A prominent sandhill, 18m high, rises 1 mile NNE of the mouth of Mto Kilifi.

Between Mto Kilifi and Kipini, the coast consists of sand hills which are mostly wooded.

Caution.—Within the head of Ungwana Bay, extensive shoaling has been reported (1988). A submerged well head exists 11.5 miles NE of Ras Ngomeni.

6.25 Kipini (2°31'S., 40°32'E.) is a large village at the NE end of Ungama Bay. Anchorage can be taken about 3 miles S of Kipini, in a depth of 7m, sand. Deeper draft vessels may anchor farther out, W of Mwamba Ziwayu, in a depth of 8.5m.

Ras Mwana (2°34'S., 40°36'E.) is a low rocky point fringed by a drying coral bank extending 0.5 mile S.

Mwamba Ziwayu is a group of jagged rocky islets lying 3 miles S of Ras Mwana. A shoal spit, marked near its S extremity by a lighted buoy, extends 4 miles SSW from Mwamba Ziwayu.

Mwamba wa Tawa Ndani (2°34'S., 40°40'E.) is a group of shoal patches extending 4 or more miles E of Ras Mwana; the shallowest of these patches dries 1m.

6.26 Between Ras Mwana and **Ras Biongwe** (2°23'S., 40°49'E.), 17 miles NE, the coast consists of sand hills from 15 to 60m high. A prominent group of sand hills with a white patch on their seaward slope are located 4.5 miles NE of Ras Mwana. Another prominent sand hill, 55m high, rises 5 miles farther NE; a sharp boulder stands on the N side of this sandhill.

Ras Tenewi (2°27'S., 40°46'E.), a low sandy projection, is located 11.7 miles NE of Ras Mwana. Hills, which are good marks, rise to a height of 70m, 4.2 miles NE of Ras Tenewi.

Ras Biongwe, 5 miles NE of Ras Tenewi, forms the SE extremity of a rounded peninsula.

Tenewi ya Juu (2°28'S., 40°48'E.) are a line of rocky islets, with heights up to 12m, located on a reef 1.5 miles S of Ras Tenewi. The reef is steep-to on its E side but it is connected to Ras Tenewi by reefs and shoals.

Kinyika (2°26'S., 40°50'E.), a rocky islet 9m high, lies on a reef 4.5 miles ENE of Ras Tenewi. Foul ground extends SW from the islet and no attempt should be made to pass close off this side of the islet.

During the Northeast Monsoon, good anchorage may be obtained W of the reef surrounding Tenewi ya Juu, in depths of 13 to 15m. The anchorage should be approached with the prominent sand hill 55m high, located 2.7 miles WSW of Ras Tenewi, bearing 308°. As soon as Kinyika is open NW of Tenewi ya Juu, course may be altered to anchor as convenient. The above track leads about 0.5 mile SW of a reef.

Lamu Island (2°17'S., 40°52'E.) lies at the head of Lamu Bay; its S extremity is located 3.7 miles N of Ras Biongwe. The S coast of the island consists of a sandy beach backed by prominent white sandhills from 9 to 81m high, partly covered with scrub.

These sand hills, and particularly the ones near the entrance to Luma Harbor, are whiter than those in the vicinity of Ras Biongwe. The SE extremity of the island is marked by a light; it is the rear light of a range in line bearing 015°.

Lamu (2°16'S., 40°54'E.)

World Port Index No. 47110

6.27 Lamu is situated on the E side of Lamu Island; the port consists of a town and a small natural harbor. It has been reported (2010) that the Kenyan government wants to expand the port and make it a cargo gateway serving southern Sudan and Ethiopia. Plans include constructing three berths which

could handle vessels up to 100,000 dwt.

Winds—Weather.—The Northeast Monsoon and Southwest Monsoon blow regularly along this coast, but close inshore the wind draws in during the daytime, and a land wind prevails at night. In January the wind varies from NE to SE and is generally fresh, though at times light. It is usually somewhat hazy.

Tides—Currents.—The N current off Lamu is stated to be uncertain in strength, but this applies chiefly to the Northeast Monsoon when the N and S currents meet somewhere between Lamu and Castle Point.

The general N set between Mombasa and Lamu is from 2 to 4 knots during the Southwest Monsoon and from 1 to 2 knots during the Northeast Monsoon. There is a strong indraft with the incoming current into Manda Bay and Pate Bay. The tidal current runs about 2.5 knots at Shela and much stronger at Lamu, especially with a N wind.

Depths—Limitations.—The channel across the bar is about 0.5 mile wide. In 1963, there was a depth of 5.2m over the bar on the range line, but mariners are cautioned that depths are subject to change during the rainy season. The channel leading to Lamu Harbor is dredged to 5.5m (1989). In 1985, less water was reported over the bar near the range line. A draft of 5.2m can be carried in the fairway to the anchorage off the town of Lamu.

Aspect.—Dongo Kundu, the W shore of Lamu Bay, is a rounded peninsula rising to a height of 70m; there are conspicuous white sand hills on the peninsula.

Ras Kitau, the SW extremity of Manda Island, is low, rocky, and is backed by bush. Manda Island forms the E shore of Lamu Bay.

Pilotage.—Pilotage for vessels 200m or over in length is compulsory at Lamu. Pilots should be ordered in advance and are normally picked up at Mombasa.

Anchorage.—The harbor has three sheltered anchorages deep enough for vessels up to 91.5m long with a draft of 5.2m.

Kenya—Lamu to Kiwaih Bay

6.28 From Lamu to **Kiwaih Island** (2°00'S., 41°17'E.), the coastline is indented to a distance of about 12 miles and forms several bays, which are encumbered by several islands and numerous reefs. From the S the largest bays are Manda, Pate and Kiwaih.

From Kiwaih Island to Raas Kaambooni, 27 miles farther NE, the coast consists of a series of ranges of hills from 45 to 100m high. For the most part these hills are sandy, with sparse scrub and low bushes, and have few recognizable features.

Manda Island (2°16'S., 40°57'E.) separates Lamu Harbor from Manda Bay. A few low hills are seen along its seaward face; the low parts are comprised of sand, but are of a much more yellow hue than the hills of Lamu.

Prestgrave Bank (2°19'S., 41°01'E.) lies in the S approach to Manda Roads there is a least charted depth of 5.2m on the bank. Mchangamneni, an extensive coral shoal, with a least known depth of 1.8m, lies between Prestgrave and the coastal reef. The sea does not always break on these shoals and they may be difficult to see.

Vidal Bank (2°18'S., 41°04'E.) lies with its SW extremity 1.5 miles E of Prestgrave Bank and extends 3.7 miles NE. The

bank has a least charted depth of 3.6m. The sea seldom breaks on this bank and it is inadvisable to cross this bank due to the irregular depths.

Mlango Muhaji (2°18'S., 41°01'E.), the S entrance channel to Manda Roads, is formed between Prestgrave Bank and Vidal Bank; it has a least depth of 10.4m in its central part.

Clark Patch (2°16'S., 41°01'E.), with a depth of 8.2m, lies in the N part of Manda Roads.

Mwamba Hanawi is a detached coral reef, awash in places, that breaks at all states of the tide.

Barracouta Channel is formed between Vidal Bank and Mwamba Hanawi.

6.29 Manda Roads (2°16'S., 41°01'E.) is an anchorage lying close E of Manda Island. It may be approached from the E through Barracouta Channel by crossing the 40m curve, with the highest hill on Ras Ukowe bearing 269°. When the beacons E of Manda Toto Island (2°14'S., 40°59'E.) are in line 354° course may be altered to anchorage about 2 miles SE of Ras Ukowe.

Mlango Muhaji is the S approach to Manda Roads. The 40m curve line may be crossed, with the islet Jiwe la Mpupu (2°13'S., 41°01'E.), 6m high, in range with the SE extremity of the Shongoni Peninsula bearing 357°. When the beacons are in range 354° follow that track into Manda Roads and proceed to anchorage as desired.

Good anchorage may be taken in Manda Roads, in depths of 16.5 to 22m, mud and sand. Presgrave and Vidal Banks afford some shelter from the prevailing monsoons, but there is usually some swell in the roads.

Manda Bay (2°07'S., 40°57'E.) is entered from Manda Roads through a channel between the reef extending from Manda Toto Island and the range beacons about 1 mile ENE; there is a least depth of 11.3m in the fairway.

The tidal currents are strong in the entrance to the bay and attain a velocity over 4 knots at springs; at neaps the velocity is considerable. Off Ras Mtangawanda, the W extremity of Pate Island, the maximum velocity is about 1.5 knots. Completely sheltered anchorage may be obtained in the S part of Manda Bay, in depths of 10 to 14m.

Pilotage.—Pilotage is compulsory for all vessels 200m and over in length at Manda Bay. Pilots should be ordered in advance and are normally picked up at Mombasa.

Caution.—In Manda Bay, there is often a considerable amount of weed and mangrove debris floating on and just below the surface which may be drawn into suction inlets.

6.30 Pate Bay (2°10'S., 41°05'E.) is formed between Ras Shongoni, the S extremity of Pate Island, and Ras Mitu Mitu 7 miles NE.

Ras Mitu Mitu (2°09'S., 41°06'E.) is a point formed of distinctive sand dunes, about 9m high, which make the only break in the wide belt of mangroves lining the S coast of Pate Island.

Kisingati Island lies on the edge of the fringing reef, in the center of Pate Bay, 4 miles NE of Ras Shongoni, the S coast of this island is free of mangroves and to a degree resembles Ras Mitu Mitu.

Pazarli Ridge (2°12'S., 41°07'E.), a chain of coral rocks which dry from 2 to 3m, lies across the central part of the entrance to Pate Bay. There is a pass at each end of the ridge lead-

ing into the bay.

The E side of the bay is flanked by an extensive group of drying sand and coral reefs; among these reefs are Mercer Rocks and Mwamba Hasani (2°08'S., 41°10'E.). Siwi Spit extends NE from Mwamba Hasani.

Caution.—A number of detached coral patches with charted depths from 6.1 to 12.2m lie within 3.5 miles S and 2 miles E of Pazarli Ridge, in the approach to Pate Bay. These patches have not been fully examined and less water than charted may be expected over them. The entrances to the bay have also not been fully examined and great care should be exercised when navigating in this vicinity.

6.31 Mlango Pazarli (2°12'S., 41°05'E.), the SW entrance to Pate Bay, is formed between the shoals extending S from Pazarli Ridge and a depth of 1.8m about 1 mile W. The pass is about 0.4 mile wide and has a charted depth of 6.7m, but on the bar less depths may be found.

A vessel approaching the pass from the S should cross the 40m line with the E extremity of Kisingati Island bearing 333°. As soon as the S extremity of Manda Toto Island bears 243° course may be altered to anchor as convenient in Pate Bay.

Mlango wa Sera (2°10'S., 41°07'E.), the NE pass into Pate Bay, lies between the NE rock on Pazarli Ridge, which dries 2.4m, and the edge of the foul ground extending SW from Mercer Rock.

Mlango wa Sera is about 0.5 mile wide and has a least charted depth of 5.2m, but less water may be found in the fairway.

Vessels should cross the 40m curve line with the W extremity of the sand dunes forming Ras Mitu Mitu bearing 314°; this course leads through Mlango wa Sera close to the NE rock of Pazarli Ridge. This entry should only be made when the NE rock of Pazarli Ridge is visible. When the vessel is within Pate Bay alter course W when the S extremity bears 270°, which leads to the anchorage in the NE part of the bay.

6.32 Kiwaihu Bay (2°04'S., 41°12'E.) is entered between the E extremity of Pate Island and Boteler Ledge, 4.5 miles NE. Within the entrance points the whole bay is shallow, with numerous isolated patches of coral with depths from 0.3 to 1.8m. In calm weather, these patches can sometimes be seen in the earlier part of the day because of the discolored water around them. Later in the day, when a sea breeze develops, they are impossible to identify and navigation in the bay is hazardous at LW, even for boats.

Owen Patches (2°05'S., 41°15'E.), 3 miles NE of Siwi Spit, has a least charted depth of 3.9m; it is difficult to see. An entrance channel to Kiwaihu Bay lies between this patch and Siwi Spit.

Boteler Bank, with a depth of 4.9m, lies in the N part of the entrance to Kiwaihu Bay, in a position about 1 mile N of Owen Patches. This bank is irregular and is not easily seen.

Kiwaihu Island (2°00'S., 41°17'E.) lies 6 miles NE of the E extremity of Pate Island. A conspicuous conical hill, 47m high, stands in the central part of the island; a smaller, but more symmetrical, hill lies close NE.

Kenya—Kiwaihu Bay to Raas Kambooni

6.33 Little Head (1°57'S., 41°19'E.) is situated on the

mainland, 0.7 mile NE of the N extremity of Kiwaihu Island. From Little Head to Raas Kaambooni, 25 miles NE, the coast consists of a series of ranges of hills from 45 to 100m high. For the most part these hills are sandy, with sparse scrub and low bushes; few have recognizable features.

Kiwaihu Knolls (2°00'S., 41°20'E.), a ridge of coral pinnacles with a least charted depth of 4.5m, lie 2.5 miles SE of Little Head; they are not easily seen and the ridge is steep-to. Halliday Shoal with a depth of 11.6m lies 2.2 miles off the mainland 1.5 miles NE of Kiwaihu Knolls.

Arletts Ledge (1°55'S., 41°24'E.), with coral pinnacles having a least known depth of 5.5m, lies 1.2 miles NE of Halliday Shoal.

Simambaya Ledges has several pinnacles of coral and rock with depth of 4.9 to 8.2m; they lay close NE of Arletts Ledge and extend NE, parallel to Simambaya Island for its entire length. These ledges are steep-to but can usually be seen due to the light sandy bottom over the coral.

Simambaya Island (1°52'S., 41°25'E.) lies about 0.7 mile offshore with its S extremity about 6 miles NE of Little Head. It is the largest of the islands along this stretch of coast and has a steep range of hills that rise to a height of 60m. The seaward edge of the island is steep-to and is usually fronted by breakers.

Lama Shaaqa (1°39'S., 41°35'E.), a small group of islets, lie on the coastal reef 1 mile SW of Raas Kaambooni.

Raas Kaambooni (1°39'S., 41°36'E.) is a low rocky promontory slightly raised in the center. On the S side of the rise there is a red sandy patch. The rocky face of the headland, when seen from the E, appears to have a narrow sandy cove in the center.

Somalia—Raas Kaambooni to Qooriga Kismaayo

6.34 Isole Giuba is the collective name for a chain of islands, islets, and rocks which front the coast between Raas Kaambooni and Ras Ogaden (0°27'S., 42°29'E.), the SW entrance point to Qooriga Kismaayo, 90 miles NE. Few of these islands lie more than 2.5 miles offshore and from a distance they may be mistaken for the mainland which is generally flat. Most of the islands, which show up well on radar, rise up abruptly from a narrow connecting line of reefs marked by breakers.

To safely pass Isole Giuba, vessels should keep seaward of the 100m curve, which lies about 4 miles offshore.

Within the 40m curve, about 1 mile closer inshore, the depths are irregular with numerous ridges and patches of coral having depths less than 5m; there is, however, usually a clear channel, with depths more than 18m about 1.5 miles seaward of the islands.

6.35 Ras Gome Lahecua (1°32'S., 41°39'E.) is a bold round-topped rocky hill, located above a sandy beach; it is the second most conspicuous object on this coast.

Just S of Ras Gome Lahecua are some white sandy patches which at times show well from seaward; just N of the point a short range of hummocky rocks, 30m high, stand close to the beach.

Raas Warafoole (1°24'S., 41°44'E.), a projection of land, is

located 9 miles NE of Ras Gome Lahecua. A hill, with a ridge of cliffs below its summit, stands on the point; it is most noticeable when bearing about 310°.

Collinadelle Rose (1°22'S., 41°45'E.), 2.2 miles N of Raas Warafoole, 1 mile inland, is flat-topped and slopes gradually to the S and steeply to the N.

It shows above the coastal range of hills and is a conspicuous landmark for a considerable distance. Rozier Peak, 1.5 miles NE of the hill, is insignificant, but the locality may be identified by a huge haystack-shaped black rock standing between it and the beach.

Buur Buurdheere (1°15'S., 41°50'E.) is 43m high; it has a slight dip in its summit when seen from the S.

6.36 Buur Gaabo (1°12'S., 41°50'E.) is entered between Ras Gowlaani and Ras-Kaamba Kiyamba; a beacon stands on the extremity of Ras-Kaamba Kiyamba.

Tides—Currents.—The incoming tidal current has a velocity of 1.5 knots; the outgoing tidal current has a velocity of 2 knots.

Depths—Limitations.—There is a bar across the entrance channel with depths from 6.4 to 8.7m. The depths inside the bar increase to 19m 2.5 miles N of Ras Gowlaani.

Aspects.—Buur Buurdheere rises 0.5 mile NW of Ras Gowlaani. Shimofongo, marked by a beacon, rises to a height of 61m, about 2.3 miles NW Buur Buurdheere.

Anchorage.—Anchorage may be obtained in mid-channel, about 0.4 mile NNW of Kifenni (1°13'S., 41°51'E.), in a depth of 16m.

During Northeast Monsoon, small vessels may anchor in Qooriga Kiyambo, close W of Ras-Kaamba Kiyambo. Temporary anchorage may be obtained outside the bar, but vessels should be prepared to leave the anchorage on short notice.

Directions.—There are three sets of range beacons, shown on the chart, that lead into Buur Gaabo. These range beacons may be followed to a position about 500m SSW of Gees Yuunda (1°13'S., 41°51'E.), when a mid-channel course of 320.5° will lead toward the inner anchorage. The pillar on Gees Yuunda should not be mistaken for any of the range beacons.

Caution.—Breaking reefs extend from Ras Gowlaani to a position close N of Keti Keti. Keti Keti, a group of islets surrounded by a drying reef, lie about 0.6 mile SSW of Ras-Kaamba Kiyambo.

An islet, 6m high, lies close SW of the beacon situated on Ras-Kaamba Kiyambo. A ledge, about 1 mile in extent, lies off the NE side of the entrance; it breaks along its seaward side.

6.37 From Ras-Kaamba Kiyambo, the coast trends in a NE direction to Raas Ogaden, a distance of about 60 miles.

This entire coast is fronted by a series of islands, islets, and rocks which lie up to 3.5 miles offshore. The 10m curve lies close off some of these dangers, but in other places it lies up to 4.7 miles offshore.

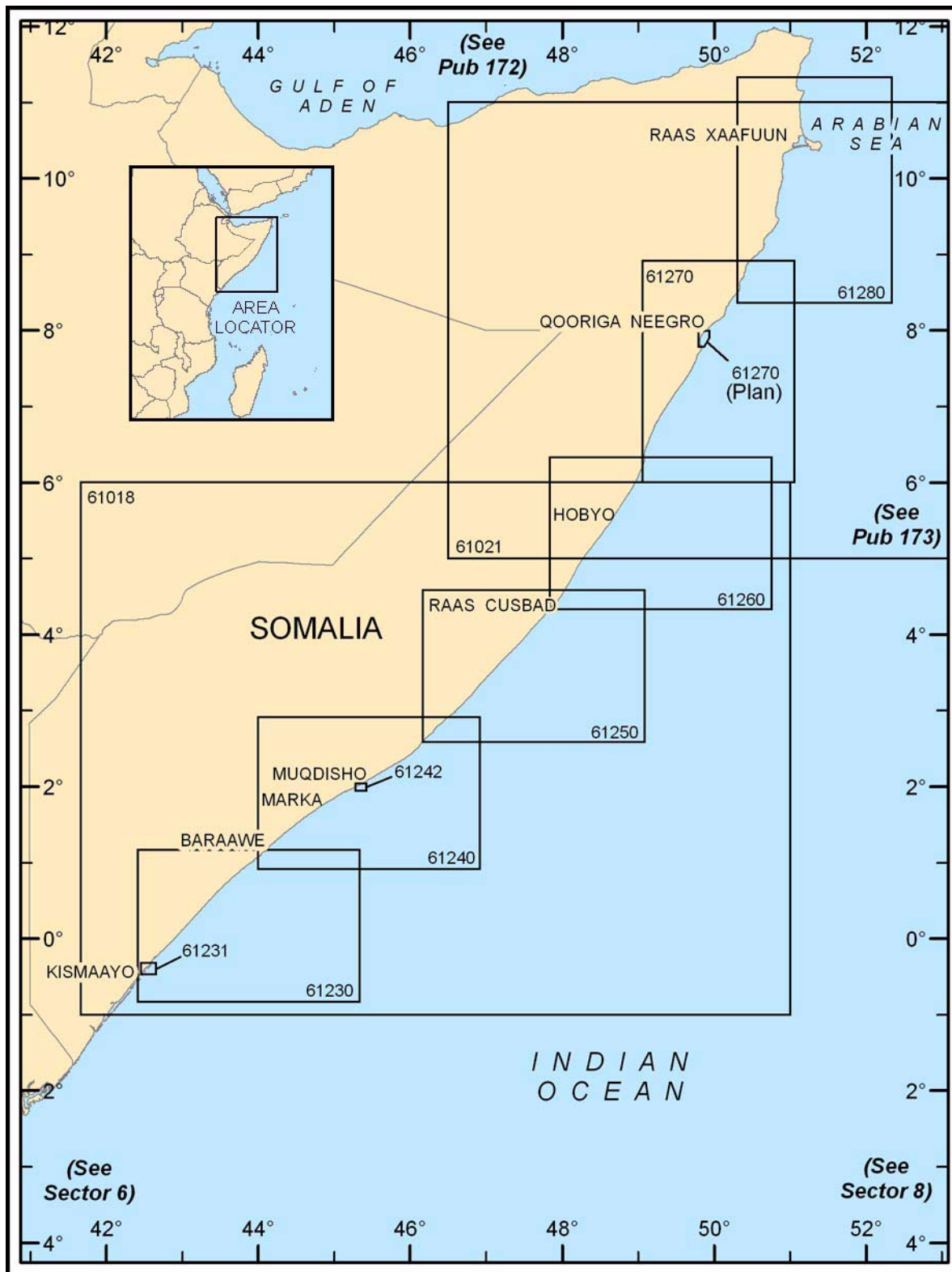
Qooriga Juula (1°01'S., 42°00'E.) is a bay that is fronted by islands; it may be entered by vessels with local knowledge. There are depths from 9 to 18m in the entrance, but within the entrance the depths decrease suddenly to 5m.

Between Qooriga Juula and Raas Ogaden there are two anchorages where small ships with local knowledge may anchor; they are Qooriga Jofay, 12 miles NE of Qooriga Juula, and Qo-

origa Koyaama, 19 miles farther NE.

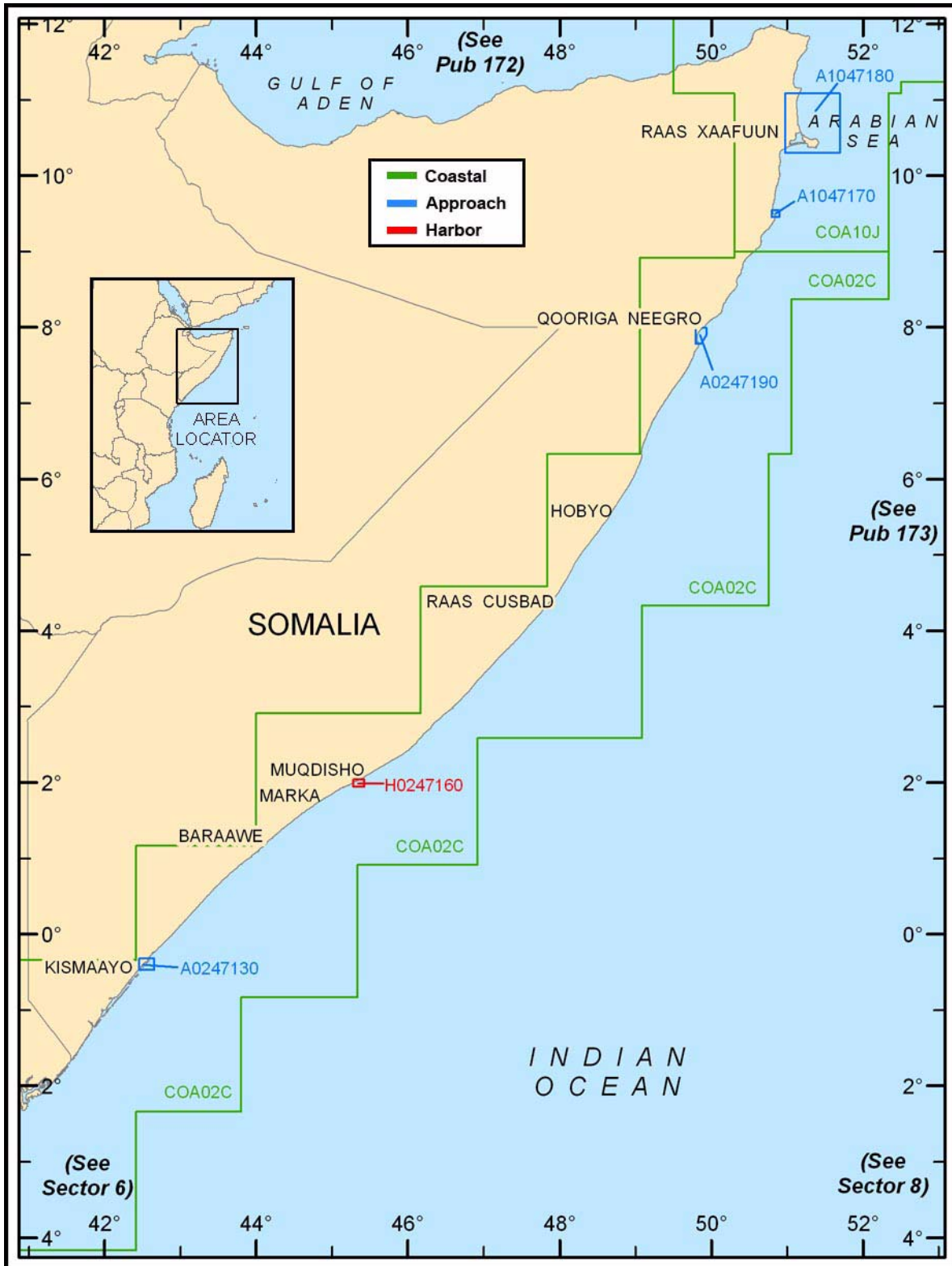
Raas Ogaden (0°27'S., 42°29'E.), the NE extremity of J-sha

Kuwaajuule, is the SW entrance point to Qooriga Kismaayo, which is described in paragraph 7.2.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 7 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNCS 02 AND 10 (Limited Distribution) disc within the README\GRAPHICS folder.
SECTOR 7 — DNC LIBRARY INFORMATION

SECTOR 7

SOMALIA—QOORIGA KISMAAYO TO RAAS XAAFUUN

Plan.—This sector describes the E coast of Africa from Qooriga Kismaayo (Baia di Kismaayo) NE to Ras Xaafuun (Ras Hafun), a distance of 859 miles.

General Remarks

7.1 Between Kismaayo and Baraawe (Baraawa) (1°06'N., 44°02'E.), the coast consists chiefly of reddish sand dunes, backed by high sand hills; most of these hills are bare and are visible from a distance of 25 miles.

A hill close inland in the vicinity of Ras Audalla (0°46'N., 43°37'E.) is a saddle about 1 mile in extent between the conical hills. A black rock stands on the seaward side of the central part of the saddle and there are dark red patches on the coastal hills 3 or 4 miles NE of the saddle.

Between Baraawe and Marka the coast consists of a series of hills from 80 to 165m high; on a portion of this coast stunted bushes appear on the sand hills. Between Marka and Muqdisho the sand hills continue giving it an arid and desolate appearance.

From Muqdisho to Hobyo (5°21'N., 48°31'E.), the coast continues low and sandy, but a short distance inland the dunes have a thin covering of grass which after the inter-monsoon rains resembles an undulating prairie. The monotonous aspect of this coast is broken by numerous white shifting sandhills and by occasional outcrops of limestone rocks which chiefly occur in the vicinity of Hobyo.

From Hobyo to Raas Xaafun the coast has a different character, becoming rocky, bold and inaccessible and backed by tablelands in places, and in other areas having undulating sandhills.

Caution.—Several incidents of piracy have been reported on vessels approaching ports, and transiting the coast of Somalia. Vessels as much as 40 miles off the coast have been boarded by armed men. Any radio communications, including VHF, should be avoided. Vessels should stay 50 to 100 miles from the Somali coast.

Kismaayo (Kismayo) (0°22'S., 42°33'E.)

World Port Index No. 47130

7.2 Kismaayo is situated at the NE end of Qooriga Kismaayo. The port consists of a town and a small artificial harbor formed by an L-shaped breakwater extending SW from Jasiirad Seerbeenti.

Winds—Weather.—During the Northeast Monsoon, the nights are always cool and the air always dry.

Tides—Currents.—During both monsoons, the current sweeps across the channels used in entering the bay, and the greatest care must be taken to keep on the range lines, even when going through Passo Interno.

Strong currents and winds are common and vessels must have full power available when berthing.

Depths—Limitations.—There are two passes, Passo Nord and Passo di Levante, which lead through the barrier reef. There is a least depth of 9.1m on the range line leading through these passes. Passo Interno, with a least depth of 10.4m on the range line, leads through the foul ground extending SW from Jasiirad Fafaatu and then into the entrance channel, which leads to the harbor basin; the entrance channel is 200m wide.

The port basin is L-shaped; the berthing lengths of the two faces are 280m and 340m, with an alongside depth of 8.5m. Four vessels can be accommodated.

Dredging is carried out within the limits of the entrance channel and harbor basin to a minimum depth of 8.5m. A vessel with a maximum draft of 8.5m may enter.

Aspect.—The coast surrounding Qooriga Kismaayo has few conspicuous features and is often obscured by haze.

In 1984 it was reported a conspicuous pink-walled building was situated near the deep water jetty and a conspicuous tank stood nearby. In 1985, a radio tower standing 0.5 mile NW of the church was reported to be conspicuous; there is a mosque in Kismaayo.

Pilotage.—Pilotage is compulsory for vessels over 200 nrt; pilots may be embarked in position 0°23.5'N, 42°34.0'E. Entry and departure are permitted during daylight hours only.

Regulations.—Vessels should send their ETA 36 hours in advance via their agent, who will relay this information to the pilot.

Anchorage.—A long swell generally sets into Qooriga Kismaayo, causing vessels at anchor to roll.

Vessels of medium draft can obtain sheltered anchorage in either its N or S end, according to the monsoon, in depths of 6 to 7m. Large vessels can anchor about 0.7 mile W of Jasiirad Fafaatu, in depths of 10 to 13m.

Anchorage, with excellent holding ground, may be obtained in the harbor basin, in depths of 8 to 9m.

Directions.—Passo Nord and Passo di Levante lead from seaward to the entrance to Qooriga Kismaayo, then through Passo Interno to the harbor.

Passo di Levante is only recommended for small vessels with local knowledge during good weather. Beacons in range 269.5° lead through this pass over a least depth of 6.7m; this track leads about 0.5 miles S of Buur Badeed Doodaali Noo.

Passo Nord is wider and deeper than Passo di Levante and is the one generally used. Beacons, in line bearing 246.5°, lead through this until the S islet of Jasiira Toomba (0°21'S., 42°35'E.) bears 340°, when Jasiirad Bishikaani (0°26'S., 42°31'E.) may be steered for on a heading of 226°. Range beacons, in line bearing 325.15°, lead through Passo Interno.

Caution.—During both monsoons, the coastal current sets directly across the approach channels, flowing inshore of Buur Badeed Oaani, and along the coasts of the off-lying islets. It is advisable to approach the respective range lines some distance seaward of the barrier reef before actually entering the pass, in order to observe the set before actually entering the pass.

No attempt should be made to cross the barrier unless the

range marks can be clearly seen as there is always a heavy swell and only the range lines have been closely examined; depths may be less than charted adjacent to these passes.

Kismaayo to Muqdisho

7.3 Jubba (0°15'S., 42°38'E.) enters the sea about 9 miles NNE of Jasiirad Seerbeenti. Temporary anchorage can be taken off the river entrance, in depths of 16 to 18m. In this area the depths are irregular and are subject to change; the locality is exposed to the full force on the monsoons.

Baraawe (1°06'N., 44°02'E.) (World Port Index No. 47140) consists of a town and a small open roadstead. The current in the roadstead follows the direction of their coast and is either NE or SW, according to the monsoon. It is strongest at high tide with a NE set when it sometimes runs at a rate from 3 to 4 knots.

Naraan, an islet 1.5 miles SW of the town, is marked by a tower on its summit; the islet shows well against a white hill behind it. A light is situated about 1 mile NNE of the town, with a beacon WNW of the light; the beacon, along with the light, forms a range with a bearing of 300.5°.

Anchorage.—Anchorage during the Northeast Monsoon may be taken, in 15 to 18m, with the beacon above in line with a radio tower, bearing 328°, 1 mile distant from the tower. Anchorage in the SW monsoon may be taken, in 9m, with the light and beacon in line bearing 300°, distant 1.1 miles. The best sheltered anchorage is 0.5 mile SW of Naraan, good holding ground.

7.4 Between Baraawe and Marka, the coast consists of a series of hills from 80 to 165m high, with a few rocks lying close offshore in places. Inland of the coastal hills the land is subject to inundation.

The current in this area normally follows the coast, running NE or SW depending on the monsoon. However, an onshore set has been observed and it is advisable to maintain a good offing, especially at night.

Raas Daay (1°11'N., 44°08'E.) lies nearly 8 miles NE of Baraawe. On the N side of the point there is a bay, about 0.5 mile in width, which affords good anchorage for small vessels during the Southwest Monsoon.

A reef, awash, which breaks, lies 1 mile offshore about midway between Baraawe and Raas Daay.

7.5 Raas Filfile (1°16'N., 44°13'E.) is the extremity of an extensive rocky headland backed by a sand patch covered by brushwood.

Raas Siindhass (1°21'N., 44°18'E.) is rocky and may be identified by a large white sand patch on a hill within the point.

There is a village situated on the coast close to a cliffy promontory, 4.2 miles NE of Raas Siindhass. Anchorage may be obtained 0.5 mile S of the promontory, in a depth of 15m.

A reddish-colored hill, sparsely covered with brush and having two conical summits, rises to a height of 147m close within the above cliffy promontory; it is prominent.

Munghia (1°37'N., 44°37'E.), a small village of huts, is only visible from close inshore. Temporary anchorage, in a depth of 20m may be taken 0.5 mile S of the village.

7.6 Merca (1°43'N., 44°47'E.) (World Port Index No. 47150) is situated on a small coral peninsula and consists of a town and a small open roadstead. Merca is the capital of the Uadi Scebeli (Uebi Scebeli) district and is one of the most important centers of Somalia.

Tides—Currents.—The current follows the general direction of the coast, running NE or SW depending on the monsoon, with rates from 3 to 4 knots at times.

Aspect.—Fort Trevis, situated on a red-topped dune, 115m high, 1 mile N of town, is a good mark. Sheikh Osman Mosque, standing alone near a cove W of town, and the customhouse a little W of town are good landmarks.

The ruins of a mosque on shore 1 mile S of Sheikh Osman Mosque is not conspicuous, but is a good mark when anchoring.

Anchorage.—The anchorage is on the edge of the shore bank and is entirely exposed; because of the steepness of the bank, the space available for anchorage is narrow. The anchorage is considered to be one of the worst on this coast, but vessels lying to two anchors, with a good scope of chain, generally ride out even a hard Southwest Monsoon, but anchors may foul because of dragging and swinging.

7.7 Between Merca and Muqdisho, the coast is formed of sand hills which give it an arid and desolate appearance. There are numerous villages along this coast. Rocks and islets extend up to 1.5 miles offshore, in places, in this area. Temporary anchorage may be obtained off some of the villages, but the anchorages are completely unsheltered.

Gilib (1°48'N., 44°54'E.), a large village, is situated on a rocky promontory 23m high. The promontory is joined to the mainland by a narrow isthmus; it resembles an islet.

Anchorage.—Anchorage may be obtained abreast of Gilib, about 0.5 mile offshore, in depths of 20 to 29m.

7.8 Raas Kaaf (1°51'N., 45°01'E.) is a prominent rocky promontory. Danane, a village, sits at the foot of a sand hill near the S end of a bold, rocky point about 15m high. The village is marked by two white tombs on the sand hill behind it and by a flagstaff, 10m in height, in the village.

Anchorage.—Anchorage may be obtained 0.5 mile SSE of Danane, in 22m, good holding ground. Small vessels may anchor 0.2 mile off the village, in 15m, good holding ground.

Muqdisho (2°02'N., 45°21'E.)

World Port Index No. 47160

7.9 Muqdisho (Mogadishu) (Mogadiscio) is the principal port of Somalia and comprises an artificial harbor and an outer anchorage. Muqdisho is the capital and main commercial center of Somalia.

The port was reopened in 2006 after being closed for 11 years.

Winds—Weather.—In winter, winds are generally from the NNE in the early part of the day, increasing and shifting to the ESE later in the day.

Tides—Currents.—In August, a current with a NE set has been experienced running nearly parallel to the coast at a velocity of about 3 knots. The SW current usually reaches Mu-



Mogadishu Harbor

qdisho about the month of December; it is said this current invariably begins to run with bad weather from the NE. Seas can build to as much as 2.5 to 3.1m; during the monsoon, seas can build to up to 6.1m.

Depths—Limitations.—There is a deep water port with six berths. The main quay is situated on the inshore side of the S breakwater. There are three berths (Berth No. 1, Berth No. 2, and Berth No. 3), with reported depths alongside of 7.6 to 9.8m, although a wreck renders Berth No. 2 unusable. During the Southwest Monsoon, a heavy strain, caused by the scend in the basin, is put on the mooring lines of ships using these berths.

The Livestock Quay (Berth No. 4) is 160m long, with an alongside depth of 9.4m. A wreck lies at the S end of the quay.

The Banana Quay (Berth No. 5 and Berth No. 6) is 340m long, with alongside depths of 7.6 to 9.4m. Berth No. 5 handles containers; Berth No. 6 is a ro-ro facility.

There is a sea berth for tankers 0.1 mile SW of Ras Sif (2°01'N., 45°20'E.) that will accommodate a vessel of 12.2m draft. This berth is open to the effects of the Southwest Monsoon, and when the monsoon is blowing strongly the weather conditions, combined with the poor unmooring facilities, have been reported to render the berth untenable.

Berthing and unberthing of vessels in the harbor are restricted to daylight hours only.

Aspect.—The terrain surrounding the port area consists of low coastal hills. The entire port area is flat. It was reported (1982) that the city is visible at 20 to 25 miles from any direction. Among the structures that are good landmarks are the twin square towers of the cathedral, 1 mile NNE of Ras Sif; a dark-colored tower 0.7 mile E of the cathedral; and a white tower just over 1 mile ENE of the cathedral.

Pilotage.—Pilotage is compulsory for vessels over 200 nrt and is available during daylight hours only. Pilots board in position 2°01.2'N, 45°20.6'E.

Pilots may be requested by International Code of Signals or by radio on VHF channel 12, 14, 16, or 70.

Regulations.—Vessels should send their ETA via their agent 72 hours, 48 hours, and 24 hours in advance.

Vessels should contact Muqdisho Port Control, on VHF channels 16 and 70, giving the following information:

1. Vessel name, flag, and call sign.
2. Draft fore and aft.
3. GRT and nrt.
4. Discharge tonnage and type.

Muqdisho Port Control assigns anchorage or gives berthing instructions on VHF channels 16 and 70.

Anchorage.—The roadstead is exposed to the monsoons, but the holding ground is good. Vessels should anchor 0.5 mile S of the head of the breakwater in a depth of not less than 13m; because of the heavy swell, vessels of 9.4m draft or less should anchor here. Anchoring is prohibited NE of a line drawn in a 130° direction from the light on the S breakwater.

Caution.—Anchorage may be difficult to maintain during the monsoon due to the heavy swells.

Navigation aids are reported (1996) to be unreliable and subject to change.

Muqdisho to Cadale

7.10 Between Muqdisho and Uarsciech, the coast consists mainly of low sandy desert backed by reddish-colored hills dotted with scanty vegetation; there are few projecting points.

El Maan (2°10'N., 45°36'E.), about 18 miles ENE of Muqdisho, is an anchorage/lighterage port serving as an alternative port for the port of Muqdisho. El Maan also serves as a trans-shipment port for Ethiopia, Kenya, and other parts of the Horn of Africa.

Tides—Currents.—From December to February, the monsoon-influenced Somali Current flows SW at rates of up to 4 knots. From June to September, it flows NE at rates of up to 5 knots.

Between the monsoons, currents are variable, with sharp changes occurring over short distances. Variations in the currents, and higher than expected rates, can be caused by tropical cyclones.

Pilotage.—Pilotage is compulsory for vessels entering or leaving the inner anchorage or anchoring in the outer roads and is available 24 hours. Pilots can be requested on VHF channel 12 or by the International Code flag signal; the pilot boards, as follows:

1. Vessels from N—in position 2°11.8'N., 45°39.0'E.
2. Vessels from S—in position 2°06.0'N., 45°31.0'E.

Anchorage.—Vessels awaiting a pilot or a berth in the cargo anchorage may anchor, in a depth of 20m, in the vicinity of position 2°19'N., 45°54'E.

The cargo anchorage is in the vicinity of position 2°09.9'N, 45°55.0'E. This anchorage is exposed.

Habay (Punta Arai) (2°12'N., 45°39'E.) is a dark rocky point; from a distant the point resembles an islet. The sand hills 1 mile NW of Habay rise to a height of 70m. The point is fronted by black rocks.

Caution.—Within the 100m curve, which lies 2 miles off Habay, depths decrease rapidly. A chain of rocky shoals, with depths from 2 to 6.7m, lies within the 100m curve from a position 8 miles SW of Habay to a position 15 miles ENE of this point. This stretch of coast should be given a wide berth.

7.11 Uarsciech (Warshiikh) (2°18'N., 45°48'E.) is a village situated on steeply rising ground close within a rocky promontory; the village is visible for a considerable distance in clear

weather. Additional prominent landmarks are an official residence about 0.1 mile N of the promontory; a white sandy hill, 63m high; and a hill with twin summits, the highest one 57m, which lie 1.7 miles WNW and 1.2 miles NNW, respectively, of the promontory.

Vessels may cross the off-lying shoal with the beacons in line 350°, in a least depth of 7.6m, and anchor when about 0.7 mile offshore, in a depth of 27m, sand and coral, good holding ground.

From Uarsciech to **Warshiikh** (Punta Uarsciech) (2°26'N., 46°01'E.), 16 miles NE, and then to Cadale, 25 miles farther NE, the coast is bare, desolate and hilly. Reefs and shoals fringe the coast from Warshiikh to Cadale and extend over 1 mile offshore in places.

Collina Murot (2°36'N., 46°11'E.), a hill, rises about 12 miles NE of Warshiikh. Viewed from S, it appears as a small, regularly-shaped crater, with a dark rim, and is visible between sandhills which, in this vicinity, are very low. It is not so prominent when seen from N, but its dark rim may be distinguished between the dunes at some distance. Several ranges of hills, rising in terraces, parallel with coast, may be seen N of Collina Murot.

7.12 Cadale (Itala) (2°45'N., 46°20'E.) is a village situated 0.4 mile W of Punta Itala. Moderately-sheltered anchorage may be obtained in the roadstead during either monsoon.

Conspicuous features are the official residence, a large building, which was originally a castle, with a flagstaff, situated at the E end of the village; a palm grove close N of the village, which has the appearance of an oasis; and Burel Harion Beacon, which stands about 0.4 mile NNW of the official residence.

The anchorage for large vessels during the Northeast Monsoon is marked by the intersection of the alignments of two pairs of range beacons. The front beacon of the N of the pair stands near the coast, about 230m SW of the residence. The rear beacon stands on Bur el Harion, about 0.4 mile N of the front beacon. In range the two beacons bear 357.5°. The front beacon of the S pair stands near the coast about 1.5 miles SW of the residence, and the rear beacon about 0.5 mile NW of the front beacon. These beacons, when in line, bear 308.5°. The anchorage used during the Southwest Monsoon is also marked by a pair of range beacons. The rear beacon of this pair stands on Bur el Harion; the front beacon, stands near the coast about 0.4 mile ENE of the rear beacon. These beacons in range, bear 256.5°. The depths in this anchorage are from 7 to 7.9m, sand and coral.

During the Northeast Monsoon, vessels drawing less than 6.1m may obtain anchorage W of Secca Volturmo, in about 7m, with the middle pair of range beacons in range and about 0.8 mile from the front beacon. Large vessels may obtain anchorage, in about 9m, close W of the intersection of the alignments of the middle and S pairs of range beacons, nearly 2 miles SSW of Punta Itala.

Cadale to Hobyo

7.13 Between Cadale and Hobyo (Obbia), the coast is generally low and sandy, but a short distant inland the dunes have a thin covering of grass which after the inter-monsoon rains re-

sembles undulating prairie. The monotonous aspect of this stretch of coast is broken by numerous white, shifting, sand hills and by an occasional outcrop of rocks, which chiefly occur in the vicinity of Hobyo.

During the Southwest Monsoon, the visibility is often poor, and at times it is severely reduced by sand storms which are especially prevalent off the coast for about 20 miles SW of Hobyo.

Caution.—There is the possibility of an onshore set of the current during either monsoon, therefore care is necessary when approaching the coast, especially in the vicinity of Secca Dafne (3°58'N., 47°35'E.), a rocky patch with a least known depth of 8.2m.

7.14 Between Cadale and Ceel Magaad, the coast is low and fringed by reefs which extend up to 2 miles offshore in places.

Ceel Magaad (El Meghet) (3°14'N., 46°50'E.) is a small village situated on the sand hills close within the shore. A beacon consisting of a wall painted in black and white checks, with a small topmark, is 4.9m high; it stands at an elevation of 12.8m on the coast near Ceel Magaad.

Mareeg (Meregh) (3°46'N., 47°18'E.), a village on the coast, may be readily identified by Massaua Beacon and by several white-washed stone buildings; the building farthest N is an official residence, and it has a flagstaff. Massaua Beacon, 6.7m high, stands on a dune 0.2 mile W of the official residence.

Off Mareeg, the depths decrease regularly from 15m, 3 miles offshore, to about 8m, 0.7 mile offshore. There is flat rocky bottom in places, but local pilots state there are no off-lying dangers. The best anchorage, in 9m, sand, good holding ground, is about 1 mile from shore.

7.15 From Mareeg to **Garable** (4°09'N., 47°39'E.), the coast is, in general, low and sandy, but from Garable to Raas Cusbad there are elevations from 30 to 90m. A number of villages are situated close inland on this stretch of coast.

A beacon with an elevation of 22m stands on a sand patch about 5 miles NE of Mareeg.

At **Madaxweyne** (3°53'N., 47°26'E.), a village situated about 10 miles NE of Mareeg, there are some conspicuous bushes. Secca Dafne lies about 3.2 miles offshore, 11 miles NE of Madaxweyne. An isolated shoal patch, with a charted depth of 8.8m, lies 4 miles offshore in an approximate position 5 miles SE of Madaxweyne.

7.16 Hocti Darute Beacon (4°28'N., 47°57'E.) stands on a prominent terrace, comprised of limestone and clay, that is 55m high and 3 miles long. The coast adjacent to the terrace is low and from a distance seaward the terrace resembles an island.

Raas Cusbad (Ras Assuad) (4°34'N., 48°01'E.) does not project from the adjoining coastline but consists of a sheer cliff of black rock 20m high, at a position where there is a slight bend in the coast. A small belt of sand hills, covered with grass, is located on Raas Cusbad.

From Raas Cusbad, the coast trends in a NNE direction. The intervening coast is low and sandy, with some raised rock terraces about 8 and 15 miles NNE of Raas Cusbad, and with some sand hills NNE of Ceel Hur.

7.17 Ceel Hur (El Hur) (5°00'N., 48°16'E.) is a small village situated on a sandhill about 15.2m high; the land both N and S of the village is high. From the S the village may be distinguished by the light red color of the sand dunes behind it and by the nearly dry bed of the Didinta River. From the N the view of the village is partly shut in by the coastal sand hills. A good landmark is the guardhouse, situated about 1 mile inland; it is a square white house with black and white battlements.

The offshore depths are regular and vary from 9m about 1 mile off to 20m about 2 miles off. Vessels may anchor, in 10m, 1 mile offshore, with the guardhouse bearing 326°. It should be noted that a detached coral reef, awash, lies parallel with the coast a short distance seaward of Ceel Hur.

Between Ceel Hur and Hobyo, the coast is low and sandy; an occasional black rock, which shows well against the white coast, will be found close offshore along this stretch.

Two ranges of hills run parallel in this area, one close to the coast the other 1 mile inland. A group of low elongated shifting white sand hills lie near the coast N of Ceel Hur.

Hen Daier Beacon (5°09'N., 48°22'E.), 3m high, stands on a sandhill about 1 mile inland. There is a light-colored patch on the S side of the sand hill which may help identify the beacon.

A prominent white, shifting, sand hill is located on the coast about 4 miles NE of Hen Daier Beacon.

7.18 Hobyo (Obbia) (5°21'N., 48°32'E.) is a small town situated on a large open undulating plain close inland of Raas Diga (Punta Diga). During the Northeast Monsoon, the wind sometimes reaches Force 7, and is characterized by periodic cessations of up to 2 days at times. During this monsoon, the current runs strongly to the S.

The town may be identified by a sandhill S of the town which has three distinctive peaks. The official residence, a prominent building with a flagstaff, stands on the summit of a small sand hill, about 0.9 mile WNW of Raas Diga. Two radio masts with an elevation of 40m stand close N of the official residence. An anchorage beacon stands 0.3 mile E of the official residence and another beacon stands 0.6 mile NE of the residence. A fort is situated close WNW of Raas Diga.

The anchorage off Raas Diga, in 7 to 9m, is good but is entirely exposed; with a fresh wind there is a heavy surf.

Caution.—Raas Diga (5°21'N., 48°32'E.) is the NE extremity of the rocks which extend NNE from a projection of the shoreline. Scoglio Sud, two rocks awash, and Scoglio Nord, an above-water rock, lie on a coastal bank about 0.3 mile and 0.5 mile NNE, respectively, from Raas Diga; there are other rocks located on the bank.

Hobyo to Raas Gabaac

7.19 Between Hobyo and Raas Cabaad, 65 miles NE, the coast is bare and receives no rain for the greater part of the year.

For 15 miles NNE of Hobyo, the coast consists of a broad sandy beach fringed with small rocks, awash, extending 0.5 mile offshore, and is backed by the sandy undulating hills which surround Hobyo.

Grab Cadde (5°29'N., 48°37'E.) is a village situated on the coast; a beacon is situated near the village. Another beacon is situated at the village of Buuq, 7 miles farther NNE; between

these two beacons the coast is fringed by below-water rocks. A sandhill, 32m high, with dark rocks at its base, lies 2 miles NNE of Grab Cadde beacon; this sand hill is prominent from the N.

7.20 From the vicinity of Buuq, the coast gradually rises in double ridge of terraces from 40 to 52m high, which parallel the coast for a distant of about 40 miles, and then abruptly terminate. Then the coast is low and sandy to Buur Gool, about 6 miles farther NNE, where it again rises in an isolated rock terrace.

A minaret, 32m high, stands in a village 7.5 miles NNE of the beacon in Buuq. Another beacon, 4m high, stands on the shore at Kalad (Calat) (5°53'N., 48°53'E.), 14 miles farther NE; in clear weather, this beacon is visible from about 16 miles.

Buur Gool Beacon (Bur Gol Beacon) (6°14'N., 49°04'E.) stands near the shore. It is conspicuous when seen against the reddish-colored background, especially from the N.

Raas Cabaad (Ras Auad) (6°18'N., 49°05'E.), 4 miles NNE of Buur Gool, is a slight sandy projection that is backed by gradually rising ground. Close S of the point, the coast forms a low level terrace, white at its base and reddish above. Raas Cabaad is not distinctive.

7.21 From Raas Cabaad to Ras Ilig, the coast is low, sandy, is fringed by reefs in places, and backed by numerous sand dunes.

Garacad (Garad) (6°57'N., 49°19'E.) is the ruins of a fort, which are visible between the bearings of 335° and 005°. A beacon and a light are situated in the vicinity of the ruins.

Il Foooshe is situated on the coast 17 miles NNE of Garacad. The coast in this area is backed by a prominent line of sand dunes and inland of the dunes there is a broad flat plain.

To the N of Il Foooshe, the appearance of the coast changes and becomes bold and rugged. Between Il Foooshe (7°10'N., 49°28'E.) and Dhanaane, two well-defined rocky ranges parallel to the coast, are connected by a rocky terrace, which has randomly spaced patches of greenery.

This coast has not been well-surveyed and should not be approached closer than 5 miles.

Ras el Cheil (7°44'N., 49°52'E.) is the farthest S and highest of three cliffs which jut out from the coast at intervals of 2 miles. A pillar, 2.1m high, stands on the summit of Ras el Cheil. Punta di Mezzo is lower than Ras el Cheil and Ras Ilig, the farthest N of the three, is sharp, perpendicular, and has a height of 35m.

Qooriga Neegro is formed between **Ras Ilig** (7°48'N., 49°50'E.) and Raas Gabbac; there are no known off-lying dangers in the bay.

Ilig Anchorage (Ilig Anchorage) is entered between Ras Ilig and Xolob (Uadi Gululle), about 4 miles NE. There is indifferent anchorage during the Southwest Monsoon, in 9.1 to 10.9m, with Ras Ilig bearing 172°, about 1.2 miles distant. The village of Ilig is situated close within a point W of the anchorage.

7.22 Eyl Marina (7°58'N., 49°51'E.), situated on the N bank of Nugaal, can readily be distinguished from the S by the customs house, a mosque, and a white barracks with a verandah with columns. At the entrance of the Nugaal River there is a red cliff, with two yellow spots under it and a dark round-

topped hill in back.

There is good anchorage, in 10m, with the residence bearing 310° distant 0.9 mile, or closer in on the same bearing, in 10m.

Raas Gabbac (Ras Gabah) (8°08'N., 50°04'E.), the NE entrance point of Qooriga Neeqro, is 106m high. During the Northeast Monsoon, anchorage may be taken in a small bay on the S side of Raas Gabbac, in a depth of 15m.

Raas Gabbac to Raas Xaafun

7.23 From Raas Gabbac to **Qureexane** (8°12'N., 50°08'E.), the coast consists of a high wall of cliffs from 75 to 90m high.

The coast between Qureexane and Raas Macbar is rocky, bold and inaccessible. It is from 75 to 120m high and backed by a tableland that is furrowed by the beds of numerous water courses, which for the most part are dry for the most part of the year. The sea constantly breaks against the base of the cliffs which are precipitous in places.

Between Qureexane and Raas Garmaal, the cliffs are indented and broken by clefts formed by the water courses. From Raas Garmaal to Raas Durdura, these clefts in the cliffs are more noticeable.

Raas Garmaal (8°32'N., 50°19'E.) is a large headland with precipitous cliffs. A beacon, 4m high, stands at an elevation of 99m at the edge of the cliffs on the point.

A beacon stands at an elevation of 134m at Bur Load, 5.2 miles N of Raas Garmaal, and an obelisk of rock stands on the coast 3 miles N of Raas Suud.

Buurraska (8°39'N., 50°23'E.), an isolated patch with a least charted depth of 6.8m, lies 2 miles offshore E of the beacon on Bur Load.

A beacon stands at an elevation of 147m at Marbixis (8°57'N., 50°30'E.).

Raas Durdura (9°05'N., 50°39'E.), 108m high is marked by a beacon.

Raas Macbar (Ras Mabber) (9°28'N., 50°51'E.) is a rugged bare rocky point which rise precipitously from the sea to a height of 40m which then slopes in a series of steep terraces to an elevation of 138m; it is easily recognized. A beacon stands about 0.3 mile from the shore near Raas Macbar.

There are conspicuous sand hills toward Ras Gonded.

7.24 **Bandarbeyla** (Bender Beila) (9°30'N., 50°49'E.) is a small town situated on the coast about 2.8 miles NW of Raas Macbar. The town stands on a sandy beach at the foot of precipitous cliffs and contains numerous stone buildings, which are mostly in ruins. A ruin and a low mosque, without a minaret, are found, respectively, on the summit and at the foot of a hill 70m high located at the center of the village. To the S of the above hill, and higher than the village, an isolated building, the former residence, can be seen quite well. Two beacons stand, respectively, 0.3 mile WSW and 0.9 mile SSE of the hill;

a light stands 0.4 mile S of the village.

During the Southwest Monsoon, anchorage may be obtained abreast the town, about 0.8 mile offshore, in a depth of 8m, with the extremity of Raas Macbar bearing 145° and the light bearing about 224°. Anchorage may be taken further S, in a depth of 6m. These anchorages are moderately-sheltered in the Southwest Monsoon but there is a long swell at the anchorage.

An isolated patch, with a charted depth of 7.6m, lies 3.2 miles N of Raas Macbar.

From Bandarbeyla to Raas Gumbax (10°00'N., 50°54'E.), a slight projection 31 miles N, and then to the vicinity of Foo-caat, 20 miles farther N, the coast is bold, rocky, and precipitous.

From Foo-caat, a low narrow isthmus of white sand, shells, and mud extends, to Xaafun, which is located on the SW part of J-Sha Xaafun.

7.25 **J-Sha Xaafuun** (10°26'N., 51°20'E.), a limestone and sandstone peninsula, rises from the sea in steep cliffs and attains a height of 210m on its S side. As the adjacent coast is low, the peninsula has the appearance of a large island, especially from the N or S.

The SW part of J-Sha Xaafuun, within Dentiino, is high and flat; from a distance it appears separated from the rest of the peninsula as the intervening land is low.

Raas Xaafuun (Ras Hafun) (10°26'N., 51°25'E.), the E extremity of J-Sha Xaafuun, is flat; a light is exhibited from its summit.

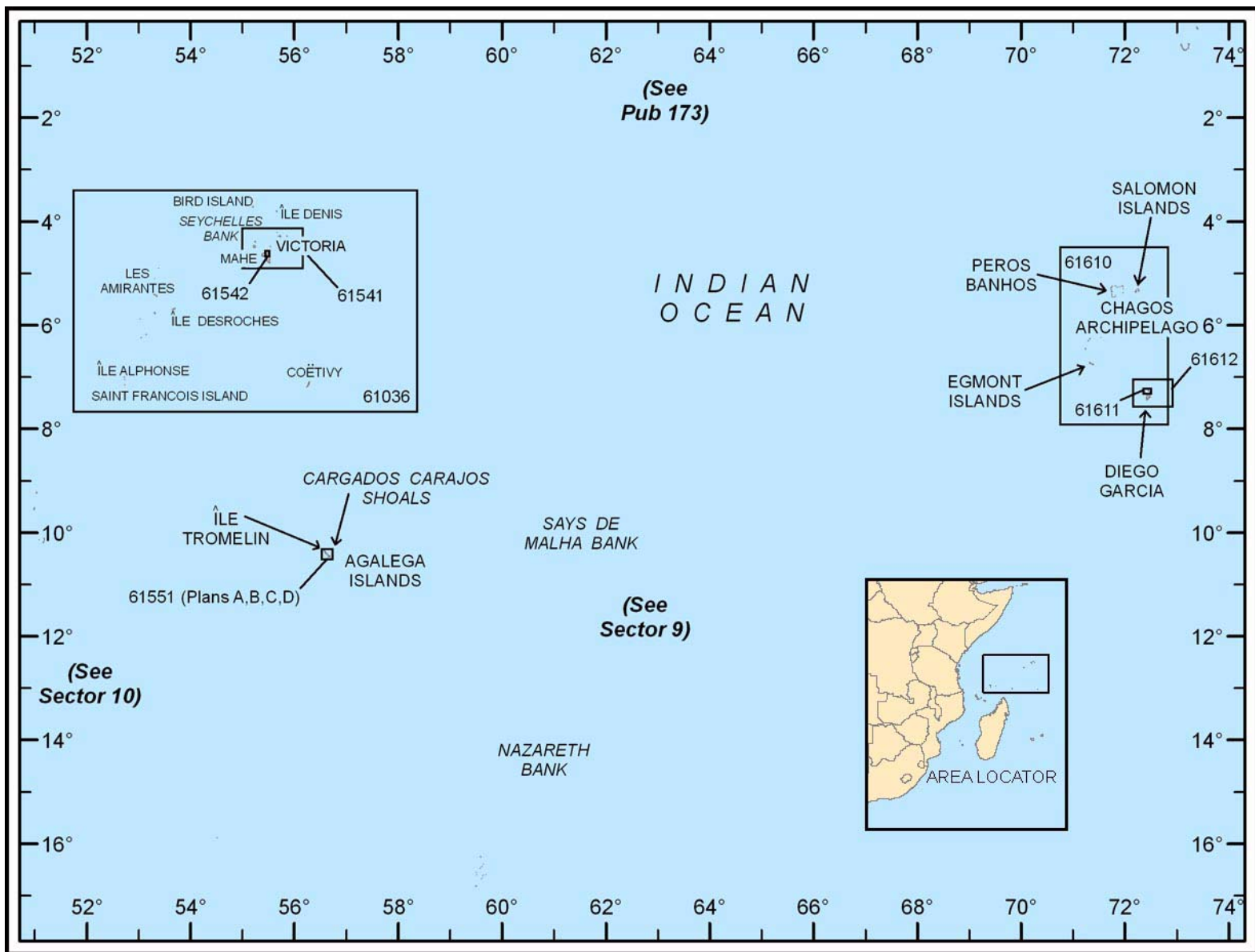
Gacanka Xaafuun Koof (Xaafun South Anchorage) lies W of **Dentiino** (10°23'N., 51°16'E.), the SW extremity of J-Sha Xaafuun. During the Northeast Monsoon, the wind blows across the peninsula and a cross swell rolls into the greater part of the anchorage.

A beacon stands on Dentiino; the village of Xaafuun (Dante) is situated near the beach 2 miles N of the point. There is a dark-colored tower at the W end of the village and a mosque at the E end. Monte Conico, 0.5 mile N of Xaafuun, is a bare conical hill 83m high; it only becomes prominent on close approach. A prominent two-story loading station, with a flagstaff on its seaward side, is situated about 1 mile SW of Xaafuun; it is connected to the land by an aerial ropeway supported by pylons.

There is a wharf, with a depth of 10m at the loading station, but vessels should not load to a draft of more than 7.9m, as there is danger of bumping on the stony bottom should a particularly heavy swell set in.

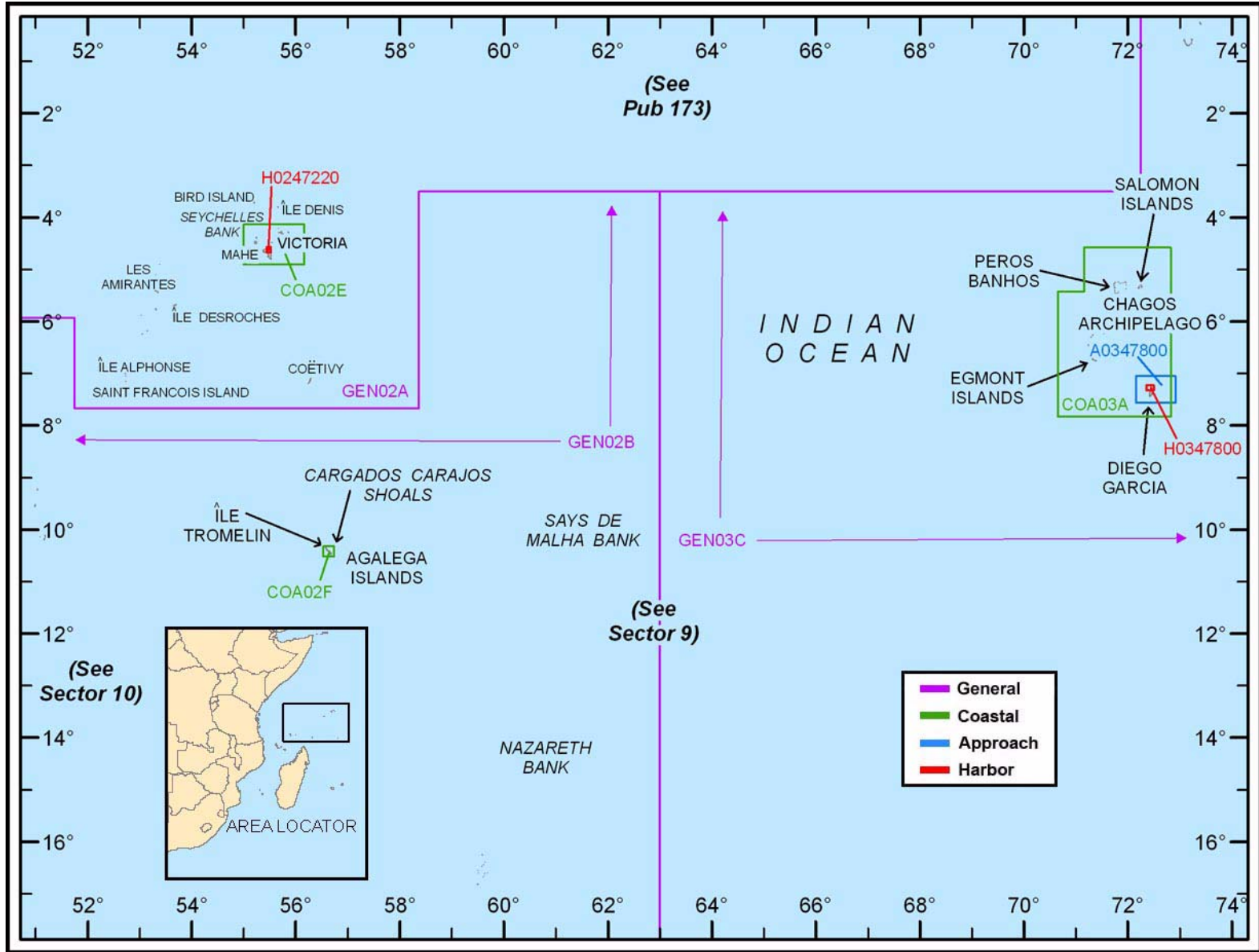
Anchorage.—Anchorage may be obtained off Xaafuun during the Northeast Monsoon, in depths of 10 to 12m, rock covered with sand and loose stones, poor holding ground. The anchorage, about 0.3 mile S of the loading station, should be approached with Mount Conico or the loading station bearing 030°.

For the coast of Africa N of Raas Xaafuun, see Pub. 172, Sailing Directions (Enroute) Red Sea and the Persian Gulf.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 8 — CHART INFORMATION



Additional DNC library coverage may be found in NGA DNCS 02 AND 03 (Limited Distribution) disc within the README\GRAPHICS folder.

SECTOR 8 — DNC LIBRARY INFORMATION

SECTOR 8

WEST INDIAN OCEAN—THE SEYCHELLES ISLANDS TO THE CHAGOS ARCHIPELAGO

Plan.—This sector sets forth a description of several groups of islands lying in the W portion of the Indian Ocean between India and Madagascar. These several groups are the Seychelles Islands, the Amirante Islands, Ile Alphonse, the Agalega Islands, and the Chagos Archipelago.

General Remarks

8.1 The Seychelles Islands rise from Seychelles Bank, an extensive coral reef contained within an area between 3°40'S and 6°35'S, and 53°56'E and 57°10'E. A vessel must pass over some portion of the bank to reach the islands.

A vessel found that a nearly continuous rim of relatively shallow water extends from Cows Island to the W extremity of Seychelles Bank, and then for a considerable distance around its S side. It is possible many dangerous shoals may exist on this rim besides those known, and vessels are advised not to cross Seychelles Bank N of latitude of 5°S, except by described routes.

Caution and vigilance of more than ordinary intensity are demanded of the navigator traversing Seychelles Bank; soundings should be taken continuously.

Areas to be Avoided.—Two IMO-adopted Areas to be Avoided have been established within the Seychelles group, E and W of Mahe Island, and may best be seen on the chart. Vessels greater than 200 grt should avoid entering the Seychelles Bank area, which includes the waters between the Areas to be Avoided and the approach routes to Port Victoria, as the area has not been surveyed to modern standards, and uncharted dangers may exist. Vessels should navigate with caution.

Vessels should note that the charted boundaries of the Port Victoria approach routes are not affected by the Areas to be Avoided, although they overlap in several locations.

Note.—Vessels proceeding to Port Victoria are required, as far as practicable, to stay within the N and S approach limits as indicated on the chart.

The N approach is made from a position about 16 miles E of Ile aux Vaches (Cows Island) at the N end of Seychelles Bank.

The S approach is made from a position 26 miles SSW of Police Pointe (4°48'S., 55°31'E.), the SW extremity of Mahe Island, at the S end of Seychelles Bank.

The Amirante Islands rise from a bank of coral and sand whose N extremity lies between 4°51'S and 6°17'S, and 52°50'E and 53°24'E.

The Amirante Islands are flat and are formed of coral; none attain a height greater than 6.1m, but they are usually visible up to 10 to 14 miles, depending on the height of the palms on each islet.

There are several islets and a number of coral reefs on the bank which dry. Depths over the bank are generally deeper S of D'Arros Island (5°25'S., 53°18'E.) than N of it. There is a lip along both the E and W edges of the bank with depths which vary from 10.1 to 35m and are usually about 19.8m.

All of the islets are flat, sandy, and fringed with coral reefs.

South Island of the African Islands; Sand Cay, 6 miles NW of Poivre Island; and Etoile Cay and Boudeuse Cay on the SW side of the bank are bare. Coconut trees up to 24m tall grow on the other islands; they are visible at a distance up to 14 miles.

Vessels are advised not to navigate over Amirante Bank as soundings give little or no warning of the approach to the islands. The currents on the bank are strong and uncertain in direction. The anchorages, when obtainable, are usually insecure.

Saya de Malha Bank is an extensive bank which has a distinct division between its N and S part; the S part is much larger. The two parts, which are steep-to, lie between 8°16'S and 11°46'S, and 59°37'E and 62°30'E.

The bottom appears to be coral when in depths of less than 60m and fine sand in greater depths.

Poydenot Rock is covered with 8m; a depth of 7m is charted in a position 90 miles NW of Poydenot Rock. Charting is incomplete and lesser depths than those shown on the chart could exist; extreme care should be taken when in transit in the vicinity of this bank.

Routes.—The shipping routes between Cape Town and ports on the W coast of India, Sri Lanka, and the Bay of Bengal pass NW of Seychelles Bank and NW of the N end of the bank where the Amirante Islands are situated.

The routes between ports of central E Africa and Australia or to the Far East taken via Sunda Strait usually pass N of Seychelles Bank.

The routes taken between Port Louis (Mauritius) and the Gulf of Aden or to other Red Sea ports pass E of Seychelles Bank.

Caution.—Vessels conducting seismic surveys on Seychelles Bank are to be given a wide berth.

Fishing activity in these waters occurs year round; all fishing activity and equipment should be given a wide berth. See Pub. 160, Sailing Directions (Planning Guide) South Atlantic Ocean and Indian Ocean for more information.

The Seychelles Islands

8.2 Ile aux Vaches (Cows Island) (3°43'S., 55°12'E.), the farthest N of the Seychelles Islands, is a flat island of coral and sand which hardly exceeds 2m in height. Clusters of casuarina trees and coconut palms rise in the interior while its shore is generally bordered by thick brush, except at the N end, from which a sand spit extends for about 0.2 mile. There is an airstrip on the SE side of the island which provides daily communications with Mahe.

Bar Silhouette, a shoal with a depth of 7.3m, is located 4 miles S of Cows Island.

Denis Island (3°48'S., 55°40'E.) is a low flat island marked by a light. It has been reported (1991) that the light may be obscured by trees.

A shallow bank, with depths less than 10m, extends 2.5 miles N of the island; depths from 4.5 to 5.5m lie up to 1.8 miles from the NW through N to NE of the island. More coral



Denis Island Light

heads than charted are likely to exist on the bank and a ship should exercise extreme caution when navigating within 3 miles N of Denis Island.

Anchorage may be taken W of Denis Island in depths of 35 to 40m, sand and coral.

Surf breaks heavily on the E and S shores of the island during the Southeast Trade Winds.

Bar de l'Est (3°47'S., 55°50'E.) is a shoal with general depths of 13 to 18m; a coral head, with a depth of 8.5m, is located on the E side of the bar.

Mahe Island

8.3 Mahe Island (4°40'S., 55°28'E.), the largest of the Seychelles Islands, is mountainous and generally wooded; on clear days its summit can be seen about 50 miles. Mahe Island is traversed by a range of hills and mountains that are separated by many deep ravines with sheer cliffs; the summits of the range are conspicuous.

Morne Seychellois (4°39'S., 55°26'E.) rises to a height of 913m; it is comprised of four peaks. During the Southeast Monsoon, the summit of this mountain is nearly always obscured by clouds.

Trois Freres (4°38'S., 55°26'E.), 767m high, rises 0.5 mile N of Morne Seychellois; it dominates the city of Victoria.

Mount Simpson is the most prominent of several peaks in the range extending WNW from Morne Seychellois; it may be identified by a distinctive thumb-shaped rock on its summit.

Morne Blanc, 0.7 mile SSW of Morne Seychellois, is steep with remarkable cliffs about its upper part and a rounded summit; it rises to a height of 666m.

Mount Harrison (4°41'S., 55°29'E.) rises to a height of 688m 3.2 miles SE of Morne Seychellois. A radio tower, marked by obstruction lights, can be seen at a great distance by a vessel coming from the SW.

Mount Sebert (4°41'S., 55°30'E.), 550m high, is located about 1.8 miles E of Mount Harrison; Cascade Valley is formed between these peaks.

Castle Peak, 2.5 miles SE of Mount Harrison, is conspicuous; it has three summits. The middle peak of Castle Peak is bare rock, broad, and flat with a distinctive thumb-shaped rock on its S side.

8.4 Southwest side.—The SW side of Mahe Island is indented by several small bays fronted by steep-to reefs; anchorage can generally be taken outside the reefs by vessels with local knowledge.

Pointe Lazare (4°46'S., 55°28'E.) is the S extremity of Lazare Headland. Two conspicuous conical hills are located on the headland; the outer hill is 148m high while the inner hill is 210m high.

Boileau Bay is entered between Lazare Headland and Therese Island. Chauve Souris, a rocky islet, lies 0.2 mile NW of the N extremity of Lazare Headland; it shows conspicuously white against the mainland. Isle Vache, 54m high, is located 0.3 mile offshore, 3.5 miles NNW of Isle Vache; it shows white from seaward.

Trois Dames, a rock with a depth less than 1.8m, lies nearly 1 mile NW of Isle Vache; the sea breaks heavily over it.

Vessels with local knowledge can anchor in several places in Boileau Bay, but the preferred anchorages are in Anse la Mouche, on the N side of Lazare Headland, and in Anse Boileau, 1.7 miles NNE of the headland; the former anchorage is well protected from the swell.

A prohibited area about 0.6 mile long extends about 0.6 mile offshore, close NW of Anse Boileau; its seaward corners are marked by special buoys.

Ternay Pass leads between **Conception Island** (4°40'S., 55°22'E.) and the Ternay Peninsula, 0.7 mile NE. A strong current sets through the pass; its direction is invariably N during the Southeast Monsoon.

Pilot Patches (4°42'S., 55°20'E.) are three coral patches with a least charted depth of 18m; in good weather, the bottom can be distinctly seen. A fishery raft is anchored 3 miles W of the patches.

Stork Patch (4°43'S., 55°25'E.), comprised of coral, has a least depth of 5.5m; it lies in the approach to Boileau Bay, 2.7 miles SW of Isle Vache. The sea does not always break over this patch, but the swell increases near it. An isolated patch,

with a depth of 18.3m, lies 0.7 mile WNW of Stork Patch.

8.5 Northwest side.—Cape Ternay (4°38'S., 55°22'E.) is the NW extremity of Mahe Island; it is marked by a light. The cape is steep-to, and a cross stands near its extremity.

Baie Ternay, formed on the E side of Cape Ternay, is well sheltered, but its head is filled by a steep-to reef which does not show in any way.

North Islet, 0.5 mile W of North Point, is 15.5m high; it is easily seen when clear of the land. Patches of 5.5m lie 0.2 mile W and 2.5 miles WSW, respectively, of North Islet.

Requin Bank (4°34'S., 55°22'E.), formed of coral, with a depth of 19.6m, lies 4 miles W of North Islet. A fishery raft marked by a red flag is moored on the bank; similar rafts are moored 4 miles W and 7.2 miles SW of the bank.

From April to November, the Southeast Trade Winds often blow with considerable force from the hills that encircle North West Bay.

8.6 East side.—Police Pointe (4°48'S., 55°31'E.), the S extremity of Mahe Island, has a rounded summit, 65m high, covered with coconut palms; it is steep-to, except off its W side, where there is a rock with a depth less than 1.8m. A light exhibited from a height of 62m marks the point.

Capucin Rock (4°49'S., 55°31'E.), awash, lies 0.5 mile SSW of the light on Police Point; the sea breaks heavily over it.

Pointe du Sud (4°48'S., 55°32'E.), 1 mile E of Police Point, is high and nearly steep-to; a rock, 0.9m high, lies close S of the point.

Pointe Capucins (4°47'S., 55°32'E.) is located 1 mile N of Pointe du Sud; Anse Marie-Louise indents the coast between Pointe Capucins and Cap Lascars.

Anse Royale indents the shore between Cap Lascars and Sel Point, about 2.5 miles N. A conspicuous white church stands on the shore of the bay at its head.

South East Island (4°41'S., 55°32'E.), 63m high, is joined to the mainland at its SW extremity. An international airport has been built fronting the coast W of South East Island.

8.7 Northeast side.—From South East Island, the coast trends in a general NW direction to North Point. It is fronted by numerous islands and rocks, and is the location of Port Victoria.

Recif Island (4°35'S., 55°46'E.) is 48m high and has a distinctive white rock shaped like a building on its summit. Submerged rocks extend 0.5 mile SE and SW from the S extremity of the island, and a rock, 4.6m high, is located 0.5 mile SE of that point. Depths of less than 5.5m extend 0.2 mile N and W of the island. An 18.3m patch and a 16.5m patch lie 1.2 miles NW and 1 mile W, respectively, of Recif Island.

Caution.— Between Recif Island and Saint Anne Island, the

bottom is very uneven; eddies and ripples are frequently encountered.

8.8 Rat Island (4°40'S., 55°32'E.) lies close offshore, 0.3 mile NNE of South East Island. Tortue Rock lies about 0.3 mile E of Rat Island; the sea usually breaks on the rock, but in calm weather it is sometimes scarcely visible at HW.

Cerf Island (Ile au Cerf) (4°38'S., 55°30'E.), 3.7 miles NW of South East Island, is the farthest S of the principal islands fronting Port Victoria; it rises to a height of 107m. Long Island, Round Island, and Moyenne Island lie 0.3 mile NE, 0.4 mile N, and 0.6 mile NNE, respectively, of Cerf Island. All four of these islands lie on a large coral reef, covered with sand, which dries in patches and on which there are numerous coral heads.

Saint Anne Island (4°36'S., 55°30'E.), the farthest N and largest of the islands fronting Port Victoria, lies 0.4 mile NNW of Moyenne Island. It is separated from the coral reef surrounding Moyenne Island by Saint Anne Channel.

It was reported (1990) that the light structure on Sainte Anne Island was obscured by foliage and not visible in daylight.

A pipeline extends N from the W side of Cerf Island to the SW extremity of Saint Anne Island, and SSW from Cerf Island to Brillant Point on Mahe Island. Anchorage is prohibited in the vicinity of the pipelines.

Caution.— Sainte Anne Channel, as well as Sainte Anne Island, Ile au Cerf, Ile Longue, and Ile Moyenne, are now part of Sainte Anne Marine National Park. The boundary of the national park is marked by buoys and is best seen on the chart. These islands and their surrounding reefs are governed by local regulations.

8.9 Harrison Rock (Ile Seche) (4°38'S., 55°32'E.), 8m high, lies a little over 1 mile E of Long Island; it is the highest and largest of several rocks enclosed by a 10m curve.

There is an established Nature Reserve on Ile Seche which is governed by local regulations. A dumping ground lies with its center about 0.8 mile SE of Harrison Rock.

Beacon Island (4°37'S., 55°31'E.), 31m high, lies 1 mile NNW of Harrison Rock, in the approach to Saint Anne Channel. It is fringed by a shallow bank, except on its SW side. An isolated patch, with a depth of 4.4m, lies about 0.3 mile SW of Harrison Rock.

Port Victoria (4°37'S., 55°27'E.)

World Port Index No. 47220

8.10 Port Victoria is located on the NE side of Mahe Island. The port consists of an outer harbor, an inner harbor, and a town which is the capital and the seat of government.

Port Victoria—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Maximum Vessel LOA
Mahe Quay	370m	9.5-11.5m	210m
S. Anne Oil Terminal	200m	11.5m	185m
B1	72m	5.5m	55m

Port Victoria—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Maximum Vessel LOA
B2	132m	7.5m	115m
B3	90m	7.5m	115m
B4	60m	7.5m	105m

The port authority is the Seychelles Department of Transport and Marine Services Division, which is represented by a port director and a harbormaster. The Port Office and Customs Office are situated at the NW end of the quay at the New Port Area.



Port Victoria—New Port Area

Depths—Limitations.—The N entrance is the most important channel to Victoria Harbor; it is marked by lights, beacons, and buoys. Saint Anne Channel is not considered safe for vessels drawing more than 2.5m, due to an extensive reef at its W end. Cerf Passage is navigable by vessels drawing up to 4.5m. The depths over the shoal heads and patches in Cerf Passage are 3.6 to 5.4m; none of these dangers are marked. A vessel should not attempt passage unless the light is favorable.

Extensive dredging and landfill operations are being conducted in Victoria Harbor. The area immediately N of Long Pier has been filled and the area NE of the filled area has been dredged to 7.5m. The area 0.3 mile SW of Victoria Light, on the NW side of the channel, was dredged to a depth of 12.5m.



Port Victoria—Inner Harbor



Port Victoria Harbor

The reef area 0.3 mile SSW of Victoria Light and the same distance NE of the wharf, has been dredged to a depth of 13m.

The inner harbor has been dredged to a depth of 10.7m within an area 0.2 mile in diameter.

Berthing details are shown in the accompanying table titled **Port Victoria—Berthing Information**.

In the New Port Area, Berth No. 1, at the NW end of Mahe Quay, is normally used by tankers and vessels discharging bulk cement; it will accommodate tankers up to 174m in length. Berth



Port Victoria Entrance Light

No. 2 will accommodate vessels up to 244m in length; quarter ramp ro-ro vessels can berth at the quay. The maximum draft permitted at the berths is 10.2m.

Pilotage.—Pilotage is compulsory for any vessel of or exceeding 150 grt to either the outer or inner harbor and is available 24 hours. The pilot will embark in position 4°35.9'S, 55°29.6'E. The vessel's ETA should be sent 72 hours, 48 hours, and 24 hours in advance. Movement in the inner harbor is permitted in daylight only. Pilots can be contacted on VHF channel 17.

Regulations.—Victoria Port Control has established a reporting system on VHF channel 12. Inbound and outbound vessels are to radio Victoria Port Control when passing the following Reporting Points:

1. North Reporting Point—position 4°23'S, 55°29'E.
2. South Reporting Point—position 4°40'S, 55°37'E.

Vessels must give 12 hours notice at the Port Office prior to departure. No vessel may call at any of the Seychelles Islands unless Government permission has been obtained at Victoria.

Signals.—The signal tower is situated in the New Port Area; the berth to be taken by incoming vessels will normally be indicated by signal.

Anchorage.—The master should always contact the harbor-master for anchorage instructions. Anchorage No. 3 and Anchorage No. 4, best seen on chart, are situated to the NW of the entrance channel, in depths of 24 to 26m, sand, silt, and coral. It has been reported that a pilot is not required if directed to these anchorages.

These anchorages are open N and a swell is sometimes felt. The Southeast Trade Winds seldom blow hard, but during the Northwest Monsoon, heavy gusts come off the high land.

The most convenient anchorage is in the inner harbor, in depths of 16 to 18m, opposite the large warehouse on the head of Long Pier.

Directions.—From a position at the S end of the outer har-

bor 1.1 miles NE of Victoria Light, follow a 249° range line which leads to the seaward end of the inner harbor entrance channel. An alternate approach to reach the inner harbor from the anchorages is to follow a 264° range line.

The Seychelles Islands (continued)

8.11 Anse Etoile (4°35'S., 55°27'E.) is formed between Pointe Conan, 0.7 mile N of Port Victoria, and North East Point (4°35'S., 55°28'E.), 1.5 miles NNE. An aero light is exhibited from a metal framework tower, 3m high, on the summit of North East Point. Seven orange and white radio masts, 46 to 91m high, stand on the coastal reef within 0.2 mile of a building situated 0.4 mile SSE of the N entrance point of Anse Etoile. Each of the radio masts is marked by obstruction lights. An overhead structure, supported by gantries 9m high, extends W from the building to the shore. The structure and building are marked by lights.

Boats should keep clear of the area under the masts. There is a boat passage under the structure, with a vertical clearance of 9m, 0.2 mile W of the building.

Caution.—**Brisans Rocks** (4°32'S., 55°29'E.) is comprised of above and below-water rocks; the rock farthest NW is 6m high. There are several patches, with depths of 14m, in the vicinity of the rocks.

In the area between Brisans Rocks and Mamelie Island, 4 miles NE, there is a bank of sand with rock pinnacles; more pinnacles than charted may exist and soundings give no warning of the proximity of the dangers.

8.12 Silhouette Island (4°30'S., 55°14'E.) lies about 11.8 miles WNW of Mahe Island; it is mountainous and is primarily covered with coconut palms. Mon Plaisir rises to a height of 752m on the W side of the island. The S side of the island presents long shelving faces of rock, descending from a considerable elevation to the water's edge; the entire coast is moderately steep-to.

There is anchorage, for vessels with local knowledge, N of **Haddon Point** (4°29'S., 55°15'E.), the E extremity of the island, off a steep-to reef, which dries, about 1.8m. Anchorage may also be taken off Grande Barbe, on the SW side of the island.

Hope Knoll, a 29m patch, lies 5.7 miles WSW of Silhouette Island.

North Island (4°23'S., 55°15'E.), when seen from the N, has a bare and desolate appearance, with only a few trees showing near its summit.

8.13 Praslin Island (4°20'S., 55°44'E.) has a range of hills extending along its whole length that rises to a height of 384m near its center. The lower parts of this range of hills are covered with trees. The SW, S, and NE sides of the island are fringed by reefs, which extend up to 1.3 miles offshore.

Millers Point (4°17'S., 55°41'E.) is the NW extremity of Praslin Island; vessels should proceed with extreme caution in the vicinity of this point. Les Parisiennes, three small above-water rocks, lies 1 mile S of Millers Point.

Chevalier Bay is formed between Millers Point and Chevalier Point, about 1 mile E. Depths of 14.6m in the entrance of the bay shoal gradually to a sandy beach at its head.

Adriens Shoal (4°16'S., 55°40'E.), whose position is doubtful, has a depth of 6.5m; it lies about 1.3 miles N of Millers Point. Anchorage may be taken in the bay during the Southeast Monsoon; it can be approached from the N.

8.14 Round Island (4°21'S., 55°47'E.), 76m high, lies off the fringing reef, 0.5 mile off the SE extremity of Praslin Island. There is no safe anchorage S of Praslin Island during the months of May to November, when the SE trades are at their strongest, but at other times anchorage may be taken, in 23m, with the summit of Round Island bearing 025°, distant 0.5 mile.

Curieuse Bay (4°18'S., 55°43'E.) is formed between the NE shore of Praslin Island and the S shore of Curieuse Island. There is a safe navigable channel 0.4 mile wide that may be approached from the E. In the passage between the islands depths are uneven and depths of less than 7m extend up to 0.2 mile from the shore on both sides of the passage.

Zanguilles Point projects from the coast of Praslin Island opposite the S extremity of Curieuse Island; Saint Pierre Islet lies 0.8 mile ENE of Zanguilles Point. Foul ground extends 0.1 mile NW of Saint Pierre islet.

Vessels of moderate draft may anchor in Curieuse Bay, in a charted depth of 27m, with Saint Pierre Islet bearing 088°, distant 2.3 miles. Vessels should approach the anchorage from the E on a course of 265°, taking care to clear the foul ground extending NW from Saint Pierre Islet.

The Seychelles Islands—Off-lying Islets and Dangers

8.15 Mamelles Island (4°29'S., 55°32'E.), marked by a light, lies in the N approach route to Port Victoria in a position 13 miles SW of Praslin Island; a dangerous rock lies 0.2 mile W of the light. A wreck, with a depth of 1.2m, lies 1.2 miles SW of Mamelles Island. There are other shoal patches in the vicinity of the wreck which may best be seen on the chart.

Madge Rocks, which cover at HW, lie 5.2 miles NNE of Mamelles Island. The summit of Saint Anne Island (4°36'S., 55°30'E.), bearing less than 195° and open W of Mamelles Island, leads W of Madge Rocks.

Trompeuse Rocks (4°23'S., 55°36'E.), 2.7 miles ENE of Madge Rocks, are 1.8m high. There is a rock, awash, 0.3 mile NW of the main group. An isolated patch, with a depth of 20.1m, lies 5.5 miles W of Trompeuse Rocks.

Cousine Island, 77m high, lies 3 miles NE of Trompeuse Rocks; the intervening channel is reported to be foul and unsafe to transit.

North Cousin, an island 66m high, lies about 1.5 miles NE of Cousine Island and about the same distance SW of Les Parisiennes. The area between North Cousin and Whale Rocks, 2 miles N, is fouled by numerous shoal patches; these patches may best be seen on the chart.

Whale Rocks, 1.5 miles W of Millers Point, are two rocky heads that uncover at half tide.

Booby Island, 28m high, lies 2 miles N of Millers Point. Aride Island, 135m high, lies 2.7 miles NNW of Booby Island; it is surrounded by foul ground.

8.16 La Digue (4°21'S., 55°50'E.), located with its N ex-

trinity 2.5 miles E of Pointe La Farine, the E extremity of Praslin Island, is flat along its W coast, with a ridge on its E side rising to a height of 326m. Its W side is fringed by a reef extending 0.2 mile offshore.

Caution.—A submarine power cable extends W to the E shore of Praslin Island.

Les Roches Canales lie nearly in the middle of the channel between Praslin Island and La Digue; they uncover 1.2m.

An isolated patch, with a depth of 5.8m, lies 0.3 mile WNW of the NW extremity of La Digue and Ave Maria Rock (4°19'S., 55°49'E.), 17.4m high, lies 1.5 miles NNW of the same point. There are other dangers in this area which may be seen on the chart.

8.17 Caiman Rock (4°24'S., 55°46'E.) lies in a position 4 miles WSW of the W extremity of La Digue. Shark Rock, above water, lies 0.5 mile S of Caiman Rock. There are several charted depths of 9.1m or less within a 1 mile radius of Caiman Rock.

The S extremity of La Digue, bearing 068° and in line with the S extremity of Marianne Island, leads about 0.4 mile S of Shark Rock.

Marianne Island (4°21'S., 55°55'E.), lying 4 miles E of La Digue, is 130m high; it is steep-to except on its W side. An isolated bank, with a depth of 37m, lies 8 miles E of Marianne Island.

Felicite Island is 228m high, its S extremity lies 2 miles W of the N extremity of Marianne Island. Albatross Rocks, above and below-water, lie on a foul area about 0.4 mile NNW of Felicite Island.

Grand Soeur (4°17'S., 55°52'E.), 113m high, lies 1.2 miles N of Felicite Island. Petite Soeur lies close W of Grand Soeur. A spit, with a least charted depth of 2.1m, extends 0.7 mile NNW from Petite Soeur.

Renommee Rock (4°27'S., 55°51'E.), 4.5 miles S of La Digue, is 0.3m high; it covers at half tide. Chimney Rocks, 6.1m high, lie 1.5 miles ESE of Renommee Rock. There is a charted depth of 4m located 0.5 mile SSW of Chimney Rocks.

8.18 Frigate Island (4°35'S., 55°57'E.) 122m high, lying 7.5 miles SSE of Chimney Rocks, is the farthest E of the Seychelles group. The E and NE sides of the island are fringed by reefs which break.

Caution.—Pyramid Rock lies close off the E extremity of Frigate Island; a dangerous rock lies 0.4 mile SSE of Pyramid Rock. Noddy Rock, awash at HW, breaks heavily; it lies about 0.6 mile NNW of Frigate Island.

8.19 L'Ilot (4°36'S., 55°54'E.), 24m high, lies 2 miles WSW of Frigate Island; a submerged reef extends 0.3 mile W from the islet. An isolated depth of 10.1m lies 2 miles NNW of L'Ilot, and a depth of 12m lies about 0.2 mile farther NNW. Barracouta Rock, which breaks, has a depth of less than 1.8m.

There is good anchorage for vessels, with local knowledge, off NE and SE sides of Frigate Island; the SE side is preferred during the Northwest Monsoon.

Topaze Bank (4°41'S., 56°20'E.), on the SE side of Seychelles Bank, is reported to lie between 8 and 28 miles E of Frigate Island; it has a least depth of 12.8m.

Zoroaster Shoal (5°00'S., 56°40'E.) has a depth of 12.8m.

In the vicinity of this shoal are several patches with depths of 16.5m; their positions may best be seen on the chart. La Junon, a bank with a depth of 18.3m, lies 27 miles SE of Zoroaster Shoal; a depth of 16.5m lies 8 miles SW of the charted 18.3m depth.

Gilberte Bank (5°07'S., 55°40'E.), with a depth of 11m, lies 22 miles SSE of Mahe Island.

Plate Island (5°52'S., 55°24'E.) is separated from the S side of Seychelles Bank. The low and wooded island is visible at a distance from 10 to 12 miles. Barrier reefs, over which the sea breaks heavily, extend 3 miles N, about 0.5 mile E, and 1.5 miles S of the island. Within the barrier reefs, the lagoon is quite smooth, and landing is safe and easy. Numerous 2.7m coral heads lie within 2 miles W of the island. There are two intricate passages through the reef on the NW side, available for small vessels with local knowledge only.

La Perle Reef lies about 10 miles SW of Platte Island. Depths of less than 4m can exist on this reef where breakers have been observed.

8.20 Le Constant Bank (6°17'S., 56°18'E.) has a least charted depth of 20.1m; it is an extension of Seychelles Bank.

Coetivy Island (7°06'S., 56°16'E.) forms part of the Republic of Seychelles. Vessels passing S of the island should not approach closer than 6 miles.

Vessels can anchor anywhere off the W side of Coetivy Island. Excellent shelter from the Southeast Trade Winds is available in the large bay indenting that shore of the island. The most convenient position is off the settlement.

Fortune Bank (7°12'S., 56°59'E.) extends about 30 miles E and 25 miles SSE, with general depths of less than 31m.

Andromache Shoal (3°51'S., 54°50'E.) has a least charted depth of 9.1m. Vigilant Shoal, 8 miles WSW of Andromache Shoal, has a least depth of 11m; the two shoals apparently lie on the same ridge.

Swan Shoal (3°59'S., 54°34'E.) has a least known depth of 5.5m, although lesser depths have been reported over this shoal.

Dupont Shoal, with a depth of 6.4m, lies 17 miles SSW of Swan Shoal.

Roberts Bank (4°22'S., 54°12'E.) has a least charted depth of 15.5m. The W side of the bank is steep-to; the 200m line lies 1.5 miles NW of the bank and a charted depth of 443m lies adjacent to its N end.

Hermes Bank, with a depth of 12.8m, lies 10 miles SSW of Roberts Bank and Owen Bank (4°40'S., 54°00'E.), with a charted depth of 14.6m, lies 10 miles farther SSW. Owen Bank is the farthest SW of Seychelles Bank.

From Owen Bank, Seychelles Bank trends in a general ESE for about 95 miles to a position about 28 miles SSW of Mahe Island, the entrance to the S approach to that island. Seychelles Bank is steep-to in this sector, with many depths less than 18.3m. In the entrance to the S approach there are reported depths of 33m and a 22m depth is reported to lie close E of the entrance. These shoal patches may be seen on the chart.

The Amirante Islands Group

8.21 The Amirante Islands Group, centered in position 5°35'S., 53°15'E., consists of a chain of small islands lying

mostly on the E side of the extensive bank located S of Seychelles Bank. It is very dangerous to make a passage between them when heading on a course more than 180°. In the daytime, they may be seen at distances of 8 miles, but at night they may be invisible even to a vessel on the E portion of the reef from which the islands rise.

The Amirante Islands Group consists of Desroches, Desnouveaux, Boudeuse, Poivre, Sand Cay, Saint Joseph, and Remire, as well as North Island and South Island on Bancs Africains.

Bancs Africains, comprised of North Island (4°53'S., 53°24'E.) and South Island, lies 1.75 miles SSW. North Island is marked by a light.

In the Southeast Trade Winds, the swell breaks violently on the SE side of the bank surrounding the islands and the sea is often rough at its N extremity because of currents.

Anchorage may be taken, in 14m, 0.8 mile W of North Island Light; the anchorage is sheltered from the SE swell. There is also anchorage 1 mile NW of South Island, in a depth of 10m; this anchorage is preferred.

Lady Denison Pender Shoal (4°49'S., 53°20'E.) has a charted depth of 14.6m.

Remire Reef (5°05'S., 53°21'E.) dries in patches at LW and extends about 3.5 miles SSW.

Remire Island (5°07'S., 53°19'E.), marked by a light, lies 1.5 miles W of the S extremity of Remire Reef. The trees on Remire Island are 15.2m high to their tops and are usually visible up to 12 miles distant. Anchorage has been taken, in 14m, about 0.2 mile N of the island with its E extremity bearing 137° and its W extremity bearing 186°.

Caution.—Navigation in the area between North Island and Remire Island should be avoided except during daylight and in good weather; the bottom is foul in places throughout the entire area. In favorable conditions the bottom may be plainly seen in depths of 22m.

The area between Remire Island and D'Arros Island, 28 miles S, is similarly encumbered.

8.22 D'Arros Island (5°25'S., 53°18'E.) is of the usual coral type, flat, and nowhere more than 3m high; the tops of the trees are about 27m high. The island lies on a detached reef and a shallow spit extends 0.5 mile NE from it. The most convenient anchorage is 0.3 mile N of D'Arros Island, in a depth of about 45m, sand and coral, sheltered from the SE trades winds. Vessels in this area should always anchor for the night weather and sea permitting, otherwise, an offing from the bank should be made.

The tidal currents set with considerable strength through the channel between the reef and the spit extending NE from D'Arros Island. Unless the sun is in a favorable position, the edges of the reef are difficult to make out, and vessels proceeding through the channel must exercise more than ordinary caution.

Saint Joseph Island (5°26'S., 53°21'E.) is the largest and farthest E of a group of eight islets located on a coral atoll; the tops of the trees on the island are about 24m high. Bertaut Reef, about 14 miles SSW of Saint Joseph Island, has a small sand cay on its S part; the reef is steep-to and the sea breaks heavily over its edge.

8.23 The **Poivre Islands** (5°46'S., 53°19'E.) are near the E

edge of Amirante Bank. A settlement stands on the NE side of the N island amid a clump of trees.

At the anchorage W of the N island, the tidal currents set NNE, N, and NNW from 3 hours before HW to 3 hours after HW, at a velocity of 0.25 to 1 knot; the set is between S and W at other times, at a maximum velocity of 0.5 knot. There is a short period of SW between tides.

The best anchorage lies off the W end of the Poivre Islands, in about 22m, well sheltered from the wind and swell. Anchorage can also be taken about 0.2 mile off the reef facing the settlement, in 22 to 37m, but the sea in this area may get rough when the wind is opposed to the tide.

Marie Louise Island (6°11'S., 53°09'E.), low and sandy, is covered with palm and casuarina trees. There is a coral reef on the E side of the island which breaks.

Boudeuse Cay (6°06'S., 52°50'E.) is the farthest SW danger on Amirante Bank. The cay is 4.6m high and sandy; there is a depth of 8.2m, 1.5 miles E of it.

Etoile Cay, 4.6m high, lies 18 miles NE of Boudeuse Cay; it lies on a coral knoll about 1 mile in extent.

8.24 Desroches (5°41'S., 53°41'E.), which lies on the S edge of a reef of the atoll character; a light is situated on the NE end of the island. The island is fringed by a drying reef which extends 1 mile offshore from the NE extremity and 0.5 mile from the SW extremity. The island is low and is covered with coconut palms and tall hardwood trees. On the N side of the island, a white cross stands about 2 miles WSW of the lighthouse. A deep channel, about 1 mile wide, leads into the lagoon from seaward. The least depth in the channel is 18.3m, and it crosses the atoll in a position about 7 miles NW of Ile Desroches. A vessel of moderate size can proceed through the channel; the drying reef shows on radar.

Anchorage may be obtained, in 22 to 24m, about 0.7 mile NW of the settlement. During the Southeast Trade Winds, this is an excellent anchorage; a slight swell may be experienced.

Ile Alphonse

8.25 Ile Alphonse (7°01'S., 52°43'E.) is separated from Bijoutier Island and Saint Francois Island by a deep channel. The reef surrounding the latter two islands is about 8 miles long. Ile Alphonse is inhabited and forms part of the Republic of Seychelles.

The tidal current in the channel S of Ile Alphonse sets between W and SW on the falling tide and between E and NE on the rising tide; at neaps the current attains rates from 0.5 to 2.5 knots. There is no SW current and a vessel swings to the new tidal current in about 5 minutes. Small tide rips pass through the channel once every hour; a heavy tide rip marks the change of the current.

Bijoutier Island is located 3.2 miles S of Ile Alphonse, on the W side of the S reef; it is covered with coconut palms. Saint Francois Island is located on the reef, 5.2 miles S of Bijoutier Island; it is a mere ridge, covered with coconut palms. Both islands are visible at a distance of about 12 miles.

The Agalega Islands

8.26 The Agalega Islands (10°24'S., 56°38'E.), two in

number, appear as one small island when approached from the SE or NW. North Island is about 7.6m high and South Island is about 4.5m high. They are covered with coconut palm and casuarina trees, which are visible at distances up to 15 miles. The Agalega Islands are fringed by a reef which is steep-to; there are boat passages through the reefs.

The main settlement of the dependency is at Port Sainte Rita, on the NE side of South Island. The islands are a dependency of Mauritius.

The Chagos Archipelago

8.27 The Chagos Archipelago consists of a number of islands, banks, and reefs lying between 4°44'S and 7°39'S, and 70°50'E and 72°47'E.

Caution.—It is said that the deeper parts of the banks within the Chagos Archipelago may be crossed when there is not much swell. However, the uncertainty regarding the depths over areas that have been only partially examined, the changeable character of coral reefs, and the unexpected manner in which the sea sometimes breaks all emphasize the advisability of avoiding the banks. Moreover, it is possible to proceed from island to island without crossing over any of the banks.

8.28 Speakers Bank (4°55'S., 72°20'E.), the farthest N of banks in the archipelago, extends 24 miles SSW from its N extremity; it is steep-to. The bottom of the bank consists of coral, sand, and some rock.

The depths at the edge of the bank are from 5.5 to 14.5m; they increase to a depth of 42m near the center of the bank. Near its SW edge, where the depths are least, the sea breaks heavily over it during the Southeast Trade Winds; the area should be avoided.

Colvocoresses Reef (4°54'S., 72°37'E.), with a least charted depth of 9m, lies 8 miles E of the E extremity of Speakers Reef; it has not been closely examined. A SE current of 1.5 knots has been observed on the reef in January.

Blenheim Reef (5°12'S., 72°28'E.) is steep-to; it covers nearly everywhere at HW except at its S extremity. The lagoon of the reef is encumbered with rock.

8.29 The Salomon Islands (5°22'S., 72°13'E.) lie on an atoll reef, which encloses a lagoon. The entrance to the lagoon is through a passage on the NW side of the atoll. A least depth of 5.8m may be carried through it, but the bar is impassable during the Northwest Monsoon.

Tides—Currents.—The tidal currents at the anchorage outside the lagoon entrance set between NNE and E at a velocity of about 0.5 knot when the tide is rising, and between NW and W while it is falling, at a velocity of 0.5 to 1.25 knots. There is no period of SW current; each current was at its greatest strength at the beginning of its course, gradually slackening. The current on the bar sets with considerable strength, sometimes attaining a velocity of 2.5 knots on the rising tide shortly after springs. The tidal currents are not felt at the anchorage off Ile Takamaka.

Anchorage.—During the Southeast Trade Winds, anchorage may be found outside the entrance of the lagoon, in 18m.

Small vessels with local knowledge visiting the atoll find anchorage off the settlement on the E side of Ile Boddam.

8.30 Peros Banhos (5°20'S., 71°51'E.), which comprises a group of islets, is the largest of the Chagos Archipelago and are atoll-shaped. These islets are all low, the highest is only 3.7m high, but the coconut palms rise to about 30m and have been seen at distances up to 15 miles.

Tides—Currents.—At the anchorage off Ile du Coin, the tidal current sets NW, while the tide is rising, attaining a maximum velocity of about 0.5 knot; it is scarcely felt during the falling tide. At the anchorage off Ile Fouquet, the currents are barely appreciable during either tides. At the entrances to the lagoon, the tidal current sets between NNW and W, while the tide is falling, at a velocity of from 0.75 to 1 knot, or more at springs; the other current is less strong, and sets toward the SE quadrant at a velocity of about 0.5 knot, while the tide is rising. These observations were made during the Southeast Trade Winds, and the result may be very different in other seasons.

Depths—Limitations.—The existence of a shoal, with a depth of 2.7m, lies about 1.5 miles E of Ile Anglaise.

Anchorage.—Peros Banhos Atoll, being so open and having wide entrances to the lagoon, possesses no completely sheltered anchorage. The quietest anchorage is off Ile Fouquet, 1.7 miles E of Ile du Coin.

The usual anchorage during the Southeast Trade Winds is off the E side of the N end of Ile due Coin, in 22m, with the N extremity of the islet bearing 274° and the E extremity bearing 128°; this position is moderately well sheltered from this wind, and is reported to be also sheltered from the Northwest Monsoon.

During the Northwest Monsoon, the anchorage off Ile Diamant is preferred; the best berth, in depths from 26 to 31m, is with the center of the islet bearing 310°, distant 0.5 mile.

Caution.—These islets undergo considerable alteration; one monsoon washes away portions of them and the next monsoon piles up new land masses.

Several clear deep channels between the various islands lead into the lagoon. Moresby Channel, between the Moresby Island on the E and Ile Diamant on the W, is convenient for vessels approaching from the NW, particularly during the season of NW winds. The depths are 10.9m or more over a width of nearly 0.8 mile. Passe de l'Ile Poule, between Ile Poule on the S and Petite Soeur on the N, leads into the lagoon from the W and has depths of 14.6m or more over a width of 0.7 mile.

A channel between Ile Fouquet and Ile Vache Marine, about 2.3 miles NNE, leads WNW into the lagoon toward Ile du Coin. It is noteworthy that tide rips may be experienced in any of the entrances of the lagoon; a slight disturbance sometimes experienced on the bar between Ile Fouquet and Ile Vache Marine is due to the outgoing tidal current setting against the wind and swell.

Benares Shoals (5°15'S., 71°40'E.), an isolated patch with a least charted depth of 4.5m, lies 5.5 miles W of Ile Diamant, off the NW extremity of Peros Banhos.

Victory Bank (5°32'S., 72°14'E.) lies about 18 miles SE of Peros Banhos and rises steeply from great depths; there are depths of 5.5m around the edge of the reef and depths up to 33m in the interior.

8.31 Great Chagos Bank (6°13'S., 72°05'E.), which occupies the central part of the Chagos Archipelago, consists of a submerged atoll supporting several islands on the N and W sides. The

bank extends about 60 miles in a N and S direction, and about 90 miles from E to W. A narrow coral ridge around the edges of the bank has a least depth of 5.5m; within the ridge the depths increase to 88m. A shoal of 1m depth was reported in position 6°17'S, 72°15'E; its position is doubtful. There are known to be a number of uncharted shoals on the bank.

Vessels should not cross Great Chagos Bank when there is much swell, and then only in case of necessity; if necessary to cross it, the passage should be made in daytime.

Caution.—The profiles of the islands beaches change considerable at each monsoon.

8.32 Nelsons Island (5°41'S., 72°02'E.), an uninhabited island, lies on the N edge of Great Chagos Bank. A deep channel close E of Nelsons Island leads to an anchorage, in depths of 29 to 31m, inside the outer ridge of Great Chagos Bank.

Three Brothers (6°09'S., 71°31'E.), comprised of three islands, lie on the W side of Great Chagos Bank. Reefs fringe these islands and a bank, with a least depth of 7.5m, extends 11 miles ESE from the farthest E of these islands. A rocky islet lies between the middle and E island.

Close SW of Three Brothers, a break in the coral ridge forms a deep channel, with a least width of 1.5 miles; some shoals, with a least depth of 5.5m, lie on the S side of the channel.

The **Eagle Islands** (6°12'S., 71°19'E.) are located on the edge of the bank 10 miles WSW of Three Brothers. The N island is covered with tall coconut palms; a reef extends 0.5 mile SW from this island.

The S island, nearly 2 miles SSW from the N island, is low and covered with trees. Anchorage may be obtained between the two islands, in depths of 7 to 16m, sand and coral, but care must be taken to keep on the bank of soundings, which is only about 1 mile broad.

Danger Island (6°23'S., 71°16'E.) lies on the W extremity of Great Chagos Bank in a position 8.7 miles SSW of S Eagle Island. The sea breaks heavily round its coast, and a reef which extends 3 miles SSE from the island breaks in places. Good anchorage, in a depth of 31m, can be taken E of the island.

8.33 The Egmont Islands (6°39'S., 71°23'E.), a group of six islands, lie on the SW edge of an elliptical atoll, 16 miles SSW of Danger Island.

Anchorage.—Anchorage can be taken just outside the entrance channel. The tidal currents at the anchorage are felt only slightly; they set NNW with a maximum velocity of 0.5 knot during the falling tide. The current during the rising tide is inappreciable. It should be noted that the above anchorage position plots inside the encircling reef.

Caution.—It was reported (1986) that all the islets except Ile des Rats, the farthest NW, were connected by sand banks which dry at LW, breakers were observed along the SW side of the bank. The lagoon can be entered by way of a shallow channel through the N portion of the encircling reef.

8.34 Pitt Bank lies SSE to SW of the Egmont Islands, centered in approximate position 7°04'S, 71°20'E. Vessels are advised not to cross over Pitt Bank, especially at night. Pitt Bank extends 35 miles SE and is steep-to on all sides. A buoy, marked by a radar reflector, is moored on the NW side of the bank.

Wight Bank (7°25'S, 72°31'E) has a least charted depth of 8.5m. It is possible that lesser depths than those charted exist on Wight Bank; mariners should navigate in this vicinity with caution.

Ganges Bank (7°23'S., 70°58'E.) is small, about 3.8 miles in distant from SE to NW, and steep-to. A least depth of 12m is charted in its SW side, but there may be less water. A buoy, fitted with a radar reflector, is moored on Ganges Bank.

Centurion Bank (7°39'S., 70°50'E.), with a least charted depth of 11m, is the farthest SW of the Chagos Archipelago. This bank is steep-to on all sides, but heavy rollers have been observed to break over its NE end. A buoy is moored on the W side of the bank.

Diego Garcia (7°21'S., 72°28'E.)

World Port Index No. 47800

8.35 Diego Garcia is the farthest S of the islands of the Chagos Archipelago. It lies on an atoll, which is steep-to on its seaward side, and forms a natural harbor in an extensive lagoon which is entered from the NW side.

Diego Garcia is part of the British Indian Ocean Territory and is the site of a U.S. Communications Relay Station for military traffic that is run jointly with the United Kingdom.

Winds—Weather.—Because of the strength of the Southeast Trade Winds, a fresh to strong (force 5 to 6) breeze may be experienced at the anchorage.

Rain falls on most days, but is often limited to a short shower; droughts, however, sometimes last for a month. Frequent rain squalls occur at night.

Earthquake shocks are felt at times.

Tides—Currents.—The tidal range at springs is 0.2m at MLW to 1.9m at MHW.

In the approaches to the Main Pass, there is an E flow of about 1.5 knots about 2 hours before HW, and on the falling tide a W flow of about 1 knot. Rates of up to 4 and 2 knots, respectively, have been reported; the effect of this flow may be felt up to 8 miles seaward.

In the Entrance Channel, the tidal current sets SE on a rising tide and NW on the falling tide, with spring rates of 1.5 and 1.25 knots, respectively. In 1985, an outbound vessel experienced a sudden heavy E set about 0.3 mile before the sea buoys. The effect of the tidal current is barely perceptible 2 miles within the entrance.

When arriving, it is recommended that a long approach to the Entrance Channel be planned, in order to assess the effect of the set before entering the channel. The tidal current is reported to be unpredictable.

Depths—Limitations.—The Entrance Channel, formed between Spur Reef and West Island, is the recommended passage for entering the lagoon. A fairway, marked by buoys, and which has been dredged and swept to a depth of 13.7m over a width of 210m, leads to the turning basin SE of Eclipse Point.

There is a deep draft wharf about 2 miles SSE of Eclipse Point that has a minimum depth alongside of 13m. The L-shaped Supply and POL Pier, about 0.8 mile SE of the deep-water wharf, has a minimum depth alongside of 13m. A channel leading to the wharf off Point Marianne has been swept to a depth of 11m. The limits of the fairway and the turning basin



Diego Garcia



Diego Garcia Harbor

may best be seen on the chart.

Aspect.—From a short distance Diego Garcia appears to be covered with a bright green vegetation, fringed by a white sandy beach. The principal trees are coconut palms, which are 34m high in places; there are several clumps of casuarina trees on both islands. The general height of the land is from 0.9 to 1.5m. The land is subject to alteration, being carried away at one part and raised at another by the seasonal monsoons. Eclipse Point is sparsely covered with trees, interspersed with buildings, and is easily identified. West Islet, Middle Islet, and

East Islet, lying on the reefs in the entrance to the lagoon, may be clearly distinguished at a distance of 5 miles. A radio tower stands 0.2 mile SSW of Eclipse Point, and a conspicuous tank is situated 0.5 mile SSW of the point; a radio tower, situated 0.3 mile NNE was not easily seen until within 8 miles from the island. There is a control tower situated at the root of the causeway, about 3 miles SSE of Eclipse Point, but it was reported to be surrounded by taller buildings and was not seen.

Pilotage.—Diego Garcia is a daylight port, although vessels may be taken in at night through prior arrangement with Diego Garcia Port Control. Pilots are compulsory on the vessel's initial visit for both entry and departure. The boarding ground is located 2 miles NW of the channel entrance.

Regulations.—Access to the British Indian Ocean Territory is restricted and a permit is required. There are no commercial airline flights to the territory and permits are only issued to yachts in safe passage. The territory is not a tourist destination.

Access to Diego Garcia is only permitted to those with connections to the military facility. The British Indian Ocean Territory Administration in the United Kingdom Foreign and

Commonwealth Office in London (<http://www.fco.gov.uk>) is responsible for issuing permits.

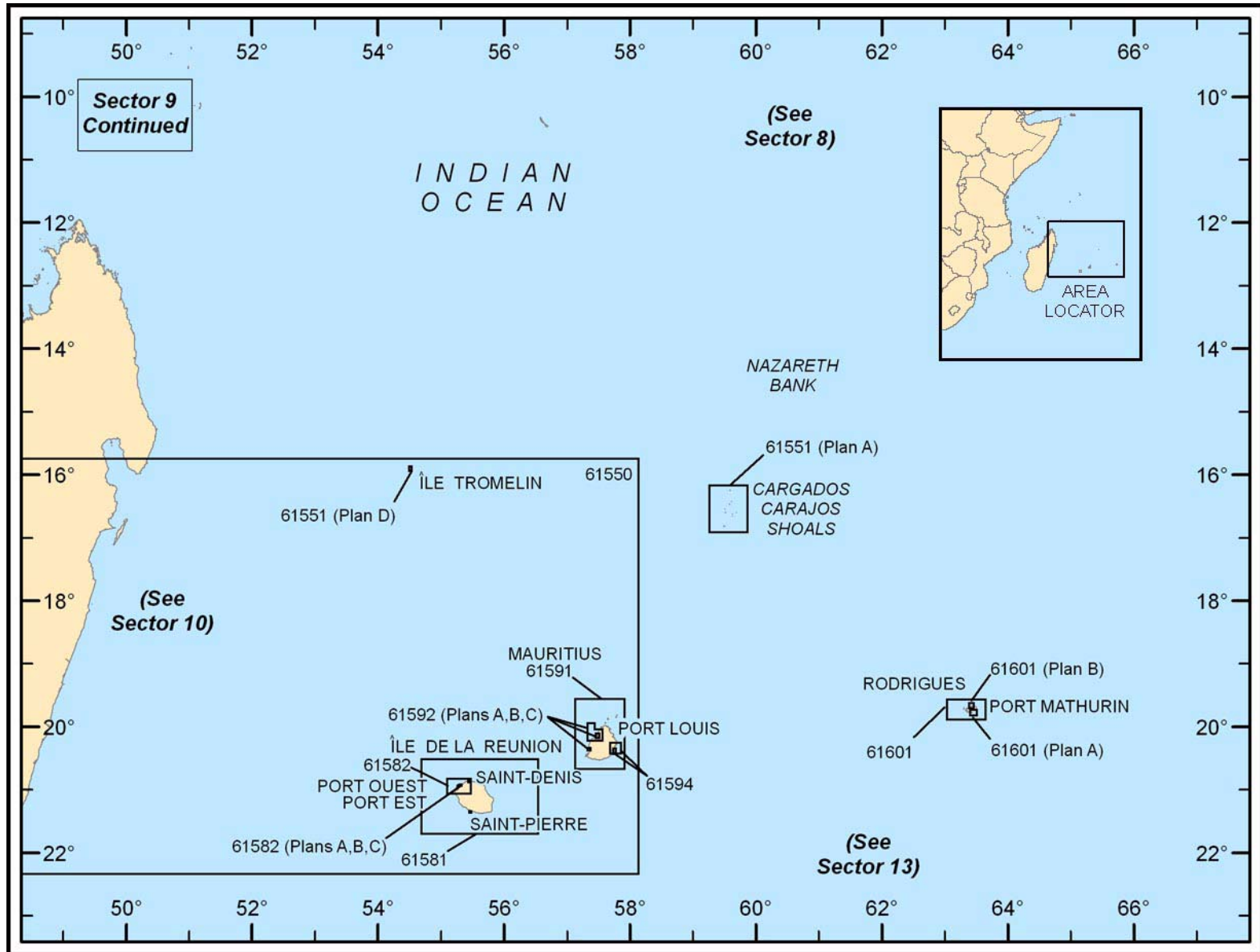
There are no medical facilities in the territory. Search and rescue facilities are limited. Comprehensive travel insurance, to include medical evacuation to the value of \$100,000, and yacht insurance, to include wreck clean up and disposal, should be obtained before traveling.

Signals.—The port control tower is manned 24 hours and may be contacted on VHF channel 16.

Anchorage.—During the Northwest Monsoon, from the beginning or middle of December until the beginning or end of April, vessels should anchor on the W side of the lagoon under the lee of the land. Eclipse Bay, S of Eclipse Point, affords the smoothest water during the monsoon, being protected by the point and the reef connecting it with West Islet.

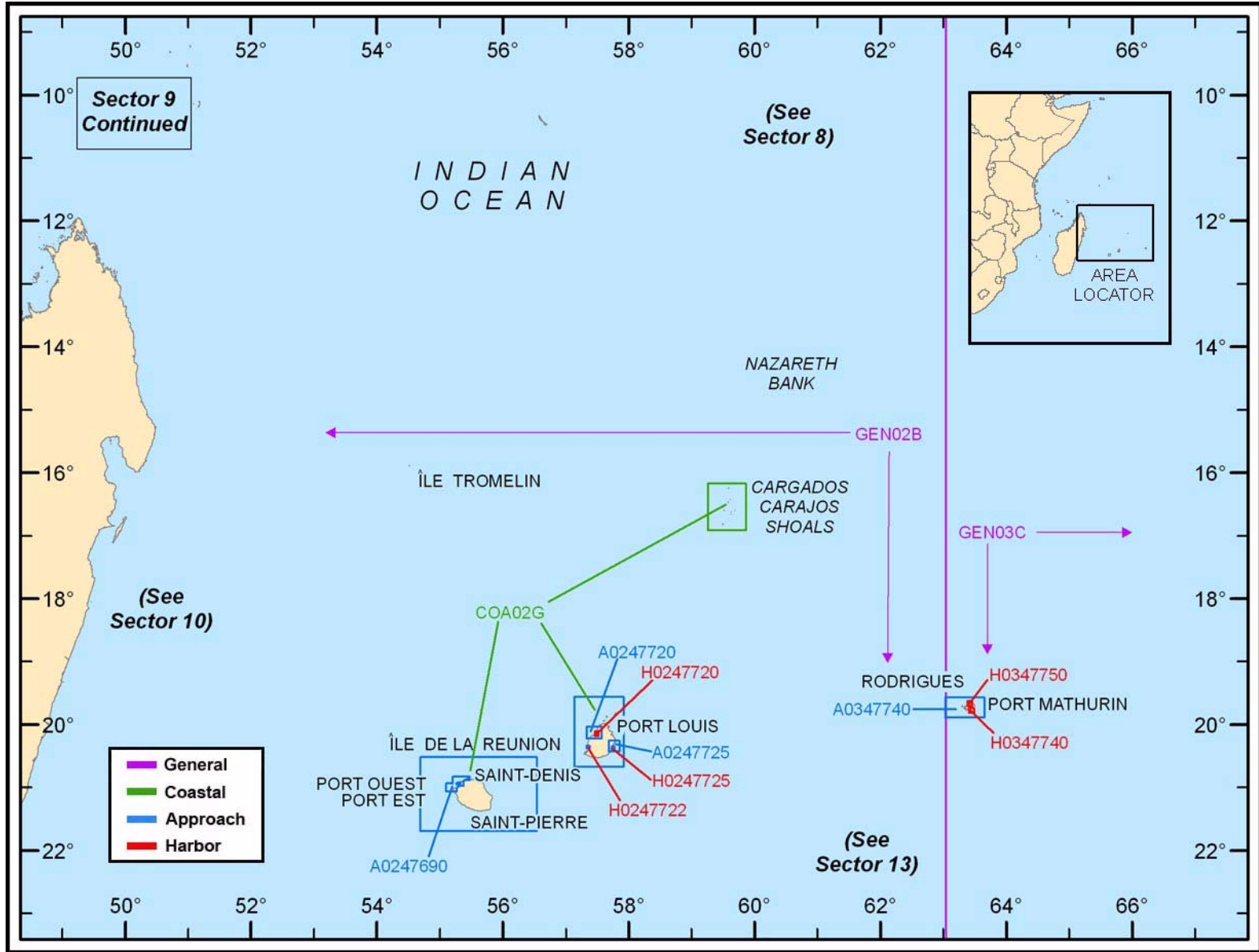
A vessel can anchor about 1 mile E of Point Marianne, in 16 to 18m, broken coral, good holding ground.

Caution.—A depth of 29m is located 0.7 mile off the SE extremity Diego Garcia. A depth of 18m is charted 1 mile SSW of the S extremity of the island; its position is approximate.



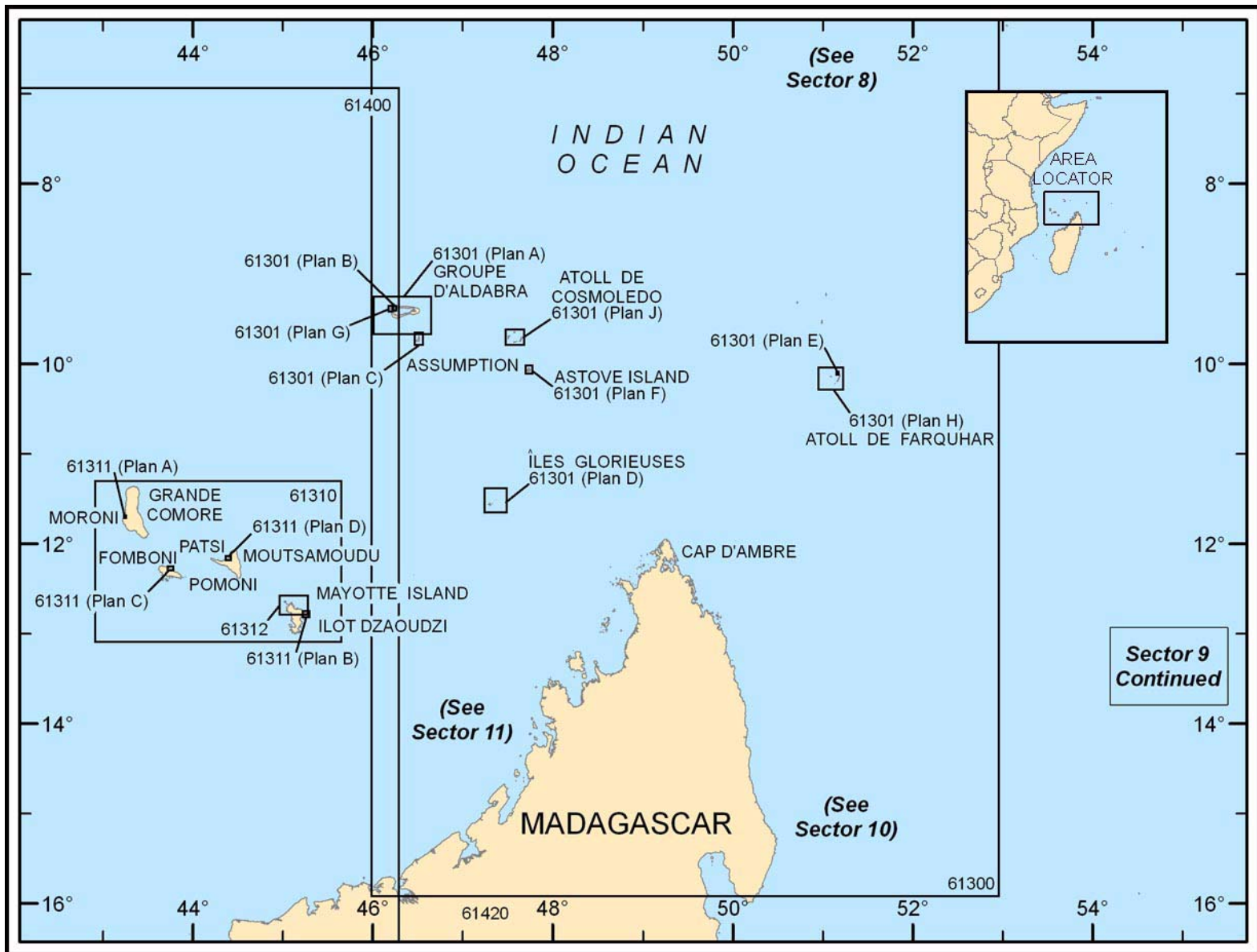
Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 9 — CHART INFORMATION



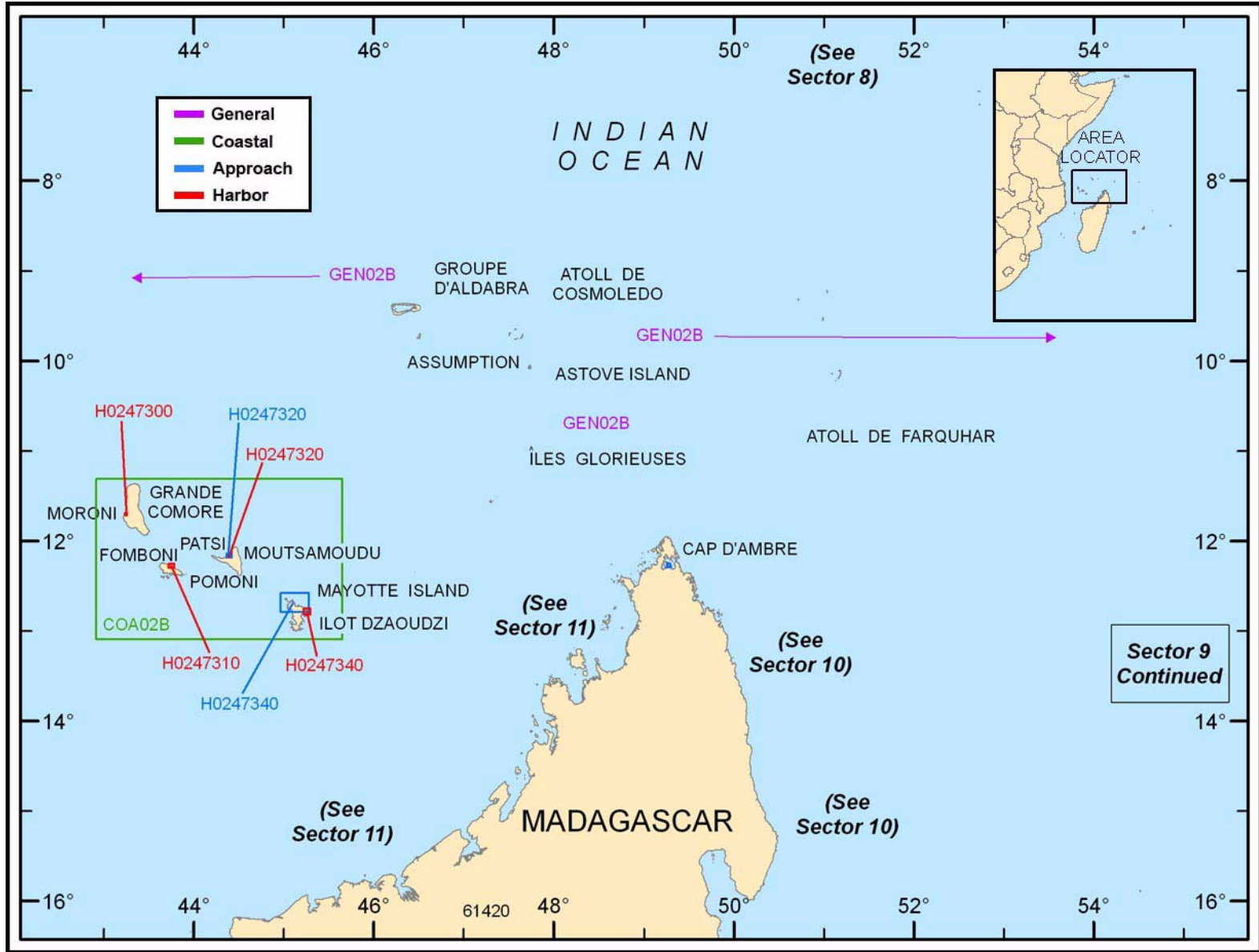
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SECTOR 9 — DNC LIBRARY INFORMATION

SECTOR 9

ISLANDS AND BANKS NORTH AND EAST OF MADAGASCAR

Plan.—This sector describes the Mascarene Ridge, Ile Tromelin, Ile de la Reunion, Mauritius, Cargados Carajos Shoals, and Rodrigues (Rodriguez Island). It then describes the Aldabra Islands, Assumption Island, Providence Island, the Farquhar Group, the Comores Islands, and Iles Glorieuses.

The Mascarene Ridge

9.1 The Mascarene Abyssal Plain lies off the E coast of Madagascar where the continental slope drops to a depth of 5,914m. The Mascarene Basin rises NE and E of Madagascar between the Mascarene Abyssal Plain and the Mascarene Ridge. The depths in the Mascarene Basin range from 4,000 to 4,363m.

The Mascarene Ridge encumbers the Mascarene Basin on its the NE and E side and contains a chain of detached plateaus. This formation of the Mascarene Ridge curves around the Mascarene Basin from Seychelles Bank, leads SSE to Agalega Island, continues SSW towards the Cargados Carajos Islands, continues on to Mauritius, and then extends to the detached rise where Reunion Island forms, a total distance of about 850 miles.

The banks and shoals on Mascarene Ridge, from N to S, are Fortune Bank, Poydenot Shoal, Soudan Bank, Nazareth Bank, Saya de Malha Bank, Souden Bank, and Cargados Carajos Shoals.

Caution.—Fishing vessels, with lengths of 10 to 35m, are active year-round on the Mascarene Ridge.

Vessels engaged in seismic surveys may also be encountered on Seychelles Bank and around the Madagascar coast; they should be given a wide berth.

Ile Tromelin

9.2 Ile Tromelin (15°53'S., 54°31'E.), a small low and sandy islet with bushes scattered about, is fringed by a narrow reef. The islet is part of the French Republic and is administratively attached to Reunion Island.

Two shoals, with a depth of 10m, lie 0.75 mile NW of the NW extremity of the islet. A light is situated at the weather station which stands on this NW point.

During the Southeast Monsoon, anchorage can be taken in the lee of Ile Tromelin with the weather station bearing 113°, about 0.7 mile distant, in a depth of 13m, sand and coral; the holding ground is indifferent.

Strong overfalls may be seen off the NW side of Ile Tromelin, where the general current flowing W encounters the ebb current; the resulting breakers can be dangerous for small boats as far as 0.25 mile offshore.

Ile de la Reunion

9.3 Ile de la Reunion (21°06'S., 55°34'E.) is composed of a very narrow coastal plain, which is succeeded by hilly

ground, which in turn rises inland to mountain masses and tableland. It is of volcanic formation, with many extinct craters. The mountain peaks are often visible at a distance of 100 miles or more. The island is a French possession.

La Perause Seamount, with a depth of 54m, lies 100 miles NW of Ile de la Reunion.

Volcan (Piton de la Fournaise) is an active volcano, 2,626m high, in the SE part of Ile de la Reunion; it frequently emits ashes. Slight earthquakes are frequent, however, the general volcanic nature of the island is clearly shown by the many extinct craters on the island.



Ile de la Reunion

Les Salazes, a mountain mass, rises near the middle of the island and during portions of nearly every winter, Piton des Neiges, 3,070m high, is snow-capped. Petites Salazes form three needle-pointed peaks, each about 2,286m high.

A mark for the SE end of the island is a black wavelike formation, formed by lava flow that solidified, that flowed toward the sea; it is nearly devoid of vegetation.

The roadsteads off the N side of the island are safer than those off the other sides. With gales from the N, a very violent sea beats upon the N coast of Ile de la Reunion from Saint-Paul to Sainte-Rose.

Merchant vessels from abroad must first call at Sainte-Pierre, Saint-Paul, Le Port (Port des Galets), or Saint-Denis; permits are granted at these places to visit other places on the island. It is necessary to clear through one of these ports before leaving the island.

Regulations.—Vessels over 25m in length can only anchor in special areas. All vessels must request authorization from Reunion Rescue Operational Center on VHF channel 16.



Pointe de Bel-Air Light

Caution.—Fish aggregating devices, marked by orange, red, or yellow buoys equipped with radar reflectors, may be found up to 15 miles off the coast. A good lookout should be kept for these buoys; vessels should keep at least 1 mile clear of them.

9.4 Pointe des Jardins (20°52'S., 55°28'E.) is the N extremity of Ile de la Reunion. The Riviere Saint Denis flows into the sea through a deep ravine close W of Pointe des Jardins; a bridge spans the river near its mouth.

Saint-Denis (20°52'S., 55°28'E.) (World Port Index No. 47680), situated at Pointe des Jardins, is the capital and the most important town on the island.

The town, surrounded by vegetation, can be seen from a considerable distance; the high tower of the church is prominent.

Anchorage.—Anchorage off Saint-Denis is practically no longer used. From November to April, the stormy season, anchorage is possible, in depths of 18 to 31m, NW of Saint-Denis. Vessels should be prepared to get underway at the first sign of stormy weather.

Between April and November, the fair season, vessels may approach land and anchor, in 24m, sand and broken shell, with the church steeple bearing 174°, 0.4 mile from the shore. A better anchorage is found a little farther SW, in 13m; this site is better sheltered from the swell.

Le Cousin, a dangerous sunken rock, lies about 0.2 mile offshore in a position about 1 mile E of Pointe de Sainte Marie. Cap Bernard, bearing 274°, and seen open N of the cathedral at Saint-Denis, leads N of Le Cousin.

Sainte-Suzanne is a village situated about 0.5 mile SE of Pointe de Bel-Air (20°53'S., 55°37'E.); the point is marked by a light.

Anchorage can be taken, in about 24m, 1 mile E of the light on Pointe de Bel-Air, but it is not recommended because of the bad holding ground and the difficulty of communicating with the shore.

There are storehouses on Pointe du Bourbier (21°01'S., 55°43'E.) that are visible from seaward. Anchorage can be taken off the point in a position about 1.3 miles ESE of the point, but is not recommended because of the bad holding ground and the difficulty of communicating with the shore. A church may be seen in the town of Saint-Benoit, which is situated about 1 mile SE of Pointe du Bourbier.

Sainte-Rose is a town with a small harbor protected by a breakwater situated about 6 miles SE Saint-Benoit. Anchorage is not recommended due to bad holding ground, unsurveyed areas, and the difficulty of communicating with the shore.

9.5 Pointe de la Table (21°19'S., 55°49'E.), the SE ex-



Sainte-Rose Breakwater

tremity of Ile de la Reunion, lies about 9 miles S of Pointe du Bambou. Within the coast is a hilly, arid region, Grand Brule, which has been deforested and crevassed by solidified flows of lava from the volcano Volcan.

Vessels should give the coast between Pointe du Bambou and Pointe de la Table a wide berth. A light is shown at Pointe de la Table.

From Pointe de la Table, the coast of Ile de la Reunion trends SW to Pointe de la Mare d'Arzule, 3 miles distant. The coast then trends in a general W direction to Pointe de Langevin (21°23'S., 55°39'E.), a distance of 7.3 miles, the S extremity of the island.



Saint-Pierre—South Jetty Light

Pointe de Saint-Joseph is located 2 miles W of Pointe de Langevin and Pointe Riviere d'Abord is located 7.3 miles farther WNW; the 200m curve lies up to 1.3 miles offshore along this part of the coast.

9.6 Saint-Pierre (21°20'S., 55°29'E.) (World Port Index

No. 47700) is situated on the S coast of Ile de le Reunion at the foot of the mountains on the W bank of Riviere d'Abord; the port is very small and consists of a town, an artificial basin protected by breakwaters with lights, and an outer roadstead. Saint-Pierre can be identified from a considerable distance by its white buildings and church belfry. Lights, in line bearing 018°, lead into the inner harbor, which is no longer used because of silting

Vessels may anchor with the church steeple bearing 018° and Pointe Riviere d'Abord bearing about 063°, in depths of 37 to 42m, sand. A heavy swell sometimes occurs from May to September; a vessel must be ready to weigh anchor at any time of the year.



Saint-Pierre—North Jetty Light

Pointe des Avirons (21°14'S., 55°20'E.) lies NW of Saint-Pierre; a light stands on the coast 1 mile SE of the point, and an aero beacon is situated 1.3 miles farther SE. Anchorage can be taken, in about 37m, about 0.8 mile SW of the point, but it is not recommended.

The villages of Saint-Leu and Saint-Gilles les Bain are situated near the coast, 5.3 and 13 miles NNW, respectively, of Pointe des Avirons; a light is situated on the coast near each village.

Baie de Saint-Paul is entered between Cap la Houssaye (21°00'S., 55°14'E.) and Pointe de la Riviere des Galets. Baie de Saint-Paul is the best roadstead of Ile de la Reunion. Vessels at anchor here are usually sheltered when rollers are setting in at Saint-Denis.

The roadstead at Saint-Paul is utilized as a waiting anchorage by vessels prior to entering Port de la Pointe de Galets (Port Ouest). Vessels are informed when they can enter port by the harbor master's office on VHF channel 16.

During the good season, anchorage can be taken with the



Port Reunion

signal mast bearing either 114° or 124°, in 26m, muddy sand.

A wreck, with a reported depth of 32m, lies about 0.5 mile NNW of Saint-Paul Light. A spar buoy is moored close N of the wreck.

Good anchorage can be taken with the signal mast bearing 240°; where the depths are 20m and the bottom is black sand. A mooring buoy is anchored about 0.7 mile W of the light-house.

During the good season, from about the middle of April to the middle of November, the wind is usually SW as a result of an eddy around this mountainous island. During the winter the winds are usually NE and vessels should anchor farther offshore than mentioned above; depths of 37m are recommended in position NNW of the signal mast.

Port de la Pointe des Galets (Port Reunion) (20°55'S., 55°18'E.)

World Port Index No. 47690

9.7 Port de la Pointe des Galets (Port Reunion) is comprised of Port Ouest (West Port or the “Old Port”), which is about 0.8 mile S of Pointe de Galets, and Port Est (East Port or the “New Port”), which is in Baie de la Possession.

Port Ouest is further subdivided into a N basin and a S basin.

Port Reunion Home Page

<http://www.reunion.port.fr>

Winds—Weather.—The port is subject to “rollers,” which

are ocean waves which occur between April and October; their frequency is about 2 days per month. They occur in any weather and during perfect calm, unaccompanied by any change in atmosphere or other indication. The first appearance is a long swell not assuming the shape of a wave until it reaches the shore where it will break, with great violence, often causing damage to installations; they sometimes assume greater proportions than during a cyclone. This phenomenon usually last 24 hours, but can sometimes continue for 4 or 5 consecutive days. Masters would be advised to discontinue cargo operations and vacate the berth before the swell reaches severe proportions. From June to September, the S swell can cause a heavy undertow in Port Ouest.

Tides—Currents.—Generally, on the approaches to Ile de la Reunion, the current flows W when N of the island. West of the island the current is extremely variable. Offshore, about 3 miles from Pointe des Galets, the current sometimes reaches 3 knots. Nearer the coast it flows most often to the N at a speed not in excess of 0.8 knot.

There is a cross current in the entrance passes; in front of Port Ouest, it flows most often N, but does sometimes flow S. Its average speed is 1 knot, but can be as fast as 2 knots. In front of Port Est it flows W, and its speed does not exceed 1 knot.

A vessel should keep to the axis of the channel at a speed of 3 or 4 knots. When a vessel of great length passes between the mole heads, the bow will be held in still water while the stern is deflected by a current, which may have a rate up to 2 knots.

Depths—Limitations.—Port Ouest can accommodate vessels up to 14,000 gross tons, with a maximum length of 175m, and drafts of less than 9m. Ship movements take place during

daylight hours only.

Berthing details are shown in the accompanying table titled **Port Reunion—Berthing Information**.

The channel to Port Est is dredged to a depth of 13.1m over a width of 130m. The W arm of the basin is dredged to 12.8m.

Aspect.—The entrance to Port Ouest is protected by two jetties, the ends of which are each equipped with a light. Range lights, in line bearing 162°, lead through the channel.

The main lighthouse is situated on top of a cement silo; the large towers of which constitute a good landmark. A tower, with its red and white bands, 2 miles S of the harbor, serves as a good landmark. It displays aerial obstruction lights which are occasionally visible from a distance of 28 miles.

Pilotage.—Pilotage is compulsory for all vessels over 50m in length and is available from 0430 to 2200 for Port Est and from sunrise to sunset for Port Ouest. Vessels send their ETA 24 hours in advance, stating vessel draft, whether vessel is carrying hazardous materials, and whether vessel is equipped with a bow thruster. The pilot boards 1 to 2 miles from the entrance, on the range line for the respective port.

Regulations.—Vessels greater than 120m long are required to use a tug.

Signals.—The following signals are displayed for the regulation of traffic into Port Ouest:

1. Red flag—Entry prohibited.
2. Green flag—Departure prohibited.
3. Red flag over green flag—Entry and departure prohibited.

Anchorage.—There is restricted anchorage 0.4 mile SW of the entrance of Le Port, in a depth of 40m, black sand bottom. Anchorage may not be taken without prior authorization by the Port Authority.

Directions.—The best maneuvering conditions are met at dawn or in the evening, because of the calm usually prevalent at these hours. When entering, large vessels must take into account the crosscurrent, the direction and speed of which are difficult to predict. At times vessels may find their bow in calm water while the stern is still subject to strong current.

9.8 Pointe des Galets (20°54'S., 55°16'E.) is located 1

mile N of the entrance to Port de Galets. This low point forms the NW extremity of an arid plain; Port des Galets is situated on the edge of this plain. Between Pointe de Galets and Cap de la Possession, 3.3 miles E, the coast is low.

From **Cap de la Possession** (20°55'S., 55°21'E.) to Pointe du Gouffre, the coast is high, steep, and broken by ravines; there are several cascades which fall to the sea from an elevation of 91m or more. Pointe de la Ravine a Malheur, 0.75 mile NE of Cap de la Possession, is a prominent headland.

From Pointe du Gouffre, the coast trends nearly 2 miles ENE to Pointe des Chiendents, then 1.4 miles farther ENE to Pointe des Jardins, the N extremity of Ile de la Reunion. The 20m curve lies up to 0.4 mile off this part of the coast.

Mauritius

9.9 Mauritius (20°15'S., 57°35'E.) is mostly fringed with coral reefs and is steep-to except on the NE side; depths of more than 180m are found from 1 to 1.5 miles offshore.

Winds—Weather.—The Southeast Trade Wind prevails throughout the year, with brief interruptions as described below; it is strongest and most regular in winter, from June to September, when it gives pleasant weather with sunshine predominating.

The trade wind is less dominant in summer when the weather may temporarily become unsettled. This occurs when the high pressure area over the South Indian Ocean becomes weaker; small depressions appear S of these islands and equatorial air reaches them. The air becomes hot and humid, with light winds, mainly from the N; blue sky at dawn soon gives way to heavy cumulonimbus clouds, with outbreaks of rain, especially in the afternoon. The sky clears at dusk. A warning sign of the onset of this type of weather is the deep blue appearance of mountain ridges and of distant vegetation.

As pressure rises and the trade wind returns, there may be a period of disturbed weather, with rain or drizzle and very low clouds on exposed coasts; the SE wind increases to Force 5 or 6 over the land and may reach Force 7 over the sea. This weather is very unpleasant if it occurs in April or May.

Port Reunion—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Remarks
No. 1	160m	8.5m	—
No. 2	160m	8.5m	Molasses and general cargo. Maximum vessel loa of 160m.
No. 4	160m	8.5m	Navy berth.
No. 5	160m	7.5m	Navy berth.
No. 6	160m	6.0m	Small vessels
No. 7	160m	8.5m	Sugar.
No. 8	190m	8.0m	Passengers and tankers. Maximum vessel loa of 175m.
No. 9	175m	8.0m	Bulk grain.
H	135m	7.8m	Bitumen, cement and gas. Maximum vessel loa of 135m.

Port Reunion—Berthing Information			
Berth Name	Length	Maximum Vessel Draft	Remarks
No. 10	255m	12.0m	Containers, vehicles and tankers. Maximum vessel loa of 215m. Maximum vessel size of 45,000 dwt.
No. 11	215m	—	Containers and vehicles.
No. 14	215m	—	Bulk and general cargo.
No. 15	215m	—	Bulk cargo.

At Rodriguez, the trade wind may back to NE for a few days during disturbed weather in summer.

The W and N coasts of the islands are more sheltered and are dryer than the E and S coasts. At Ile de la Reunion, the NW coast from Pointe des Aigrettes to Cap Bernard is particularly sheltered, and light variable winds prevail here.

Rainfall in these islands varies greatly, not only from coast to coast, but from year to year; it is at maximum in summer. At Ile de la Reunion it reaches an annual average of 4,300mm at Saint-Benoit, on the E coast, and 990mm at Saint-Pierre, on the SW coast.

Rainfall tends to reach a maximum in the afternoon, except when the trade wind is well-established when it is more common at night.

There are many streams and rivers, generally flowing through deep ravines, but none is navigable beyond a short distance from the sea; in dry season they are little more than brooks, but become raging torrents during heavy rains.

Tides—Currents.—The tidal currents around the islets on the bank extending NE from the NE side of Mauritius attain rates of 4 to 5 knots during springs, and form dangerous races. The rate at neaps seldom exceeds 2 knots. The currents at night are stronger than those during the day; the strongest occur 2 days after full and change of the moon.

The flood, or E current, begins 5 hours before the moon's meridian passage and continues for 6 hours; the ebb, or W current, then sets in immediately and continues for 6 hours; there is no interval of SW. The E current sets with great strength over The Carpenters and The Blacksmiths, and causes dangerous races as far as 3 miles off Gunner's Quoin. Vessels should not pass this islet at distances of less than 1 mile.

The E current sets strongly onto Cannoniers Point, then sweeps through Quoin Channel and around the N end of Mauritius at a high rate. West winds cause an increase in the velocity; strong S winds deflect the current to the NE.

The tidal currents separate at LW off Piment Point, the N point of the entrance to Arsenal Bay, on the NW shore of Mauritius; the line of separation works toward Rocky Point, which lies about 2.3 miles NNE of Piment Point, and reaches Rocky Point by the time of HW. When the E current is setting around the N part of Mauritius, a weaker current sets S along the W shore of the island.

The so-called W current actually sets generally about WNW past the N end of the island, but is felt very little off the W shore of the island between Cannoniers Point and Caves Point. The inshore current turns 2 hours before the current in the offing, and during the last half of the flood sets E at a rate near Gunner's Quoin of 4 knots. At the 20m curve skirting Mauri-

tius, the W current has a rate of 3 knots.

Aspect.—The central and W parts of the island are mountainous. Piton de la Petite Riviere Noire (Piton Riviere Noire) rises in a position about 6.8 miles NE of the SW extremity of the island; it is pointed, and appears dark in clear weather, when it is visible for 50 miles. Pieter Both, a remarkable mountain, rises about 15.5 miles NNE of Piton de la Petite Riviere Noire; it has a huge knob on its summit. Piton du Milieu, near the middle of Mauritius, is a steep-sided cone. Mount Rempart, about 6.5 miles N of Piton de la Petite Riviere Noire, shows three needle-pointed peaks. All these mountains are useful marks for the island, but the summits are often enveloped in mist; among the summits are many extinct craters and extensive caves.

Caution.—A bank extends about 16 miles NE from the N extremity of Mauritius; several islands and lesser banks are located in this area.

9.10 Serpent Islet (19°49'S., 57°48'E.), the farthest NE of the dangers off Mauritius, lies near the NE extremity of the bank; it is 162m high. The SE and NW sides of the island are foul to a distance of 0.2 mile.

Nab Reef, about 0.8 mile WSW of Serpent Islet, has depths of less than 1.8m; the sea breaks over it.

Round Islet (19°51'S., 57°47'E.), 1.5 miles SSW of Serpent Islet, is 322m high; it is the highest islet in this group.

In the channel between Serpent Islet, and Round Islet, the tidal current attains a rate from 3 to 4 knots.

The Blinder is a submerged reef, which breaks occasionally, lying 0.25 mile W of the NW extremity of Round Islet. Both the E and W tidal currents run with great strength over both The Blinder and Nab Reef.

La Caille Bank lies 2.8 miles SSW of Round Islet; Abbe Bank lies 1 mile farther SSW. The sea occasionally breaks over these two banks in bad weather and Abbe Bank will occasionally break in good weather.

Serpent Islet, bearing 009° and open its own breadth E of Round Islet, leads about 0.5 mile E of La Caille Bank and about 0.8 mile E of Abbe Bank.

Flat Islet (19°53'S., 57°39'E.) is the farthest NW of the islets N of Mauritius; it is generally flat, but the SW extremity rises to a hill, 91m high. Pigeon House Rock lies close N of Flat Islet; it is 52m high. The N side of Pigeon House Rock is steep-to and may be safely passed as close as 0.3 mile; the current N of the rock flows E and W at rates of 2 to 4 knots; there may be tide rips encountered in this area.

Gabriel Islet lies on the reef, about 0.4 mile SE of Flat Islet, and Sandringham Reef extends 0.5 mile farther SE; the tidal

currents set with great force over the reef, and it should be given a wide berth.

Vessels can anchor off the S end of Flat Islet, with the light situated on the SW end of the islet bearing 315°, about 1 mile distant, and the summit of Serpent Islet bearing 060°, in a depth of 16m. The holding ground of sand and coral is not good; moreover, the sea rises quickly with S winds so that vessels should proceed to sea at the first indication of bad weather. If a pilot is required, one will be sent from Port Louis.

Rip Bank, about 0.9 mile SE of Gabriel Islet, has a least charted depth of 12.8m.

The NE extremities of Flat Islet and Gabriel Islet, in line bearing 316°, lead NE of Sandringham Reef and NE of Rip Bank; the disused light tower on Cannoniers Point, the NW extremity of Mauritius, bearing not less than 235°, and well open S of the S extremity of Gunner's Quoin, leads S of Rip Bank.

Low-powered vessels arriving off Round Islet during the E current should pass N of Serpent Islet and should give Pigeonhouse Rock a berth of at least 1 mile.

Gunner's Quoin (19°56'S., 57°37'E.) is an islet 3.5 miles SSW of Flat Islet; it is separated from Mauritius by Quoin Channel, which is 0.8 mile wide between the 15m curve line.

The Blacksmiths are a group of rocks which extend 0.3 mile NE of Gunner's Quoin and The Carpenters are three rocks, awash, which extend 0.2 mile SE from the islet; the sea breaks heavily over them.

The tidal current runs with great force N and S of Gunner's Quoin, causing dangerous races up to 3 miles off the islet. Vessels should not pass within 1 mile of this islet.

Mapu Patch (19°59'S., 57°40'E.), with a depth of 12.8m, lies 3 miles SE of Gunner's Quoin and 1.5 miles off Mauritius.

9.11 Cannoniers Point (20°00'S., 57°33'E.), the NW extremity of Mauritius, has a tower, formerly a lighthouse, situated on its NW extremity; there is a dangerous set toward the point, which should be kept in mind.

There is a quarantine station situated on Cannoniers Point, which includes the sea area to a distant of 0.1 mile. When the station is in use, two yellow flags are displayed.

Whale Rock (19°59'S., 57°33'E.), on the edge of the coastal reef, 0.5 mile NNW of Cannoniers Point, has a depth of 1.2m. The summit of Serpent Islet, in line with the W extremity of Gunner's Quoin bearing 056°, leads N of Whale Rock.

Rocky Point (20°03'S., 57°32'E.) lies about 3.3 miles SSW of Cannoniers Point; the fringing reef lies up to 0.8 miles off this part of the coast. From this vicinity, a gap in the trees on Cannoniers Point is conspicuous.

Pointe Piments (20°05'S., 57°31'E.) is the N entrance point to Arsenal Bay.

Arsenal Bay is too confined to offer good anchorage at any time, and for those vessel which anchor here, it should be left at once on the least appearance of a W wind, as a swell quickly sets in and breaks heavily over the reefs around.

Tombeau Bay, immediately S of Arsenal Bay, affords good anchorage, except in W winds, in a depth of 9m.

Port Louis (20°10'S., 57°30'E.)

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9.12 Port Louis is of medium size and consists of a city, an outer roadstead, and an inner and outer harbor; it is the principal harbor of Mauritius. There are facilities for general cargo vessels and tankers and is the site of a bulk sugar terminal.

The port authority is Mauritius Marine Authority, represented by the harbormaster.

Winds—Weather.—The harbor is sheltered from all winds except NW, which seldom blow with any strength, except in the cyclone season from December 1 to April 30.

When a cyclone is expected to pass within 300 miles of the island, a weather forecast is delivered daily to each vessel in port; more frequent forecasts are delivered or signaled during cyclone emergencies. Ships can expect at least 24 hours notice of a cyclone; about 3 day's warning is normally given.

The most critical time during a cyclone is when the wind is on the beam. Provided the vessel is not too high out of water, there is a good chance of riding out the storm if the following procedure is complied with:

1. No attempt should be made to keep the ship broadside to the wind by holding on to windward cable and heaving the headlines taut; the headlines should be slacked down and the windward cable payed out, to allow the ship's head to fall off the wind, even if this is towards and the side of the channel. Since the sides of the channel are steep-to, the bow will come to rest against the side of the channel with any surging to cease, and the stern moorings will not be disturbed.
2. Should the wind shift from one side of the ship to the other, as the cyclone passes over the island, the slack in the cable should be taken in and the other cable payed out, to allow the ship to fall off the wind as before.
3. No outside assistance can be given until the weather moderates; pilots are placed on the more vulnerable vessels.
4. Any vessel remaining in Port Louis more than 48 hours in the cyclone season should obtain special moorings from the port authorities.

Tides—Currents.—At the entrance, the ebb current flows SW and the flood current flows NE. Tidal range is 0.5m.

Port Louis—Berthing Information

Berth Name	Length	Depth Alongside	Maximum Vessel Draft	Remarks
Terminal 1				
Quay A	210m	12.2m	11.0m	General cargo.
Quay D	170m	12.2m	11.0m	General cargo.
Quay E	135m	9.0m	8.0m	Passengers. Maximum vessel loa of 110m.

Port Louis—Berthing Information				
Berth Name	Length	Depth Alongside	Maximum Vessel Draft	Remarks
Terminal 2				
No. 1	123m	12.2m	11.0m	Liquid cargo.
Cement Dolphin	—	12.2m	—	Cement. Maximum vessel loa of 135m.
No. 2	180m	12.2m	11.0m	General cargo, containers, fertilizer, cement and coal.
No. 3	185m	12.2m	11.0m	General cargo and containers
No. 4	185m	12.2m	11.0m	General, containers and liquid cargo.
Mauritius Freeport	115m	9.0m	—	Fishing vessels.
Bulk Sugar Terminal				
Jetty	210m	12.2m	—	Sugar and oil.
Christian Decotter Cruise Terminal				
Cruise Jetty	124m	10.8m	—	Passengers. Maximum vessel loa of 300m.
Terminal 3				
MCT1/MCT2	560m	14.0m	13.0m	Containers.
Oil Jetty	—	—	13.0m	Petroleum products.

Depths—Limitations.—Port Louis is a very simple harbor to navigate. The harbor entrance is well marked by navigation aids. The channel is only about 1 mile in length. There is a least charted depth of 12.8m on the entrance range line; the harbor is dredged to a depth of 12.5m as far as Quay D.

Berthing details are shown in the accompanying table titled **Port Louis—Berthing Information**.



Port Louis Harbor

Aspect.—The cement silos, 43m high, situated near Berth No. 2 are conspicuous; a water tower, marked by a light, situated 1 mile NE of the cement silos, makes a good mark, as does the tank 230m NW of the silos.

The Citadel, situated near the range line 1.2 miles SE of the cement silos, has a mast, with an elevation of 106m, situated at



Port Louis—Bulk Sugar Terminal

its SE corner and Signal Mountain are conspicuous.

Other good marks from the offing are The Pouce (20°12'S., 57°31'E.), which resembles a thumb held upright, and Pieter Both (20°11'S., 57°35'E.), which is surmounted by a knob-like formation.

Pilotage.—Pilotage is compulsory for all merchant vessels over 100 nrt and is available 0700 to 1700. The pilot boards about 0.5 mile NW of the entrance buoys.

Vessels should send their ETA to the harbormaster via the agent 24 hours in advance, stating length, draft, and tonnage (grt or nrt), confirming these details 2 hours in advance on VHF channel 12 or 16. The pilots and harbormaster can be contacted on VHF channels 12, 14, and 16.

Arriving vessels should have both anchors ready for letting go, and two hawsers and two wires ready aft, before the pilot embarks.

Signals.—The conspicuous signal tower at the signal station

at Fort William, on the S side of the entrance, is 21.3m high and painted in black and yellow checkers; there is a white iron flagstaff on a tripod.

Anchorage.—There is anchorage in the outer roadstead, about 1.3 miles NW of Fort George, in depths of 27 to 33m, sand and coral.

The quarantine anchorage, whose position may be seen on the chart, is situated on the SW side of the entrance range, NW of the signal station.

Anchorage is prohibited in an area W of the signal station, in an area of submarine cables.

For vessels anchoring in the outer roadstead, the following is the advice of a former experienced harbormaster:

When anchoring in the outer roadstead, from the moment of anchoring, vessels should be ready to weigh anchor and put to sea if necessary. Use chain for a buoy rope. If the signal is made to put to sea, do so at once, and never attempt to ride out the storm. When leaving the anchorage from stress of weather, note the direction in which the wind shifts, and run the vessel in the opposite direction until clear of the land, when an E course will take its into good weather. Never heave-to with the vessels head toward the shore; in bad weather, local currents are often very strong and uncertain in direction; many vessels, in the belief that they had made a sufficient offing, have been hazarded, and some lost, through neglecting this precaution.

Directions.—Vessels approaching Port Louis at night from the SW should pass from 1 to 1.5 miles off Pointe Aux Caves Light on a course of 040°, until the entrance range lights are in range bearing 127°. The aft range light is conspicuous on the mountain behind the city, but the forward range is a white square on top of a building that is more difficult to see. Then alter course to 127° and take up anchorage in the outer anchorage.

Vessels approaching Port Louis from the NE should pass about 5 miles W of Flat Island Light (19°53'S., 57°39'E.); when that light bears 090°, a course of 205° should be steered. Pointe Aux Caves Light should be picked up on that course. When the entrance range lights are in line bearing 127°, alter course to that bearing and take up anchorage in the outer anchorage area.

By day, local knowledge is recommended, as the entrance range marks are difficult to identify.

9.13 Grand River Bay (20°10'S., 57°28'E.) on the W side is formed at the mouth of the Grand River, where it enters the sea through a gap in the reef; the reef extends 0.7 miles offshore in this area. Martello Tower, which is conspicuous, stands on the SW shore of the bay.

Pointe aux Caves (20°11'S., 57°24'E.) is marked by a light; the 20m curve lies 0.2 mile off the point.

Pointe Petite Riviere, 0.7 mile SW of Pointe au Caves Light, is the N entrance point of Petite Riviere Bay, which is almost filled by a reef.

Baie du Tamarin (20°19'S., 57°22'E.) has depths convenient for anchoring, but the holding ground is bad.

Grande Riviere Noire Bay is entered about 2.3 miles SSW of Baie du Tamarin. The bay is easily identified by a tower situated on the N entrance point, and by Mount Tamarin (20°21'S., 57°22'E.), which rises from the NE shore to a height of 548m.

Anchorage.—Anchorage can be taken in Grand Riviere

Noire Bay. After obtaining pratique at Port Louis, a mid-channel course between the reefs flanking the entrance should be steered; the reefs are easily seen.

Anchorage can be taken as convenient, in 10m to 28m. The anchorage is good, but with W winds a heavy swell sets in; the swell is felt less in positions toward the N side of the bay. Vessels should be prepared to leave the anchorage on short notice.

Pointe Sud Ouest (20°28'S., 57°18'E.) is the SW extremity of Mauritius. Pointe Sud Ouest is low and rises to a height of 556m at Le Morne Brabant, an isolated flat-topped hill 1.2 miles NE; the hill is an excellent landmark.

Tides—Currents.—During springs, the currents run over the bank W of Pointe Sud Ouest at rates from 3 to 5 knots causing considerable rips. The flood current runs ESE and the ebb current WNW along the S coast, but immediately N of the point the currents follow the coastline, the flood running NNE and the ebb running SSW at a rate of 2 to 3 knots.

Flinders Bank (20°35'S., 57°09'E.), about 1 mile in diameter, has a least charted depth of 101m.

9.14 South side.—From Pointe Sud Ouest, the S coast of the island trends ESE to the mouth of the River Savanne, which enters the sea close W of the S extremity of Mauritius. An islet, 49m high, lies on the coastal reef, 1.7 miles ESE of Pointe Sud Ouest.

Bel Ombre (20°31'S., 57°24'E.) is a narrow opening in the barrier reef about 5.5 miles E of Pointe Sud Ouest; a beacon stands on the reef on the E side of the entrance.

Bay Jacotet is an indentation abreast an opening in the reef, 3 miles E of Bel Ombre. The S extremity of Mauritius lies 5 miles ESE of Bay Jacotet, and Souffleur Point (20°29'S., 57°40'E.) lies 9 miles ENE of the S extremity.

Grand Port (20°24'S., 57°42'E.) is entered E of **Pointe D'Esny** (20°25'S., 57°44'E.); it is an extensive harbor and extends about 8.3 miles NNE. The three entrances to the bay are exposed to the full force of the Southeast Trade Wind and to the ocean swell. Reefs and banks border the shoreline and it is unapproachable.

Pointe Laverdure (20°25'S., 57°46'E.), which dries, lies at the edge of a reef, extending just over 2 miles E of Pointe D'Esny. Heavy rollers form nearly all the time over Laverdure Spit, 0.5 mile ESE of the point. Ile de la Passe, 11.6m high, lies 1 mile N of Point Laverdure; the ruins of a fort are situated on the islet.

The S entrance to Grand Port is formed S of Ile de la Passa and Danish Entrance, which is not recommended, and is formed at the N extremity of a reef, which dries in places, extending about 4.5 miles NNE from Ile de la Passe.

Ile aux Fouquets (20°24'S., 57°47'E.) lies on the edge of the reef 0.6 mile ENE of Ile de la Passe; a prominent disused light stands on the islet.

Ile aux Oiseaux (20°20'S., 57°49'E.) stands on the SW part of the reef, on the N side of Danish Entrance. The reef extends 1.2 miles NNE from the islet. Great South Point is the spit extending NNE from the reef; it breaks heavily at all times.

Ilot de Roches, on the N side of the North Entrance, lies just over 1 mile NNW of Great South Point; a beacon stands on the islet. Ilot de Roches marks the E edge of the reef, which extends 2 miles from the N entrance point of Grand Port.

Tides—Currents.—The tides are much influenced by the

winds. During strong SE winds, the HW stand sometimes last for several hours at and near Mahebourg, in the SW corner of the port.

In the South Entrance, the flow of water is nearly always out; the ebb may attain a velocity of 0.5 knot during a strong wind. The water may stand still during a flood tide.

In the North Entrance, both flood and ebb currents are regular and, though never strong, vary a good deal in velocity.

Aspect.—The Bambou Mountains rise over the NE part of Grand Port; the most conspicuous peaks on the range include:

1. Grand Port Mountain, near the SW extremity of the range, 4 miles N of Pointe D'Esny (20°25'S., 57°44'E.).
2. The outline including Lions Head, 0.4 mile SE, resembling the Sphinx facing inland.
3. Mount Bambou, 2.7 miles NNE of Lions Head.

The Thumb is a conspicuous upright column of stone, 0.1 mile E of Mount Bambou.

Point Bambou lies about 1 mile SSW of Pointe du Diable (20°20'S., 57°47'E.). Piton Rouge, just within Pointe Bambou, is a useful mark for vessels entering Grand Port by way of North Entrance. Mount Chat, 0.2 mile NNE of The Thumb, is distinctive from N and E of Pointe du Diable. A conspicuous white bungalow, with a black roof, stands just over 1 mile SW of Piton Rouge.

Anchorage.—Anchorage can be taken in Horseshoe Bight, close within Southern Entrance, with the SW extremity of Ile de la Passe bearing 161°, 0.3 mile distant, and Ile aux Fouquets disused lighthouse bearing 102°. This anchorage is on Annanas Bank and has depths of 10 to 14m.

The next most frequented anchorage is N of Petit Pate (20°23'S., 57°44'E.), 2 miles farther WNW of Annanas Bank, in a clear space 0.3 mile wide, with depths of 12 to 16m, mud.

Anse d'Hercule, 1.5 miles NNE of Petit Pate, affords anchorage, in a depth of 20m, mud.

Directions.—Three entrance channels, South Entrance, Danish Entrance, and North Entrance, lead through the reefs lying off the bay. Danish Entrance is not considered a safe channel.

All of these entrances are exposed to the Southeast Trade Wind, and swells from this source are often of considerable size.

Other problems met with by deep-draft vessels proceeding to and from Grand Port are the narrow fairways, rocks, and shoals in the inner anchorage areas.

9.15 Northeast side.—From **Ilot de Roches** (20°18'S., 57°49'E.) to Cape Malheureaux, the N extremity of Mauritius, a reef extends up to 2.5 miles from the coast. The reef has some openings, suitable only for boats, and encloses a number of bays, where several small rivers enter the sea.

There are no anchorages of any significance along this coast; the boats which enter the breaks in the barrier reef should have local knowledge.

Cargados Carajos Shoals

9.16 Cargados Carajos Shoals (16°38'S., 59°36'E.) is an extensive group of reefs, islets, and shoals. They have been reported to lie about 3 miles further SW than charted. The E side of the reef has not been closely examined, because it is almost

impossible to approach it from the E; in addition to the tremendous sea always breaking over it, is reported to be steep-to, and, therefore, most dangerous to approach under any circumstance. Several small islets and rocks rise from the long central reef of Cargados Carajos Shoals, and others lie off its N end and its W side. All of them are low; many are subject to being submerged in heavy weather.

Albatross Island (16°15'S., 59°35'E.) is about 3m high and is marked by a light. When viewed from the N, the light may be obscured by trees.

North Island, surrounded by coral reefs, lies 2.5 miles NNE from the main reef; depths off its W side are about 12.8m, but the E side is unsurveyed. Breakers are charted 1.8 miles NNE of North Island and isolated depths of 2.1m lie 1 and 1.3 miles SSE, respectively, of the island.

Ile Raphael (16°27'S., 59°37'E.) is a group of three islets visible at a distance of about 10 miles. There are fishermen's huts and a meteorological station on the islets; they are situated in the N part of the extensive shoal.

Siren Island lies 1.8 miles SW of Ile Raphael. Pearl Breaker lies 3.8 miles SSW of Siren Island.

Pearl Island (16°33'S., 59°31'E.) lies 2.3 miles SSW of Pearl Breaker; it is bare of vegetation, except for a conspicuous clump of trees on its NE end.

Frigate Island lies about 5.3 miles W of the extensive shoal area in a position 3 miles S of Pearl Island.

Mapare Island and Avocare Island lie about 10 miles SSE and 9.5 miles S, respectively, of Ile Raphael. Trees grow on both islands and are visible from a distance. Avocare Island can be approached from the W by small vessels with local knowledge, although such approach is difficult because of numerous coral heads and other dangers.

9.17 Baleine Rocks (16°41'S., 59°31'E.), an isolated group of rocks. The swell usually breaks over these rocks, but in good weather, with a calm sea, the position of the rocks, which is approximate, can be seen by discoloration of the water.

Coco Island (16°49'S., 59°31'E.) is located close within the S extremity of the primary reef, 8 miles SSW of Baliene Rocks.

Tides—Currents.—At the anchorage of Ile Raphael, the tidal currents are felt strongly in both directions; the N current is the stronger. Off Frigate Island they are very slight; the S current only is distinguishable. At the anchorage off Coco Island, the tidal current sets N when the tide is rising, at a velocity of about 0.5 knot. Here, the S current is barely perceptible.

In the month of August, a strong current setting W was experienced off the S side of Cargados Carajos Shoals.

Cargados Carajos Shoals should not be approached at night. A vessel approaching during the daytime from the S should steer for the long central reef. The SW extremity of this reef may be rounded at a distance of 1 mile. Vessels approaching from the N during the daytime should make Albatross Island.

Anchorage.—There are several anchorages in Cargados Carajos Shoals; all them should be approached from the W. There is an anchorage about 0.4 mile WNW of Ile Raphael, in a depth of 18m, one about 1.5 miles SSW of that islet, and 0.75 miles E of Siren Island in a depth of 20m. There is an anchorage, in 22 to 26m, 0.3 mile N of Frigate Island.

There is anchorage in the bight NE of Coco Island, at a dis-

tance of 2, 3, and 4.3 miles NNE of the light; vessels should not anchor in less than 20m in these berths.

Rodrigues

9.18 Rodrigues (Rodrigues Island) (19°42'S., 63°25'E.) is of volcanic formation and a dependency of Mauritius. A mountain range extending E and W across the island reaches a height of 396m in Mount Limon. Rows of peaks, separated by deep ravines, connect the central range to the N and S coasts of the island. The island is composed principally of basalt, but at either end is some upraised coral. It is hilly throughout; a central ridge trends ENE and WSW through the middle of the island along nearly its entire length. Spurs from the central ridge extend to the N and S coasts of the island; between the spurs are deep ravines. The W portion of the island is more or less broken into isolated hills and is generally lower than the E portion.

Rodriguez is connected with the general submarine cable system and has periodic communication by sea with Mauritius and Madagascar.

Tides—Currents.—During the Southeast Trade Winds, there is a constant W current at a velocity of 0.2 to 0.6 knots.

An extensive coral bank, with a least known depth of 42m, lies 90 miles W of Rodrigues. The limit of the bank, as defined by the 180m curve, appears to be about 10 miles in extent. The general depths over the bank are from 70 to 73m; the E limit of the bank has not been determined. The bottom for about 15 miles around the bank is most irregular; depths from 366 to 549m are found in close proximity to those from 1,829 to 3,658m.

Rodrigues is surrounded by a coral reef which projects about 0.1 mile off the NE side, 4.5 miles off the NW side.

The reef, which is flat, partially uncovers and bares numerous islets; during LWS, some parts may have 0.3 or 0.6m over them. The reef is steep-to, but with the swell that rolls in, the sea often breaks in depths of 18.3m more than 0.1 mile outside the actual reef. The heaviest breakers may be found on the SW extremity of the encircling reef. In light winds a vessel can anchor almost anywhere outside the reef, in depths of 18 to 37m.

There are many islets on the reef, which may be seen on the chart; Crab Islet, 46m high, lying 0.6 mile W off the S extremity of the island, is the highest of these islands.

Pilotage.—Pilotage for the island is not compulsory; a local boatman is always available for vessels that need advice as to the channels.

9.19 Port Mathurin (19°41'S., 63°25'E.) (World Port Index No. 47750) is situated on the N coast of Rodrigues; it consists of a large village situated on a mud bank, and is the principal settlement and administrative center of the island.

Depths—Limitations.—Mathurin Bay is the only harbor of Rodrigues available to deep-draft vessels.

It was reported (1978) that a depth of 18.3m was indicated by depth meter in position 19°37'28"S, 63°24'30"E. A depth of 35m is charted in this position.

The channel leading to Port Mathurin was reported to have been dredged to 8.7m in 1990.

Aspect.—Mont Piton shows as a rounded cone and is quite unmistakable from the vicinity of Mathurin Bay, but when seen from E or W, it loses its conical shape.



Port Mathurin



Quay at Port Mathurin

Pointe Venus (19°40'S., 63°26'E.) is a cliffy headland; a telegraph station stands on the point. The station consists of five large concrete and corrugated iron buildings that face the harbor; they are conspicuous.

The most conspicuous and blackest cliff on the N coast of Rodrigues in the vicinity of Port Mathurin is near the telegraph station. A whitewash mark is toward the E end of the cliff; if the mark does not show up well, the cliff itself is a useful mark.

A conspicuous flagstaff stands 0.3 mile WSW of the front range light; a group of radio masts stands S of Pointe Venus.

Anchorage.—Abandoned submarine telegraph cables exist in the N and E parts of Mathurin Bay; to avoid these a vessel should anchor, in 16 to 22m, W of a line drawn 010° from Point Venus and S of an E-W line, 0.8 mile N of the point.

Vessels at anchor in Mathurin Bay are sheltered from the SE wind that prevails the greater part of the year. The anchorage is further protected from the N by Middle Ground. Even so, rollers set in occasionally and cause a swell in the bay. They may come from any quarter, but usually last only a few hours.

Small boating is extremely hazardous.

In 1978, a vessel with a draft of 7.9m anchored, in 28m, in Mathurin Bay, just outside Western Pass, near the entrance range line, good holding ground, mud and sand.

Directions.—Vessels approaching Mathurin Bay from the W should keep Pointe au Sel, near the NE extremity of the island, open N of Pointe aux Cornes, the N extremity, until the lighted beacons are in line bearing 165.5°. A course of 165.5° should then be held until Booby Island bears 252°; from this position a SE course will lead to the anchorage.

Vessels entering by way of Eastern Pass should steer with Diamond Island in line bearing 231°, with a notch in the hills at the W end of Rodrigues. This course should be held closely until Mont Piton, the 354m summit, bears 181° and is in line with the whitewash mark on the black prominent cliff. A vessel in this position will be inside the reefs and shoals, and may alter course as necessary for the anchorage.

9.20 Port South East (19°45'S., 63°27'E.) is on the SE side of Rodrigues; it is approached through Grande Passe. No marks can be given for the entrance.

Port South East is suitable for vessels drawing up to 6.1m; it is well-sheltered, being protected by the reef, and has a clear space E of Hermitage Islet with depths from 5.8 to 18.3m, mud and sand, good holding ground. It would be a useful anchorage were it not for the difficulty of entry and exit.

Grande Pass, which has moderate depths, is free from dangers. Because of the strong tidal currents, the tortuous nature of the channel, and the usual strength of the wind, entry should not be attempted without local knowledge, except in a case of emergency.

The Aldabra Islands

9.21 The Aldabra Islands (9°25'S., 46°22'E.) lie on an atoll in the NE approach to Mozambique Channel and are comprised of four islands, namely West Island, Middle Island, Polymnie Island, and South Island. South Island is the largest of the group and forms the E and S, and the greater part of the W sides of the lagoon. The islands are reef-fringed, with the reef extending up to 0.2 mile off shore in places; they are steep-to. The islands are generally visible up to 15 miles.

The Aldabra Islands are a part of the Republic of Seychelles.

Tides—Currents.—The flood current runs through the passes for about 1 hour 5 minutes after HW, and the ebb current an equal time after LW. Throughout Main Channel and its branches, the current runs with great velocity, at springs attaining a velocity of 6.5 knots, with scarcely any SW; at neaps the velocity is 2.5 knots.

With any wind from a N direction; when ebb tides are running, dangerously confused seas suddenly occur in the entrance of Main Channel and for a distance seaward of up to 1 mile.

Anchorage.—During the Southeast Monsoon, the best anchorage for vessels up to 91m in length, with a 4.3m draft, lies about 0.3 mile W of the flagstaff at the settlement on West Island, in 37m; this is only about 0.1 mile from the edge of the reef, therefore, should the wind change and blow with any strength from the NW, vessels should be prepared to move.

During the Northwest Monsoon, anchorage may be taken E

of Hodoul Point, on the bank extending from the E end of South Island. This bank is uneven, therefore, vessels should anchor outside the 15m curve, about 0.2 mile from the extreme E end of the atoll. Should the wind change to the SE, a sharp sea soon builds up over this part of the bank.

Caution.—An IMO-adopted Area to be Avoided has been established around the Aldabra Island, Ile Picard and Assumption which may best be seen on the appropriate chart. Vessels greater than 500 grt, carrying oil or hazardous materials, should avoid the area.

Assumption Island

9.22 Assumption Island (9°43'S., 46°30'E.), which is a part of the Republic of Seychelles and is considered to be part of the Cosmoledo Group, lies 15 miles S of the E end of the Aldabra Islands. The island is surrounded by a narrow fringing, except at the N end of the bay on the N end; shoal water extends 0.9 mile SE from the SE end of the island. Except on the W side of the island, where there is a sandy beach, the seaward sides of Assumption Island are steep or overhanging cliffs. At the SE end of the island, there is a series of sand dunes, which are conspicuous and reach a height of 30m.

Tides—Currents.—At St. Thomas Anchorage, the flood current sets WSW at a velocity of 3 knots at springs while the ebb current ENE at a velocity of 1 knot at neaps.

Anchorage.—In the bay off the W coast, anchorage during the Southeast Monsoon may be taken anywhere about 0.1 mile from the high water line, in about 9m, but the stern would then be in about 55m and a vessel would need to weigh anchor should the tide cause the vessel to swing against the wind.

Small vessels loading from the island normally drop their anchors on the reef edge, about 0.1 mile NE of a ruined pier, and lie back on their chain during the Southeast Monsoon.

During the Northwest Monsoon, vessels could anchor, in 29m, 1.3 miles E of the highest sand dune at the SE end of the island.

Caution.—An IMO-adopted Area to be Avoided has been established around Assumption Island, which may best be seen on the appropriate chart. Vessels greater than 500 grt carrying oil or hazardous materials should avoid the area.

9.23 The Cosmoledo Group (9°43'S., 43°36'E.) lies on an atoll and is a part of the Republic of Seychelles.

The group consists of many islands of raised coral lying on the perimeter of an almost circular reef. The largest islands are Menai, on the W extremity, and Wizard Island (9°44'S., 47°39'E.), on the SE extremity. The seaward edge of the reef, which dries from 0.6 to 0.9m, is steep-to.

The maximum elevation is normally 4.5m, but sand hills of considerably greater heights have been raised. All of the islands of the Cosmoledo Group show signs of great erosion, both on the seaward and lagoon sides.

Menai Island (9°42'S., 47°31'E.) is the site of the only settlement in the group; the only other houses are at a fishing station on Wizard Island. The seaward coast is sandy. Johannes Point, the NW extremity of the island, is conspicuous. The settlement is situated close NE of Johannes Point; another conspicuous point is located close N of the settlement. A clump of trees, about 15m high, is located on the S end of Menai Island.

9.24 West North Island (9°39'S., 47°34'E.), the farthest N of Cosmoledo Group, lies NE of Menai Island; it has a height of 8m. South Island, 6m high, is the farthest S of the group; it lies SE of Menai.

Tides—Currents.—At the anchorage off Menai Island, the tidal currents are strong. The ebb sets NE, augmenting the ordinary set of the equatorial current around the island. The flood, during neaps, barely neutralizes the set; at other times it sets SW. The velocity of the outgoing current in South West Passage is 4 to 6 knots; the velocity of the outgoing current in South East Passage is 4 knots.

Anchorage.—Anchorage may be found during the Southeast Monsoon, in about 28m, about 0.2 mile from the reef off the settlement of Menai Island. The bank is steep-to, but the sea is smooth and little swell passes around the island.

During the Northwest Monsoon, anchorage can be taken, in 9 to 18m, it is reported, in positions E of the N part of Wizard Island or, in 18 to 37m, about 1 mile SE of this island. Neither anchorage has been surveyed, therefore, they should be used with caution.

9.25 Astove Island (10°04'S., 47°45'E.), which is a part of the Republic of Seychelles, lies on an atoll SSE of the Cosmoledo Group. The reef fringing the island is steep-to, except on its SE side and off the N point. The settlement is on the W side of the island, about 0.8 mile SSW of the N extremity. A wooden cross, painted white, is easily visible among the trees at the N end of the settlement.

Providence Island

9.26 Providence Island (9°14'S., 51°02'E.) lies at the N end of a reef; Cerf Island lies at the S end of this reef. Providence Island is well-wooded, with coconut palms and an avenue of casuarina trees, 15.2m high, traversing the middle of the island from E to W. Near the W extremity of the island is a long low red-roofed building. The islands are a part of the Republic of Seychelles.

The E side of the reef has not been examined from seaward; the prevailing SE winds and heavy seas render it unapproachable. It was reported (1972) that the reef lies 2 miles farther to the E than charted. A light is exhibited from a metal framework tower on the NE end of Providence Island. The light is obscured over the island, and the S and W parts of the reef, between the bearings of 359° and 020°.

Wizard Reef, which breaks heavily, lies N of Providence Island.

Cerf Island has been planted with coconut palms; the tops of some of these are 10.7m high, and it is said that the island is visible up to 10 miles. A flagstaff marks Cerf Island.

A depth of 16.8m lies 9.5 miles S of the N extremity of Cerf Island; depths of 17.6m and 18.1m lie 1.5 miles NNW and 4 miles NE, respectively, of this depth.

Tides—Currents.—At the anchorage off Cerf Island, the tidal current sets N at a velocity of 0.25 to 0.5 knot (at springs, possibly more), while the tide is rising by the shore, and SW at about the same velocity, but irregularly, while the tide is falling. The currents are slack for about 1 hour at the turn of the tide.

At the anchorage off Providence Island, there is a marked

difference in the currents; they are stronger and set N for 9 hours, from 3 hours before HW until the succeeding LW, at a nearly constant velocity of 1.5 knots (at 5 days after the change of the moon); then they slacken and set SSW for about 3 hours at nearly 1.5 knots, then turn rapidly again to the N.

Anchorage.—The most convenient anchorage from which to communicate with Providence Island is in 35m, sand and coral, with the village boathouse bearing about 119° and the N extremity of the island bearing about 046°; caution is necessary, as the depths decrease very rapidly. This anchorage is free from much swell during the Southeast Trade Wind, but is exposed to the wind. A vessel of 900 grt anchored in this position, but was informed by the manager of the island that a better anchorage could be found, in 22m, 0.1 to 0.2 mile farther S.

Southeast winds blow about 9 months of the year, but in January and February, when NW winds are strong at times, it is reported that vessels can anchor E of Providence Island.

The most sheltered anchorage is in 18m with the N end of Cerf Island bearing about 142°, distant 2 miles; the bottom here is more even, and anchorage depths extend farther from the reef.

9.27 St. Pierre Island (9°19'S., 50°43'E.) is a part of the Republic of Seychelles. The island is barren except for a clump of casuarina trees, 12.2m high, on its N part.

The seaward faces of St. Pierre Island are abrupt coral cliffs, 2.4 to 3m high. The ceaseless sea swell has undercut these faces; jets of water are thrown up in many places by each wave as it strikes “blow holes” worn out of the coral.

At the SE shore of the island, the wearing away has caused the formation of flat shelves.

Anchorage can be obtained off St. Pierre Island, in 37m, coral, with the pier bearing 180°. The holding ground is bad and a vessel should always be ready to put to sea should the wind freshen from the N.

The Farquhar Group

9.28 The Farquhar Group (10°10'S., 51°07'E.), part of the Republic of Seychelles, lies on an atoll 35 miles S of Cerf Island. The islands are visible from a considerable distance.

The barrier reef is steep-to, except on its NW side where there is a sand bank, with a least depth of 11m; the bottom is plainly visible.

North Island (10°07'S., 51°11'E.) is the farthest N of the Farquhar Group; North Point is the N extremity of the island. Race Point is situated 1.2 miles SW of North Point and is the principal entrance to the lagoon.

North Island has a height of 12.2m near the settlement manager's house; a height of 6.1m is located 0.7 mile SE of North Point.

Golette Island (10°13'S., 51°08'E.) is the farthest S of the islands in the group and is difficult to identify at more than 4 miles. The fringing reef extends nearly 5 miles WSW from Golette Island and then extends the same distance WNW to its W extremity.

Ile des Deposes lies on the edge of the reef 3.5 miles NNE of its W extremity; Race Point is located 5.5 miles ENE of Ile des Deposes.

Winds—Weather.—Southeast winds prevail from April to October. During the remainder of the year the winds are vari-

able.

Tides—Currents.—At the anchorage, the tidal current sets NE during the rising tide until 3 hours after HW by the shore. The velocity at springs is 0.25 to 1.25 knots. The tidal current sets W at a velocity of about 0.5 knot, or is slack for the remaining 3 hours before LW.

Anchorage.—Anchorage can be taken on the bank off the entrance of the channel at Race Point, except during the cyclone season from December to April, inclusive.

In the recommended position for anchoring, the depth is 12m, with Race Point bearing 173° and North Point, on North Island, bearing about 079°. The bottom in this position is sand. Considerable swell is felt here.

Directions.—Vessels approaching the anchorage from the E should round North Point at a distance of at least 1 mile.

Vessels drawing more than 3m should not, except in cases of emergency, attempt to proceed through the channel to Inner Harbor; the channel is narrow and winding and the tidal currents attain velocities of 3 to 4 knots.

Bulldog Bank (10°00'S., 50°48'E.), with a least charted depth of 18.3m, lies WNW of the N extremity of the Farquhar Group; McLeod Bank, with a similar depth, lies farther in a WNW direction.

The Comores Islands

9.29 The Comores Islands (12°12'S., 44°16'E.) lie in about the middle of Mozambique Channel; all four islands of the group (Njazidja, Mwali (Moheli), Nzwani, and Mayotte) are of volcanic origin

Njazidja

9.30 Njazidja (11°37'S., 43°22'E.) is covered with vegetation, except where lava has solidified. Mount Karthala is a crater, but from a distance the mountain appears smooth and dome-shaped. The S slope rises so evenly from sea level as to give a deceptive impression of the height. In clear weather, Mount Karthala can be seen from distances up to 100 miles.

Ras Habu (11°21'S., 43°25'E.), the NE extremity of the island, is connected with the shore by a low neck of land, and from a distance appears as an island.

Between Ras Habu and the NW extremity of Njazidja, 6 miles W, the N coast is generally low, but the land rises steeply to a plateau about 762m high, which is the site of some volcanic cones. The extent of the reef fringing this coast is little known.

9.31 West side.—The coast is steep-to, but has no distinctive features.

Mitsamiouli (11°23'S., 43°17'E.) is a village situated close S of the NW extremity of the island. A large white conspicuous hospital, surmounted by a flagstaff, stands in the middle of the village. Temporary anchorage, in case of necessity, may be obtained, in 55m, with the flagstaff on the hospital bearing 099°, distant 1.2 miles, or in 20m, with the flagstaff bearing 114°, distant 0.7 mile. It was reported (1996) that the hospital is obscured by trees.

Moroni (11°42'S., 43°15'E.) (World Port Index No. 47300) is situated on the W side of Njazidja, at the head of Moroni

Bay, about 2.5 miles SSW of N'Tsoudjini. The port consists of a town, a very small harbor, and an open roadstead.



Moroni Harbor

The bay is encumbered by a shallow flat of sand and coral. Ilot Souazou lies on the flat and is marked by a light. The anchorage off Moroni is poor and the holding ground is not good; it is open to SW winds and vessels are often forced to put to sea during the dry season. The depths in the anchorage are from 22 to 35m, sand and coral. The anchorage should be approached before sunrise, but a night approach is dangerous as the lights are only visible from a short distance and are often extinguished.

A jetty, 280m long and 30m wide, is situated 0.1 mile WSW of Ilot Souadzou. Local knowledge is required to use the berths for varying limitations of depths. Vessels with an loa of 70m and a draft of 3m have used the jetty.

Tankers berth at an offshore mooring buoy where the maximum depth is 4.5m. A submarine pipeline connected to the shore the buoy.

9.32 Southwest side.—Pointe N'Gouni (11°44'S., 43°13'E.), the W extremity of Njazida, lies SSW of Moroni. Pointe Moindzaza is located 3 miles S of Pointe N'Gouni; the intervening coast is fronted by a reef which extends 0.3 mile offshore.

Cratere Moindzaza, on the coast N of Pointe Moindzaza, is distinguished by its small ravines forming regular, parallel furrows from its base to summit. A lookout station on the summit forms a remarkable landmark.

Caution.—Recif Vailheu (11°49'S., 43°02'E.) lies 12 miles W of Pointe Moindzaza. The reef is reported to lie 2 miles SE of its charted position; it is always covered with a minimum of 4.9m of water. It can be identified by the discoloration of the water, and, in good visibility, it can be seen.

Between Pointe Moindzaza and the S extremity of Njazidja, the coast is low, rocky, and appears to be steep-to; it is backed by many villages.

9.33 East side.—Between the S extremity of Njazidja and **Pointe M'Vouni** (11°53'S., 43°30'E.) the coast continues low and rocky and a reef extends 0.5 mile from it in places. Pointe M'Vouni is low, but a hill rises to a crater close within it. Baie des Essarts is formed about midway along this coast.

Chindini (Shendini) (11°54'S., 43°31'E.) is a village situated about midway between West Point and North Point. A white house in the village is a useful mark. A steep-to patch, over which the least depth is 5.7m, lies in the outer anchorage off Chindini in a position about 0.6 mile ESE of the village. A reef fronts the village.

The anchorage off Chindini, in 33m, is SW of the shoal patch, with North Point bearing 023°, West Point bearing 258°, and the white house in the village bearing 307°. Local knowledge is required before anchoring.

From Pointe M'Vouni, the E coast of Njazidja trends in a NNW direction to Ras Habu; this coast is nearly uniform in aspect and has no coastal plain.

A table topped hill rises to a height of 500m, 12 miles NNW of Pointe M'Vouni and about 4.5 miles farther NNW are lava cliffs. A mosque in the village of Mahale, 1 mile NW of Pointe M'Vouni, is conspicuous.

Mwali (Moheli)

9.34 Mwali (12°19'S., 43°45'E.), the smallest island of the group, rises to a height of 790m. It lies SSE of Grande Comore; this fertile island is well-wooded and coconut palms are abundant.

9.35 Northeast side.—From **Pointe Hoani** (12°15'S., 43°40'E.), the coast of Mwali trends SE 15 miles to Pointe Tsinayouhi, the SE extremity of the island. This coast is little known except in the vicinity of Fomboni, which is about 5 miles SE of Pointe Haoni.

The most conspicuous feature on this coast is Square Top, situated near the coast 4.5 miles NW of Pointe Tsinayouhi.

Fomboni (12°16'S., 43°45'E.) (World Port Index No. 47310) is situated in a slight indentation in the coast at the head of Anse Doueny; the port is very small and consists of a town and an open roadstead in Baie Fomboni (Fomboni Road).

Depths—Limitations.—The port is visited by small coastal vessels only.

Signals.—There is a signal station at Fomboni; storm signals are shown.

Anchorage.—The anchorage off Fomboni is good during the SE trade wind, although a troublesome swell is sometimes experienced; during the Northwest Monsoon, from about November to February, the swell is very heavy and the anchorage is not safe. Small vessels can obtain better shelter in Anse Tsoa (12°17'S., 43°46'E.) during SE winds.

Large vessels should not anchor in depths of less than 16.5m.

A vessel of moderate size can anchor on the alignment of Beacon A and Beacon B, in line bearing 195°, and with the daymark on the reef close off the W entrance point of Anse Doueny in range with the beacon 1.5 miles WNW of Fomboni, bearing 267°, in about 15m; in 1970, a vessel was recommended to anchor N of the latter alignment.

9.36 South side.—From **Pointe Tsinayouhi** (12°23'S., 43°52'E.), the S coast of Mwali trends WNW to Pointe Miremani, a distant of 12.7 miles. Pointe Tsinayouhi is steep-to, but the intervening coast to Pointe Domode, 5.5 miles WNW, is fringed by a coastal reef which extends up to 1.5 miles offshore. Between Pointe Domode and Pointe Miremani, the coast

and fringing reef are indented by numerous coves.

A depth of 1.4m is charted in a position 1.5 miles SSE of Pointe Domode, and breakers have been observed in a position about 3 miles SSW of the same point.

Ile Dzaha (12°24'S., 43°39'E.), located 2.5 miles S of Pointe Miremani, is the farthest SW of the islets off this coast; a charted depth of 9m lies 1.2 miles SSW of this islet.

Sail Rocks (12°21'S., 43°40'E.), located on the coastal reef 0.5 mile SE of Pointe Miremani, are a good mark; they have perpendicular sides, about 15.2m high, and are visible up to 10 miles. The other islets off this coast are best seen on the chart.

Anchorage.—Vessels with local knowledge can anchor, in 18m, muddy sand, with Nioumachoua Point bearing 288°, 0.7 mile distant.

Miremani Cove is an indentation close E of Sail Rocks. Vessels with local knowledge can take secure anchorage in the cove, in 18 to 37m, with a bottom of sand and mud. In the recommended position, Sail Rocks bear 270° and the NE extremity of Ile Canzoni bears 169°.

9.37 West side.—From **Pointe Miremani** (12°21'S., 43°39'E.), the coast trends NNW to Pointe Damou, then continues NNW to Pointe Miringoni, the W extremity of the island. Vessels can anchor off the villages along the stretch of coast, keeping from 1 to 1.5 miles offshore. From Pointe Miringoni, the coast trends 2 miles NNE to Point Tsandzani, then continues 2 miles ENE to Pointe Hoani, the N extremity of the island. Ile Bouelachamba, located on a reef, lies 0.5 mile SW of Pointe Miringoni. Midway between Pointe Tsandzani and Pointe Hoani is the village of Domoni. Anchorage can be obtained off Domoni; the depths decrease regularly from 24 to 14.6m, 0.5 mile offshore.

Nzwani

9.38 Nzwani (Anjouan) (12°13'S., 44°22'E.), lying E of Mwali, is of volcanic origin and is fertile. From the W it appears as a succession of peaks, wooded to their summits, rising one behind the other. From a distance of 50 miles from the E, it appears as two peaks, of which the N is the higher. Pic Mtintgui, in about the middle of the island, is conspicuous; it attains a height of 1,595m, but its highest point is rarely visible, except in the early morning during good weather, because of enveloping clouds. The peak is cone-shaped.

9.39 North side.—Between the N and W extremities of the island, the coast forms a bay and is fringed in places by coral reefs. The reefs show up green at HW and the sea breaks over them at half-tide unless it is calm; there are usually tide rips off each extremity.

Patsy Road (Patsi Road) (12°08'S., 44°27'E.) (World Port Index No. 47330) is an indentation between Pointe Patsi and Pointe Mirontsi.

9.40 Mutsamudu (12°10'S., 44°24'E.) (World Port Index No. 47320) is SSW of the N extremity of Nzwani and lies 0.5 mile SSW of Pointe Mirontsi. The port of Mutsamudu is an artificial dredged harbor situated close W of the town and is the principal port of the Comores Islands.

Depths—Limitations.—The harbor is formed between



Pointe Miringoni—W extremity



Nzwani Coast

Quai Principal, on the N side, and Quai de Transit, on the S side. Quai Principal, which projects from reclaimed land W of the Mutsamudu minaret, has three berths on its S face.

Berth 1A, at the outer end, has a dredged depth of 9m alongside; this berth is used for foreign trade and can accommodate ro-ro vessels. Berth 1B, E of Berth 1A, has a depth of 4.5m alongside and used by coasters. Berth 1C, between Berth 1B and the root of the quay, is for vessels that can be grounded.

Berth 2, on the N side of Quai de Transit, has a depth of 3.7m alongside; this berth is used by inter-island traffic.

Aspect.—The most prominent objects are a large white minaret near the center of town and a white church, which stands alone on a hill, ESE of the minaret.

Pilotage.—Pilotage is compulsory. Pilots and tugs should be requested through the harbor master's office; a radiotelephone watch is kept. The pilot embarks 2 miles N of the harbor.

Anchorage.—Anchorage for ocean-going vessels off Mutsamudu is approached with the lookout station light tower bearing 102°. Vessels anchor with the range beacons in line bearing 184°, in a depth of 60m. There is also anchorage in Mouillage de la Fontaine, in a depth of 55m, about 0.8 mile offshore, with the N and SE anchoring beacons in line bearing

134°.

Ilot de la Selle (12°09'S., 44°13'E.) lies close NW of the W extremity of Nzwani; it is a small saddle-shaped bluff. There is said to be good anchorage off the N side of Ilot de la Selle, in 22m. Vessels rounding the W extremity of Nzwani should stay at least 1.5 miles off Ilot de la Selle.

9.41 Southwest side.—Between the W extremity of Nzwani and Pomoni, a reef extends up to 1 mile from the coast; there are some gaps in the SE part of this area in the vicinity of the villages. From Pomoni to the S extremity of the island, 9 miles SE, the coast is mostly steep-to.

An isolated coral shoal, with a charted depth of 5m, lies close offshore NW of Pomoni.

In May, rollers are heavy at times along this coast; rain is said to be incessant.

Pomoni (12°16'S., 44°24'E.) (World Port Index No. 47315) inner anchorage consists of a natural basin in the coastal reef, which dries. During the Northeast Moonsoon, the anchorage is calm. With strong winds from the S to SW, and during spring high tides, the anchorage may be dangerous. The depths in the fairway are from 16.5 to 35m, but a reef with a least depth of 1.2m lies in middle of the outer part of the entrance; it is difficult to distinguish. The harbor of Pomoni can be used by vessels with a length not exceeding 61m.

Pomoni may be identified by its high saddle-shaped land and two contiguous peaks dominating the coast. The white square chimney of a sugar refinery, 0.7 mile SE of the basin entrance, and a white beacon situated 0.2 mile NE of the chimney, are good landmarks. There is anchorage about 0.4 mile SW of the sugar refinery, in 26m.

Directions.—Pomoni can be approached with the sugar refinery chimney in line with the beacon NE, bearing 046°. The harbor is then entered with two distinctive walls in line bearing 009°, which passes close E of the 1.2m coral shoal; care should be taken not to have too much way on so as to be able to turn short round the NW extremity of the S reef.

9.42 East side.—Between **Mourne de la Pointe** (12°23'S.,

44°32'E.), the SE extremity of Nzwani, and the N extremity, the coast is high, rocky, and generally steep-to. The most important places on this coast are M'Ramani, Domoni, and Bamboa, situated 2, 7, and 10.5 miles N, respectively, of Mourne de la Pointe. At M'Rami, there is a white minaret which is prominent.

Domoni (Deumoni) (12°15'S., 44°32'E.) is a village N of Mourne de la Pointe. There is a good anchorage off the sugar refinery, in depths of 14 to 27m, 0.4 mile offshore, except at the height of the Southwest Monsoon in August and September.

Bamboa (12°12'S., 44°31'E.) is a village N of Domoni. A white factory chimney on the W side of Bamboa and a house, with a flagstaff NW of the village, are easily identified.

Two range beacons stand on the S side of the village; M'Sangani Beacon, the front beacon, stands on the shore near a break in the fringing reef; Achombo Beacon, the rear beacon, stands 0.3 mile W of the front beacon. Gege Beacon stands on the beach, off the mouth of the Riviere Gege, 1.2 miles SSE of M'Sangani beacon tower.

The N of two anchorages off Bamboa is on the alignment of the range beacons, bearing 274°, with Gege Beacon bearing 184°, in depths of 29 to 35m; this is the more convenient berth for working lighters, but there is deep water close seaward.

Mayotte

9.43 Mayotte (12°49'S., 45°10'E.) is remarkable from all directions due to its uneven profile. The coasts are low and swampy and are inundated by the sea in many places; they are covered by mangroves. The administrative and commercial capital of Mayotte is on Ilot Dzaoudzi, off the E coast of the island.



Mayotte

Choungui rises from comparatively low land about 3 miles N of the S extremity of the island; the peak has the shape of a sugarloaf. An observer approaching the island from the E can easily identify Morne Carre, a square-topped hill about 1.7 miles E of Choungui. Combani Hill has a fairly conspicuous conical summit; the hill rises in about the middle of the island and is not distinguishable from the SE or S.

Tides—Currents.—The current in the vicinity of Mayotte is variable, but close inshore they usually follow the direction of the coast and reefs; at times they attain a rate of 3.5 knots in the passages. Between Nzwani and Mayotte the current usually sets SW, but sometimes it sets SE at a considerable rate.

Depths—Limitations.—Mayotte is surrounded by a barrier reef which is generally steep-to and should be approached with caution due to uncertain currents in the vicinity and to the considerable distance parts of it lie off the island. The reef is broken by many passages except off the S and NE coasts; the principal passage is Passe M'Zamboro, N of the island.

The best time for a vessel to proceed through the passage, draft permitting, is at or near LW, when the reefs are generally visible in a good light. The passage is marked by lights, beacons, and buoys, but the buoys are often swept away by seas.

The barrier reef is usually marked by breakers, but discoloration of water is the only warning in a calm sea at HW.

9.44 Northeast side.—Between **Rassi Douamoungo** (Cap Douamoungo) (12°39'S., 45°06'E.), the N extremity of Mayotte, and Pointe Makoén, about 10 miles SE, the coast is high, rocky, and indented; the barrier reef lies up to 4.5 miles off parts of this coast, and many islets and reefs lie in the area between the coast and the barrier reef.

Reefs extend 1 mile NE and 1 mile E of Rassi Douamoungo; a light marks the SE extension of the reef. A depth of 8.8m lies 0.2 mile ESE of the light.

Pointe Bandaboa (12°42'S., 45°08'E.) is high and steep; a beacon stands on this salient point.

Baie de Longoni is entered between Pointe Bandaboa and Pointe de Longoni. Ile Verte, surmounted by a beacon, lies close off the head of the bay, 1 mile WSW of Pointe de Longoni.

Baie de Longoni affords good sheltered anchorage, in depths of 18 to 37m. The beacon on Ile Verte, bearing 175°, leads into the bay clear of all dangers.

Longoni Cove, at the E end of Baie de Longoni, affords restricted anchorage in depths from 7 to 15m.

From Pointe de Longoni the coast trends ESE about 3 miles to Pointe Kongo (12°44'S., 45°13'E.), then SE 1.7 miles to Pointe Makoén. The first part of this coast is almost steep-to, but between the latter two points the reef extends 0.7 mile offshore, and reefs and foul ground extends 1.5 miles SE of Pointe Makeon.

Passe M'Zamboro (12°36'S., 45°07'E.), the principal approach to Mayotte through the barrier reef, is approached from the N and leads between the E extremity of Recif du Nord and the W extremity of Grand Recif du Nord-Est; it has a least depth of 10.5m in the fairway, although caution is necessary, as depths of as little as 9.1m lie close to the charted recommended tracks.

Pilotage in Passe M'Zamboro is compulsory for all vessels over 30m in length; the maximum draft that can be taken in is 11.5m. Pilotage is available from 0600 until 2200. Vessels send a request for pilotage 48 hours and 24 hours in advance. Vessels confirm their ETA with the harbormaster 18 hours in advance and contact the pilot on VHF channel 14 or 16 about 2.5 hours in advance. The pilot normally embarks 1.5 miles off the pass. Passe M'Zamboro and passage to Dzaoudzi should not be attempted at night.

9.45 East side.—From Pointe Makoén, the coast trends in a general SSE direction to Pointe Saziley (12°58'S., 45°12'E.). Pointe Saziley is steep-to, rocky, and has a white patch on the cliff; it rises to Morne Saziley, close W, and is a good mark.

Anse Choa is formed N of Pointe Choa, about 1.5 miles SSE. Pointe Makoén; a coral reef, which dries 0.9m, lies in the middle of the entrance of the bay. An underwater cable has been laid from the jetty in Anse Choa in an ESE direction to Ilot Dzaoudzi, a distant of 1.2 miles; anchoring is prohibited within 45m of the cable. There is a mooring buoy in Anse Choa.

A minaret is situated in a village 1 mile SW of Pointe Choa.

Pointe Hamouro (12°52'S., 45°13'E.) is located SSW of Pointe Choa; Benara rises to a height of 660m WSW of the point.

Two lights, which form a range bearing 293°, are situated 0.5 mile SW of Pointe Hamouro; they should not be relied upon.

Pointe Saziley, the SE extremity of Mayotte, lies 6 miles SSW of Pointe Hamouro; a reef extends about 0.8 miles SE of the coast midway between these two points.

Ile Pamanzi (12°47'S., 45°18'E.) lies E of Pointe Choa; from a distance the island appears as a saddle. The E side of the island terminates in a high, almost perpendicular cliff; the cliff is a useful mark for vessels approaching from the S. There is an airfield at the S end of Ile Pamanzi.

Ile Combe Doume lies 1 mile NW of the N extremity of Ile Pamanzi, E of the N approach to Ilot Dzaoudzi.

There are several islets in the fairway between Mayotte and Ile Pamanzi; their positions may best be seen on the chart.

Sisoa Bouzi (12°49'S., 45°14'E.), 163m high, lies about 1.8 miles SW of Ilot Dzaoudzi. Four isolated rocks, the highest one 2.3m, lie within the 20m curve, 0.2 mile NE of Sisoa Bouzi.

The barrier reef off the E coast of Mayotte, between Ile Pamanzi and Recif du Sud, is broken by several passages; the principal one is Passe Bandele, and is the usual route for vessels from the E bound for Ilot Dzaoudzi. The passage is entered E of Ilot Bandele, which can be identified from seaward by a scar on its E slopes resembling a quarry. A maximum draft of 5m is allowed in the passage.

The passage is not suitable for large ships and should not be attempted at night; it is difficult to navigate due to its narrowness and the strength of the tidal currents.

9.46 Ilot Dzaoudzi (12°47'S., 45°15'E.) (World Port Index No. 47340) is an islet lying off the NE side of Mayotte and close W off the W extremity of Ile Pamanzi. A drying reef extends 0.4 mile W from the NW side of Ilot Dzaoudzi and Roche Orests, which covers 1m, lies 0.2 mile W of the W extremity of the islet. Vessels anchor, according to the season, in Baie de Pamanzi, NE of Ilot Dzaoudzi, or SW of the island. During the dry season, May to October, vessels use the NE anchorage and anchor, in a depth of 20m. From November to April, the preferred anchorage is about 0.2 mile SSW of the head of the W jetty. Cargo is handled in steel barges of 100 tons capacity each. Oil products are handled at a mooring buoy berth off the NW side of Ile Pamanzi; a submarine pipeline is laid between the berth and the shore.

9.47 South and W sides.—Pointe Dapani (12°59'S., 45°11'E.) can be distinguished from the E by a high hill in the vicinity. Chissioi M'Bouini, 2.2 miles WSW of Pointe Dapani, the S extremity of Mayotte, is joined to the island by a sand bank.

Between Chissioi M'Bouini and Pointe Boueni (12°54'S., 45°04'E.), 7 miles NNW, the only outstanding features are

Pointe Kana, 4.2 miles NW of Chissioi M'Bouini, and a peak 1 mile E of Pointe Kana backed by Choungui, 2.2 miles farther E.

Baie de Boueni (12°53'S., 45°06'E.) is entered between Pointe Boueni and Pointe Doujani. The bay is encumbered with dangers; entrance requires local knowledge.

Passe du Morne Rouge (12°52'S., 44°57'E.), through the W side of the barrier reef, near its W extremity, is far from the coast for the range marks to be identified. The N slope of Red Mount, in line bearing 066° with the S slope of M'Sapere, 5 miles ENE, may be of use for proceeding through the passage.

Red Mount (Ochoungui) (12°48'S., 45°06'E.) is 223m high and conspicuous. A dangerous bank lies 2 miles WSW of Red Mount. Vessels can pass W of the bank by keeping the E summit of Chissipi M'Zamboro (12°39'S., 45°02'E.) in range with the hill on Pointe Acua (12°45'S., 45°03'E.).

Passe des Iles Choazil (12°41'S., 44°58'E.) leads through the barrier reef in a position about 3.5 miles SW of Chissipi M'Zamboro; the area over the reef has been dredged to a depth of 5.3m. Banc de la Pudente lies 1.7 miles N of the fairway.

Banc du Geyser (12°21'S., 46°26'E.) is a dangerous reef with numerous rocks. Most of these rocks dry and many are visible at half ebb; the largest rocks appear to be about the size of boats under sail.

Banc de la Zelee (12°27'S., 46°14'E.) has a least charted depth of 10m; it lies with its center about 10 miles WSW from the extremity of Banc du Geyser and is about 14 miles in extent in an E and W direction.

Caution.—The area in the vicinity of Banc du Geyser is the most dangerous part of Mozambique Channel. In fine weather, at high tide and with smooth water when the sea does not break, there is, even by day, little warning of nearness to the reef. Reliance must be placed on a sharp lookout and on careful sounding. On the N side of the reef, it has not been shown that sounding will give any warning of proximity to the reef.

The bank should be given a wide berth. Even though the trend of the general current is to the W in the area of Cape d'Ambre (11°57'S., 49°17'E.), E to NE countercurrents, at an average velocity of 1 knot, have been experienced in the vicinity of the bank.

Depths shallower than charted may be encountered on Banc de la Zelee and Banc du Geyser. These two banks are reported (1994) to lie 3 miles E of their charted positions.

Iles Glorieuses

9.48 Iles Glorieuses (11°31'S., 47°20'E.) are French possessions administered from Ile de la Reunion. The group lies on a reef 9 miles long and is comprised of Ile Glorieuse, Ile du Lys, and some scattered low rocks.

Ile Glorieuse (11°33'S., 47°18'E.), 12m high, located at the SW extremity of the reef, is the largest; it is flat, sandy, and covered with trees, up to 12.2m high. The trees may be seen at a distant of 15 miles. A meteorological station, with a flagstaff, is located on the S side of the island and there is an airstrip.

Discolored water, having the appearance of a reef, has been observed extending 2 miles W from Ile Glorieuse; caution is necessary when approaching the island.

Rocher Sud, 0.9m high, lies near the edge of the reef, about 0.1 mile S of Ile Glorieuse. A radar conspicuous piling stands

on this rock. Roches Vertes, 1.4 miles ENE of Ile Glorieuse, consists of three rocks, about 4m high.

Ile du Lys (11°30'S., 47°23'E.) lies NE of Ile Glorieuse. The outline of Ile Glorieuse and Ile du Lys changes with the time of year, especially at the height of the monsoons. An observer in a position 10 miles N of Ile du Lys sees three hummocks, with trees between them which are 10.7m high.

No channel or break traverses the reef between the islets. In a position about 1.5 miles E of Ile Glorieuse, in the vicinity of Roches Vertes, the reef is only about 0.5 mile wide. The sea does not always break on this narrow part, even when it is breaking heavily elsewhere. There is danger of mistaking this narrow part for a passage.

A bank, with depths of less than 20m, extends 4.7 miles NW and 3 miles NE from Ile du Lys; depths increase rapidly outside the seaward edge of the bank. On the bank there are depths of 10m or greater at a distance over 1 mile from the reef. A shoal, with a depth of 5.3m and a 3.2m patch, lie 2 miles and 0.7 miles WNW, respectively, of Ile du Lys.

A spit of the reef, with a 3m depth charted near its extremity,

extends 2.5 miles NNE from Ile Glorieuse.

Tides—Currents.—The tidal currents are weak; the flood sets W and the ebb sets E at the anchorages off Ile du Lys. At the anchorage off the NW side of Ile Glorieuse, the ebb was found running WSW at a rate of about 1.5 knots.

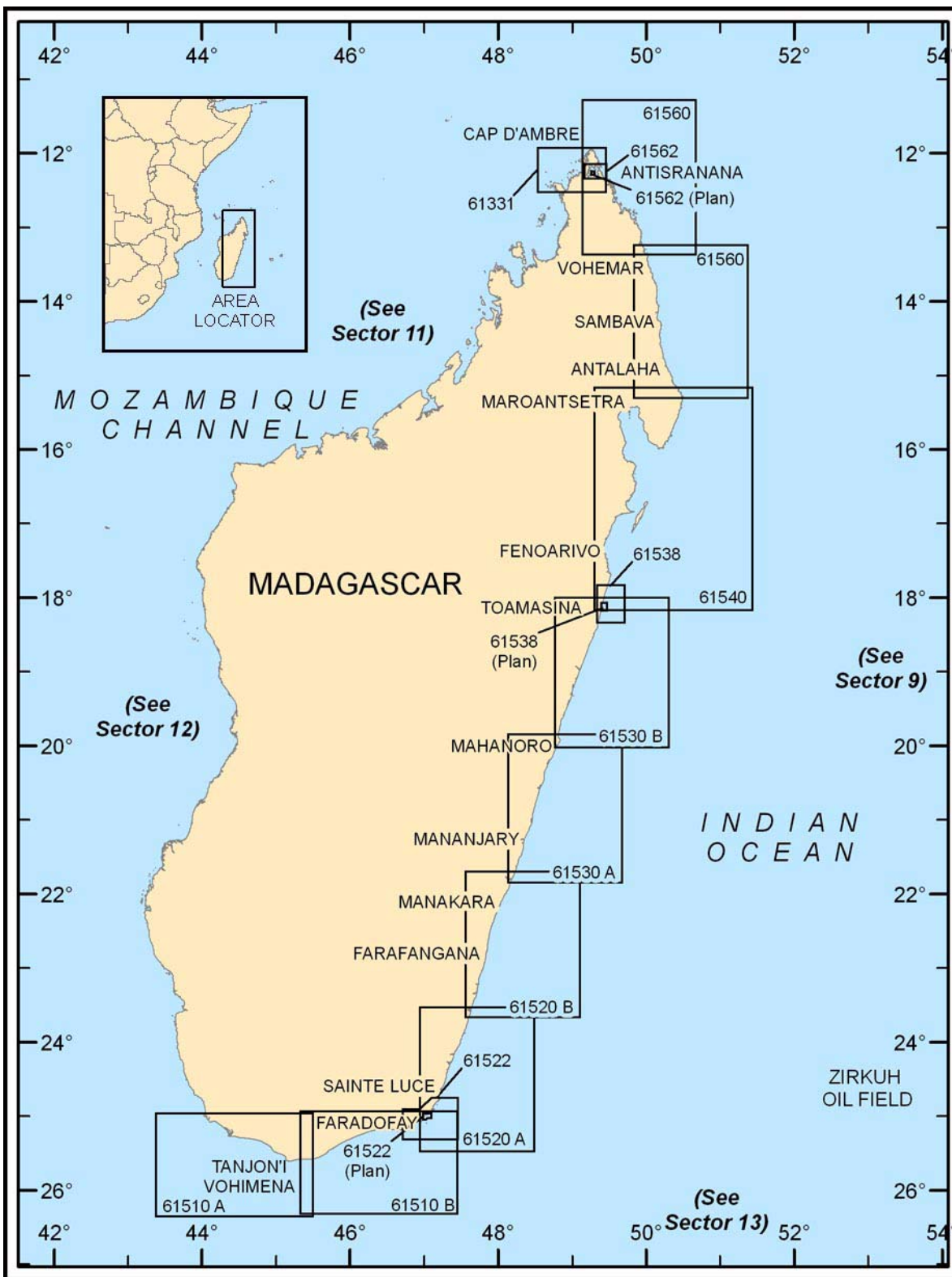
Anchorage.—A vessel of 751 grt found good anchorage, in 14m, sand and level bottom, with Ile du Lys bearing 151°, distant 1.5 miles.

A vessel of shallow draft can find anchorage, in a depth of 7m, with the island bearing 082°, distant about 0.5 mile, but care must be taken to avoid the 3.2m patch about 0.5 mile WNW of the island.

Anchorage can be obtained, in 26m, with the N extremity of Ile Glorieuse bearing 092° and the summit of Ile du Lys bearing 061°. There is a small channel through the coral reef opposite this anchorage.

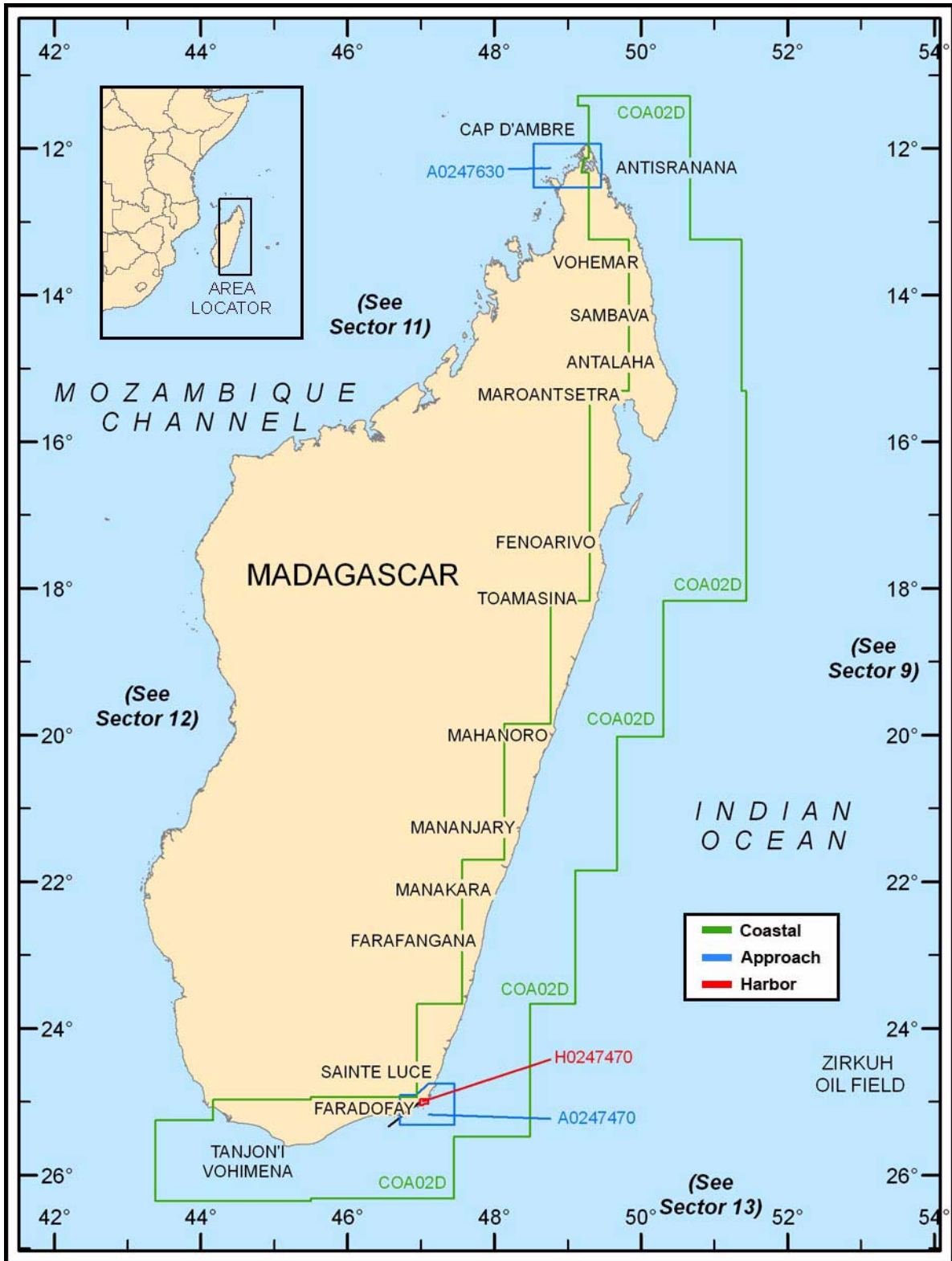
Ile Glorieuse is uninhabited except when the meteorological station is manned during the cyclone period from November to May

Caution.—A local magnetic anomaly of small extent was reported in the vicinity of the islands.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 10 — CHART INFORMATION



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SECTOR 10 — DNC LIBRARY INFORMATION

SECTOR 10

MADAGASCAR—EAST COAST—TANJON'I BOBAOMBY TO TANJON'I VOHIMENA

Plan.—This sector describes the E coast of Madagascar from Tanjon'i Bobaomby (Cap d'Ambre) to Tanjon'i Vohimena (Cap Sainte Marie) (25°35'S., 45°08'E.), a distance of 939 miles. The sector is described from N to S.

General Remarks

10.1 The E coast of Madagascar consists principally of dunes, lagoons, and plains from 10 to 50 miles wide. The ground rises from the plains by successive ranges of hills to a high interior plateau. This elevated region, the edge of which is formed on all sides by cliffs as high as 152m, is broken in all directions by mountains that, from some directions, show varied and picturesque outlines. The well-watered E slope of the island is marked by many waterfalls.

The E coast of Madagascar is, with good reason, noted for its inhospitable shore. During the SE trade wind, from April to October, it is subject to almost increasing strong winds and a heavy swell breaking on the coast. In summer, rain squalls obscure the land, making it hard to identify the landmarks; moreover, this is the season for cyclones, to which this coast is exposed.

There is not a single good harbor to be found on this coast. Canal de Sainte-Marie, between Ile Sainte-Marie and the coast, is the best harbor for large vessels, and Baie de Sainte-Luce, nearly 500 miles SSW of Ile Sainte-Marie, is the best for small vessels. Tamatave, 70 miles SSW of Ile Saint-Marie, is the most important commercial harbor.

Tides—Currents.—Currents can be strong and variable in direction. A vessel making a landfall on the E coast of Madagascar is advised to do so with the sun astern.

The lights on this coast are unreliable and a night approach is not recommended.

Observations made of the tidal currents in a position a little W of Tanjon'i Bobaomby during a period of 6 days during March show that the tidal currents set generally NE and have maximum rate 1 hour after HW. The maximum current that has been observed is 2.25 knots. The current sets S for an hour at the time of LW, its strength was observed to be about 0.5 knot of the NE current. The turn of the current is almost instantaneous; no period of SW was observed.

A N current was reported off Tanjon'I Bobaomby, on one occasion running at 3 knots, but was reported to ease to 2 knots off Helodranon Antongila.

The current off Baie de Rigny sets NW with great strength during the greater part of the year, but during the Northwest Monsoon, a current of 0.5 knot has been observed, at times, setting SSE.

The general N current during the Southeast Monsoon season is deflected by the Iles Leven to the NE; an eddy or countercurrent sets S or SW past the W side of this deflected current. This S or SW countercurrent is potentially dangerous to southbound vessels, particularly at night. The demarcation between these currents is uncertain and caution of more than ordinary intensity must be observed in approaching and passing Barracouta Is-

land.

The current is strong off Tanjon Antsirakosy, especially during the Southeast Monsoon. After approaching the coast from the S or SE it veers, near the projecting land, to the N or NE; a countercurrent setting generally S develops along the coast to the N and NNW of the cape. The line of demarcation between the N or NE current and the countercurrent is not known with certainty. This interplay of currents is similar to that in the vicinity of Iles Leven.

The strong indraft of the current into Helodranon Antongila must be allowed for in approaching or passing the bay. It is not uncommon for vessels intending to make Canal de Sainte-Marie to find themselves off Tanjona Belao. The current sets rapid Nor de Iley around Tanjona Belao and Cap Antsirikira in Helodranon' Antongila during the Southeast Monsoon; during this season, the capes should be given a wide berth, especially when leaving Helodranon' Antongila at night. A surface current, generally of some strength, enters Helodranon' Antongila continuously during the Southeast Monsoon. The ebb current during spring tides has been observed to attain a rate of over 1 knot.

In Canal de Saint-Marie, the currents are generally variable, but off Lohatanjon' Antsiraka, they are very strong. As a rule the currents take the direction of the wind and the N current is usually the strongest current.

The current sets SSW along the coast between Tamatave and Mahanoro at an average rate of 1.25 knots.

A vessel found a N current, with a rate in excess of 1 knot, between Baie de Faradofay and Tanjon'i Vohimena.

Vessels near the land in the vicinity of Tanjon'i Vohimena have found a decided set toward the coast sometimes with a rate of 1 knot.

Tanjon'i Bobaomby to Helodranon' Antsiranana (Baie de Diego-Suarez)

10.2 Tanjon'i Bobaomby (Cap d'Ambre) (11°57'S., 49°16'E.) consists of three, low, rocky points; the middle point, which is visible up to 20 miles, is the termination of a large, regular plain of moderate height and has a barren, parched appearance. To an observer approaching from the NE, the most conspicuous of the hills S of the cape is Boboala at 2.7 miles. All the hills in the vicinity have barren slopes, but the summits are grass-covered. An obstruction, a partially sunken drilling rig, is situated about 18 miles N of Tanjon'i Bobaomby.

Caution.—To round Tanjon'i Bobaomby from the W to E requires care from April to November. The ocean current, in conjunction with the tidal current, attains a rate of 3 to 4 knots; at half flood it has reached 6 knots in one place. The Southeast Monsoon often blows with great strength, raising a short, choppy, and very rough sea; both current and sea are much reduced the nearer the cape is approached. A vessel frequently made the passage, without difficulty during the worst season, by passing 0.2 to 0.3 mile off the rocky islets.

To round the cape a vessel should be in its vicinity at day-break, hug the shore of the islets as described, and avoid being set into the strength of the current and sea, where she would lose ground.

Low-powered streamers, if attempting to round the cape with the wind and current against them, should do so during the first 2 hours after HW, close to the land, and at night.

When passing from E to W, the breeze falls as soon as the vessel has passed the cape; although squalls and swell may follow for a few miles, they are soon succeeded by calms or baffling winds. Tanjon'i Bobaomby is marked by a light, but it should be noted that it is not on the farthest point N.

Ambohibiri (12°05'S., 49°18'E.) rises about 2.5 miles inland, 7.5 miles SSE of the light on Tanjon'i Bobaomby; it is possibly the only distinguishable feature along this section of the coast.

Andramahimba (Andramaimbo) (12°13'S., 49°10'E.), 392m high, rises on a level ridge on the neck of land separating Helodranon' Antsiranana from Helodranon' Amponkarana (Baie Amponkarana). This conspicuous conical hill has a flag-staff on its summit; the hill is visible at a distance of several miles from either side of the island.

Ankaramisampana (12°12'S., 49°12'E.), a conspicuous hill, rises on the same ridge as Andramahimba, in a position about 2 miles E of the latter hill; it is sometimes known as Dover Castle.

Ambohitra (Montagne d'Ambre) (12°36'S., 49°09'E.), rising to a height of 1,475m, is the highest and most conspicuous landmark near the N extremity of Madagascar and is visible from positions off both the E and W coasts of the island. The peak rises regularly from near the S end of a range about 10 miles long; its sides are covered with thick forests. In weather, even moderately clear, it can be seen long before the intervening land.

Morne Noir (13°26'S., 49°58'E.), a conical hill, is conspicuous even when seen against higher land in the background. The hill is bare and rocky, and its blackness contrasts markedly with its surroundings of yellow or green according to season.

Mont de la Table (14°41'S., 50°09'E.) is massive, perfectly circular, and may be seen for a distance seaward of 40 miles; it appears to be on the coast, though really it is 3 miles inland, the intervening land being low. Sommet de la Fausse Table, 18 miles N of Mont de la Table, is a hill of less regular shape and may be mistaken for Mont de la Table; in clear weather, both will be seen at the same time, but the mistake is easy to make in poor visibility. A bare conical hill rises 2 miles SSE of Mont de la Table.

Pitons d'Angontsy (15°16'S., 50°18'E.), rising 10 miles inland W of Tanjon' Antsirakosy, consists of three summits like the teeth of a saw, and a fourth summit separated from the others by a U-shaped gap; from the NE, the mountain appears to have only two summits.

Helodranon' Antsiranana (Baie de Diego-Suarez)

10.3 Helodranon' Antsiranana (12°16'S., 49°18'E.) is entered through Passe d'Orangea between **Cap Tanifosty** (12°13'S., 49°22'E.) and Cap Mine (Cap Andranomody), 1 mile SSW, about 17.5 miles SSE of Tanjon'I Bobaomby. This bay is indented by Baie du Tonnerre and Baie des Cailloux

Bancs (Baie des Andovobatofotsy) on the N side, and by Baie des Francais (Baie Andovobazaha) and Port de la Nievre on the S side.

Pilotage.—Pilotage is compulsory for vessels of more than 50m in length.

Nosy Diego (Ile Diego) (12°11'S., 49°24'E.) lies on the E side of the shore reef, it is the farthest E of the dangers in the N approach to Passe d'Orangea. The 10m curve lies 0.2 mile E of the S extremity of Nosy Diego.

Le Grand Banc (12°18'S., 49°27'E.), with depths less than 10m, extends NNE for a distance of about 5 miles from a position on the coast 7 miles SSE of Cap Mine.

Banc de l'Yvonne, a coral head with a depth of 15m, lies close S of the approach to Passe d'Orangea, 2 miles ESE of Cap Mine. Banc du Nord-Est, with a least depth of 11m, lies 1.7 miles SE of Banc de l'Yvonne.

There are several islets lying on the coastal reef within the above banks; their positions may best be seen on the chart.

Nosy Volana (12°13'S., 49°22'E.), in the entrance of Passe d'Orangea, is wedge-shaped and slopes from a height of 28m near its N end; a chimney in ruins is situated near the summit. A coral reef, partly uncovered, connects the island with Cap Tanifosty, about 0.2 mile N. A bank, with depths less than 2.9m, extends 0.2 mile S from Nosy Volana, reducing the navigable width of the fairway to about 0.4 mile.

10.4 Nosy Langoro (12°13'S., 49°19'E.), marked by a light, is fringed by a coral reef. A rocky shoal, with a depth of 4.6m, lies 0.2 mile SSE of the island.

Tides—Currents.—The tidal currents in Passe d'Orangea attain velocities of 1 to 2.5 knots. Inside the entrance the flood current makes for 30 minutes before LW, until about 30 minutes after HW at Port de la Nievre.

Depths—Limitations.—The least charted depth on the entrance through Passe d'Orangea is 19m, located about 0.8 mile WNW of the light situated on Cap Mine. Depths of 14 and 17m are charted in positions 0.2 mile NNW and NW, respectively, from the above light. The general depths in Helodranon' Antsiranana are from 20 to 53m.

Aspect.—**Ambohitra** (Montagne d'Ambre) (12°36'S., 49°09'E.) rises to a height of 1,475m SSW of Cap Mine; this excellent landmark is frequently obscured by clouds.

Mont Andramahimba, 392m high, lies W of Cap Mine; it is sometimes known as Windsor Castle.

Ankaramisampana, 293m high, and Bobaomby, 267m high, rise 2 and 3 miles ENE, respectively, from Mont Andramahimba. A boulder on the side of a hill in a position about 1.2 miles N of Bobaomby is conspicuous. The three named hills are useful marks in the approach to Helodranon' Antsiranana.

Pointe du Corail is SW of Cap Mine; a hospital, a large yellow building with a red roof, stands on the point. The Residency, a large gray house with a flat roof, stands about 0.3 mile W of the hospital.

A bare promontory, with overhanging cliffs, is located 1 mile NW of Pointe du Corail. The promontory has three summits; the one farthest W is 68m high. A hospital and a military establishment are situated on its SE part.

The NW side of Port de la Nievre is formed by steep hills, but on the SE side the hills slope more gently to the shore. Baie des Amis, on the SE side 1 mile within the entrance, lies at the

foot of this slope. A group of oil tanks stand on the hills 0.5 mile S of Baie des Amis, and a number of towers, some marked by lights, stand W of the tanks.

Pilotage.—The pilot station covers the whole of Helodranon' Antsiranana, except Port Militaire, and the approach to the bay within a radius of 2 miles of Cap Mine; it is divided into an optional pilotage area seaward of a line joining Pointe de l'Aigle, 0.4 mile SW of Cap Mine, and Cap Vatomainy, 3 miles WNW, and a compulsory area for vessels of more than 150 nrt, within the line. Although not part of the pilot station, pilotage is also compulsory in Port Militaire. Berthing and sailing are permitted throughout 24 hours.

If optional pilotage is required, the pilot embarks at the entrance to Passe d'Orangea; otherwise at the seaward limit of the compulsory area. If the pilot is unable to board, a frequent occurrence from April to November during the SE trade winds, he will lead a vessel through the optional area into the harbor and embark on the entrance range line in sheltered water.

Requests for pilots should reach the Port Office at Antsiranana on VHF channel 16 before 1630 if required on the following morning; a pilot required in the afternoon should be requested on the previous morning.

In 1980, the pilot vessel was out of action and the pilot embarked in the bay from a small launch which was not equipped with radio; messages were passed via Durban radio. In 1985, the harbormaster's office was not equipped with radiotelephone.

Port de la Nievre (12°16'S., 49°16'E.)

World Port Index No. 47630

10.5 Port de la Nievre is situated on the SW side of Helodranon Antsiranana and is entered between Pointe du Corail and Cap Ampanolohamiraty, 1 mile WNW. The port comprises Port de Commerce in the N part and Port Militaire farther SW. The city of Antsiranana is situated on a peninsula E of this commodius harbor.

Winds—Weather.—The harbor is subject to very strong winds from May to October.

Tides—Currents.—The tidal currents in Port de la Nievre attain a velocity of 1 knot.

Off the N end of Quai du Commerce, 0.6 mile SE of Cap Ampanolohamiraty, the current sets W during the rising tide and E during the falling tide; in the rainy season this current can attain a rate of 3 knots and its meeting with the eddy running along the quay, N during the rising tide and S during the falling tide, combine to make it difficult for vessels to berth alongside. After a heavy rain, the outgoing current can persist during the whole of the rising tide.

Depths—Limitations.—The channel leading to the dry dock in Baie des Amis, about 1 mile S of Cap Ampanolohamiraty, has a least depth of 7.4m and is marked on its E side by a buoy reported missing in 1993. A depth of 4m is charted 0.2 mile NW of the drydock.

Quai du Commerce, at the NE extremity of the harbor, is a concrete quay and can accommodate vessels drawing less than 8.5m; its S end is shoal. Tankers discharge at this quay which can also accommodate container and ro-ro vessels. The ebb current can run strongly round the N end of the quay and then it

is better to berth after the flood current makes. During the SE trade wind, large vessels are recommended to proceed alongside the quay in the calm periods at daybreak or nightfall.

Pilotage.—Pilotage is compulsory for vessels of more than 150 nrt; refer to Passe d'Orangea.

Signals.—Storm signals are shown from a tall flagstaff close W of the light tower at Cap Mine, and from the signal station at the N end Quai du Commerce.

Anchorage.—There are good anchorages throughout Helodranon' Antsiranana; vessels entering the roadstead without the aid of a pilot can anchor, in 20 to 23m, about 0.8 mile N of the parallel of Cap Ampanolohamiraty. There is a very good anchorage in Anse Farafakabe, a cove in the NE part of Baie des Cailloux Blancs, in depths of 9 to 18m, mud.

The pilot should be consulted for other anchorages.

Anchorage is prohibited in parts of Baie des Francais and Port de la Nievre; their limits may be seen on the chart.

Directions.—The approaches to Helodranon' Antsiranana are not difficult in clear weather, which is generally the case in the SE trade wind from April to October, but there is a heavy SE swell at this season. From November to April, when rain squalls obscure the land, it is important to identify the landmarks before standing W. It must be remembered that there is a N current which may exceed a rate of 3 knots. As the entrance is neared, Cap Mine is more easily identified than the light tower situated about 0.5 mile ESE. The best mark for the transit of Passe d'Orangea is Nosy Langoro, bearing 275° and seen between Monts Ankaramisampana and Andramahimba, which leads nearly midway through the fairway. This approach must be strictly adhered to, but in bad weather it is best to keep Nosy Langoro in line with Mont Andramahimba, bearing 274°.

When through the pass, a vessel will be in smooth water and should keep on the same range line until within 1 mile of Nosy Langoro, when a course of 230° should be steered for Port de la Nievre, with the beacons situated 0.7 mile NW of Cap Tanifosty, in line, astern, bearing 050°.

Cap Mine to Iles Leven

10.6 From Cap Mine, the coast of Madagascar trends in a SSE direction to Iles Leven. Le Grand Banc lies up to 3.7 miles offshore; it is the farthest offshore danger charted along this coast until in the vicinity of Iles Leven.

Baie d'Ambodivahibe is entered W of Pointe Cornard (12°22'S., 49°27'E.). Baie d'Ambodivahibe is very deep; it is difficult for ocean-going vessels to find a suitable anchorage. Baie d'Ambodivahibe is frequented by coastal vessels, which run up on the beach at the head of the bay. Antsapahano, a small pointed hill, 187m high, which lies about 3 miles SSW of the head of the bay, bearing 204°, and seen midway between Andraombe and Ankarakatova, two summits farther in, leads through the entrance and into the bay.

Pointe Ambodivahibe (12°21'S., 49°31'E.) lies about 3 miles E of Pointe Cornard; Banc d'Antala fronts this part of the coast. Banc du Necessaire is a SE continuation of Banc d'Antala; the 9m curve line lies up to 1.7 miles offshore off the NE extremity of Nosy Tendro.

Baie de Rigny (12°26'S., 49°31'E.) is entered between the S end of Nosy Tendro (Nosy Antendro) and Pointe Sanson, about 0.4 mile S. A mark for the entrance of Baie de Rigny is La

Bosse, a large white sandhill rising about 1.8 miles S of Pointe Sanson. Nosy Laliara, about 0.5 mile SE of Pointe Sanson, is also of use. Ile aux Huitres lies in a position about 0.8 mile WNW of Pointe Sanson; a white wooden beacon stands on the S extremity.

Anchorage can be taken in mid-channel just NW of Pointe Mancel, about 1.5 miles WSW of Pointe Sanson, in 11 to 14m.

The white wooden beacon at the S extremity of Ile aux Huitres, in line bearing 268° with Mont Corre (Ankarakatova), leads into Baie de Rigny. It is better to keep to the N side of this entrance range as shoal water extends about 0.2 mile N from Pointe Sanson.

When a position in the bay is reached from which Nosy Ambatomkena bears 210° and the beacon is about 0.5 mile W, a mid-channel course should be shaped and round Pointe Mancel at a distance of 0.1 mile, and then proceed to the anchorage.

The coast between Baie de Rigny and Helodranon'I Lokia (12°44'S., 49°41'E.) is little known; its indentations are shallow and unsuitable for navigation. Nosy Lowry, about midway between these two inlets, is 26m high; it lies about 0.8 mile offshore. Helodranon'I Lokia (Baie de Loky) is entered between the S extremity of Nosy Ankomba (12°42'S., 49°40'E.) and Pointe Ambodilamoty.

The depths in the navigable channel, which is about 0.3 mile wide, vary from 10.9m irregularly to about 73m, but over several shoal heads, the depths are only 3.3 to 8.2m.

Anchorage can be taken, in 9 to 14m, over a bottom of sand and mud, in positions about 2.5 miles within the bay. Such positions are well-sheltered from all winds. Farther in the bay there is a broad inner expanse of shallow water, and a relatively small area, with depths of 7.3 to 10.9m, where protection is had from the N swell. This small deeper area is partly separated from the outer anchorage by a sandbank projecting from Pointe de Sable, which lies on the E shore of the bay in a position about 3.5 miles within the entrance; the narrow opening off the W end of the sand bank leading into the small deep area has depths of 12.8 to 20.1m. Baie de Mangerivy or Port Leven lies between Nosy Manambiby (12°46'S., 49°46'E.), an island on the coastal reef about 3.5 miles SE of Pointe Ambodilamoty, and Cap du Diable, 8.7 miles SSE. It is protected from the NE and E by a reef located from 1 to 8 miles N of Cap du Diable, but is exposed to N winds. The Iles Leven lie on the above reef; Nosy Barracouta (12°48'S., 49°52'E.), the farthest E of the islets, is not easily recognized.

Port de Mangerivy is essentially a channel about 8 miles long trending S and SE between Nosy Manambiby, Pointe de l'Artemise, Ilot Moury, Ilot Guy, Ilot aux Oiseaux, Ilots du Sud, and Pointe Owen on the W side, and, on the E side, Ilot du Nord, Nosy Akao, Ilot du Milieu, Nosy Satrana, and Nosy Vahala. The entrance to the port from the N is about 0.6 mile wide between the 10m curves, but there are several patches, the shallowest of which has a depth of 8.2m in mid-channel. The entrance from the SE is restricted by shoals. A vessel should not be taken into the port by way of this entrance except in case of necessity, and then only after the fairway has been marked by buoys.

Anchorage.—Anchorage should be taken W of Pointe de l'Observatoire, in depths of 11 to 14m, sand. A vessel 65m in length, drawing 4.9m, has anchored 0.5 mile NW of Pointe du Sable, the W extremity of Nosy Akao, and with the W ex-

trémity of Nosy Satrana bearing 150°.

Caution.—Caution is required on entering as the islands are sometimes difficult to identify, the currents are strong, and the shoals extend well to the N. Vessels generally approach from the N and steer in toward the anchorage when Ilot Guy bears 204°, local knowledge is necessary.

10.7 Iles Leven (12°48'S., 49°51'E.) lie up to 5 miles offshore and are low, and brush covered; they all have beaches of white sand. Nosy Manambiby (12°46'S., 49°46'E.), the farthest N of the group, is over 1 mile long N and S and is nearly as wide. Pointe Leven, the N extremity of the island, lies about 1.6 miles NE of Pointe Antseranambe.

The island is low, dark, and partly wooded; it is the most easily distinguished of Iles Leven. Shoal banks, which have depths of 5.5m or less, extend 1 mile E and SE from the E side of Nosy Manambiby.

Nosy Akao, 29m high, is the largest island in the group. A bank, with depths less than 5.5m, extends 0.5 mile W from the W extremity of the island and forms the E side of the anchorage area in Port de Mangerivy. The island is marked by a light.

Ilot du Nord lies about 1.3 miles NNE of Pointe de l'Observatoire, the N extremity of Nosy Akao. This tiny white islet lies near the N edge of a bank of coral fronting the N, NE, and E shores of Nosy Akao; the islet is prominent.

Nosy Barracouta is the largest of several islets lying E of Nosy Akao. A shoal, with a depth of 5m, lies about 1.5 miles E of the islet.

Ilot Rata lies about midway between the S ends of Nosy Akao and Nosy Barracouta.

Ilot du Milieu, Nosy Satrana, and Ilot Manampahana are reef-fringed islands lying S and SSE of the S extremity of Nosy Akao on the E side of Port de Mangerivy. They are possibly on the same bank as Nosy Akao and Nosy Barracouta.

Ilot du Milieu lies about 0.9 mile SSW of the S extremity of Nosy Akao.

Nosy Satrana, an island 22m high in a summit near its center, lies with its N extremity about 0.9 mile S of the extremity of Nosy Akao.

Nosy Vahala (12°52'S., 49°51'E.), the farthest S of Iles Leven, lies NNW of Cap du Diable, near the edge of the shore bank.

Iles Leven to Sambava

10.8 From Cap du Diable, the coast trends in a SSE direction to Iharana. There are no dangers charted offshore along this part of the coast.

Helodranon' Andravina (Baie d'Andravina) is entered between Cap du Diable and Lohatanjon' Andronona (12°56'S., 49°52'E.). Lohatanjon' Andronona (Cap Berry) is the N termination of level reddish ground of moderate elevation.

The depths in Helodranon' Andravina range from 5.5 to 20.1m, however, reefs extend as far as 0.5 mile off the N and W shores and in one place off the S shore the reef extends 0.4 mile. An islet lies near the center of the bay and reefs extend about 0.2 mile SE and 0.4 mile SW from the islet.

Helodranon' Andravina is open to the N and NE, but shelter from E winds is possible in its SE part, with Lahatanjon' Andronona bearing 053°, distant 0.5 mile, in a depth of 7.3m.

Between Lohatanjon' Andronona and Helodranon'Iharana there is little known about the coast and it does not possess any sheltered anchorage.

Close off **Tanjona** (Cap Tanjona) (13°03'S., 49°55'E.) foul ground extends up to 1.3 miles offshore. Some islets lie close off the point and Nosy Trois Freres (Iles des Trois Freres) lie 1.7 miles S of the point. All of these islets are so close inshore that none of them can be distinguished from a distance.

Tanjona Manambato (Cap Manambato) (13°13'S., 49°56'E.) is a massive, dark, triangular rock that stands out clearly against the high land in the background. Its triangularity and contrast with the background are particularly marked when seen from E; it is an excellent mark for vessels approaching Helodranon' Iharana from the N.

The Manambato River flows into the sea N of Tanjona Manambato; the muddy waters of the river discolor the sea to an appreciable distance from the outlet, and create an appearance of a reef; the extremity of Tanjona Manambato is steep-to. Antsivaregna, a hill, rises close NW of the outlet of the Manambato River; it is a useful mark to vessels approaching from the N or NE, but when seen from the S the hill is obscured by the mass of Tanjona Manambato.

Nosy Be (Ile Verte) (13°17'S., 50°00'E.) lies on the edge of the shoal bank in the N approach to Helodranon' Iharana; it is 30m high. Ilots Noir lie close within the coastal reef, 1.5 miles S of Nosy Be; these islets and Nosy Be are useful for marking the coastal reef for a vessel approaching Iharana from the N.

10.9 Iharana (Vohemar) (13°21'S., 50°00'E.) (World Port Index No. 47620) is a small port situated in Helodranon' Iharana (Baie de Vohemar), an inlet in the coastal reef; it is shallow, but affords good shelter to small vessels with local knowledge. Southeast winds prevail from April to November. From January to the end of March the winds vary from N and W; this is the season of great storms and heat.

Currents in the channel attain a velocity 1.5 knots at springs. The entrance channel is about 0.1 mile wide and during strong SE winds it is difficult to distinguish as the sea breaks across it.

There is room in the port for one vessel up to 100m in length; verify before entering. There are depths of 9.1 to 33m in the channel and a depth of 15m in the anchorage.

Directions.—A vessel approaching from the NE should, when 5 to 6 miles from the Ilots Noir, see Vohemar Point between two high tablelands. The S tableland is the smaller.

Morne Noir (13°29'S., 50°01'E.) is a useful mark to vessels approaching from the S.

The best time to enter Baie de Vohemar is at LW, when more of the dangers are visible; moreover, no current then sets across the reef mass on the NW side of the entrance channel.

It is advisable to maintain a speed sufficient to work against any N cross entrance current, if met with, until past the wrecks on the outer NW side of the entrance channel.

A course with Beacon No. 3 in line bearing 260° with Beacon No. 5 should be followed from seaward to the entrance channel, and then to a position with Beacon No. 4 abeam and about 50m distant. Course should then be altered to the SW and the vessel kept in mid-channel.

10.10 Between **Lohatanjona Iharana** (Pointe de Vohemar) (13°21'S., 50°00'E.) and Sambava the coast has some slight in-

dentations.

The general aspect of the coast between Lohatanjona Iharana and the parallel of 14°S is the same as farther N. In the background are mountain ranges gradually diminishing in elevation the closer the coast is approached; these mountains and hills are mostly bare and of reddish aspect. The open plains are yellow and dried up during the SE trade wind, but are green during the rainy season and have a scanty growth of shrubs and trees in the ravines and sheltered places where it is not rocky.

From S of the parallel 14°S, to Tanjon Antsirakosy there is an unbroken sandy beach which fronts a thickly-wooded country.

Anse de Bonne Tenue lies on the N side of Tanjon' Anorontany (Cap Anorontany) (13°38'S., 50°07'E.). A small sugarloaf-shaped hill on its W side is a mark for the cove. It is reported that the cove is a good anchorage.

Morne de Mahanara (13°55'S., 50°07'E.), a low isolated hill, is conspicuous because of its shape and dark color. From the NE it has the appearance of a truncated cone, while from the SE it appears wedge-shaped. This hill is a good mark for a vessel approaching Sambava from the N. A little S and behind Morne de Mahanara there is a distinctive gap which must not be confused with that just W of Piton de Sambirano (14°05'S., 50°02'E.).

10.11 Sambava (14°15'S., 50°12'E.) (World Port Index No. 47610) is an open roadstead off the entrance of a river. A lagoon forms at the mouth of the river and the village, Sambava, is situated on a promontory on the E side of the lagoon. A shoal, with a least depth of 4.9m, lies in the middle of the roadstead, 0.7 mile NE of the mouth of the river. A depth of 4.6m lies just over 1 mile ESE of the river's mouth. A bank, with a depth of 7.9m, extends SE from this shoal to another, with a depth of 4.9m, 0.5 mile S.

Anchorage.—Anchorage can be taken, in a depth of 14m, muddy sand; the holding ground is poor. An approach at night is not recommended.

Directions.—Vessel approaching from the S should stay well off the coast until Sambirano Peak (14°02'S., 50°01'E.) bears 275°. Vessels approaching from the N should proceed to the recommended anchorage position by steering for Beacon D, bearing 196°.

Sambava to Helodranon' Antongila (Baie d'Antongil)

10.12 From Sambava the coast trends S to Antataha, little is known of this coast. From Antataha the coast trends SSE to Tanjona Tsihananina (Cap Tsihananina). From Tanjona Tsihananina the coast continues in a SSE direction to Tanjon Antsirakosy (Cap Est).

A reef extends 1.5 miles from the coast for a distance of 5 miles SSE of Sambava. A coral shoal, with a depth of 10m, lies 13 miles S of Sambava and extends 3.5 miles seaward.

Mont de la Table is massive, perfectly circular, and may be seen from a distance seaward of 40 miles; it appears to be on the coast, though it really sets 3 miles inland. Sommet de la Faussea, a hill of less regular shape, may be mistaken for Mont de la Table; in clear weather, both will be seen at the same time, but the mistake is easy to make in poor visibility.

10.13 Antataha (Antalaha) (14°54'S., 50°17'E.) (World Port Index No. 47600) is an open roadstead suitable only for anchorage during fair weather.

The best anchorage, in about 18m, sand, is 0.8 mile off the town, at the intersection of the alignments of the range lights and the beacons bearing 276° and 207°, respectively. This anchorage is only practicable from October to April, but this is the season for cyclones, to which it is particularly exposed.

10.14 Tanjona Tsihananina (Cap Tsihananina) (14°57'S., 50°19'E.) lies 4 miles SSE of Antataha. A group of above-water rocks fringe this cape, but there is no passage inside them; shoal depths extend not less than 1 mile seaward from these rocks. This cape should be given a wide berth.

Tanjon Antsirakosy (Cap Est) is the S entrance point to Rade d'Angonsty and is also the E extremity of Madagascar; this part of the coast is fringed by a reef in places.

Rade d'Angonsty (Angonsty Road) (15°15'S., 50°29'E.) lies close NW of Tanjon' Antsirakosy. The village of Angonsty stands on a sandy spit, 0.7 mile NW of Tanjon' Antsirakosy.

Winds—Weather.—Vessels can anchor in the roadstead, with protection from all but winds from the N to ENE.

Depths—Limitations.—The depths are 10.9 to 14.6m in the entrance, and from 7.3 to 10.9m in the roadstead itself.

Aspect.—Nosy Angonsty, lying on the coastal reef 0.2 mile ENE of Tanjon' Antsirakosy, is low-lying, flat, and covered with vegetation of a lighter color than that on the mainland; this circumstance helps to identify the locality, though the islet cannot be seen until after the hummocks on the mainland, and never appears detached from the coast until the vessel is entering Rade d'Angonsty.

Anchorage.—Vessels should approach the anchorage in Rade d'Angonsty, with Tanjon' Antsirakosy Light in line with the beacon at the village, bearing about 193°, and anchor a little W of this alignment, in 10m, with Nosy Angonsty (15°16'S., 50°30'E.) bearing about 146°; the two beacons in line bearing 240°, also lead through the entrance to the bay. During the SE trade wind, the SE part of the bay is the safest.

Caution.—The entrance of Rade d'Angonsty is about 0.7 mile wide and trends SW between reefs lying off the coast. The reef on the NW side extends about 1 mile offshore; the reef on the SE side of the entrance channel extends about 1.5 miles N from Tanjon' Antsirakosy. These reefs are steep-to and plainly visible, so that entering the roadstead is not particularly difficult. Here and there are narrow, dangerous openings in the reef where the sea breaks heavily; in other openings there are high overfalls, but none of the openings can be mistaken for the wide entrance of Rade d'Angonsty.

10.15 Tanjon' Antsirakosy (Cap Est) (15°16'S., 50°29'E.) is a low, wooded point; the land in the vicinity first appears as a succession of hummocks. The point is bordered by reefs extending up to 1 mile offshore, beyond the reefs it is reported to be free of dangers.

The current is very strong off Tanjon' Antsirakosy, especially during the SE trade wind. Currents approaching the coast from the S or SE, set N or NE near the projecting land, and a countercurrent, whose limit is uncertain, is formed close inshore off the receding coastline N. During hazy weather, or at night, a vessel should keep a good offing in order to avoid this

countercurrent.

An explosive dumping area is situated with its center about 20 miles ENE of Tanjon' Antsirakosy.

10.16 The coast in this area is backed by wooded hills which slope steeply to the sea, and are interspersed by sandy beaches. The coast is bordered by a reef extending up to 2 miles offshore; a few gaps in the reef give access to anchorages for small vessels. There are some islets and rocks on the coastal reef, and in good visibility a vessel may navigate close outside it. The reef is steep-to on its seaward side and the sea usually breaks on it.

Nosy Fanala (15°26'S., 50°28'E.), a long low islet, lies on the coastal reef 10.5 miles S of Tanjon' Antsirakosy. Two isolated rocks, which dry between 0.9 and 1.8m, lie close off the coastal reef, 13.5 miles SSW of Nosy Fanala.

Ampanavoana (15°41'S., 50°21'E.), the capital of the district, stands on the bank of a river 3 miles S of the above rocks. Anchorage may be obtained 0.5 mile off the village, but it is not sheltered.

Nosy Ambatoharana (15°56'S., 50°15'E.) lies close off the coast, the islet is low and wooded. A wooded hill rises on the second ridge from the coast; when it is viewed from the NE it resembles a turtle shell, from the SE it appears as a long ridge trending inland.

There is anchorage off the village of Vinanivao, 2 miles NNE of Nosy Ambatoharana in Mouillage de Vinanivao, for a vessel up to 100m in length. The entrance to the anchorage is encumbered by reefs.

Tanjon'i Masoala (15°59'S., 50°14'E.) is high, wooded, and can be easily recognized. Nosy Nepato is a small islet, low and wooded, lying close E of the cape. Nosy Nepato is easily identified when open of the land; when not so open, the darker color of the vegetation on it when seen against the vegetation on the coast is of use as a mark.

Helodranon' Antongila (Baie d'Antongil)

10.17 General.—Helodranon' Antongila is entered between **Cap Antsirikira** (Cap Baldrisy) (16°00'S., 50°10'E.) and **Tanjona Belao** (Cap Bellone).

Shoals of 19m lie 2.7 miles SSE and 4 miles SE, respectively, of Cap Antsirikira.

Aspect.—On all sides, Helodranon' Antongila is enclosed by high mountains covered with forests. Those on the E side are uneven, and are detached branches of a central chain, which decline to the shore in very remarkable long slopes, leaving deep valleys between them; those on the W side are uniform in elevation and shape, and form a wall running parallel with the coast. The land at the head of the bay is low; the two mountain ranges forming the sides continue to run N converging toward each other, and ultimately join, leaving a thickly-wooded plain about 12 miles wide between them and the coast.

Cap Antsirikira is very low and cannot readily be distinguished; it is formed by a tongue of land that is prolonged S by Nosy Behentona, a low, sandy, and light-colored islet partly covered with trees that shows up well against the coast. The islet is marked by a light. One of a number of rocks that lie around the islet is conspicuously black and lies S of the islet.

Directions.—In clear weather, there is no difficulty in entering Helodranon' Antongila, especially from the S, as the marks are easily identified.

When approaching from the N and rounding Tanjon'i Masoala, care is necessary to give the cape a wide berth because of the N current, the velocity of which is uncertain. The E shore of the bay can generally be seen at night.

10.18 East side.—Ankazofotsy (15°50'S., 50°01'E.) is a village NW of Cap Antsirikira. The Riviere Ankazofotsy flows into a bay at the village. A white rock, 10m high, its flat summit covered with trees, lies close S of the river mouth. Vessels with local knowledge can anchor 0.4 mile W of the mouth of the Riviere Ankazofotsy, in about 30m; the depths decrease rapidly toward the shore.

Antalavia is a village situated on the N side of the mouth of the Riviere Antalavia, 3.2 miles N of Ankazototsy. A small beach of yellow sand marks the river mouth.

A vessel approaching Antalavia from the S should bring a conspicuous whitewashed tree, standing beside a conspicuous house in the village, to bear 047°; steer for it on that bearing and anchor, in 18m, fine yellow sand, with the mouth of the Riviere Sahaleona, 0.5 mile S of the village, bearing 135°. A vessel approaching from the N should give the coast a berth of at least 1.5 miles. This anchorage is encumbered by rocks.

Lohatanjon'i Tampolo (Pointe Tampolo) (15°44'S., 49°57'E.) can be identified as being low-lying while the other points in the vicinity are high. A vessel can anchor about 0.3 mile N of the point, in 15m, mud bottom.

The Riviere Ambanizana flows into the bay 6.7 miles N of Lohatanjon'i Tampolo. Anchorage, in about 7m, may be obtained 0.5 mile NW of the mouth of the Riviere Ambanizana. Care is necessary to avoid a sand bank, which extends from the river mouth. The anchorage can be approached on a bearing of 047° on the village of Ambatambe. The village is not visible from offshore, therefore, bearings of the mouth of the Riviere Ambanizana and Pointe Nandrahana, about 2.3 miles NW, are helpful.

10.19 West side.—Mananara (16°10'S., 49°46'E.) is a town WNW of Tanjona Belao (16°14'S., 49°51'E.); anchorage is available in the roadstead off the town.

Aspect.—Baie Mananara, into which the Riviere Mananara flows from the SW, can be identified by Pointe d'Ambitsika, the extremity of a wedge-shaped tongue of land extending in an ENE direction from the coast; the W and higher part of the tongue of land is darker than the rest of the coast.

Good landmarks are the Residency at Mananara, standing on a hill, 37m high, 1.7 miles WSW of Pointe d'Ambitsika, and Colline Mahambolona, a bare conical hill, 42m high, with a beacon on it, 0.5 mile SE of the Residency.

Pic Ankirihiry, an isolated conical hill, rising 18 miles W of Pointe d'Ambitsika and 819m high, is not visible when bearing more than 283°. A conspicuous tree, painted white with a black vertical stripe, stands on the shore 0.2 mile S of Ile aux Mouettes.

The front mark of the first range is the light on the NW extremity of Ilot Rocheux; the rear mark is the wooded summit of Antevalabe, a hill, 439m high, rising about 5 miles SSW of Ilot Rocheux. These marks are in line bearing 210°.

The front mark of the second range is the large isolated tree, described above, standing on the shore S of Ile aux Mouettes. The rear mark of this range is a small beacon on a bare, 43m summit, Mahambolona, rising SE of the town. These marks are in line bearing 154°.

Between the Riviere Mananara and Cap Tanjona the coast is fringed by numerous black rocks, always easily seen.

Directions.—A vessel approaching Baie Mananara from the ENE, having rounded Cap Masoala and Cap Antsirikira, should steer for Pic Ankirihiry until the light on Ilot Rocheux bears about 210°; this bearing should be maintained until the conspicuous black and white painted tree on the coasts of Ile aux Mouettes is in line with the white beacon on Colline Mahambolona, bearing about 154°. The intersection of these two bearings indicates the anchorage, which is in depths from 12 to 14m, hard sand.

Anchorage can also be obtained, in a depth of 10m, on the same range, bearing about 154°, and with the light on Ilot Rocheux, bearing 225°.

A vessel coming from the SE should pass about 5 miles off Cap Bellone, and steer a NNW course until Pic Ankirihiry is on a W bearing, when she should proceed as directed above.

A vessel coming from the head of Baie d'Antongil should, after passing Cap Tanjona, steer for Cap Bellone until the light on Ilot Rocheux bears about 210°, when she should proceed as previously directed.

Caution.—Ile aux Mouettes, 8.5m high, 1 mile E of the light on Ilot Rocheux, lies on the coastal reef, which extends 0.5 mile seaward, with depths of less than 5.5m, and which dries in places. A 1.5m patch lies on the seaward edge of the reef, 0.3 mile NW of Ile aux Mouettes.

Banc des Cormorans, with depths from 1.5 to 11m, lies from 1.2 to 1.7 miles NE of the light on Ilot Rocheux. A rock, with a depth of 3.7m, lies 0.1 mile SW of its SW end; the rock scarcely shows in calm weather, but the sea breaks heavily on it during SE winds.

10.20 North side.—Pointe Ansirake (15°27'S., 49°45'E.) lies on the E side of the Riviere Antanambalana, at the head of the bay, 27 miles N of Cap Tanjona. Pointe Veringotra, 3 miles W of Pointe Antsiraka, can be distinguished by its two hillocks.

A bank, with depths of less than 3m, fronts the mouth of the Riviere Antanambalana, and extends 0.7 mile S from the man-grove fringed Pointe Antsiraka; it tends to advance SW.

Nosy Milomboka (15°35'S., 49°45'E.) lies on an isolated shoal patch 7.7 miles S of Pointe Antsiraka, in the approach to Maroantsetra; it is the farthest S of several island extending N. Nosy Mitomby lies on the same shoal patch, 0.5 mile NNW of Nosy Milomboka. Nosy Haramy and Nosy Ravina lie 2.2 and 3 miles N, respectively, of Nosy Milomboka. Nosy Mangabe (15°30'S., 49°45'E.), 333m high, is the largest of the above chain of islands; it lies 2 miles SSE of Pointe Antsiraka.

There are several shoals on the W side of the approach to Maroantsetra. The one nearest the fairway has a depth of 6.4m; it lies 3.7 miles WNW of the light on Nosy Mangabe.

Maroantsetra (15°27'S., 49°49'E.) (World Port Index No. 47590) is situated at the head of Helodranon' Antongila, 1 mile NW of Pointe Antsiraka, where the Riviere Anjahanambo flows from W along the head of the bay into the mouth of the Riviere Antanambalana; the port is very small and consists of a

town and an open roadstead.

Signals.—There is a signal station at Maroantsetra with which vessels can communicate by day. Signals indicating the locality threatened by a cyclone are shown.

Anchorage.—There is anchorage off Maroantsetra in 11m, mud, with the range lights at the head of the bay in line bearing about 045°, and the SW extremity of Nosy Mangabe in line with the NW extremity of Nosy Haramy, bearing about 155°; this anchorage affords no shelter from the SE trade wind, when vessels seek shelter at Port Memoria, on the W side of Nosy Mangabe. Vessels may anchor anywhere around Nosy Mangabe, in depths of 14 to 18m, 0.2 or 0.3 mile offshore, avoiding the reef, partly above-water, that lies about 0.2 mile off the SE extremity of the island. The best anchorage off Nosy Mangabe is in Port Memoria; there is a berth with a rock on the E side of the cove in line with the trunk of a large tree, bearing 078°, and the W fall of the land N of the cove bearing 355°, where excellent shelter has been found from S and E winds.

Helodranon' Antongila (Baie d'Antongil) to Lohatanjon' Antsiraka

10.21 Tanjona Belao (16°14'S., 49°51'E.), the SW entrance point to Helodranon' Antongila, a high rounded mass of rock which is visible from a distance of 40 miles, is the termination of a mountain range that extends along the coast in a SSW. A beacon stands on the summit of the rock mass.

From Tanjona Belao the coast trends S to Tanjona Lohatrozona (Cap Lohatrozana), the S entrance point to Baie de Antanambe.

Nosy Atafana (16°19'S., 49°50'E.) lies on a reef which has a depth of 1.9m off its NE side; it is the largest of three islets that lie on this reef. From a distance of 2 or 3 miles, Nosy Atafana appears as two islets, the S and smaller part is wedge-shaped. The dark vegetation on the islet stands out clearly against the lighter vegetation on the mainland.

Antanambe is a town situated on the SE shore of Baie de Ananambe, 0.7 mile SW of Tanjona Lohatrozona. A hotel stands at the NE end of Antanambe.

For the assistance of vessels anchoring, two beacons, each 4.9m high, stand on the shores of the bay. The W beacon stands 0.1 mile SSE of the S entrance point of the Riviere Vahibe, nearly 2 miles WNW of Tanjona Lohatrozona. The E beacon stands on the E side of the bay, 0.2 mile NNE of the hotel.

Reefs extend 1 mile NE and 2 miles SE of Tanjona Lohatrozona; a depth of 4.2m is charted just over 2 miles SE of this point. In the approach to Baie de Antanambe, Tanjona Lohatrozona should be given a wide berth.

10.22 Lohatanjona Titingo (Pointe Tintingue) (16°42'S., 49°46'E.) is a hill, rising to a height of 194m, 2 miles NNW of the point.

Baie de Tintingue is entered between **Pointe Mahela** (16°42'S., 49°45'E.) and the mouth of the Riviere Fandraranana.

A current has been reported, usually setting ESE, in the entrance channels of Baie de Tintingue.

The bay is encumbered with rocks and shoals and is difficult to access; it is only suitable for vessels of shallow draft.

There is anchorage, in 7m, mud, with Pointe Mahela bearing

195°, and the white patch on Nosy Vorona, in the W part of the bay, bearing 252°. Anchorage can be obtained outside Baie de Tintingue, in 35m, with Pointe Mahela bearing 319°, distant 3 miles.

A vessel should approach Baie de Tintingue, to a position 1 mile distant bearing 160° from Pointe Mahela, and then steer through Passe du Golo with the two beacons 1.5 miles SW of Pointe Mahela in line bearing 279°. This line leads through a buoyed channel to the anchorage. There are no pilots available and only those vessels with local knowledge should attempt entry.

Lohatanjon' Antsiraka (Pointe a Larree) (16°50'S., 49°50'E.) is a long, low, and sandy projection that is partly wooded; it is visible about 10 miles in clear weather.

Anchorage can be taken off the N side of this point; the holding ground is good. Anchorage can also be taken about 8 miles NW of Lohatanjon' Antsiraka, about 0.5 mile offshore, in 26m, good holding ground. This anchorage is sheltered from SE winds, but is exposed to the ENE swell.

The currents are strong off Lohatanjon' Antsiraka, but elsewhere in the vicinity they are generally variable and of moderate strength. As a rule they follow the direction of the wind, so that the N current set predominates.

Nosy Sainte Marie

10.23 General.—**Nosy Sainte Marie** (16°53'S., 49°55'E.) lies with its N extremity, Lohatanjon' Antsirakakambana (Pointe Albarnd) (16°42'S., 50°00'E.), separated from Madagascar by Canal de Sainte-Marie. From Lohatanjon' Antsirakakambana, Nosy Sainte Marie extends 28 miles SSW; the surface of the island is undulating and the hills attain heights up to 122m. The island is thickly wooded, but throughout the valleys are either beds of rivulets of fresh water or salt water marshes which cover at spring tides.

10.24 East side.—Lohatanjon' Antsirakakambana, the N extremity of the island, is backed by a forest; a light exhibited at a height of 80m is situated 2.5 miles SSW of the point. The point is fringed by rocks and depths of less than 11m extend 1 mile NE from it. The E coast of Nosy Sainte Marie is bordered by a coral reef; the 30m curve line lies up to 10 miles off this coast, and there are several off-lying dangers.

A drying reef, which nearly always breaks, lies 12.5 miles S of Lohatanjon' Antsirakakambana. The several banks in this area lie within the 30m curve; their positions are best seen on the chart.

Lohatanjona Vohibato (Pointe Blevac) (17°08'S., 49°48'E.), marked by a light, usually considered the S extremity of Nosy Sainte Marie, is actually the S extremity of Nosy Nato (Ile de Nattes), which is low and separated from the larger island by a narrow boat channel.

A drying reef extends 1.5 miles S from Nosy Nato. Toraka Vohibato (Banc de Blevac), with a depth of 11m, lies 4.5 miles SSE of Nosy Nato, and reefs, which dry, lie from 3 to 5 miles ENE of Lohatanjona Vohibato, and about 2.5 miles offshore.

The E coast of Nosy Sainte Marie is exposed to the SE trade wind and a heavy swell sets in. There is no sheltered anchorage, but Anse d'Ampanhy midway along this coast may provide refuge for boats. The entrance to this cove, through a

narrow gap in the coastal reef, can be identified by a white cliff at its head. The entrance has not been examined and breakers have been seen there.

10.25 West side.—Lohatanjon' Antsitakaraiky (Pointe d'Antsirakaraiky) (16°45'S., 49°58'E.) can be identified by its sandy beach; the N part of this low salient point is covered with casuarina and coconut palms, but the S part by coconut palms only.

Anchorage.—Anchorage can be obtained in the bay on the N side of Lohatanjon' Antsirakaraiky, in 16.5m, sand, with the light bearing 117°, distant 1.5 miles. This anchorage, which is sheltered from E and S winds, lies 0.5 mile offshore; there are no known dangers between this position and the 10m curve which lies about 0.4 mile offshore. There is anchorage 1.7 miles S of the point off the village of Ambatoroa, in 7m, sand, 0.4 mile offshore. This anchorage is open SW, but is sheltered from winds from the S through E to NE.

Directions.—Vessels approaching Port Sainte-Marie from the N or S should not approach closer than 1 mile to the shore of Ile Sainte-Marie, until a position is reached from Ilot Madame Light bears 134° and is in line with the cathedral in the E part of the harbor. This range should then be followed to the anchorage position.

10.26 Pointe Tafondro (16°53'S., 49°53'E.) lies 12 miles SSW of the N extremity of the island. A reef extends nearly 0.2 mile N of the point. This point should be given a wide berth.

Port Sainte Marie (Ambodifotatra) (17°00'S., 49°51'E.) (World Port Index No. 47570) is situated on the W side of Nosy Saint Marie is an open roadstead for large vessels.

Depths—Limitations.—Ocean-going vessels can anchor in the roadstead off Port Sainte-Marie.

Aspect.—Pointe des Sorciers, the N entrance point, is a small hill marked by white-washed rocks. Rocher des Baleiniers, the S entrance point, is high and black with a clump of trees on it. The following are good landmarks; the buildings of Ilot Madame; the barracks, situated on a hill, 45m high, 0.2 mile E of Ilot Madame; a storehouse, 0.2 mile N of the barracks; and a yellow church, 0.1 mile SW of the barracks; this church stands out well when approached from the N.

Anchorage.—Anchorage can be obtained on the range line, in about 20m, muddy sand, with Ponte des Sorciers Light bearing 051°. There is also anchorage, in 12m, with swinging room of 0.1 mile, with the light on the head of the jetty at Port Sainte-Marie in line with the white bank on the S end of the roof of the storehouse nearest to the basin at Port Saint-Marie, bearing 098°, and Ilot Madame Light bearing 166°.

Vessels surprised in the roadstead by bad weather from the S or SW should take shelter under Lohatanjon' Antsiraka, 9 miles N.

Caution.—Shoals, with depths of 4m and 7.6m, lie on the N side of the fairway, 800m and 0.5 mile WSW, respectively, of Pointe des Sorciers, the N entrance point; there are two 5.5m patches 0.1 mile N and S of the 4m shoal. A buoy marks the SW side of a shoal, with a depth of 4.3m, 0.3 mile NNW of Ilot Madame Light. On the S side of the fairway there are depths of 7.6m and 11.9m, 0.2 mile and 0.3 mile WNW and NW, respectively, of Ilot Madame Light; these dangers are covered by the red sector of Pointe des Sorciers Light, bearing less than 050°. A buoy marks the N side of a 3.7m shoal, 0.2 mile NW of Ilot

Madame Light; a buoy, moored 137m N of the light, marks the edge of a bank extending from the islet. A reef extends nearly 0.1 mile from the NW side of Ilot Madame.

10.27 Canal de Sainte-Marie.—The narrowest part of the canal is SE of Lohatanjon' Antsiraka (16°50'S., 49°50'E.), where the width is about 3.5 miles between the point and Nosy Sainte Marie.

Toraka Fry (Banc Fry) (17°12'S., 49°35'E.), with a depth of 7.3m, lies in the S part of Canal de Sainte-Marie. Depths of 11m lie 9.5 and 12 miles WSW of Lohatanjon' Antsiraka.

Anchorage.—Where the depths are suitable, any part of Canal de Sainte-Marie may be considered as a fairly secure roadstead. The holding ground N of Lohatanjon' Antsiraka is good, but S and SW of the point the bottom is loose and sandy and heavy seas come tumbling in; the E side of the canal, where the reefs are steep-to and may be approached closely, is the best anchorage. Anchorage may be taken off the village Soanierana-Ivongo, 15 miles WSW of Lohatanjon' Antsiraka, in about 10m, sand, with the fort at Port Sainte Marie bearing 110°. An 11m depth lies in the approach to this anchorage.

Canal de Sainte-Marie to Toamasina

10.28 Between the mouth of the Riviere Maningory (17°12'S., 49°28'E.) and the town of Fenerive, 11 miles SSW, the coast is low and sparsely wooded. Pointe Takoandra (17°25'S., 49°27'E.), wooded and moderately high, is located 3 miles SE of Fenerive; the point is marked by a beacon.

Pointe du Nouvel Hopital (17°23'S., 49°25'E.), 2.7 miles N of Pointe Takoandra, can be identified by an isolated, barren, flat-topped hill about 49m high, rising 1.2 miles SW of the point. An old fort and a disused light stand on the hill.

There are three hills near the coast, from 0.6 mile to 1 mile SE of Pointe du Nouvel Hopital. The Residency, with a flagstaff nearby, stands on the NW hill; it is visible from some distance. Colline Lakaria, the SE hill, is marked by a light.

Nosy Ilansambo, lying 0.6 mile ESE of Pointe du Nouvel Hopital, is low and covered by trees; it is fringed by a sandy beach and a continuous reef, which breaks heavily. A reef extends 0.2 mile NE from the island. The reefs cause the islet to stand out well when approached from the SE, but from the NE, it is not distinguishable until within 3 or 4 miles.

The coast between Nosy Ilansambo and Pointe Takoandra is fringed by a reef, which extends up to 0.4 mile offshore; the sea breaks on this reef. Several shoals, having a least depth of 2.7m, lie within 2.2 miles NE and E of Pointe du Nouvel Hopital. Vessels should not attempt to pass between these shoals and the reef extending NE from Nosy Ilansambo.

Fenerive (17°23'S., 49°25'E.) (World Port Index No. 47560) consists of a town, a very small harbor, and an open roadstead.

Anchorage.—Anchorage off Fenerive, which is exposed and dangerous in winter, should only be considered temporary. Large vessels can anchor, in about 11m, on the 224° range line, with the flagstaff bearing about 190°. Small vessels can anchor, in 7.3m, on the 224° range, with the light bearing 164°, or with the light bearing 181° and Pointe du Nouvel Hopital bearing about 271°; the latter is better protected from the swell and wind by Nosy Ilansambo.

Directions.—Vessels approaching from the N should stay at

least 5 miles off the coast to avoid the foul ground N of Fen-erive, until the range beacons situated W of Pointe du Nouvel Hopital and on Vohimassoa Fort, which establishes a course of 224°, are in range. One authority recommends that the land in the vicinity of Pointe Takoandra be made, or even the land in a position farther S, and that then the directions given for a vessel approaching from the SE be followed.

Vessels approaching from the SE should steer so as to pass at least 1 mile E of Pointe Takoandra, and then to make good a course of 350° for about 4 miles to a position where the 224° range can be followed to the anchorage.

Between Pointe Takoandra and Foulpointe the coast is irregular, consisting of a series of beaches and rocky points; it is fringed by rocks, especially off the points. Reefs extend up to 0.6 mile offshore and are marked by breakers.

There are several banks off this coast whose positions may be seen on the chart; their depths vary from 11 to 13m. Toraka Laperouse (Banc du Laperouse) (17°23'S., 49°40'E.), with a depth of 13m, lies 11 miles offshore, ENE of Pointe Takoandra. The other banks in this area extend about 8 miles SSW.

10.29 Mahambo (17°29'S., 49°28'E.) is situated 4 miles S of Pointe Takoandra; the ground in the vicinity is a reddish color. A wooded point lies E of the village and the outlet of Riviere Tsirita, about 1.5 miles NW, lies between two rock-bordered points. A conspicuous rock, La Bitte, rises from the reef extending off the middle point.

The best anchorage, but practicable only for small vessels with local knowledge, is in about 9m, N of Mahambo and NW of a reef, which extends NE from the village. Large vessels must anchor outside the reefs where they are exposed to the swell; La Bitte is a mark for the anchorage area.

Grand Recif (17°40'S., 49°32'E.), a projection of the coastal reef which fringes the point at Foulpointe, extends 1 mile NE from the village. The reef is not steep-to and is separated from the coast by a narrow boat channel.

Toraka Mahavelona (Bancs de Foulpointe) lies close E and NE of Grand Recif. A depth of 10m lies in the approach to Foulpointe, 1.7 miles NNE of Grand Recif.

The coast in the vicinity of Foulpointe may be identified by some high white sand hills with trees on their summits.

10.30 Foulpointe (17°40'S., 49°31'E.) (World Port Index No. 47550) is a large village standing on low ground close W of Grand Recif. The port is small and consists of the village and an open roadstead. The ruins of Fort Hova, about 15.2 high, are situated about 0.5 mile W of the village.

There is safe anchorage during the good season, from April to October, when the prevailing winds are from between the S and SE; it is open to N and NE winds, but these seldom last long, and do not raise a high sea.

Anchorage can be obtained, in 13m, speckled sand, good holding ground, with the ruined Fort Hova bearing about 220° and the N extremity of Grand Recif bearing 090°; this anchorage, which affords reasonable shelter from N winds, is only about 0.1 mile from the 10m curve.

There is anchorage, in depths of 9 to 10m, with the N extremity of Grand Recif bearing 058° and the tangent of the coast S of the village bearing 183°; this anchorage is only 0.1 mile from the reef and is close to the 5m curve. This anchorage

is convenient for small vessels during S winds, but if blowing strongly from that direction, a slight W swell is felt in the roadstead causing vessels to roll.

Between Foulpointe and Toamasina (Tamatave), the coast is fringed for about 8 miles with reefs which have not been well defined, and should not be closed within 0.5 mile.

Toraka Antetezana (Banc d'Antetezana) (17°49'S., 49°33'E.) lies 3 miles offshore has a least charted depth of 11m.

Mamelles de Natte (17°50'S., 49°25'E.) are two conspicuous hills. Fausses Mamelles rise near the coast, about 1.3 miles E of Mamelles de Natte, and resemble the latter. Although they are not nearly as high, in hazy weather there is a possibility of mistaking them. Southward of these hills, the coast is thickly wooded and decreases in elevation towards Toamasina.

As the white sandy coast S of Collines Mamelles de Natte is free from dangers outside a distance of 0.5 mile, vessels proceeding along the coast should keep about 1 mile offshore and thus pass within all the out-lying dangers off this part of the coast. This practice is particularly recommended by day, and also for those with local knowledge on a clear night, for the land is easily followed by the white line of breakers.

The Riviere Ifontsy flows into the sea about 13 miles S of Foulpointe. Anchorage can be taken off the outlet, in 24 to 29m, or in a position as far as 3 miles N of the outlet.

Ile aux Prunes (18°03'S., 48°28'E.), a small coral island, is low and level and its shores are perpendicular. The tops of trees covering the island have heights up to 27m; their uniform dark green foliage makes the island stand out clearly from the mainland. It is visible from distances up to 15 miles, and is a very useful mark for vessels proceeding to Toamasina. Vessels approaching from the S will first sight the flare of the oil refinery at Manangareza.

Toamasina (18°10'S., 49°25'E.)

World Port Index No. 47540

10.31 Toamasina (Tamatave), the principal port of Madagascar, is connected by rail with Tananarive, the capital. The harbor lies between Lohatanjona Hastie (Pointe Hastie) and Pointe Tanio, 1.5 miles NNW. The port consists of the town and a small natural harbor protected from the NE by reefs and a breakwater.

Winds—Weather.—Toamasina is sheltered from the winds and seas by Ilay Harandriaka Lehibe (Le Grand Recif) and the breakwater. The heavy storms occurring from November to February may effect berthing at the wharves because of the swell; at this time vessels may have to put to sea or anchor in the harbor.

Tides—Currents.—The tidal range is from 0.4m at MLWS to 1m at MHWS. Caution is necessary because of the uncertainty of the current, for at the same season and apparently under similar conditions, a vessel may be set 10 or 12 miles N or S. During SE winds, no reliance can be placed on a N current, but during winds from between the N and NE, which are comparatively rare, a fairly strong S current will generally be found. On the whole it is best to be prepared for the latter, and if approaching from the E, to make the land between Mamelles de Natte and Ile aux Prunes.



Port Toamasina

The currents near the coast and in the channels leading to Tamatave are affected by the wind, and usually set in the same direction as the wind. However, in Passe du Sud, a current is reported to set frequently ESE at a velocity of 1.5 to 2 knots.

From October to December, it often happens that the current continues to set S, even when a S wind has been blowing for some time; from March to September, the current sometimes sets strongly N, even when the S winds, which predominate during this season, are not blowing, but it is also possible to experience a S set when a S wind is blowing.

The maximum velocity of the S current, from observations made during 1931 to 1933, is about 1.3 knots; the N current attained a slightly lesser velocity. It is probable that these velocities are exceeded during strong winds. The currents appear to be stronger S than N of Toamasina.

Depths—Limitations.—The following was reported in 1994:

1. Li Grand Recif was easily distinguished by sand bars and numerous breakers.
2. Le Petit Recif was only slightly discernible in daylight; there were no breakers, but there was a slight discoloration of water.
3. Toraka Six-Meters was not discernible in any way.

Berthing details are shown in the accompanying table titled **Toamasina—Berthing Information**.

Aspect.—The land around Toamasina is low and consists of small hills which are difficult to identify from seaward, but the high land behind, in clear weather, may be seen at a distance of 35 miles.

Toamasina—Berthing Information				
Berth Name	Length	Maximum Vessel LOA	Maximum Vessel Draft	Remarks
C1-South	—	200m	9.8m	Grain, chrome ore, and edible oils.
C2-Center	—	200m	10.0m	Containers.
C3-North	—	200m	10.5m	Containers, ro-ro, and passengers.
Pointe B	40m	240m	12.3m	Tankers.
B	200m	180m	8.5m	Multi-purpose.
AE	110m	100m	7.5m	General cargo.

Toamasina—Berthing Information				
Berth Name	Length	Maximum Vessel LOA	Maximum Vessel Draft	Remarks
AS-N	204m	100m	5.5m	General cargo.
AW-S	—	60m	4.0m	General cargo.



Port Toamasina

A vessel approaching from the S reported (1987) the first visible landmark was the large white grain silo on the wharves of the inner harbor. The light on Nosy Alanana (Ile aux Prunes) was identified at 17.5 miles.

When Toamasina is approached from the NE, Mamelles de Natte and Fausses Mamelles will be seen, also Pic Vohitravoha, 10 miles SSW of Mamelles de Natte. Nosy Alanana, 5.5 miles NNE of Pointe Tanio, shows up well because of its tall trees and its light.

Other marks are Grande Passe de l'Est Front Range Light and the white houses of Ampanalana Village on the coast 2.7 and 1.7 miles NNW, respectively, of Pointe Tanio. The radio mast 0.7 mile WNW of the point, the group of cranes on the harbor moles and towers, and water tanks close SE of the moles are conspicuous.

Pilotage.—Pilotage is compulsory and is available 24 hours. Vessels send their ETA to the Port Authority 4 hours before arrival. The message should also contain information on cargo to be worked. Pilots monitor VHF channels 12 and 16. The pilot boards in position 18°06.4'S, 49°26.0'E.

For tankers of over 30,000 dwt, the pilot boards in Grand Passe de L'Est, approximately 3.3 miles SSE of Ile aux Prunes. For other vessels, the pilot boards 2 miles NNE of Cap Tanio.

Signals.—There is a signal station at the Port Office; signals indicate the locality threatened by a cyclone.

Anchorage.—Anchorage may be obtained, in good weather, E of the reefs and outside the port limits, in depths of 35 to 50m. In bad weather, vessels are advised to drift well offshore.

Port authorities may allocate one of six designated anchorage berths, good holding ground, N of Pointe Tanio to vessels

waiting for a berth or under quarantine.

Caution.—**Toraka Ifontsy** (Banc d' Ifontsy) (17°53'S., 49°32'E.), with a least charted depth of 7.6m, lies 4 miles offshore, 16.5 miles NNE of Pointe Tanio. Torako Marie-Eugenie, with a depth of 6.6m, lies 2.2 miles SSW of Toraka Ifontsy.

Passe du Nord-Est, which passes between the reefs, is not recommended as the landmarks can not be made out very well.

Grande Passe de l'Est, formed between Toraka Six-Metres (Banc des Six-Metres), is the principal entrance. Range lights, in line bearing 277°, lead from seaward but have been reported (2013) to be difficult to locate as their intensity is very weak.

The white sector light (184°-193°) leading S to the berthing basin is obscured when a vessel is moored on the E part of Mole B.

It should be noted that frequent heavy rains squalls, experienced in approaching, may obscure all visible aids to navigation.

Toamasina to Mahanoro

10.32 From Toamasina, the coast trends in a general SSW to Vatomandry; there are few indentations in this coast. There are no dangers charted seaward of the 50m curve.

Nosy Faho (18°18'S., 49°24'E.) is located at the S extremity of a coral reef, 8.5 miles S of Lohatanjona Hastie, and about 2.8 miles offshore. The 10m curve line lies 1.5 miles N and 1 mile S of the island.

Nosy Dombala (18°26'S., 49°24'E.) is a sandbank on a coral reef, 7.5 miles S of Nosy Faho; these reefs are clearly marked by breakers. Toraka Malagasy (Bank Malagasy), a 6.3m depth, lies 2 miles NNE of Nosy Dombala. Vessels should not attempt to proceed through the passage between Nosy Faho and Nosy Dombala; if the vessel is obliged to do so it is better to keep close to Nosy Faho. There is a good anchorage W of Nosy Dombala, protected from SE storms, in a depth of 18m.

Toraka Tourmaline (Banc de la Tourmaline) (18°39'S., 49°19'E.) lies 4.5 miles offshore, has a charted depth of 11m and breaks in bad weather. Banc d'Anteyorando, with a depth of 9.7m, lies 7.2 miles offshore 12 miles SSW of Toraka Tourmaline. The Riviere Iaroka enters the sea in the position 18°58'S, 49°06'E. The spray of breakers extending some distance off the outlet of the river is said to be visible from a distance of 10 miles seaward. Andevoranto is a large village on the N side of the Riviere Iaroka near the entrance. There is anchorage, with a bottom of sand, off the village. The sea was reported to break during heavy weather in several places about 6 miles offshore, 10 miles SSE of Andevoranto.

Rocher Noir is a conspicuous black islet, lying a short distance offshore, in the position 19°12'S, 49°01'E.

La Selle rises at the N end of the nearest ridge of hills in the position 19°14'S, 48°48'E. The formation appears as a table-

land when seen from the N, but as a saddle when seen from the E or S.

Vatomandry (19°20'S., 49°00'E.) is situated at the mouth of the Riviere Marolo. This small port, which consists of a village and open roadstead, was closed to maritime traffic in 1950.

There are many dangers in the vicinity of Vatomandry; the farthest SE is a rock charted 5.2 miles offshore.

10.33 Between Vatomandry and Mahanoro the low coast is bordered by trees broken by the mouths of several rivers.

Colline Ronde (19°39'S., 48°44'E.) is located on the second ridge and has a dark conical summit and is one of a number of conspicuous hills in this vicinity. Saddle rises S of Colline Ronde in a position 15 miles W of Mahanoro; its summit is slightly hollowed at the center. When seen from the N, the outline of the hill appears against the sky; from the S it shows a dark outline against a background of distant mountains.

Caution.—A rock, with a depth of 7m, lies 4.7 miles SE of Vatomandry; its charted position is doubtful.

Toraka Vaudreuil (Banc du Vaudreuil) (19°30'S., 48°56'E.) has a rock, awash, located in about its center; the bank extends about 2 miles N and 2 miles S from the rock. This bank lies about 1.5 miles offshore, 11 miles SSW of Vatomandry. A shoal, with a depth of 8m, is located 7 miles NNE of Mahanoro, and another with a depth of 4m, lies 3 miles in the same direction.

10.34 Mahanoro (19°55'S., 48°49'E.) (World Port Index No. 47520) is situated on a wooded peninsula forming the E side of a river, which flows into the sea from a large lagoon. The port is small and consists of an open roadstead. The Residency, conspicuous from the NE, stands on a hill on the E side of the village. A chain of reefs extends 2.5 miles NE from the peninsula; all approaches should be from N of these reefs, and only in daylight.

There is anchorage, in 5.5m, with the Residency bearing 198°. A heavy sea from the SE sets into the anchorage in June and July and communication with shore may be interrupted for several consecutive days. Signals indicating the locality threatened by cyclones are shown at the signal station.

Mahanoro to Manakara

10.35 The Riviere Mangoro (Riviere Nosivolo) flows into the sea about 6 miles S of Mahanoro. The muddy waters of the river discolor the sea to a distance of several miles off its outlet. Navigators unaware of this fact frequently suspect shoals, but such is not the case as the depths off the outlet are very great and there are no known dangers.

Pain de Sucre (20°35'S., 48°16'E.), a conspicuous hill of sugarloaf shape, inclines slightly to the S. The hills then diminish in elevation to the S; the last of any prominence has a summit of moderate height resembling three teeth of a saw from the NE and SE, and appearing as an undefined mass from the E.

The Riviere Sakaleona enters the sea in position 20°33'S, 48°34'E. Anchorage can be taken, in 31m, off the outlet of the river. In the recommended position, Pain de Sucre bears 253°; the bottom of fine red sand is of indifferent holding quality. The depths decrease very slowly and regularly from the an-

chorage toward the outlet of the river. The depths in a position about 0.2 mile from a bar across the outlet is reported to be 10m. In depths of less than 20m in this area the bottom is of coral; in depths of more than 20m the bottom is of fine red sand. Communication with the shore is usually difficult.

Mahela (20°58'S., 48°27'E.), on the N side of the mouth of the Riviere Fanantara, can be identified by a row of casuarina trees, which border the coast N of the village and extends SW from it. Vessels can anchor in the open roadstead off the village. The best berth is with a conspicuous house bearing between 270° and 281°, in 22 or 24m, sand and coral. Except for between these bearings, the bottom is foul. This anchorage is impracticable during the Southeast Trade Winds.

Communication with the shore at Mahela is by means of decked surf boats and should not be attempted in ship's boats or by strangers. The landing place is inside the bar.

A vessel approaching the open roadstead at Mahela from the N or E should make the land about Sommet Pain du Sucre, then coast along, in depths of 14 to 15m, to the anchorage.

10.36 Mananjary (21°15'S., 48°20'E.) (World Port Index No. 47510) is situated on the N side of the mouth of the Riviere Mananjary; the port is very small and consists of the town and an open roadstead. The current about 6 miles E of Mananjary was observed, in 1944, to set S at 1.5 knots, but a strong N set was encountered when the anchorage was approached.

A hospital, in green and red colors, surrounded by casuarina trees, is situated 2 miles N of the river mouth; the gray water tower, 0.5 mile SW of the hospital, and the Residency at the S end of town are good marks from the offing. Mont Vatovary (21°24'S., 47°57'E.) is higher than the neighboring summits and of darkish color.

Signals.—Signals indicating the locality threatened by a cyclone are displayed in Mananjary.

Directions.—The anchorage position should be approached by steering in with the S pair of lights in line bearing 269° to the intersection of the alignments of the two pairs of range lighted beacons bearing 269° and 331°.

The **Riviere Faraony** (21°48'S., 48°10'E.) enters the sea about 33 miles SSW of Mananjary; outside the reef which fronts the mouth of the river there is anchorage with a bottom of sand and coral. Breakers have been reported in a position about 4 miles SSE of the rivers mouth.

Ambataloborona (21°57'S., 48°07'E.), a rock, lies close offshore 10 miles SSW of the Riviere Faraony.

The Riviere Mananano enters the sea about SSW of Ambataloborona; the tall casuarina trees at the mouth of the river are conspicuous.

10.37 Manakara (22°09'S., 48°03'E.) (World Port Index No. 47500) is comprised of two small towns lying on the N and S banks of the Riviere Manakara. The port consists of the two towns and an open roadstead; it is very small.

A chain of shoals lies about 0.7 mile offshore off the towns. Anchorage may be taken outside these shoals, just over 1 mile ENE of the Residency, in a depth of 15m, and, in a depth of 12m, about 0.2 mile farther in the same direction. An isolated shoal, with a least charted depth of 8.5m, lies in a position bearing 072°, 1.2 miles distant from the Residency. A shoal of 10.1m, whose existence is doubtful, lies 0.4 mile E of the

above 8.5m depth.

Manakara to Baie de Sainte-Luce

10.38 Between Manakara and Farafangana the coast is low and wooded and has no outstanding features; close within is a continuation of a chain of lagoons and rivers. The mountains of the interior are visible only in exceptionally clear weather. A wooded plateau, 10 miles N of Farafangana, is a good mark for identifying that place when approaching from the N.

Matatana (Riviere Matitanana) enters the sea in position 22°26'S, 47°55'E, 18 miles SSW of Manakara. The mouth of Matatana forms a large estuary, which is completely obstructed by breakers extending about 0.5 mile offshore.

From 4 to 5 miles S of the mouth of Matatana, a barrier reef extends 8 to 9 miles SSW and lies about 0.5 mile offshore. There is a passage near the N end of the reef which has been used by coasters. Small vessels, with local knowledge, can use this passage and anchor off Andranamby.

Anosikely (Nosikely) (22°42'S., 47°51'E.) is a village situated on a gray hill 10 miles S of Andranamby; anchorage can be taken E of the village and N of a large black rock, in a depth of 15m. Passengers can be embarked here when weather is too bad at Farafangana.

10.39 Farafangana (22°49'S., 47°50'E.) (World Port Index No. 47490) stands between the Riviere Manambotra and the Riviere Manambato, close within the common mouth. The port consists of the town and an open roadstead. It was reported (1972) to be closed to maritime traffic.

The current off Farafangana usually sets SSW at a velocity from 1 to 2.75 knots. During heavy rains, the water from the rivers discolor the sea; this water has been reported up to 12 miles E of town.

Anchorage, with poor holding ground, may be taken 0.2 mile off the outer reefs, in a depth of 14.9m; the outer reefs lie up to 0.7 mile offshore and do not always break. If landmarks are not visible, vessels should anchor when the water shoals to 26m.

Between Farafangana and the mouth of the **Riviere Mananivo** (23°13'S., 47°44'E.), 25 miles SSW, the coast is backed by well-wooded country. The few known dangers lie close offshore and vessels proceeding along the coast by day can see them at sufficient distance to enable them to be avoided.

The Riviere Mananivo can be identified by the contrast between the thickly-wooded country N, with the flatter coast, with few trees, S.

There is anchorage, in 33m, sand, 3 miles off the Riviere Mananivo, with the S fall of Colline Ankarana (23°05'S., 47°38'E.), a large flat-topped hill, bearing 313°; vessels wishing to work cargo must proceed closer to shore.

Mouillage de Vangaindrano (23°20'S., 47°43'E.) is the roadstead off the entrance of the Riviere Mananara.

Aspect.—A village, Benanorema, is situated on the N side of the entrance of the river; the village consists of two distinct groups of houses.

Two isolated buildings, clearly visible, stand slightly N of a tongue of sand at the entrance of the river. The town of Vangaindrano is situated about 5 miles up the Riviere Mananara.

Anchorage.—Mouillage de Vangaindrano, with depths 14 to 15m, lies 0.7 mile off the mouth of the Riviere Mananara.

Between the mouth of the Riviere Mananara and the Riviere Isandra, the high mountains of the interior gradually approach the coast.

10.40 Grande Mamelle (23°28'S., 47°11'E.) and La Dent, 9 miles S, are good marks in good weather.

The **Riviere Masianaka** (23°34'S., 47°37'E.) flows into the sea 15 miles SSW of the Riviere Mananara. Anchorage can be taken in a position about 2 miles S of the outlet and about 2.5 miles offshore. A coral reef fronts the mouth of this river.

Mahabo (23°48'S., 47°33'E.), is a village SSW of the Riviere Masianaka. Anchorage can be taken offshore in 33m, in a position with a saddle-shaped summit, within the coast, bearing 255°.

The Riviere Isandra enters the sea in position 24°03'S, 47°28'E. South of the mouth of the river, the inland range of mountains is closer to the coast; one mountain has a conspicuous knob on its summit.

Mont Sakarivo and Mont Torotoro rise 17 miles SW of the mouth of Riviere Isandra; the foot of these mountains appears to form a "V," which closes as a vessel proceeds S.

Mont Fenoarivo, 3 miles NW of Mont Sakarivo, is conspicuous. Tete Mi-Pelee is a conspicuous hill 3 or 4 miles inland, E of Mont Sakarivo; its S slopes are wooded, but its N slopes are bare.

Caution.—A rock, with a depth of 1.8m, was reported to lie in position 24°33'S, 47°24'E; this position is doubtful. A shoal, with a depth of 19m, was reported to lie 13.5 miles E of the above rock.

10.41 Baie de Sainte-Luce (24°46'S., 47°12'E.) (World Port Index No. 47480) is bounded on its E side by a chain of islets and shoals, over which the sea breaks, and affords moderate shelter to small vessels. The town of Manafiafy (Sainte-Luce) stands on the shore near the S end of the bay.

Winds—Weather.—The bay is open to NE winds, but though sometimes strong, they do not raise a heavy sea; SE winds, on the contrary, in spite of the shelter afforded by the islets, cause a choppy sea.

Aspect.—An observer approaching Baie de Sainte-Luce from the NNE will, before reaching that area, note that several small peaks on the Itaperina Peninsula appear like an island. Two small arid hills on the S side of Baie de Sainte-Luce will also appear as an island.

Anchorage.—Vessels drawing less than 6.1m can anchor with the summit of Ilot de Chartres bearing 100°, but should not proceed farther S because of a rock, with a depth of less than 1.8m, which lies 0.3 mile NNW of the summit of Ilot Babet. The holding ground is good.

Caution.—The principal islets, named in order from the N, are Ilot Souillac, Ilot aux Oiseaux, Ilot de Chartres, Ilot Babet, and Ilot aux Chevres, which has foul ground between it and the S entrance point of the bay. These islets are low, flat, rocky, and scarcely distinguishable from the coast; the sea often washes completely over them.

Garland Rock lies 0.5 mile ENE of the N extremity of Ilot Souillac, but its position is doubtful. Two shoals, each with a depth of 4.6m, lie 0.3 mile NE and NW of the N extremity of Ilot Souillac.

Several shoals are W of the islets mentioned above.

The inner part of the harbor, near the town, is shallow and encumbered by rocks.

Directions.—Because of the existence of several dangers in the approach, the exact positions of which are not known, vessels without local knowledge should approach the bay with the utmost caution.

A vessel approaching Baie de Sainte-Luce should steer for Morne Manombo (24°42'S., 47°11'E.), 221m high, which appears above the trees at the mouth of the Riviere Manombo-Arivo or Manery, 4.5 miles N of Saint-Luce, bearing 270°, keeping a lookout for Garland Rock.

When the summit of Ilot Babet, near which an isolated coconut palm tree stands, is in line with Ilot Souillac, a vessel should alter course SSW so as to pass about 0.2 mile W of Ilot Souillac, taking care to avoid the shoals NW and W of it, and steer for the middle of the gap between Ilot aux Chevres and the S entrance point of Baie de Saint-Luce, bearing 190°.

Vessels drawing less than 6.1m can anchor with the summit of Ilot de Chartres bearing 100°, but should not proceed farther S because a rock, 0.3 mile NNW of the summit of Ilot Babet. Mont Ambarabe is a conspicuous summit rising in position 24°48'S, 47°05'E.

Baie de Sainte-Luce to Faradofay

10.42 From Baie de Sainte-Luce to **Lohatanjona Evatra** (Pointe Evatra) (25°00'S., 47°05'E.), 14 miles SSW, the coast is foul for more than 2 miles offshore; breakers have been observed 0.7 mile SE of Ilot aux Chevres.

Helodrano Mananivo (Baie de Mananivo) is formed between a point 1 mile S of Manafiafy and Lohatanjona Tapera (Pointe Itapera), 8.7 miles SSW. Foul ground extends 1 mile SSW from the N entrance point and Roche Tsioumaro (24°51'S., 47°10'E.) lies 1.5 miles offshore, about 3.5 miles SSW of the same point. Between Lohatanjona Tapera and Lohatanjona Evatra (Pointe Evatra), 4.5 miles SSW, the coast recedes to form Anse d'Itaperina (Baie d'Itaperina); the N part of the bay is encumbered by islets and rocks. Lohatanjona Evatra is marked by several small, avid, reddish peaks, which are more pointed but not as high as those in the vicinity of Baie de Sainte-Luce.

Sommet Evatra (24°58'S., 47°06'E.), 173m high, Sommet Evatra Milieu, and Sommet Evatra Sud are located 1.8, 1.3, and 0.7 mile N, respectively, of Lohatanjona Evatra; a light is situated on the peninsula close S of the summit of Sommet Evatra Sud.

Roche Itaperina (25°00'S., 47°06'E.) lies about 0.5 mile SSE of Lohatanjona Evatra. The sea always breaks heavily over this rock and the resulting spray has been seen at a distance of 6 miles.

Anchorage.—Anchorage, protected from NE and E winds, may be taken on the W side of the peninsula formed N of Lohatanjona Evatra, in 21m, sand, with the N slope of Sommet Evatra bearing 044° and the light bearing 085°. A vessel may anchor closer in with the light bearing 090° and Lohatanjona Evatra bearing about 135°, in depths of 14 to 15m, sand. This anchorage lies close off Anse d'Itaperina (Anse Itapere).

It has been found that during strong NE winds, a heavy swell, up to 3m high, has set into the anchorage.

Caution.—Besides the necessity of keeping N of the point

of destination anywhere on this coast because of the SSW current, it is essential when approaching the coast to keep a constant lookout for sunken dangers, which can then generally be seen from a distance by the color of the water. The transparency of the sea is such that in ordinary conditions the bottom is clearly visible in depths from 10.1 to 11.9m.

10.43 Baie de Faradofay (Baie de Fort Dauphin)(Tolagnaro) (Tolanaro) is entered between Lohatanjona Evatra and Cap Antsirabe (25°03'S., 47°00'E.), 6.5 miles SW; the W shore of the bay is fringed by a sandy beach, fronted by some rocks. The shores of the bay are low, and there is a chain of lagoons connected with each other just within the coastline. The land rises quickly behind the lagoons and reaches a height of 529m in Pic Saint Louis. Cap Antsirabe is located at the S end of a rocky peninsula, 35m high; the E side of the peninsula is bordered by cliffs.

Faradofay (Fort Dauphin) (Tolagnaro) (Tolanaro) (25°02'S., 47°00'E.) (World Port Index No. 47470) is situated in the SW corner of Baie de Faradofay; the port consists of the town and an open roadstead. Anse Dauphine, which fronts to town, is the farthest S of the anchorages on the E coast of Madagascar. The current off Faradofay usually sets SSW at a velocity of 2 knots. Two shoals, with least depths of 8.2m and 7.9m, lie 0.6 and 0.4 mile NE, respectively, of Flacourt Light; an obstruction lies 0.4 mile N of the light. A dangerous wreck lies near the end of the pipeline extending N from Faradofay.

There are no berths alongside; cargo is worked from the anchorage. There is anchorage, in depths of 11 to 12m, sand, at the intersection of the range lines. Vessels are advised not to proceed SE of the 239.5° range line. This anchorage is at all times of the year precarious because of the swell and the squalls.

Caution.—A stranded wreck lies about 0.1 mile NNE of the anchorage point.

Vessels approaching Faradofay from the S must take care not to mistake Tanjona Ranavalona (Cap Ranavalona), a wooded bluff 84m high, lying 2.2 miles SSW of Cap Antsirabe, for the peninsula on which Faradofay stands, as in thick weather, a vessel might run into Fausse Baie de Galions.

Faradofay to Tanjon’i Vohimena

10.44 Between Cap Antsirabe and **Tanjon Andavaka** (Cap Andavaka) (25°12'S., 46°39'E.) the coast is rocky and broken. The transparency of the sea near the coast is such that, under ordinary conditions, the bottom is clearly seen in depths of 12.2m.

Fausse Baie des Galions lies between Cap Antsirabe and Tanjona Ranavalona, it is encumbered with coral, rocks, and shoals, which break, and is bordered by a sandy beach. A chapel stands on a hill which backs the head of the bay.

Pointe Ambero (25°07'S., 46°50'E.) is fronted by foul ground 0.3 mile offshore. The black tower and white building of a factory stand near the coast, 1.7 miles W of the point.

Helodranon’I Ranofotsy (Baie de Ranofotsy) (25°09'S., 46°45'E.) is entered 4.5 miles WSW of Pointe Ambero. In the middle of the entrance, which is 0.6 mile wide, there is a rocky shoal with a depth of 6.1m; vessels should pass E of this danger as there is foul ground between it and the W entrance point.

In the NW part of the bay, there is a black rock resembling the hull of a vessel.

Helodranon'i Ranofotsy affords anchorage to small vessels with local knowledge, on either side of the bay, in depths 7 to 11m, mud, interspersed with patches of rock; vessels making a long stay may find it better to anchor off the W side, as a depth of 7m will be found closer inshore than on the E side, but a cove, entered between two rocky points on the E side, is better during strong E winds. A vessel 65m in length, drawing 4.9m, has anchored with the N entrance point of the cove on the E side of the bay bearing 022°, distant 0.1 mile. Although swell and surf occur in the bay in bad weather, there is sheltered anchorage during winds from between the SE and SW.

Tanjon Andavaka, 6 miles WSW of Helodranon'i Ranofotsy, is a promontory which appears as an island as soon as a vessel is clear of Cap Antsirabe. Monte Andrahomanana rises to a height of 463m, about 1.7 miles of Tanjon Andavaka; this isolated peak is surmounted by three knolls of unequal elevation and is one of the best landmarks on this part of the coast. A shoal, with a depth of 9m, was reported to lie in a position 26.5 miles SSE of Tanjon Andavaka.

10.45 From Tanjon Andavaka to the Riviere Manambovo, 52 miles WSW, the high land decreases in elevation; the coast is backed by a large wooded plain, which becomes more wooded the farther W a vessel transits. The only heights along this coast are some large white sandhills. The location of the Riviere Manambovo is indicated by a wide depression with

gentle slopes in the featureless and slightly elevated coast. The 10m curve extends 1.5 miles offshore N of the mouth of the river.

Betanty (Faux Cap) (25°34'S., 45°32'E.) is a rocky outcrop which is backed by some white sand dunes. The coastal reef extends 1 mile from the cape; an isolated depth of 3.6m lies 2.5 miles offshore, about 5 miles SW of the reef.

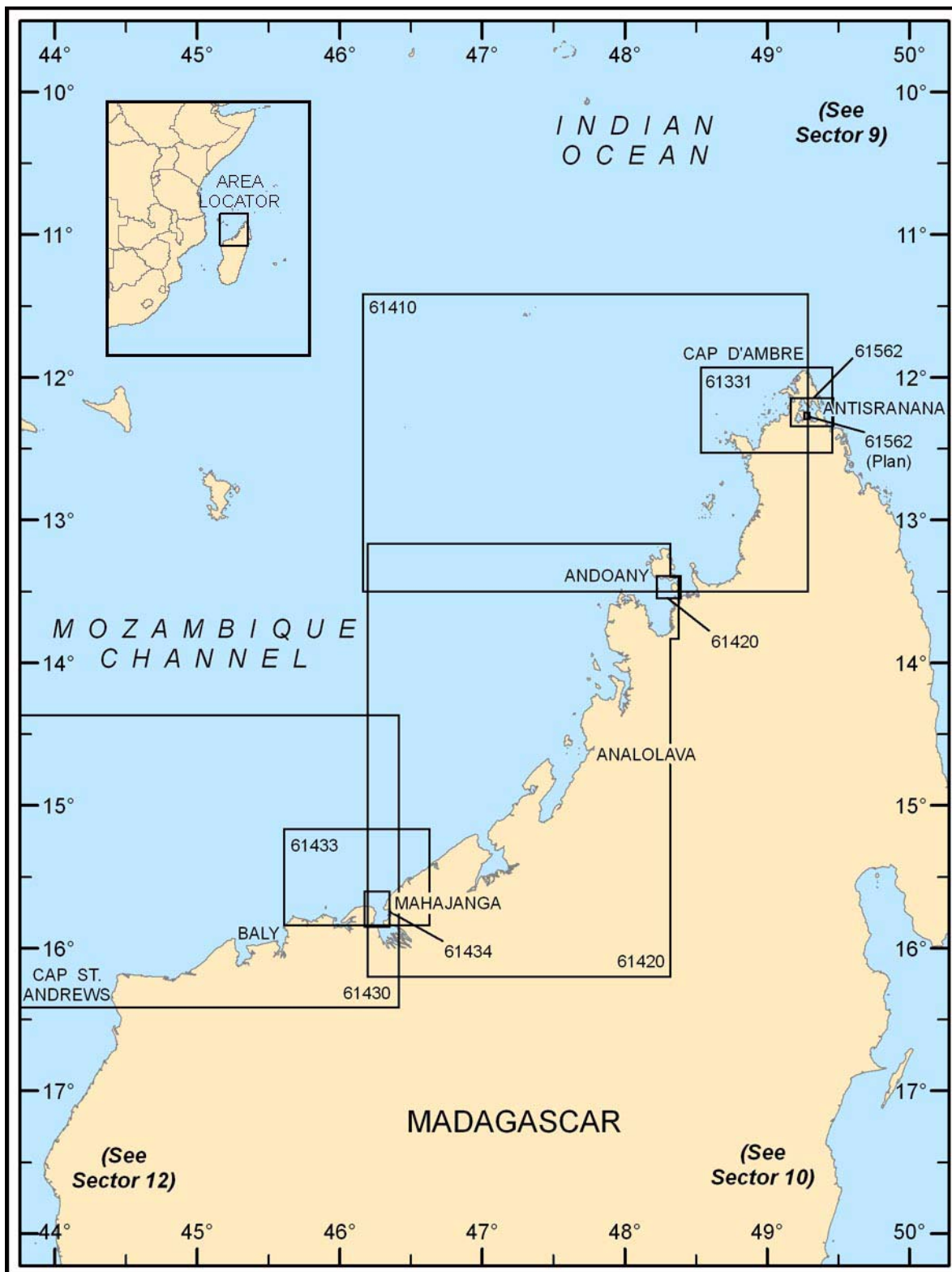
10.46 Tanjon'i Vohimena (Cap Sainte-Marie) (25°35'S., 45°08'E.) is the S extremity of Madagascar; it is a high rocky promontory rising vertically from the sea. The land in the vicinity of the cape is high and can be seen from a great distance. The extremity of the cape consists of some blackish rocks projecting 1 mile from the cliffs, and terminates in an isolated pointed rock only visible from the E. The land NW of the cape, from within 1 mile offshore, appears as a high sandy cliff with a flat summit, and is devoid of vegetation. A light is shown from the cape.

Caution.—A depth of 37m was reported (1979) to lie 29 miles ESE of Tanjon'i Vohimena.

A depth of 15m lies 42 miles SSE of Tanjon'i Vohimena; a depth of 30m was reported (1974) to lie 37 miles W of the 15m depth.

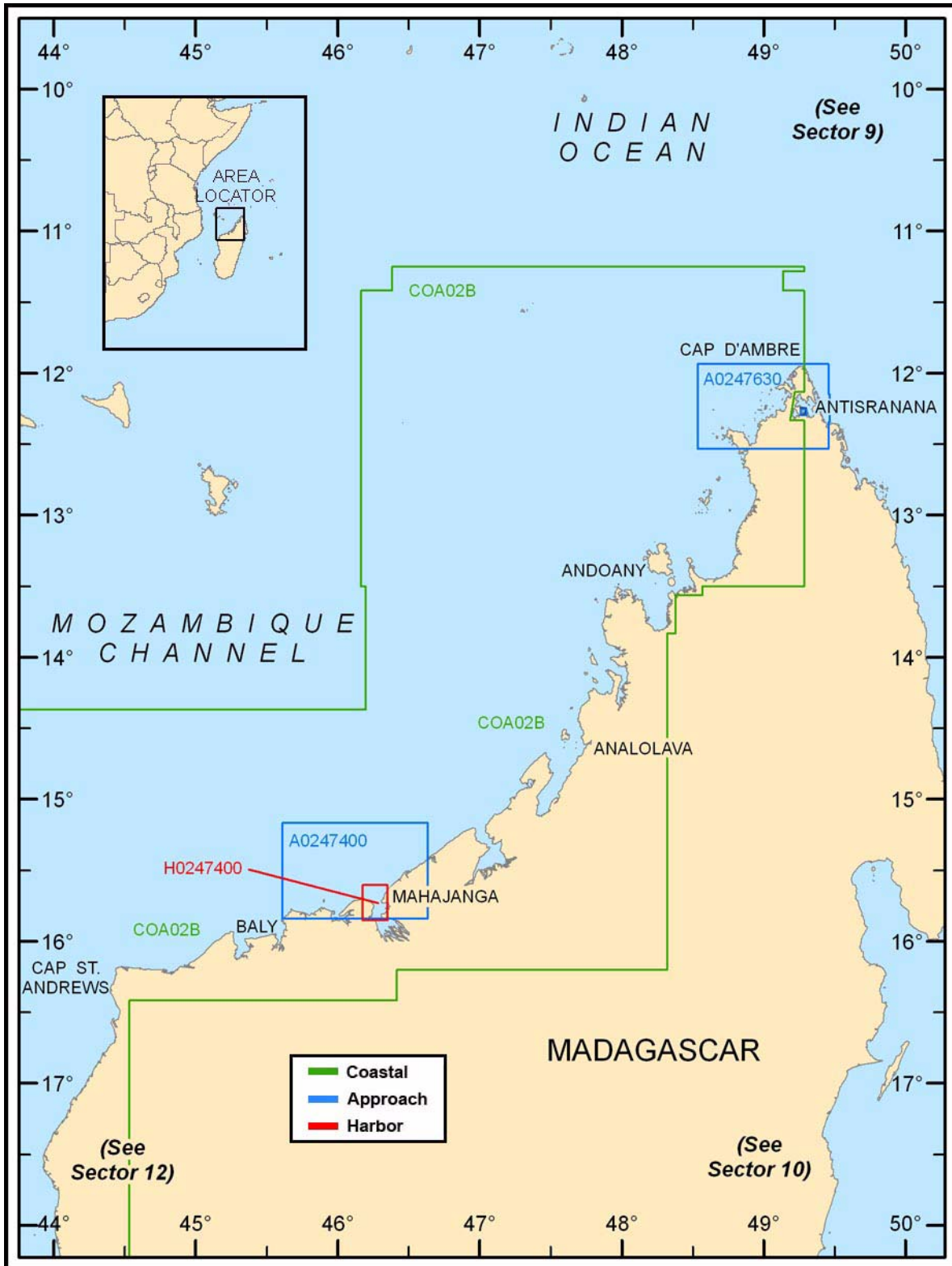
A bank, with a depth of 501m, has been reported to lie 92 miles SSE of Tanjon'i Vohimena.

Walters Shoals (33°12'S., 43°55'E.) has a least depth of 15m; these shoals have been seen to break.



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SECTOR 11 — CHART INFORMATION



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SECTOR 11

MADAGASCAR—NORTHWEST COAST—TANJON'I BOBAOMBY TO CAP SAINTE-ANDRE

Plan.—This sector describes the NW coast of Madagascar from Tanjon'i Bobaomby (Cap d'Ambre) SW to Cap Sainte-Andre (Tanjona Vilanandro). The distance is about 380 miles. A landfall at dawn on the NW coast of Madagascar is recommended, owing to the intense thunderstorms, which occur in the afternoon, often lasting well into the night and severely restrict visibility.

Tanjon'i Bobomby (Cap d'Ambre) to Tanjon' Voailava (Cap Voailava)

11.1 Tanjon'i Bobaomby (Cap d'Ambre) (11°57'S., 49°16'E.) was previously described in paragraph 10.2.

Cap d'Ambre is visible from the NW at distances up to 15, and at times, 20 miles. The country W and SW of the cape has, from the W, a broken, irregular outline; the numerous hills and hummocks have bare sides and grass-covered summits. Ambinantsandra, rising about 8 miles SW of Cap d'Ambre, is tree-covered, and broader and higher than those about it; a round hill nearby is conspicuously dark. Le Coq (Ambohitra Koholahy) rises about 2 miles ESE of Ambinantsandra; it is not seen from the NW, because it is shut in by the latter, but is a useful mark for vessels in the vicinity of Baie Andramaimba.

Caution.—Between Cap d'Ambre and Pointe d'Angadoka, the coast is bordered by a bank, with depths of less than 91.4m, extending from 5 to 20 miles offshore; its outer edge is steep-to and descends into great depths. Vessels drawing more than 4m should be navigated with great care when approaching this bank, as in some places, there are depths of 4.9m over the flats and heads of coral, which flats are often of great extent and lie most frequently on the outer edge of the bank.

It may be considered certain that, from the nature of this bank and the adjacent coast, there may be dangers other than those shown on the chart. Constant sounding and notice of any change of color of the water, are essential when navigating off this coast.

11.2 Baie Lotsoina (12°00'S., 49°13'E.) is entered 4.5 miles WSW of Cap d'Ambre; it affords good shelter for vessels, particularly those of low power, awaiting an opportunity to round Cap d'Ambre from the W.

Winds—Weather.—Although the anchorages within Baie Lotsoina are landlocked, they are, however, swept by violent offshore squalls.

Tides—Currents.—The flood current sets very strongly WSW across the entrance of Baie Lotsoina, and care is necessary in entering the channel, but when fairly entered, the current follows the channel.

Aspect.—The entrance is not easy to identify from a distance, but shows up best from the NNW or NW.

The shores of Baie Lotsoina are of uniform appearance, low, flat, and of coral formation, rising vertically to an elevation from 3 to 4.5m, and thickly covered with bushes. The hills in the background are wooded.

Anchorage.—Vessels can obtain anchorage off the entrance of Baie Lotsoina, in 20 to 21m, mud, but the proximity of the coastal reef renders it necessary to be ready to weigh anchor, if the wind blows onshore.

Ile Basse lies about 1.3 miles SE of the entrance; vessels can obtain anchorage with the islet bearing 220°, in 14m, good holding ground, mud. Vessels can also anchor in the basin NW of the islet.

Directions.—It is better to leave Baie Lotsoina in the early hours of the morning, before the breeze increases, and it is advisable to mark the projecting points of the coastal reef as the light is then bad.

Caution.—The best time for seeing these dangers is in the afternoon.

11.3 Baie Ampanasina (12°01'S., 49°12'E.), entered 1.2 miles SW of the entrance of Baie Lotsoina, closely resembles the latter inlet. Buoys should be placed to mark a fairway through the reef-fringed entrance channel before entering. The anchorage, for small vessels, in 7 to 9m, is restricted.

Directions.—Local knowledge is essential. The best time of day to enter the bay is during the hours of early morning when the winds are normally light and the reefs can be seen; it is even better, for the purpose of seeing the reefs, to proceed into the bay before the sun has risen above the hills to the E to shine directly into the eyes. The entrance should be approached by steering 112° for Ambinantsandra.

Vessels should proceed through the outer part of the channel by keeping a little N of the 128° range established by Le Ballon and L'Alette; an entering vessel should not approach Rocher Sentinelle closer than 0.6 mile. When this rock bears about 230°, and is open N of Pointe Vedette, the course should be changed more to the S to avoid the projecting reef on the N side of the entrance channel. When Rocher Aiguille bears about 262°, and is open N of Pointe Vedette, course should be changed to ESE to avoid the projecting reef on the S side of the channel. After clearing the entrance channel, course should be changed to 147° for Colline Tirailleuse, which leads to the anchorage, but passes very close SW of a 1.8m shoal.

11.4 Helodrand Ambavanibe (Baie Ambavanibe) (12°03'S., 49°10'E.) is entered between Pointe Andranovondrony, which lies 2.2 miles SW of the SW entrance point of Baie Ampanasina, and Pointe Vedette, 1.2 miles farther SW.

Winds—Weather.—The winds of the Southeast Monsoon and the current give rise to a turbulent sea in the entrance channel that makes it difficult to discern the outer edges of the bordering reef.

Tides—Currents.—The tidal currents attain velocities from 2 to 3 knots at springs, and care must be taken when entering or leaving.

Aspect.—Baie Ambavanibe can be identified by the wooded hills surrounding it, one of which, Colline Ambinantsandra (12°04'S., 49°12'E.), is typical.

Anchorage.—The best anchorage during the Southeast

Trade Winds is in 14m, mud, under the lee of Sommet Tirailleuse (12°06'S., 49°13'E.). The wind at the anchorage is strong at this season, and squalls blow down the sides of the hills, raising a choppy sea and causing vessels to drag their anchors.

Directions.—During the monsoon season, the best time to pass through the entrance is at daybreak.

Caution.—The reefs which fringe the shores of Baie Ambavanibe dry in places, but are difficult to distinguish when they are covered or when the light is unfavorable.

The reefs fringing the entrance points of the inlet can be easily seen at half tide.

Tanjon' Voailava (Cap Voailava) to Maruteza Point

11.5 Tanjon' Voailava (Cap Voailava) (12°07'S., 49°06'E.), the NE entrance point of Baie Andramaimba, is a long cape of yellow sand.

Baie Andramaimba is entered between Tanjon' Voailava (Cap Voailava) and Saint-Sebastian, about 29 miles SW. This large area consists of an outer roadstead, an inner roadstead, and a number of bays.

The outer roadstead is the area lying generally W and N of the islands Nosy Lakandava (12°15'S., 48°58'E.) and Nosy Hara (12°15'S., 49°01'E.); the chain of reefs that extends N from Nosy Hara marks the approximate E limit of the outer roadstead.

Vessels can anchor almost anywhere in Baie Andramaimba.

Winds—Weather.—When the breeze is fresh at Cap Saint-Sebastian, the sea becomes covered with foam as though there were breakers in the channels.

Tides—Currents.—The tidal currents in the neighborhood are irregular. The flood current generally sets SW and the ebb current sets NE; they are sometimes very strong and cause eddies in the channels about Nosy Hao (12°07'S., 49°04'E.).

The resultant currents and tidal currents near Nosy Anambo (12°16'S., 48°39'E.) sometimes attain a velocity from 2 to 5 knots.

Aspect.—**Potopoto Hill** (12°21'S., 48°59'E.) may be considered as a location separating Baie Andramaimba into two distinct zones.

Northward of the hill a vessel is sheltered from the ocean swell by islands and banks, but there is very little shelter from the Southeast Monsoon except close under the land.

Southward of the hill, particularly in Baie de Befotaka and near Cap Saint-Sebastian, the SW swell is strongly felt, especially during January, February, and March; the vessel itself is sheltered from the Southeast Monsoon by Montagne d'Ambre (12°38'S., 49°05'E.) and its numerous spurs.

Anftmsimno Hill rises about 4.3 miles ESE of Cap Voailava; this conspicuous hill has a rounded summit partly covered with trees. Other summits conspicuous from positions off the bay are Andramaimbo Hill and Ankaramisampana, which rise on the isthmus separating Baie Andramaimba on the NW coast from Baie de Diego-Suarez on the NE coast; these summits are useful marks from either side of Madagascar.

Nosy Foty (Nosi Foti) (12°12'S., 48°59'E.) has a beach that is conspicuous in bright weather.

Nosy Faty (Nosi Fati) (12°12'S., 48°48'E.) is a bank; the

whiteness of the bank, except at HW, is another useful mark.

Nosy Andantsara (12°16'S., 48°59'E.) has two peaks that are separated by a deep gully that is very conspicuous from the S.

Nosy Mely (12°17'S., 48°59'E.) has a conspicuous detached granite rock, 20m high, lying close S of it.

Baie Amponkarana indents the NE shore of Baie Andramaimba. Sommet Coupure, a summit 131m high, rises close to the head of the bay. A summit, 208m high, rises about 0.5 mile N of Sommet Coupure.

Lomotro (12°12'S., 49°10'E.) is a village; a conspicuous wooded bluff, 64m high, rises W of the village.

Helodrano Courier (Baie du Courier) indents the E shore of Baie Andramaimba. Les Deux Mamelles (12°14'S., 49°11'E.) are two bare, rounded summits, 246m high, rising close together. Sommet Nu, 351m high, rises nearly 1.3 miles S of Les Deux Mamelles. Petite Selle is a hill, 149m high, rising about 3 miles SSW of Les Deux Mamelles. An islet, with a fairly conspicuous wooded hill, 70m high, rises from the marsh at the head of Baie du Courier.

Helodrano Ambararata (Baie d'Ambararata) lies SW of Baie du Courier. Ankitikona, a densely wooded, conspicuous peak, 267m high, rises about 1 mile inland from the head of the bay.

Helodrano Ampasimena (Baie Ampasimena) indents the SE shore of Baie Andramaimba. Potopoto Hill, a useful mark, rises about 1.5 miles SW of the SW entrance point of the bay; this isolated hill is 59m high, conical in shape, bare, and yellow in color.

Helodranon'i Befotaka (Baie de Befotaka) indents the S shore of Baie Andramaimba. The various summits on the Orontani Peninsula are useful marks for the bay; these summits are dominated by Ambohiposa Summit, which is about 514m high, and rises 3 miles SW of the SW entrance point. Sommet Depouille is 138m high and rises about 2.5 miles SE of Pointe Baron (12°22'S., 48°58'E.). Mont Roti, a hill, rises about 5 miles E of Sommet Depouille. Grand Pele, a conspicuous bare flat hill, rises about 1 mile S of the head of Baie de Befotaka, and between this hill and the coast to the NNE is a range of conical wooded summits.

Ambatobe, a peak conspicuous because of its steep sides and dark color, rises among the bare yellow hills, which back the coast; the peak rises about 4.5 miles NW of Grand Pele. A conspicuous waterfall is visible about 3 or 4 miles inland, in a position S of the SE portion of Baie de Befotaka.

The various passes to and within the various parts of Baie Andramaimba are not marked by buoys or beacons.

Anchorage—Outer Roadstead.—Vessels can find good anchorage, in 9 to 18m, sand and coral, within the triangle formed by Nosy Vaha, Nosy Fasy, and Nosy Hara; in depths of more than 20m, the bottom is sand and mud or only mud.

When anchoring in the W part of this anchorage, vessels must be careful to avoid the deep gully, which lies E and SE of Nosy Fasy (12°10'S., 48°53'E.), where the tidal currents are sometimes very strong, the holding ground poor, and the sea rough during the SE trade wind.

There is good anchorage, in 20m, under the shelter of the W coast of Nosy Hara, with Nosy Belomotro lying 1.5 miles W of the S end of Nosy Hara, in line with Nosy Lakandava, 1 mile WSW of Nosy Belomotro, bearing 250°, and Rocher Le Lion, a small islet 1.5 miles SSW of Nosy Hara, bearing 188°.

A vessel has anchored, in 11m, 0.5 mile S of Nosy Anambo Light.

Anchorage—Baie Miroana.—Small vessels with local knowledge can obtain anchorage N of Mont Ambatoarara, in 9 to 11m, good holding ground.

Baie Amponkarana is the best anchorage in the S part of the bay, in 10m, mud, with Cap Voailava bearing 297°, a little open of the SW extremity of the peninsula on the N side of the entrance of the bay, and Les Cristaux, bearing 240°, just open NW of the S entrance point. There is a heavy swell in the bay during the SE trade wind.

Baie du Courier has anchorage, in 9 to 13m, but care must be taken to choose good holding ground of mud or of sand and mud.

The most sheltered berth is in 7 to 7.6m, mud, with the E extremity of Ilot du Courier (12°14'S., 49°09'E.) bearing 199° and Les Mamelles bearing 125°.

During the Southeast Trade Winds, there are sometimes heavy offshore squalls, rendering it necessary to anchor close off the SE shore of the bay, but this is only possible for light draft vessels.

In Baie d'Ambararata, vessels of light draft can anchor in the SW part of the bay, in 5.5m, with the middle of the reef extending ENE from the W entrance point in line with the large rock at the NE extremity of Nosy Hara, bearing 325°, and Les Cristaux bearing 028°, and just open NW of Pointe Mangoaka. The bottom in the bay is mud, good holding ground. The offshore squalls are sometimes very strong.

Baie d'Ampasimena offers useful shelter to small vessels with local knowledge, especially from the NE squalls at the changes of the seasons.

Helodrano Befotaka (Baie de Befotaka) is open to N winds, and a SW swell is strongly felt, especially from January to March; it is well-sheltered from the Southeast Trade Winds, when there is scarcely any wind felt in the bay. There is good holding ground of mud and sand.

Baie d'Ironono, close S of Ponte Baron, is open to a swell from seaward, and is unsafe during strong W winds. Small vessels can anchor in the S part of the bay, opposite the white cliffs, taking care to avoid the reefs which fringe the shore of this bay and are not visible at HW; anchorage in the bay is not recommended.

The landing place in Baie d' Ironono, accessible only at HW, is at the mouth of the stream S of the village.

Caution.—Most of the more extensive banks uncover at LWS; they appear of a dirty yellow color. The smaller detached patches are particularly dangerous in that they do not uncover nor otherwise reveal their presence.

The reefs and banks in the outer part of the bay are covered with green water which contrasts markedly with the blue of deep water. Elsewhere the reefs and banks are invisible when covered with 1.8m or more of water.

The strong SE winds raise a short choppy sea in Baie Andramaimba that appears to affect only the surface; at HW this sea causes neither breakers nor ripples over the dangers below-water. Although a lookout should be stationed aloft at all times, his ability to detect dangers below-water in the inner part of the bay will be limited by the conditions of visibility.

The water on this part of the W coast of Madagascar and toward Nosy Lava (12°44'S., 48°41'E.) is turbid, and the coral

reefs can be seen only from a short distance; these reefs are steep-to, so that sounding gives little warning.

Patches of spawn often appear like coral patches; the water is sometimes yellow in depths over 7.3m. The yellow water often covers considerable areas and gives the impression of dangerous shoals without the lead revealing any change in depth. This discoloration may be due either to spawn or to mud being stirred up from the bottom by tidal currents or other influences.

Maruteza Point to Port Saint-Louis

11.6 Maruteza Point (12°24'S., 48°46'E.) is the N extremity of the Orontani Peninsula. Anchorage, perfectly sheltered during the Southeast Monsoon, can be taken E or NE of Maruteza Point. A vessel has anchored, in 31 to 33m, in a position with Ambohiposa Summit, bearing 160° and Nosy Valiha, bearing 265°. D'Andovo Honkou Bay indents the Orontani Peninsula on the NW side of Cap Saint-Sebastian. Vessels waiting for daylight by which to enter Baie Andramaimba can anchor in D'Andovo Honkou Bay, off the village of Andovo Honkou, which is situated about 1.5 miles NE of Tanjon' Anorantany (Cap Saint-Sebastian).

In general, the best anchorage is in the S part of the bay where the coastal reef narrows considerably. The bottom, of compact sand, is good holding ground. The depths decrease rapidly from 18.3 to 14.6m, and then gradually to the shore.

Nosy Mavoni (12°26'S., 48°39'E.) provides anchorage, in 28m, in a position with Nosy Mavoni bearing 290°, distant 0.2 mile; the bottom in this position is sand and coral.

Nosy Meli, bearing 027° and just open W of the NW extremity of Nosy Hara, leads between the mainland and the dangers S of Grand Recif.

The S extremity of Nosy Anjombavola, bearing 250° and open S of the S extremity of Nosy Hara, leads between Recifs de Nosy Hara and Little Pass Banks. Nosy Foty, bearing 310° and seen over the sandy isthmus, also leads between these dangers.

Les Cristaux, bearing 124° and in line with Andramaimbo Hill, leads between Fosse Reef and Recif Est over the outer part of the bank, extending NE from Fosse Reef.

The S extremity of Ilot du Courier, bearing 098° and in line with the NW of Les Deux Mamelles, leads between Banc de l'Entre (Entrance Shoal) and the dangers extending from Basse Pointe.

Ambamonetsimani Islet (12°27'S., 48°43'E.), a rugged rock shaped like a haystack, lies about 1 mile W of Cap Saint-Sebastian.

Baie Andranoaomby (Andranoaomby Bay) (12°28'S., 48°47'E.) is entered 2.5 miles ESE of Cap Saint-Sebastian. All the islets near the entrance of the bay have seaward sides of perpendicular basaltic cliffs, which are useful marks for the entrance. Baie Andranoaomby affords shelter from all winds except those from between the S and W, which rarely blow with any force, except during the rainy season. In the dry season, the strong SE breeze raises a heavy swell, which runs around the E entrance point and enters the bay, but apart from this inconvenience the anchorage is safe.

A vessel of moderate draft can anchor near the middle of Baie Andranoaomby, in 9 to 10m, with the W side of Nosy Antolo in line with the W entrance point, bearing 200°; a small vessel can anchor on the same alignment, nearer the head of

the bay and off the village of Ambaro, in 4m, mud.

In order to enter the bay, after having passed Nosy Antolo, it is advantageous to stay close to the W shore, where the coastal reef is very narrow, whereas that of the E shore is wide and less steep-to. Antasahabe is a village situated in position (12°32'S, 48°50'E.). A large and conspicuous palm tree is a mark for the village. Anchorage has been taken off the villages, in 7m, with the SW extremity of Nosy Mandazona (12°28'S., 48°43'E.) in line with the middle of Nosy Mananono (12°27'S., 48°41'E.), and the conspicuous palm tree in the village in line with a mountain in the background.

Baie Ampamonty is entered between **Pointe Oravaka** (12°34'S., 48°49'E.) and Bekotoko Point.

Depths—Limitations.—The depths in the entrance of Baie Ampamonty are 10.9 to 14.6m. Within Rochers Jio-Jio, the depths are less than 9.1m while within Nosy Antaly the depths are less than 5.5m. The head of the bay is encumbered by mud banks.

Caution.—Rocher Oravaka, 14.6m high, lies 0.5 mile SW of Pointe Oravaka.

11.7 Nosy Vory, an islet 701m high, lies 0.7 mile offshore and W of the village of Ampasimanahy; it is connected with the shore by a bank, with a least depth of 5.5m.

Banc Ampamonty, lying 3.5 miles S of Rocher Oravaka and 1.5 miles offshore, dries, but in calm weather, when covered by a meter depth, there is no appearance or warning of danger, even from a short distance. A conical wooded hill at the head of Baie Ampamonty, bearing 030°, open NW of Nosy Vory, leads about 0.4 mile NW of Banc Ampamonty; if the conical wooded hill cannot be seen, a vessel should not bring the summit of Nosy Vory to bear less than 040°. The conical wooded hill, in line with a conical 50m hill which rises 1.2 miles SSW, bearing 021°, leads through the fairway between the coast and Banc Ampamonty and through the channel E of Nosy Vory.

Rochers Jio-Jio, two rocks about 8.5m high, lying in mid-channel 1 mile N of Nosy Vory, lie on the NW edge of a reef, which dries and extends 0.5 mile E from the W rock; the reef lies near the middle of a bank, with depths of less than 5.5m, which extends 0.9 mile ENE and WSW.

Nosy Antaly, 145.7m high, lying 1.2 miles NNE of Rochers Jio-Jio, is conical and covered with trees; it is fringed by a reef and a shallow bank. A shoal, with a least depth of 4m, lies 0.4 mile SSE of the SE end of Nosy Antaly.

Aspect.—A good landmark is a conical hill (12°32'S., 48°53'E.), with a wooded summit, 219m high, rising 1 mile N of the head of the bay and on the isthmus between it and Baie de Befotaka.

Anchorage.—A vessel drawing 4.9m can anchor at the entrance of Baie Ampamonty, sheltered from SE winds by Nosy Vory and the coast S of the islet.

A vessel bound for the anchorage from the N should pass W of Rocher Oravaka, and then between Rochers Jio-Jio and Nosy Vory, anchoring in 9 to 11m, 0.5 mile NE of Nosy Vory.

A vessel proceeding to the head of the bay can pass between Rochers Jio-Jio and Nosy Antaly, but care must be taken not to pass more than 0.2 mile from the SE side of Nosy Antaly in order to avoid the shoal, with a least depth of 4m, 0.4 mile SSE of the islet.

Alternatively, a vessel can pass between Rochers Jio-Jio and

Nosy Vory, and then bring the 50m hill at the head of the bay in line with the conical wooded hill, 1.2 miles NNE, bearing 021°, which leads E of the 4m shoal, mentioned above.

Small vessels can obtain good anchorage off Antafiabe, a village on the coast N of Nosy Antaly, in 4 to 5m. This anchorage is reached by passing E of Nosy Antaly, but care must be taken to avoid some projecting sandspits.

Vessels with local knowledge can leave this anchorage by the narrow channel NW of Nosy Antaly.

Baie Ampasindava is entered between Pointe Bekotoko, the SE entrance point of Baie Ampamonty, and Nosy Tsiringidringitra, 1 mile SSW.

A coral reef, which dries, extends up to 0.6 mile from the SE shore of the bay; Nosy Tsiringidringitra lies at its NW edge, 0.4 mile NW of Pointe Bemoka, with which it is joined by a ridge of stones.

Baie Ampasindava affords good temporary anchorage, in 6 to 11m, sufficiently sheltered from SE winds by Nosy Tsiringidringitra, Pointe Bemoka, and the reefs connecting them.

Large vessels can anchor, in 12 to 14m, W of Nosy Mamoko, near the W shore of the bay. Nosy Mamoko can be rounded to the N or S.

Baie Ankazomalemy is entered between Nosy Satza, 1.5 miles S of Pointe Bemoka and Pointe Andamoty, 2.5 miles SE.

Anchorage can be obtained in the entrance of the bay, midway between Nosy Satza and Pointe Andamoty, in about 7m.

Pointe Andiako (12°46'S, 48°54'E.) provides anchorage to small vessels with local knowledge S of the point, in about 4.9m; the anchorage is sheltered from the Southeast Trade Winds, which, in this vicinity, usually dies down at sunset.

A vessel approaching the anchorage off Pointe Andiako should steer with the summit of Nosy Ankarea, astern, bearing 265° and well open S of Mont Ankarana; these two bluff hills show up well against the horizon, which is ordinarily clear W after sunset, and remain visible long after the other land has disappeared from view.

In case of thick weather coming on before reaching the anchorage, a vessel should not approach within depths of 11m.

Between Pointe Andiako and Port Saint-Louis, there is a shallow bay, the shores of which are mostly lined with mangroves.

Port Saint-Louis to Hellville (Andoany)

11.8 Port Saint-Louis (Antsohimbondrona) (Seranana) (13°05'S., 48°50'E.) is situated close within the mouth of the Riviere Mahebo, 40 miles S of Cap Saint-Sebastian.

The usual anchorage for freighters at Port Saint-Louis is on the alignment of the lighted beacons, in line bearing 110°, from 3 to 4 miles offshore, in a depth of 9m, with Nosy Mangiho in line with E side of Nosy Lava, bearing 345°. The holding ground is good here. An uncharted wreck lies about 4 miles W of Port Saint-Louis.

Baie d'Ambaro is entered between Port Saint-Louis and Pointe de Namahory, the NE extremity of Nosy Faly, 23 miles SW. The bay is exposed to N and NW winds, but is sheltered from W winds by Nosy Faly. There is good anchorage anywhere in Baie d'Ambaro, which has a bottom of mud, but it is open N.

11.9 Iles Mitsio lie about midway between the Orontani Peninsula and Presquile d'Ambato (Presquille d'Ambato) (13°22'S., 48°30'E.). **Nosy Mitsio** (12°53'S., 48°37'E.), the largest island of the group, is 217m high at a sugarloaf hill, Mount Ankarana, near its N extremity.

Tides—Currents.—Observations of the tidal currents off the E coast of Nosy Mitsio were made in January and February, during the Northwest Monsoon. It was found that the flood current generally set between the SE and SW, altering clockwise; it attained its maximum velocity about 3 hours before HW, and at HW set E and was very weak. The ebb current set between the NE and W, altering counterclockwise, and attained its maximum velocity about 3 hours after HW. The maximum velocity observed was 1.25 knots. The current in the neighborhood of Iles Mitsio usually sets W at a rate of 1 to 2 knots.

Baie de Maribe, on the NE side of the promontory extending NW from the S part of Nosy Mitsio, is entered between Pointe Ampanomilay, the NE extremity of the promontory, and Pointe Alankirimy, 2 miles E; it is open to winds from between the NW and NE. A coral reef fringes the shores of the bay.

Roche Prevoyante, which dries, lies 0.3 mile NW of Pointe Alankirimy; southeast of Pointe Ampanomilay, a spit, with a depth of 7.6m, extending 0.8 mile NNE from the shore, reduces the width of the entrance of Baie de Maribe to 0.8 mile. A 2.7m coral patch lies on the E side of Baie de Maribe, 0.8 mile SSW of Pointe Alankirimy.

Good and well-sheltered anchorage can be obtained in Baie de Maribe, in 20m, mud, with Pointe Alankirimy bearing 040°, distant 1 mile, and Mont Leja, 4.5 miles SSW of Mont Ankarana, bearing 113° and in line with a village on the E shore. Small vessels with local knowledge can anchor nearer the head of the bay, in 6 to 7m.

A vessel with a draft of 4.9m can anchor, in 10m, with Mont Leja bearing 107° and a point NW of Mont Bekaikay bearing 175°.

The best approach to Baie de Maribe is through Grande Passe, SW of Nosy Ankarea; this wide passage has moderate depths and is free of dangers.

Passe du Nord, between Nosy Fisaka and Nosy Ankarea, and the narrow channel E of Nosy Fisaka, should only be used by small vessels with local knowledge.

Baie d'Ampasimena lies on the E side of Nosy Mitsio on the S side of Pointe d'Ampangala (12°53'S., 48°37'E.). A rock, which dries 0.3m, lies 0.3 mile E of Pointe d'Ampangala.

Nosy Vazoana, 23.5m high, an islet fringed by a coral reef, lies in the approach to Baie d'Ampasimena, 1 mile ESE of Pointe d'Ampangala. Rocher Bevaoko, midway between Nosy Vazoana and the coast, is 4m high; a bank, with depths of less than 9.1m, extends 0.4 mile SSE from it.

The anchorages on the E side of Nosy Mitsio afford shelter during the Northwest Monsoon, but the wind often veers E at night causing a swell. Off Baie d'Ampasimena, vessels can anchor SW of Nosy Vazoana, in 13 to 16m, sheltered from N winds.

Baie Alandrota is a cove between Pointe Ampasimenakely, 2 miles S of Pointe d'Ampangala, and Pointe Betamenaka, 72m high, 0.8 mile SW. A coral shoal, with a depth of 8.8m, lies 0.7 mile SSE of Pointe Betamenaka.

Baie Alandrota affords anchorage, sheltered from N winds, in 14 to 17m.

11.10 Nosy Be (Nossi Be) lies off a large indentation in the NW coast of Madagascar, between Nosy Faly and Pointe d'Angadoka, 30 miles WSW; it is volcanic, much indented, and can be identified from the NW by the high land in the background.

Nosy Ambario Vato (Nosy Komba), which can be seen from a distance of 35 to 40 miles, lies 1.5 miles S of Nosy Be.

Mont Lokobe, at the SE end of Nosy Be, is the highest part of the island; it is a granite peak, with deep ravines.

Pic du Tanylatsaka (13°19'S., 48°14'E.) is the highest peak in the center of Nosy Be.

Tides—Currents.—The flood current sets E and the ebb sets W at velocities of 0.5 to 1.5 knots; in the channel between Nosy Be and Nosy Komba, the currents attain velocities of 2 to 2.5 knots at springs. The turn of the tidal current occurs from 1 to 2 hours after HW and LW at Hellville (Andoany).

Caution.—Vessels should not proceed between any of the banks in the approaches to Nosy Be, nor between them and the island itself; it is well not to approach closer than 12 miles to the N or W shores of the island.

11.11 Helodranon'i Befotaka (Baie de Befotaka) is entered between **Pointe d'Amboday** (13°13'S., 48°15'E.) and a promontory, of which Pointe d'Andilah is the W extremity, 4 miles SW; its entrance is partially obstructed by rocks and shoals. The shores of the bay are fringed in places by a reef, which dries.

Roche Soa, with a depth of 0.9m, lies 1.5 miles SW of Pointe d'Amboday and 1 mile offshore; a shoal, with a depth of 8.8m, lies 0.4 mile NNW of this rock, and a bank, with a least depth of 7.6m, extends 0.5 mile S from Roche Soa.

In the middle of Baie de Befotaka, there is an area which affords anchorage, in 14 to 20m, free from dangers; the sea breeze is usually strong here and, blowing from the NW into the open bay, causes a troublesome swell.

11.12 Ile Sakatia (13°18'S., 48°10'E.) lies from 2.3 to 4 miles SSW of Pointe Andilah, and from the offing, appears to be part of the main island; its white and reddish dunes are conspicuous. The island is fringed by a reef, and separated from the coast E by a shallow channel, 0.4 mile wide. A spit, with a least depth of 8.8m near its outer edge, extends 1 mile N from the NW end of the island.

There is good anchorage, in 16 to 20m, muddy clay, close off the SE side of Ile Sakatia; this anchorage is sheltered from all but W and SW winds, which rarely blow here.

Baie de Fascene is entered between a point 1 mile SSE of Pointe d'Andranizany and Pointe de Berambo, 2 miles farther SSE. Rocher Noir, 4.9m high, lies 0.3 mile offshore, about 1 mile NW of Pointe de Berambo. There is anchorage in Baie de Fascene, E of Rocher Noir, in 12.8m, mud or muddy sand; the depths decrease suddenly and there is usually a swell.

Baie d'Ambatozavavy is entered between Pointe Andrano-goaka, which lies 2.2 miles S of Pointe de Berambo, and Pointe d'Ampassipohe, 2 miles S. A reef, which dries, lies 0.4 mile NE of Pointe d'Ampassipohe.

Anchorage can be obtained, in 10 to 12m, soft mud, midway between the entrance points of Baie d'Ambatozavavy. The sea breeze is not felt here, but E winds are dangerous.

Pointe Tafondro (13°24'S., 48°22'E.) is the SE extremity of

Nosy Be. A spit, which dries out 0.2 mile, extends 0.9 mile ESE from Pointe Tafondro.

The existence, positions, and coloring of the buoys off the S shore of Nosy Be cannot be relied upon.

Anse du Cratere is entered between **Pointe du Cratere** (13°24'S., 48°14'E.) and Pointe Mahatsinjo.

A spit extends 0.1 mile NE from the NE extremity of Pointe du Cratere; near its extremity there is a rock, which dries 0.6m. The W shore of Anse du Cratere is fringed by a reef. From the E side of the bay, an extensive reef, which consists of rocks, shingles, and sand, and dries in part, extends 1 mile offshore and 0.2 mile S from Pointe Mahatsinjo.

Four oil tanks stand on the E side of Pointe du Cratere. Pointe Mahatsinjo is 52.1m high; the hills in its vicinity are wooded.

At the oil terminal, vessels moor heading about 120°, with two anchors forward and stern lines secured to two buoys close inshore; there is reported to be a depth of 9.1m at the buoys. The berth is understood to be suitable for vessels up to 6,000 dwt.

Tankers with cargo for the oil terminal, but which are too large to moor off the terminal, anchor S of Pointe a la Fievre, in depths of 14m, to transfer cargo to smaller vessels.

Anchorage is suitable for vessels of maximum length of 200m and maximum draft of 12m; larger vessels anchor in any convenient sheltered area.

There is no local pilot, but one can be made available from another port if at least 4 days notice is given. Pilotage is advisable as the marks for the approach and for anchoring are not easily identified; vessels should pass between Pointe du Cratere and Banc Souzy on a course of about 055°.

The Port Captain should be advised of the expected time of arrival, draft, length, tonnage and nationality.

The tidal current in the vicinity of the berth is reported seldom to exceed 1 knot. Two small tugs are stationed at Hellville.

Anse du Cratere affords anchorage 0.2 mile E of Pointe du Cratere, in 16.5m, sheltered from W winds. A beacon, standing 0.4 mile N of the NE extremity of Pointe du Cratere, leads to the anchorage when bearing 329°.

Approaches to Hellville (Andoany)

11.13 Nosy Tanihely (Tany Kely), 4.2 miles SSW of Pointe Mahatsinjo, is distinctive and fringed by a coral reef; it may be safely approached within a distance of 1 mile from any direction. A conspicuous rock lies close off the N extremity of the islet. A light is shown from the islet.

Nosy Komba lies with Pointe Ambarionaomby (13°26'S., 48°21'E.), its N extremity, 1.7 miles SSW of Lohatanjon'i Tafondro (Pointe Tafondro). A sanitarium is situated on the island at an elevation of 595m.

Ilot Ambariobe lies 1.2 miles ENE of Pointe Ambarionaomby. Ilot Ambariobe and Ilots Ambariotele, a group of rocky islets, 0.2 mile NW, lie on a reef which extends 0.4 mile WNW from Ilots Ambariotele and 0.3 mile S from Ilot Ambariobe. The channels SW and close N of the reef should not be used.

Nosy Vorona, fringed by a reef, lies 0.3 mile N of Ilots Ambariotele and 0.8 mile SSE of Pointe Tafondro; there is a 6.4m patch at the W end of a shallow bank, which extends 0.8 mile

W from the islet, and between them are several coral heads, with a least depth of 4m. On the shallow bank extending 0.4 mile E from Nosy Vorona there are four rocks, which dry, nearly 0.1 mile from the islet.

Ararano Du/Nosy Vorona (Passe Lokobe), between Nosy Komba and Nosy Be, is the normal daytime route for ships coming from the N and heading to Hellville. The least depth in the passage is 8.4m; the buoyage allows large vessels to take it at the beginning of HW. The buoyage has been reported as unreliable.

Hellville (Andoany) (13°24'S., 48°17'E.)

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11.14 Hellville is situated on the S coast of Nosy Be; the port consists of a town and a very small natural harbor. Rade d'Hellville indents the coast between Lohatanjon'i Mahatsinjo and Lohatanjon'i Lokobe (Pointe Lokobe), 3 miles E; its N shore is indented by three coves, of which Anse du Plateau is the middle one and the only one frequented by shipping.

Aspect.—Anse du Plateau is entered between a promontory, on which the town of Hellville stands, and Pointe a la Fievre, 0.3 mile E. The promontory slopes steeply seaward, and there are numerous buildings on the sea front.

Range lights are exhibited at the head of Anse du Plateau; in line bearing 017°, these lights lead to the anchorage position for large vessels and to the anchorage position E of the mole.

Range lights are exhibited about 0.3 mile W of the mole light; in the SE approach, these lights, in line bearing 305°, lead clear of Pointe Lokobe and then to the anchorage position for large vessels. In 1980, it was reported that the front light was partially obscured by trees, except on the leading line.

Signals.—A signal station stands on the summit above Pointe Mahatsinjo. Signals indicating the locality threatened by a cyclone are shown.

Anchorage.—Vessels can anchor off the S coast of Nosy Be, W of Nosy Komba, in 14 to 23m, good holding ground of sand or muddy sand; it is well-sheltered here from all but W winds. In Rade d'Hellville, the anchorage for large vessels at the intersection of the alignments of the range lights at the head of Anse du Plateau, bearing 017°, and the range lights about 0.3 mile W of the mole light, bearing 305°, in 15.8m; a vessel can also anchor here with the mole light in line with Antorotoro, a peak 151m high, 1.7 miles NNW, bearing 335°, and Pointe Lokobe, in line with a rocky islet close N of Pointe Ambarionaomby, bearing 114°. The anchorage is well-sheltered, but winds from between the WSW and W cause a swell.

Small vessels can anchor closer inshore, 0.1 mile E of the mole, with the range lights at the head of Anse du Plateau range bearing 017°, in 9m.

The anchorage in the cove W of Anse du Plateau is a little more sheltered from a W swell, but communication with the shore is more difficult, as boats have to round the S extremity of the reef, which extends S from the town to reach the mole.

Coastal vessels with local knowledge can anchor as convenient off the village of Ambanoro at the head of Baie d'Ambanoro, the easternmost of the three coves indenting the N shore of Rade d'Hellville.

Directions.—The route recommended to vessels approach-



Hellville

ing Rade d'Hellville from the W passes S of Grand Banc de l'Entree, Banc de Cinq Metres, and the banks adjacent to them; it passes N of Ankazoberavina Island and the adjacent coast of Madagascar. The chart shows a least depth of 20.1m in this approach.

The route recommended to vessels approaching from the E passes between Nosy Be and Nosy Faly and then either S of Nosy Koba or N of the later island through Passe Lokobe. Only the N of the two channels through Passe Lokobe is recommended; the least depth is 8.2m. It passes S of the shoals extending SE and SW from Pointe Tafondro, and the shoal flat W of the point; it passes N of Nosy Vorona and the reefs off the latter islet.

The channel S of Nosy Koba has on its S side the patches lying N and W of Ambato Rano; this channel is available to vessels of moderate draft. The chart shows a least depth of 10.9m in the approach.

Large vessels approaching from the W should make good a course of 022°, passing about 2 miles W of Nosy Iranja to a position from which Ankazoberavina Islet bears more than 090°, a course of 067° should then be made good, passing 1 mile N of Ankazoberavina Islet.

Vessels approaching Rade de'Hellville from the E should proceed S off the E shore of Nosy Be to a position about 2 miles E of Pointe Tafondro from which the beacons near Pointe Lokobe are in line bearing 264°; course should be maintained until the beacons on Pointe Tafondro bear 040° astern; the 220° course should be maintained to a position abreast Pointe Lokobe. This channel appears to be used only by light-draft coasting vessels. In the passage between the S side of Nosy Koba and the coast, the tidal currents are strong, attaining a velocity of 2.5 knots at springs. After SW, the currents quickly reach their maximum velocity, and if the wind is fresh at this time, the seas rise quickly.

Hellville (Andoany) to Port Radama

11.15 Pointe d'Ankify (13°32'S., 48°22'E.) can be identified by a large isolated rock which lies immediately N of the point; there is a ruined factory on the E side of the point. There is anchorage off Point d'Ankify, in 10 to 12m, sand, gravel, and coral, with the E peak of Massif d'Ankify, 1.2 miles S of Pointe d'Ankify, bearing 177°, and the isolated rock close N of Pointe d'Ankify, bearing 240°. The best landing place is a little E of the point.

Helodranon Ampasindava (Baie d'Ampasindava) is entered between Pointe d'Ankify and Pointe d'Anjanozano, about 12.5 miles WSW. The bay is too open to afford shelter, but large vessels can anchor off the W shore.

There is good anchorage for vessels of moderate size in the channel W of Nosy Mamoko (13°43'S., 48°12'E.), in 11.9 to 14m, mud; it can be reached from either N or S of the islet.

Cap Makamby (13°35'S, 48°07'E.) has a drying reef extending 2 miles NNW from it; Nosy Kisimani, 90m high, lies close within its NNW extremity.

Baie d'Ambararata, on the W side of the reef extending from Cap Makamby, is a well-sheltered natural harbor. Baie d'Ambararata affords anchorage to vessels of moderate size, 0.4 mile S of Nosy Kisimani, in from 13 to 15m, the edge of the reef fringing Pointe du Rocher should be marked before entering.

Small vessels can anchor nearer the head of the bay, taking care to avoid the vicinity of Roche du Confluent.

Baie d'Ambavatoby is entered between Pointe Makamby and Pointe Antsiraka, 0.6 mile W. Within the entrance, Baie d'Ambavatoby forms a wide basin, which divided into Baie d'Amboahangy on the E side, Baie d'Andassy Be on the W side, and Baie d'Androfiabe at the head of the bay; these inlets are encumbered with reefs and mudbanks.

Aspect.—The entrance may be identified by two hills of grayish color which overlook the entrance points. From the offing, the peninsula on the W side of the entrance resembles a group of islets. Conspicuous hills are l'Arbre Mort, 138.1m high, 2.5 miles ESE of Pointe Makamby, and Sommet de la Compagnie, 146.3m high, 1.2 miles W of Pointe Antsiraka.

Anchorage.—Baie d'Andassy Be is recommended as a secure anchorage, but Baie d'Amboahangy has the advantage of a fresh sea breeze, which keeps off mosquitoes and other insects; both these inlets offer spacious anchorage, in 11 to 16m, mud, or sand and mud.

Baie d'Androfiabe has less swinging room than the other inlets, and its entrance is narrowed by the dangers mentioned above.

A vessel of moderate draft can anchor in Baie d'Andassy Be, in 12.8m, with Sommet de la Compagnie bearing 287° and Pointe Antsiraka bearing 040°.

Directions.—The entrance channel between the 10m curve is 0.2 mile wide.

The depression between the peaks of Montagnes Les Deux Soeurs, bearing about 162°, just open E of Pointe Marolay, leads through the entrance in a least depth of 21.9m. Pic Denude, situated 4 miles SSW of l'Arbre Mort, is also on this alignment.

Caution.—Pointe Makamby is fringed by a reef which dries and extends 0.4 mile NNW and 0.1 mile W from it; Pointe Antsiraka is more steep-to and vessels can pass about 0.1 mile E of it. A shallow bank extends 0.2 mile S from the latter point.

Pointe Amboaboaka, the S entrance point of Baie d'Andassy Be, is fringed by a reef, which dries, and a spit, with depths of less than 9.1m, extends 0.3 mile NW from the point;

Rocher Dalrymple, awash, with a patch with a depth of 3m, lying 0.1 mile W, lies just within the NW extremity of this spit. The head of Baie d'Andassy Be is divided into two parts by reefs and shoals, many of which dry.

Ile Verte, 27.1m high, lies 0.5 mile ENE of Pointe Marolay, the S entrance point of Baie d'Amboahangy; a coral reef,

which dries, extends 0.5 mile NNW from it. A rocky shoal, with a depth of 4.9m, lies 0.2 mile NNE of the N extremity of Ile Verte, and a rock, which dries 0.6m, lies 0.3 mile ENE of the S extremity of the islet.

Pointe des Maques, which lies 1.7 miles SE of Pointe Makamby, is a narrow rocky point, terminating in a rock, which dries 0.9m. A shoal, with a depth of 4.9m, lies 0.1 mile S of the point.

In the entrance of Baie d'Androfiabe, there is a rock with a depth of 0.6m, 0.2 mile SE of Pointe Amboaboaka; a 7.3m shoal lies near mid-channel, 0.5 mile SE of the point.

11.16 Pointe Angadoka (13°30'S., 47°59'E.) is the N extremity of Ambavatobi Promontory. Nosy Ankazoberavina is a brush-covered islet, 62m high, lying with its S extremity in a position about 1 mile N of Pointe Angadoka. From the SW Nosy Ankazoberavina appears as two islets. It may be approached to within a distance of 0.2 mile despite a reef bordering it. In 1988, a depth of 10m was reported in position 13°28.3'S, 48°00.2'E.

Andrano Miserano (13°40'S., 47°59'E.) and **Anketsabe** (13°55'S., 48°05'E.) are useful marks between Pointe Angadoka and Pointe Sangajira.

Le Cone (15°03'S., 47°15'E.), **Fausse Table** (15°08'S., 47°16'E.), and **Mount Matable** (15°12'S., 47°08'E.) are conspicuous summits in the vicinity of and N of Baie de Mahajamba.

Nearly midway between Pointe Ambararata (15°11'S., 46°57'E.) and Pointe Anorombato is a series of vertical marks on a red ground, which appear to an observer at sea as fortifications; they are useful marks.

The coast immediately WSW of Cap Amparafaka (15°56'S., 45°16'E.) is marked by red sand hills. Dunes Mamelles are two white sand hills, the first of a series, lying about 11 miles WSW of the cape and are 47m high.

Between Pointe Angadoka and Cap Saint-Andre the coast recedes slightly to form a shallow bight. A coral reef, with patches of sand and weed, lies parallel with and from 5 to 15 miles off this coast; it consists of a chain of shoals and forms a barrier with some deep passages through it, and except for some shoal heads W of Iles Radama, 28 miles SSW of Pointe Angadoka, vessels drawing less than 3.7m can pass over it in good weather. Over the whole of this barrier, the water is so clear that the bottom can be seen in depths of 29.3m, and the outer edge, where the depths increase very rapidly seaward, is distinctly indicated by the change in color of the water.

Caution.—Because of the irregular nature of the bottom and the comparative scantiness of the soundings on the banks, shoals may exist which are not shown on the chart.

11.17 Nosy Kivinjy, a steeply conical islet lying about 2.1 miles W of Pointe Angadoka, is conspicuous from the W.

Nosy Antsoha lies about 0.7 mile SW of Pointe Angadoka; anchorage has been taken in a position about 0.2 mile SSE of Nosy Antsoha, in 14.6m.

Pointe Andrahibo, about 4.8 miles SSW of Pointe Angadoka, is marked by three tree-covered hills.

Baie Kakambana is entered between Pointe Andrahibo and Pointe Antangena, about 2.8 miles WSW. The S shore of the bay is fringed by a reef, and the S and E portions of the bay are

shallow. Kibibao Rock is a danger lying nearly 1 mile SSW of Pointe Andrahibo.

Anchorage can be taken, in 6.5m, with Pointe Andrahibo bearing 343°, distant 0.5 mile. The bottom of muddy sand is good holding ground, but swinging room within the deeper central area of the bay is restricted.

The Riviere Baramahamay enters the sea about 7 miles S of Pointe Antangena. There are depths of about 5.8m in the entrance, but shoal water exists off the S bank, about 0.4 mile E of the S entrance point. A village, with a flagstaff, stands on the S shore of the river, about 0.6 mile from the sea.

Anchorage.—The entrance to the Riviere Baramahamay affords well-sheltered anchorage, except from W winds. To small vessels with local knowledge, there is room for one vessel N of the village in a depth of 11m. Small craft can anchor in the basin 0.5 mile farther up the river. The coastal bank in this vicinity dries. A vessel making the anchorages must keep near the center of the narrow entrance channel.

Ambatomilai, a detached rock 10.3m high, lies about 0.5 mile S of the W extremity of Nosy Iranja (13°36'S., 47°49'E.). From a distance, Ambatomilai appears like a boat under sail between Nosy Iranja and a small islet SSE.

Directions.—Vessels proceeding S from Hellville may pass on either side of Ankazoberavina Islet and Nosy Kivinji; the existence of the 8.2m shoal between Ankazoberavina Islet and Pointe d'Angadoka should be kept in mind.

Pointe Antangena should be passed at a distance of about 1 mile, and the vessel should then be kept from 0.8 to 1 mile off the coast S of that point until a position about 3 miles S of the Riviere Basramahamay has been reached; in this position the vessel will have passed Banc Vestal. A course should then be shaped to pass about 2 miles W of Pointe Sangajira, and with the W and lower hill of Pointe Sangajira and with the W and lower hill of Pointe Lavalohalika (14°00'S., 47°56'E.), bearing 145°, so as to pass about midway between Banc du Vaudreuil and the coastal reef. When the summit of Nosy Kalakajora bears 275°, course should be altered E to maintain this bearing, astern; then the summit of the 127m hill, located 2 miles E of Pointe Sangajira, bearing 015°, and in line with the reddish road between it and Anorontsangana, leads to the anchorage off the village.

The color of the water in Baie de Rafaralahy does not give any indication of the nearness of reefs. Vessels arriving in the morning, when the sun is more or less directly ahead, find it difficult to estimate the distance from the shore; the position of native boats off the town, seen over the reefs, is very deceptive to a stranger.

11.18 Nosy Radama (Iles Radama), 28 miles SSW of Pointe Angadoka, consist of four islands, named from N to S, Nosy Kalakajoro, Nosy Ovy, Nosy Antanimora (Antany Mora), and Nosy Valiha; they provide a noteworthy amount of shelter from winds from the W to the bays E of them.

Anchorage, with shelter from winds from the sea to the W, can be taken off the E shore of Nosy Ovy. Depths of 7.3 to 16.4m, with good holding ground, are available.

The bottom in the neighborhood of Iles Radama is very irregular, and even a small error in position is enough to give markedly different depths than those shown on the chart. The banks have not been thoroughly examined, and dangers other

than those shown on the chart may be assumed to exist. These islands and the adjacent mainland are frequently hidden by fog or during rain spells, and caution is necessary in approaching them or navigating in their vicinity. The water over the outer reef chain is very clear, but it is uncertain whether or not the water over patches of the inner reef can be seen, especially so far as the discolored river outflow of the rainy season reaches. It is therefore recommended that vessels keep to seaward of the outer reef chain in this vicinity except where directions are available. Local knowledge is recommended.

11.19 Baie de Rafaralahy is entered between Lohatanjon'i Sangajira (Pointe Sangajira) and Pointe Lavalohalika, about 6.5 miles SSE.

High water and LW succeed one another at fairly regular intervals, but the height of consecutive tides varies greatly; differences as large as 2m have been noted.

A hill, 55m high, rises near the extremity of Lohatanjon'i Lavalohalika (Pointe Lavalohalika). Another hill, 84m high, rises about 1.5 miles ESE of the 55m hill.

The customhouse in the town of Andranto, situated on the N shore of the bay about 2.2 miles ESE of Pointe Sangajira, has a flagstaff near it. Fort de Sada stands on a hill rising 127m about 0.7 mile N of the town. The village of Tanandava is built on the crest of a hill extending W from the fort.

Anchorage can be taken in a position from which Pointe Lavalohalika bears 170° and the S extremity of Nosy Kalakajoro bears 264°. The depth in this position was 16.4m; the anchorage was considered good even though it appeared to be very close to the edge of a reef.

Port Radama to Ananalava

11.20 Port Radama (14°05'S., 47°57'E.) is entered between Pointe Lavalohalika and Pointe Berangomaina, nearly 6 miles SSW. The E side of Port Radama, especially its S part, is low and fringed with a dense screen of mangroves. The W side is generally steep and rocky, with some mangroves on its S part. Large vessels with local knowledge can secure good anchorage in this bay, but its usefulness is limited in that it has been only partially examined.

Winds—Weather.—A NW sea breeze, characteristic of this area and known locally as the "talio," blows from 1000 to 1700; it sometimes blows fresh, but loses itself in the narrow part of the bay.

The "varatrazo," a SE land breeze, blows lightly during the night. The wind does not raise a troublesome sea in the bay.

Tides—Currents.—The tidal currents in the entrance rarely exceed a velocity of 2 knots at springs. The currents are stronger in the S part of the bay; the water is fresh during the ebb current.

Aspect.—**Anketsabe** (13°55'S., 48°05'E.) is a useful mark in this vicinity. Mount Angoroni (14°13'S., 48°10'E.) is isolated, and has a flat top and dark, nearly horizontal stripes on its slopes. Mount Ampombiabo (14°19'S., 47°55'E.) has a conspicuous clump of trees on the it called La Canine.

Lahatanjon'i Berangoma (Pointe Berangomaina) rises to an elevation of 61m, about 0.5 mile within its extremity. Ile Verte, 5 miles SE of Pointe Lavalohalika, is flat and wooded, with a distinctive group of trees at its center.

Anchorage.—Vessels can obtain anchorage, according to their size and draft, in Port Radama, but caution is necessary as there may be dangers other than those charted.

Vessels can anchor on the SW side of the bay, a little within its entrance, in 14 to 16m, with the 61m summit of Pointe Berangomaina bearing 259°, distant 2 miles.

A vessel can obtain anchorage near the head of the bay, in 18m, with Mont Ankaramy (13°59'S., 48°12'E.) bearing 063° and the conical summit of Pointe Amboliboso (14°10'S., 48°00'E.) bearing 185°.

Landlocked anchorage can be obtained 0.9 mile NE of Pointe Amboliboso, in 18m, but care must be taken to avoid a 0.9m shoal lying 1.5 miles N of the point.

Ramanetaka Bay lies immediately SW of Port Radama; the bay is large, but encumbered to a considerable extent by reefs and shoals, and can be recommended only to vessels with local knowledge. Such vessels proceed into the bay on either side of Nosy Valiha.

Directions.—Vessels with local knowledge approaching from the W can proceed across the outer reef chain in the vicinity of the Iles Radama by making good a course of 096° for the S summit of Nosy Kalakajoro.

It should be noted that there are numerous shoal patches and dangerous reefs on either side of this channel. Vessels approaching from the N should pass about 0.7 mile off the NE shores of Nosy Kalakajoro and Nosy Ovy, to a position about 2.5 miles N of the S extremity of the latter island. From this position a course of 137° should be steered for the 61m summit within Pointe Berangomaina, to a position where Ile Verte bears 095° and is in line with the S fall of Mount Ankaramy. A course of 095° should then be followed on this range to a position from which the 61m high previously-mentioned summit bears 180°, and from which the 55m summit on Pointe Lavalohalika bears 031° and is in range with Les Deux Soeurs. Vessels proceeding farther into the bay should first place buoys to mark a fairway.

11.21 Nosy Saba (Nosy Beroja) (14°21'S., 47°38'E.) lies 4 miles W of Pointe Antsatsiaka; its SW and higher end, 42.1m high, is covered with trees. From the W, Nosy Saba is difficult to distinguish against the coast.

Nosy Lava (14°32'S., 47°35'E.) lies in the approach to the roadstead off Ananalava from the NW. White cliffs within the W shore of the island show very clearly when the afternoon sun shines upon them. Nosy Soy lies about 3 miles S of the S extremity of Nosy Lava; from the NW it appears like a saddle, the pommel of which is towards the NE.

Anchorage.—In the best anchorage position, Nosy Lava Light bears 210° and is seen just NW of a corrugated iron house, and the E extremity of the island bears 121°. The depths are 11.9m in this position; the depths are 10m or less to within a distance of 0.1 mile from all directions except seaward. In this position there is adequate shelter from choppy seas; Nosy Lava itself provides shelter from W winds, and the reefs fringing Nosy Lango provide shelter from seas from the SE. The entire area between the E shore of Nosy Lava and the mainland may be regarded as a large roadstead affording anchorage; the bottom, generally of sand and mud, is good holding ground. An anchorage is available to ocean-going vessels off Salara, a village on the shore of a bay indenting the N part of the E shore of Nosy Lava. The bay is entered between the E extremity of

the island and a point, 15.2m high, nearly 2 miles NW. Piliér Point is the extremity of a projection from the shore of the bay in a position about 1 mile WNW of the E extremity of the island.

Directions.—Vessels approaching from the W should proceed through the outer reef chain and SW of Southwest Rocks by steering 123° for the Nosy Soi, keeping the latter islet in line with Tombee de Marotaolana. When the N extremity of Nosy Lango bears 077°, course should be changed for that extremity to a position from which Nosy Soi bears 213°. A course of 033° should then be made good, keeping Nosy Soi bearing 213° astern until the SE end of Nosy Lava has been rounded. Course should then be altered to the N, keeping Nosy Soi open its own breadth E of the S extremity of Nosy Lava, which leads through Nosy Lava Channel and midway between the 7.9m shoal and the SE edge of the shoal bank extending SE from the E extremity of Nosy Lava; Nosy Soi kept open of the SE end of Nosy Lava leads clear of the latter bank. When the NE extremity of Nosy Lava bears 310°, it should be steered for; this 310° course leads about 0.4 mile outside the reef fringing the shore of the island. When Nosy Lava Light bears 210°, it should be steered for, which leads to the recommended anchorage position in Nosy Lava Anchorage.

Caution.—Dangers in the approach to the bay, excepting Nosy Lango and the rocks and shoals or islets near it, include a shoal, with depths of 5.2m over its outer edge, that extends about 0.7 mile SE from the E extremity of Nosy Lava. Its steep-to outer edge is marked by heavy swirls. A coral shoal, over which the least depth is 7.9m, lies about 1 mile SE of the same point. The channel between these shoals is about 0.3 mile wide, and has depths of 10 to 26m. A patch of 8.2m lies about 0.5 mile NE of the E extremity of Nosy Lava. A coral head, over which the depth is 1.8m, lies about 0.6 mile NNW of Piliér Point, and at distances of 0.3 mile NNE and also ESE of this projection are patches of 8.2 to 8.8m, respectively.

Ananalava to Majunga (Mahajanga)

11.22 Analalava (14°38'S., 47°46'E.) (World Port Index No. 47380) is situated on the NW coast of Madagascar, on the SE side of the entrance of the Riviere Loza SSW of Pointe Angadoka; the port is very small and consists of a small town, off which anchorage is available.

Winds—Weather.—The temperature during the dry season varies from 33° to 31°C; the temperature attains its maximum value at about 41°C. Night temperatures are usually 2° lower than day temperatures. In the rainy season the temperature varies from 29° to 31°C, but the heat is bearable. The rainy season begins toward the end of November; maximum rainfall occurs in January. The winds during the rainy season are variable, but usually NW of SW.

Tides—Currents.—The currents attain considerable strength. The outgoing ebb current of the Riviere Loza becomes stronger, and draws closer to the shore on which the town stands, as the level of low tide is approached; a counter-current then develops between the main outgoing current and the shore, that sets back toward the entrance of the river and is strong in comparison to the main outgoing current.

The flood current sets into the river uniformly along each shore.

Depths—Limitations.—Passe du Nord (North Pass) lies between the mainland to the E and Nosy Lava, Nosy Lango, and East Lango Bank to the W. The least depth in the fairway through this channel is 9.4m.

Directions.—Vessels approaching from the N can, after passing Nosi Shaba, proceed through Passe du Nord by steering 165°, keeping the 42m summit at the SW end of that island bearing 345° astern, to a position from which Nosy Faohina bears 188° and is just open E of Nosy Lango. A course of 188° from this position leads between a 7.3m patch and a 8.2m coral patch to a position from which the S extremity of Nosy Lava bears 259°. When this position has been reached, the beacon on the plateau SW of the town of Analalava should be steered for, bearing 155°, to a position from which Analalava Light bears 095° and is in line with Ballon Loza. A course of 095° then leads to the anchorage.

11.23 Passe du Milieu (Middle Pass), leading ENE, is the only marked channel of the three, and is considered the principal channel partly for that reason. The fairway is about 0.5 mile wide between the 9.1m curves. Nosy Lango Reef and East Lango Bank lie on the N side of the channel, and Nosy Faohina Reef and Channel Bank lie on the S side. Nosy Soy, in the outer part of the channel, can be passed on either side; the directions available indicate that vessels can pass over the N end of Channel Bank. The least depth in the channel is 7.2m.

Passe du Sud (South Pass), trending NE toward the town, has Table Bank on its SE side and Nosy Faohina Reef on its NW side. The fairway has a least width of about 0.5 mile and has a least depth of 5.8m. The tidal currents in the channel are not as strong as those in Passe du Milieu.

A shoal flat bordering the N point of the entrance of the Riviere Loza was reported to be extending seaward. This point should not be approached closer than 0.7 mile.

Aspect.—Pic Loza (Ballon Loza) (14°38'S., 47°49'E.), a summit 221m high, rises E of the entrance of the river.

Faux Loza (14°40'S., 47°47'E.), a peak 140m high, rises SSW of Pic Loza; the latter has a rounded S extremity as does a plateau behind the town; both terminate S in a large rift.

Tombee de Marotaolana (14°43'S., 47°44'E.), a summit 259m high, rises SSW of False Loza and nearly 6.5 miles S of the town. A plateau, 49m high, rises close to the coast in a position about 2.5 miles SSW of the town.

Sommet Antsatramahavecon (14°29'S., 47°48'E.), another useful mark in this vicinity, rises in a gentle, wooded slope to an elevation of 332m.

The Residence is a large building of brick and stone overlooking the town. A white house with a red roof, in a position 0.4 mile NNW of Analalava Light, is of use in establishing a course through a portion of Passe du Lilieu.

The S extremity of Nosy Lango Reef is marked by a beacon.

The N edge of Nosy Faohina Reef is marked by a beacon.

D'Andronjana Range is established by two beacons. The front beacon stands on the N shore of the estuary of the Riviere Loza in a position about 2.3 miles NNW of Analalava Light. The rear beacon stands about 1.8 miles ENE of the beacon. These beacons, in line bearing 068.75°, lead through a portion of Middle Pass.

Table Range is established by two beacons. The front beacon stands on the 49m plateau SSW of the town. The rear beacon

stands about 5 miles ESE of the front beacon. These beacons, in line and bearing 120°, lead through a channel that bypasses the least depth of 7.2m in that channel.

A range useful in taking up the recommended anchorage position is established by two beacons, each supporting a board pointed in black and white checkers. The front beacon is on the S side of the estuary in a position about 0.9 mile N of Analalava Light. The rear beacon, nearly 2 miles NE of the front beacon, is on the N side of the river. These beacons are in line bearing 047°. The beacons are difficult to identify, especially in the early morning, the rear one only being discernible when a vessel arrives at the anchorage.

Signals.—There is a signal station, with which vessels can communicate by day, at Analalava. Signals indicating the locality threatened by a cyclone are displayed.

Directions.—Vessels should pass about 0.3 mile S of Nosy Soi. When the highest cluster of trees on Nosy Eahina bears 088°, and is in line with Ballon Loza, course should be changed to 088° to a position from which Mount Antsatramahavelona bears 047° and is open E of Nosy Lango. The beacons forming E'Andronjana Range should then be steered for bearing 068.75°. This course leads between the beacon on the S end of Nosy Lango Reef and the beacon on the N end of Nosy Faohina Reef. When Analalava Light bears 095° and is in line with Ballon Loza, the course should be changed to 095° for the anchorage. This course leads over shoals off the S end of Channel Bank in depths of 7 to 7.9m.

Anchorage.—The anchorages off Analalava lie between the deep gully in the entrance of the Riviere Loza, and the steep-to bank which forms the LW mark off the town. In the vicinity of the deep gully, the bottom is sand, and the eddies cause vessels anchored there to swing continually. There is a countercurrent in the gully, which becomes more pronounced the farther S a vessel lies in it.

Anchorage can be obtained with the anchorage beacons in line bearing 047°, and Analalava Light in line with Pic Loza, bearing 095°. This berth is inconvenient, because of the distance offshore, and the strong currents; a better one is farther NE, with the same beacons in line and 0.2 mile WSW of the head of the pier, in 25.6m, 0.1 mile from the 10m curve.

Smaller vessels can anchor 0.1 mile off the head of the pier, in 18m, sand, with the anchorage beacons in line bearing 047°, and Analalava Light bearing 129°; if a vessel's draft permits, she should anchor closer to the pier, although the eddies, as stated above, will cause a continuous swing.

Ocean-going vessels can approach this estuary by way of channels trending generally S, ENE, and NE, respectively, between off-lying islets and dangers, and take anchorage off the town of Analalava, which stands on the S bank of the estuary. Anchorage can also be taken at places farther in.

Vessels can proceed through Passe de Milieu at night by observing the white and red sectors of Analalava Light; by so doing they will remain in depths of 7m or more.

The entrance of the Riviere Loza presents no difficulties, and a vessel should proceed in mid-channel. The steep-to coastal bank on the SE side of the entrance is easily distinguished.

There is anchorage 2 miles within the entrance of the Riviere Loza in Baie de Bois Sacre, on the S side, in 19m, mud and sand, 0.1 mile off the mangroves; it is indicated by the intersection of the alignments of two pairs of beacons, bearing 060°

and 125°. This anchorage is better sheltered than that off Analalava and is used by vessels loading logs, which are floated down river.

Directions.—When approaching Pointe Loza, the projecting point, covered with dense jungle, at the sharp bend 4 miles within the entrance, the east bank of the river should be kept aboard and the point rounded closely to avoid the sand bank which fills the bay N of the point. Then a mid-channel course leads to Lagune Panantsopa, about 9 miles above the entrance of the river; this lagoon has been only cursorily examined, and there are some dangerous shoals. A vessel may anchor, in 10m about 0.1 mile from the village of Panantsopa, after having passed over depths of 5m.

11.24 Helodranon'i Nirinda (Baie Narinda), on the S side of the approaches to Analalava, is entered between **Pointe Maromony** (14°39'S., 47°27'E.), 8 miles SW of the SW extremity of Nosy Lava, and Pointe Antsamanara, 13 miles E.

In 1956, a S current into Baie Narinda was observed at a velocity of about 1 knot.

White cliffs on the coast in a position about 9 miles SW of Pointe Maromony are a mark for the approach to Baie Narinda from the SW. Pointe Maromony is marked on its E side by some red cliffs. Pointe Komatsana, 3.5 miles SE of Pointe Maromony, can be identified by some white cliffs at its extremity. Tombee de Marotaolana rises about 3.5 miles ESE of Lohatanjon'i Maroangolo (Pointe Antsamanana). Ankalafa, a village 3.2 miles SSW of Pointe Komatsana, is hidden by trees, but can be identified by the boats lying on the beach. There are some white cliffs 9 miles SW of Pointe Vatonomby, a promontory, which lies 3.7 miles SE of Ankalafa. The Riviere Atsinjo flows into the SE side of the bay, 18 miles SSW of Pointe Antsamanara.

A lighted buoy is moored 2.2 miles E of Pointe Komatsana; it marks a swell gauge.

The only anchorage used in Baie Narinda is off the mouth of the Riviere Atsinjo, with the S entrance point of the river bearing between 085° and 095°, distant 4 miles.

11.25 Lohatanjon'i Marolahy (Pointe Marolahy), about 16 miles SW of Lohatanjon'i Maromony (Pointe Maromony), slopes down to a circular red cliff, which is conspicuous from the S. A conspicuous parasol tree stands on the summit of a rounded plateau, 65m high, in a position near the coast about 2 miles NE of Pointe Marolahy.

Baie de Moramba is entered between Pointe Marolahy and Pointe Majambo, about 5.5 miles S. Two bare islets, one close off it and the other about 0.3 mile SSW of it, are useful marks for Pointe Majambo.

At Baie de Moramba, spring tides rise 3.2m and neap tides rise 2.6m.

A bar extends S across the entire bay from a position on the N shore about 2 miles SE of Pointe Marolahy. The least depth on the bar is 2.7m. The channel leading into the inner part of the bay narrows to a width of about 0.8 miles at a distance of 2 miles within the bar. Rocky tree-covered islets lie off the N shore at this narrow place. Ile du Goulet is the largest and southeasternmost of these islets.

Anchorage.—Anchorage can be taken in the bay outside the bar, in 11 to 14m, over a bottom of mud. In the recommended

position the S extremity of Ile du Goulet bears 072°. Anchorage can be taken closer in, with better holding ground, in a depth of 8m.

In the inner part of the bay there is good shelter for small vessels. Vessels drawing 4.6m may enter at or near HW, and anchor in a position about 0.2 mile SE of Ile du Goulet in 9.1m. The S extremity of Ilot du Goulet, bearing 072°, leads across the bar in a least depth of 4.9m.

Directions.—Vessels approaching from the N should steer 207° for Pointe de Marolahy to a position from which Nosy Soi bears 075° and is in line with Pointe Maromony. A vessel in this position is S of Diamond Bank. Then a course of 248°, keeping Pointe Maromony bearing 068° astern, should be made good to a position from which Pointe de Marolahy bears 186°. It is necessary to round the latter point at a distance of at least 1 mile, safely outside the reef fringing that point.

The S extremity of Ile du Goulet, kept bearing 072°, leads across the bar in a least depth of 4m. Buoys should be placed to mark the fairway before proceeding into the inner part of the bay.

11.26 Helodranon'i Mahajamba (Baie de Mahajamba) is entered between **Lohatanjon' Ambozomena** (Pointe Manakara) (15°12'S., 47°02'E.) and Pointe Ambararata.

Depths—Limitations.—The extensive inner area within the narrows has not been completely surveyed.

Ocean-going vessels can anchor almost anywhere in the outer part of the bay between the entrance and the narrows.

Aspect.—Ambararata Plateau, which rises near Pointe Ambararata, is on the W side of the entrance of Baie de Mahajamba; two circular red cliffs of the plateau are conspicuous. When the sun shines on the cliffs, two large red patches are visible; the NE patch is larger and darker than the other. When the sun is behind the land, a red watercourse formed by the torrent in the W circle of cliffs is visible when bearing more than 165°.

Mount Masiaposa, on the E side of the entrance, appears as a wooded plateau; Fausse Table, NE of Mount Masiaposa, has a similar appearance. Pointe Ambararata is easily distinguished by the contrast between its regular form and the rugged outlines of Ambohitsambo and Antranonaombi, summits 8 and 10 miles SSW, respectively, of the point.

Pain du Sucre, a tree-covered hill, 114m high and named according to its shape, rises about 2.5 miles WSW of Pointe Ambararata.

Pointe Manakara has close S of it a white patch that is conspicuous when the afternoon sun shines on it. This is a useful mark for vessels passing between Toraka Anelanelana (Banc Intermediaire) and Toraka Thetys (Banc de la Thetis).

Directions.—Vessels approaching from the NE can proceed along the coast in depths of 9.1 to 10m, but must head seaward before reaching a position near Pointe Ambatomifoko so as to clear the shoals off that point, the depths are 9m or more at distances of 4.5 miles from the point. After having cleared these shoals, the coast may again be approached; depths of 14.6 to 20.1m will be found at distances of 1 mile offshore.

Vessels approaching from the NW can proceed through Grand Pass by making good a course of 135° for Pointe Ambararata. When a position has been reached from which Sommet Masiaposa bears 113°, course should be changed to 113° so as to pass NE of Banc de la Lyra. Course can be altered to the S to enter the bay when a position has been reached from

which Pointe Ambasilava bears 180°.

Vessels approaching the bay from the SW should pass W and N of Banc de la Lyra; Sommet Masiaposa should then be brought to bear 113° and the directions given in the preceding paragraph followed into the bay. The shortest route from the SW is by way of West Channel, between Banc Intermediaire and Banc de la Thetis. A vessel can pass safely through this channel by steering 096° for Sommet Masiaposa, keeping that summit in range with the white mark close S of Pointe Ambozomena to a position from which Pain de Sucre bears 229°, when course can be altered to the S as before to enter the bay.

It should be noted that the channel between Banc de la Lyra and Banc Intermediaire should be avoided.

Local knowledge is essential for entering Baie de Mahajamba.

Anchorage.—Anchorage, with good shelter from SE winds, can be taken NW of Pointe Ambararata; in the recommended position the point bears 125° and Pain du Sucre bears 219°; the depths here are 12 to 14m, and the bottom is mud.

Anchorage can also be taken SE of Pointe Ambararata, with shelter from NW winds; in the recommended position in this direction the point bears 311° and the summit of the highest sand dune between that point and Pointe Ampasilava, about 1.5 miles SSE of Pointe Ambararata, bears 256°; the depths in and near this position are 14m, and the bottom is mud.

During the winter months, a desirable anchorage, with shelter from NW winds and swell, can be taken off the village of Ambenja, nearly 4.5 miles S of Pointe Ambararata; in the recommended position, Pointe Ampasilava bears 343°, and a large sand dune at the entrance of the Riviere Ambenja bears 240°.

This position is about 0.3 mile from the outer edge of the shoal fringing this side of the bay; the depths are 12 to 14m.

Anchorage can also be taken off the village of Mangoaka, on the E shore of the bay, about 3 miles SSE of Pointe Manakara. The depths are 10 to 11m, and the bottom is mud, in a position with Pointe Ambolibozo, about 2 miles S of Pointe Manakara, bearing 343° and in range with Pointe Amboaniho, about 0.8 mile SSE of Pointe Ambolibozo; in this position Mount Masiaposa bears 064°.

There is well-sheltered anchorage for small vessels just inside the basin, in a depth of 8.5m, good holding ground, off a cove on the W side of Tombee Manja, a point, 77.1m high, 1.5 miles E of Nosy Longany.

The anchorage is with Tombee Manja bearing 065° and a daymark on the trunk of a baobab tree bearing 330°. The 10m line extends farther S than is shown on the chart. The tidal currents are strong, the incoming current running SSE and the outgoing current running NNW.

11.27 Helodrano Baly (Baie de Baly) is WSW of Baie de Mahajamba. Before describing this coast and its ports, it may be convenient to consider the shoals of the outer reef chain abreast this section, and the various passes through which the coast may be approached.

Mariners are advised to use caution when in the vicinity of the outer banks and shoals.

Directions.—A vessel entering Baie de Baly during the flood tidal current must guard against being set towards the shoals off Pointe Sada. She should steer for the 66.5m hill, 7 miles S of Cap Amparafaka, bearing 209°, until Pointe Sada

Bears 090°, when course should be altered SSE to put the conspicuous tree, on the E side of the head of the bay; ahead, bearing 161°, which bearing leads up the fairway; when Marotia (16°02'S., 45°23'E.) bears less than 100°, the depths decrease quickly towards the head of the bay.

The Riviere Tsimanenoakoho flows into the sea SW of Pointe Ambararata. A bar, over which the depth is 2.5m, extends across the entrance of the river, but within the bar is a good channel with depths of 4.9 to 10.1m.

The village of Marasokoa stands on the S side of the entrance of the river. Spring tides rise 4.2m and neap tides rise 3.2m at Marasokoa.

Coastal vessels enter the river at HW and find good shelter from W winds off the village.

Majunga (Mahajanga) (15°42'S., 46°19'E.)

World Port Index No. 47400

11.28 Majunga (Mahajanga) is situated just within the entrance of Helodrano Bombetoka (Baie de Bombetoka) on its E side, the port is very small and consists of a town and a roadstead off the town where ocean-going vessels can anchor.

Winds—Weather.—During the dry season, the mornings at the anchorage off Majunga are usually calm. In the afternoon a sea breeze often raises a choppy sea.

Tides—Currents.—In the entrance of Baie de Bombetoka, the tidal currents are always strong. During the rainy season, the outgoing current can attain a velocity of 4 knots, and the incoming current, at neaps, sometimes becomes imperceptible. Within the 5m curve, the tidal currents decrease rapidly in strength. At the anchorage for large vessels off Majunga the flood current attains a velocity of 2 knots, and the ebb current a velocity of 3 knots.

The ebb current from the Riviere d'Amparihingidro, the outlet of which lies about 1.3 miles E of Majunga, at times combines with the ebb current from the inner bay to produce a cross-current that may swing a vessel at anchor to a position at right angles to nearby vessels. The closer a vessel can approach the shore the less the currents will be felt.

It is better to sail after the incoming current, as there is little room for turning a vessel.

During the outgoing current, it is not unusual to see numerous red or discolored patches of water in the approach channels, while the water over the shoals and banks in the neighborhood appears much clearer; this is caused by the muddy water flowing into the sea from the river. Deposits of mud have been noticed in certain parts of the channels.

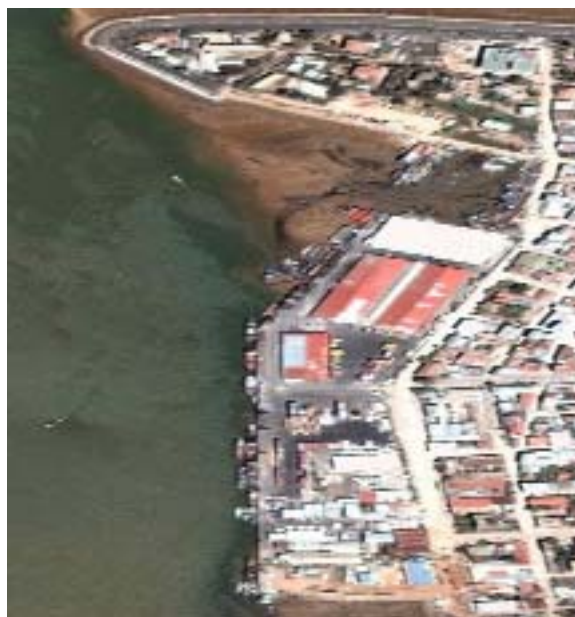
Between Baie de Bombetoka and Cap Amparafaka the current sets generally W to the SSW in calm weather; with a light WNW to NW breeze it has a rate from 0.25 to 0.5 knot. With a WSW breeze the current turns toward S but is very weak.

Depths—Limitations.—Vessels can enter day or night. The maximum draft allowed is 10m.

It was reported (1994) that the harbor is subject to severe shoaling.

A tanker mooring berth about 640m long can accommodate a vessel up to 7,000 dwt, with a maximum length of 120m and a maximum draft of 7.2m.

Aspect.—Observers approaching from the N will probably



Port Majunga from E

first make out Massif Katsepe, the highest land in the vicinity of the entrance of Baie de Bombetoka.

Point Katsepe is about 52m high; a conspicuous white patch, resembling a sail, on the point faces seaward, and is detached from the red cliffs of Katsepe to the W. Point Katsepe Light is occasionally extinguished for up to 2 hours.

Nosy Makamby, an islet lying about 18 miles W of Massif Katsepe and about 3 miles offshore, is a useful mark to vessels approaching Baie de Bombetoka from the W.

Pointe Anorombato (15°43'S., 46°18'E.), the E entrance point of the bay, is marked by a conspicuous radio tower. The radio tower can be seen at 20 nautical miles during the daylight, but it is not lighted. A meteorology pylon stand near Anorombato Light.

Massif de Kandrary, a mark useful to vessels approaching from the NE, rises about 3.5 miles S of Massif Katsepe; the former has a well-defined summit.

Range beacons stand near Pointe Besistka (15°50'S., 46°22'E.), on the S side of the peninsula projecting W from the E shore of the bay to form the narrows. The front beacon is known locally as Jovany Beacon, and is 6.1m high, standing on Pointe Besistka. This point is nearly 3 miles E of Pointe Antanandava (15°50'S., 46°19'E.). The rear beacon, 11.9m high, stands on the summit of the peninsula in a position about 0.9 mile E of the front beacon. This rear beacon is visible from the anchorage off Majunga and also from seaward, according to a report; it should not be confused with either Nosy Beza Beacon (15°46'S., 46°20'E.) or with Ambatomalama Beacon (15°48'S., 46°22'E.). The above beacons in line lead toward an anchorage area off the S side of the peninsula forming the narrows; one such area is Boanamary.

Pilotage.—If requested at least 12 hours in advance by radio, the harbormaster will board a vessel 3.5 miles NW of Kat-

sepe Light and pilot the vessel to the anchorage. Otherwise, the harbormaster indicates anchor berths by radio.

There is said to be a set seaward during a falling tide.

Signals.—There is a signal station on Pointe de Sable (15°44'S., 46°18'E.); storm signals are shown.

Anchorage.—Vessels proceeding to the anchorage off Majunga should anchor from 0.3 to 0.4 mile S or SW of Pointe de Sable, according to bearings indicated on the chart, in about 9m. Small vessels with local knowledge can anchor farther E, in 5m.

A vessel of deep draft anchored in position 15°43'34"S, 46°17'42"E, with Point Katsepe Light bearing 279°, the radio mast bearing 033°, and Ambatomalaba Beacon bearing 134°. The hard mud provided good holding ground. The depth was reported to be about 13m. This anchorage was reported to be the best one for deep draft vessels.

Vessels of moderate draft wishing to anchor farther up the bay, off Pointe Boanamaray, should approach the anchorage area with the range beacons in line and anchor when the factory chimney on Pointe Boanamaray bears 037°, in about 8m; the holding ground is poor in the rainy season, from December to April.

Only small vessels with local knowledge can anchor farther in the bay. The bottom of hard mud is good for holding; during the rainy season, the very violent ebb current necessitates a careful watch of the hold of the anchor.

Caution.—The harbor is subject to severe shoaling.

It is reported that Nosy Beza Beacon and Ambatomalaba Beacon, particularly the latter, are difficult to make out from November to January during the hours of morning when the sun is behind them. The Nosy Beza range beacon is difficult to see as it blends in with the background vegetation.

Banc du Narcissus fronts the entrance to Baie de Bombetoka. It extends about 10.5 miles N of Pointe Anorombato. Four shoals, with depths of 5.5m and less, lie on this bank. Narcissus Bank has a tendency to grow bigger. It extends towards the SW and W, spilling over into the NW channel. In these waters, the depths would appear to be less than charted.

Baie Boina affords anchorage to small vessels with local knowledge, but the approach is encumbered with reefs and shoals, and the channel is difficult to follow because of a lack of marks.

The only recognizable objects are Nosy Makamby and a conspicuous clump of trees at the N end of Nosy Antseranandava, on the W side of the entrance.

The approach channel, which has a least depth of 4.9m, leads SE, then SW close to the E shore. The dangers are difficult to see because of the muddy water.

Numerous wrecks and other obstructions, best seen on the chart, lie in the approaches to and within the harbor at Majunga.

Majunga (Mahajanga) to Helodrano Bay (Baie de Baly)

11.29 Nosy Makamby (15°43'S., 45°54'E.) lies 5.5 miles NW of the W entrance point of Helodrano Boina (Baie Boina) from a distance, it appears to be of a reddish color and the only good landmark. The islet consists of a long narrow plateau, terminating N in a gentle slope and falling steeply on its E and W

sides.

Good anchorage is obtainable, in 10m, mud, with the N extremity of Nosy Makamby bearing 309°, distant 1.5 miles; this anchorage affords good shelter from SW winds.

Tanjona Tanjo (Cap Tanjona), one of the few landmarks on this coast, is fringed with white rocks and scored horizontally with white streaks; it has a flat summit covered with trees. The land within the cape is a plateau with a cleft in it, which makes it appear from a distance as two islands close together. From the summit of Cap Tanjo, at its extremity, the cape slopes gently S at first and then declines suddenly. A chain of small hills prolongs the S end.

Vessels can anchor, according to draft, about midway between Nosy Makamby and Cap Tanjo; the depths decrease uniformly.

Helodrano Marambitsy (Baie de Marambitsy) is entered between a point about 5.8 miles SW of Cap Tanjo and a point about 8.5 miles farther SSW. The entrance is almost blocked by a shallow coral reef extending 5.5 miles offshore; the reef is steep-to at its W edge, and is not marked by any change in color of the water. A narrow and tortuous channel leads into the bay, which is well-sheltered, but it should only be entered by small vessels with local knowledge.

Caution.—Off this part of the coast, at certain seasons and in calm weather, the sea is often found covered for miles with a yellowish oily substance which, under the action of a breeze, breaks up into large patches; from the change thus caused in color of the water, this might be thought to indicate the presence of shoals. The cause, however, is the diffusion of the seed of the mangrove washed out of the various rivers; this substance is found to have a strong scent resembling linseed.

11.30 Helodrano Baly (Baie de Baly) (16°00'S., 45°17'E.) (World Port Index No. 47410) is entered between **Pointe Sada** (15°59'S., 45°20'E.) and Cap Amparafaka, 5.5 miles NW, and affords good shelter.

Tides—Currents.—The tidal currents in Baie de Baly attain a velocity of 2 knots at springs.

Depths—Limitations.—The depths in the fairway leading through the entrance of Baie de Baly are 10.9 to 16.4m; the depths are 9.1m or more as far as a position within the bay from which Tanjona Marotia (Pointe Marotia), about 4 miles SE of Tanjona Sada (Pointe Sada), bears 100° or less. The bay within this bearing is comparatively shallow.

Aspect.—Pointe Sada is 43m high and rises to two hills, which terminate in white cliffs on their W side.

Cap Amparafaka, 28.3m high, consists of red cliffs which are conspicuous from the W.

On the E side of the head of Baie de Baly are some red cliffs, crowned by trees, which break the uniform screen of mangroves bordering the head of the bay; one of these trees is conspicuous and stands at an elevation of 31.4m.

Anchorage.—Vessels can anchor, in 12 to 14m, stiff mud, near the middle of the fairway, with the village of Marotia on Pointe Marotia, bearing 105°, or, in about 8.8m, 4 miles W of the village.

These anchorages are well-sheltered from W or NW winds, which blow during the day in the dry season.

Small vessels may anchor, in 6m, off the village of Baly in the channel that extends S from a position abreast Pointe Tra-

nofotaka, which lies about 7.3 miles S of Pointe Amparafaka.

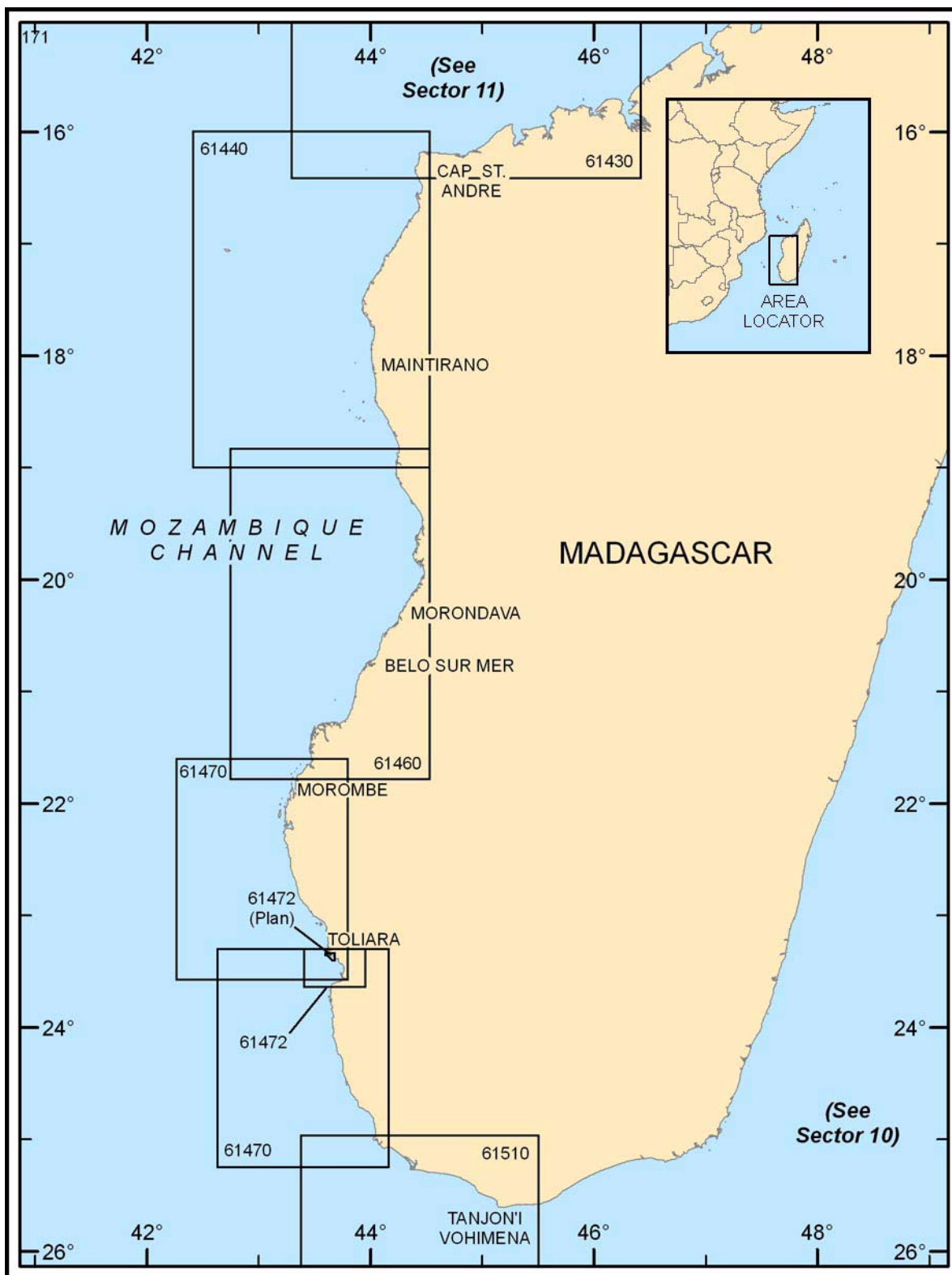
The Riviere de Vilamatsa flows into the sea E of Cap Saint Andre and may be identified by two low white sand dunes surmounted by clumps of casuarina trees.

A bank of sand and coral, over which the sea almost always breaks and which is steep-to at its northern edge, extends 2.5

miles from the river's mouth.

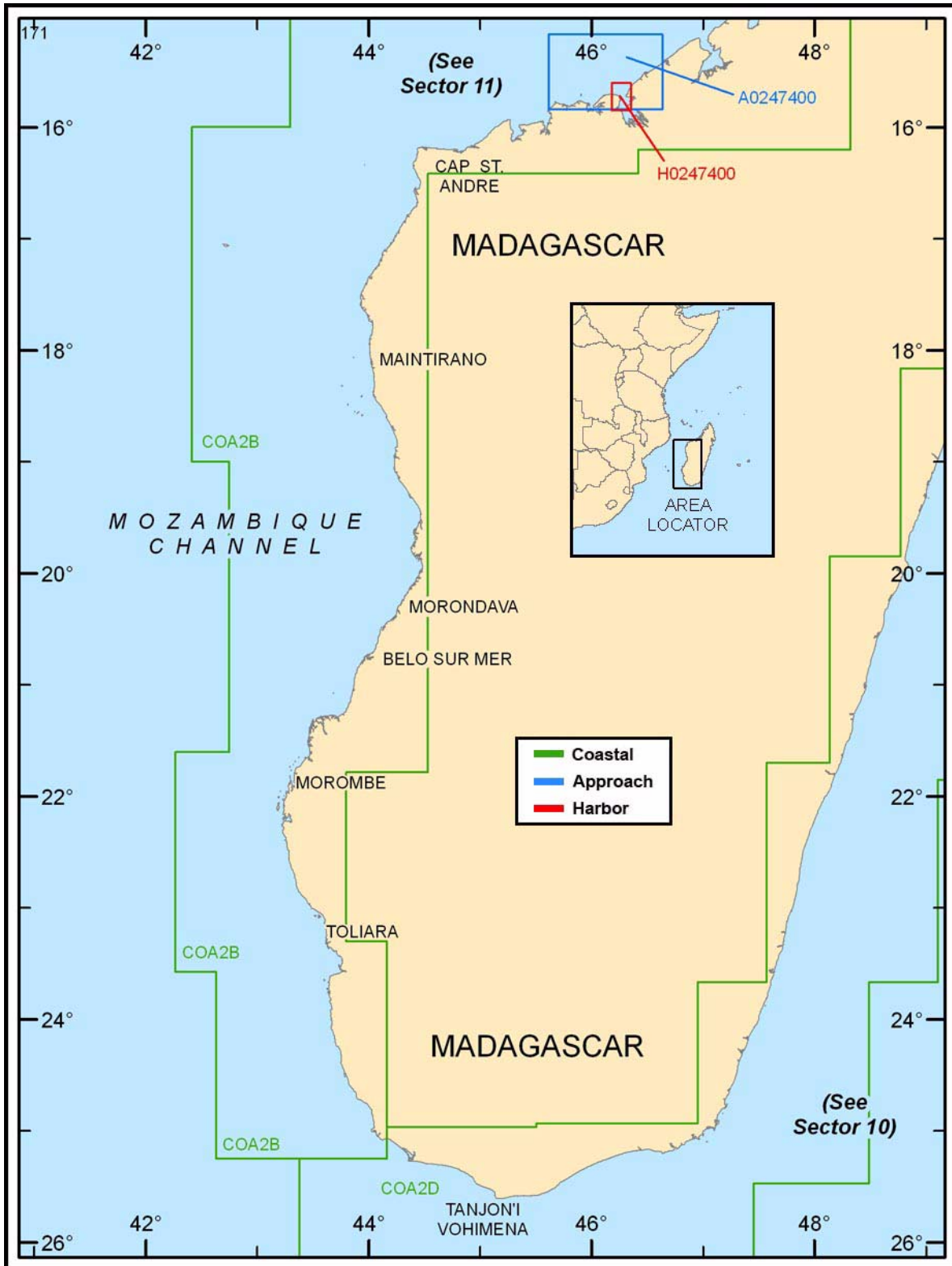
Caution.—A shoal, with a least depth of 4.3m, lies on the E side of the fairway, 2 miles W of Pointe Sada; there is an 8.8m shoal patch 2.5 miles WSW of the point.

The head of the bay is encumbered with banks and shoals which dry.



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SECTOR 12 — CHART INFORMATION



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SECTOR 12 — DNC LIBRARY INFORMATION

SECTOR 12

MADAGASCAR—WEST COAST—CAP SAINT-ANDRE TO TANJON'I VOHIMENA

Plan.—This sector describes the W coast of Madagascar from Cap Saint-Andre S to Tanjon'i Vohimena (Cap Sainte Marie) (25°35'S., 45°08'E.), a distance of nearly 600 miles; also described are the off-lying islands of Nosy Juan de Nova and Ile Europa.

Nosy Juan de Nova

12.1 Nosy Juan de Nova (Ile Juan de Nova) (17°03'S., 42°42'E.) is low, sandy, and covered with trees, mainly casuarina and coconut. An abandoned meteorological station with a white roof stands on the SW side of the island.

A light is shown from the W side of the island. An aero radiobeacon stands near the N coast of the island midway between Pointe Quest and Pointe Est. There is a ruined wharf, marked by a white mast, 0.2 mile NW of the beacon.

Tides—Currents.—The currents in the vicinity of Nosy Juan de Nova are strong and irregular, and extreme caution must be exercised.

Anchorage.—Anchorage can be obtained 2 miles NE of the wharf, in about 15m, sand and coral patches, with the flagstaff bearing 215°, distant 2.2 miles. The anchorage has depths over 10m within a radius of 0.2 mile from the anchorage. There is also anchorage 2 miles N of the wharf, in a depth of about 8.5m. A small vessel can obtain good anchorage, in 10m, with the flagstaff bearing 194°, distant 1.2 miles.

Before letting go the anchor, it is advisable to look carefully to make sure the anchor will not come to rest on a coral head; these heads can usually be seen.

Directions.—The E and W ends of Nosy Juan de Nova should not be approached closer than 4 miles.

Vessels should approach the anchorages from the N, and only during the hours of daylight.

Caution.—It has been reported that Nosy Juan de Nova lies 3.7 miles of its charted position. The surrounding reef extends farther E than shown.

Ile Europa

12.2 Ile Europa (22°20'S., 40°21'E.), which is very difficult to distinguish at night, is composed chiefly of sand, with low hummocks in places. It is partly covered with bushes, and there are some trees, attaining an elevation of 24.4m. The W side of the island is rocky, the E side consists of low steep cliffs, the S side is low, and the limits of its fringing reef are little known; as it is usually a lee shore, it should be given a wide berth. An aero radiobeacon stands near the W side of the island. A stranded wreck lies on the SE point of the island. Pointe Nord-Est, the NE extremity of Ile Europa, lies on the E side of the entrance of a lagoon; there is a conspicuous hummock on the point. A meteorological station, with various structures close to it, is located 0.5 mile ENE of Point Nord-Ouest.

Tides—Currents.—In the vicinity of Ile Europa, the current

is variable in direction and rate; frequent observations are necessary to check the vessel's position.

Anchorage.—There is no secure anchorage off Ile Europa. It is possible to anchor near the edge of the reef fringing the N coast of the island, sheltered from a S swell, in 20m, but there is no room to swing in the event of a shift of wind, and the holding ground is very poor. This anchorage is approached with the flagstaff bearing 180°. A vessel has anchored, in 15m, with Pointe Nord-Est bearing 122°, distant 0.5 mile. These anchorages are precarious, and a vessel using them should be prepared to weigh anchor at any time.

Cap Saint-Andre to Maintirano

12.3 Cap Saint-Andre (Tanjona Vilanandro) (16°12'S., 44°28'E.), the NW extremity of Madagascar, consists of level sandy ground, covered with palm trees and other vegetation, and terminating in a low sandy point. The cape is very difficult to identify. Care must be taken not to mistake the isolated casuarina tree S of the cape for the clump of casuarina trees S of the village of Bevilana.

The W coast of Madagascar between Cap Saint-Andre and Cap Sainte-Marie, the S extremity of the island, has few harbors and is sparsely populated; the only ports are Maintirano, Morondava, Morombe, and Toliara.

Tides—Currents.—The current most frequently sets NE off Banc de Parcel. In the neighborhood of Nosy Vao, the currents are variable; eddies are produced by the configuration of the shoals.

Between Ile Chesterfield and Cap Saint Andre, the flood tidal current sets S and the ebb tidal current sets N. Occasionally, an ocean current will overcome the tidal current, and the resultant flow will be steady in one direction for some time.

Observations of the currents made in July, August, and September between Ile Chesterfield and Beravina showed a maximum rate of 1.25 knots; the ebb currents set in a direction with a W component and the flood currents set in a direction with an E component. The currents attained a maximum rate 4 hours after HW and 3 hours before HW.

Tidal currents between and around the Iles Barren are strong and must be guarded against. North of Pointe Barrow, there does not appear to be much current. A British naval vessel experienced a current, with a rate of 1 knot, setting towards the land in positions E of Pointe Barrow and off the outlet of the Riviere Menarandra, which flows into the sea over Banc del'Etoile. The outlet of this river is NW of Cap Sainte Marie.

Cap Saint-Andre is the point of separation of the winds; the prevailing wind N of the cape is NW, and that S of the cape is SW. When these directions are reversed, it is found that stormy weather follows. In the vicinity of Nosy Hao, the flood current sets NNW at a rate of 0.5 knot.

In a position N of Baie De Fanemotra, a S current is often produced by N winds. As a rule, the current follows the direction of the wind, and at times even precedes its changes.

The tidal currents are fairly strong in the vicinity of Nosi Ve. The flood current sets NNW and the ebb current sets SSE. They attain a maximum rate of 1 knot, about 3 hours before and 3 hours after HW.

Caution.—Vessels should not remain in the vicinity of Cap Saint-Andre during the season of squalls, from November to April, as they will be exposed to great danger of a bank studded with shoal heads. The sea is heavy and the holding ground of coral is poor.

Vessels rounding Cap Saint-Andre should not approach it closer than 15 miles. Those approaching from the S should not alter course to round the cape until the village of Bevilana bears more than 113°. A sunken landing craft containing explosives lies 9 miles WNW of Cap Saint-Andre.

Banc de Goraka Pracel, the continuation of the coastal bank, extends S from Cap Saint-Andre to approximately 19°S. Farther S, where the coastal bank is narrower, the depths are too irregular for soundings to indicate proximity to the coast; caution is necessary when approaching the bank, as many small reefs lie on it up to 30 miles offshore.

12.4 Mozambique Channel, which separates the W coast of Madagascar from the E coast of Africa is about 225 miles wide at its narrowest part W of Cap Saint-Andre. Depths in the canal are usually great outside the coastal banks.

Caution.—The partially submerged dangerous wreck of the drill rig Gatto Selvatico lies in position 15°53'S, 44°31'E. The wreck is reported (1977) to be unmarked by navigational aids.

Bassas da India (Basse de Judie) (21°27'S., 39°41'E.) is a coral atoll about 6 miles in diameter, enclosing a shallow lagoon. It rises steeply from ocean depths and mostly dries. The sea breaks heavily over the reef and can be seen in clear weather.

In 1974, two wrecks, ships of 2,500 grt, lay stranded on the SW side of the reef.

Small rocks, 2.1m to 3m high, lie on the N and E sides of the atoll; the W and S sides dry 1.2m. The reef is completely covered from 3 hours before to 3 hours after HW. There is a narrow boat passage at LW on the N side of the reef.

Currents in the vicinity of the atoll appear to be strong; ships should not approach Bassas da India without a good fix.

Caution.—It has been reported (1993) that the W and SW extremities of the reef and the two stranded wrecks lie about 2.5 miles SW of their charted positions.

Banc de Pracel (Banc de Toraka) extends from a position abreast Cap Saint-Andre to 19°00'S. The width of the area has not been determined, but dangers as far as 30 miles offshore have been reported.

A vessel that spent 5 months in the vicinity of Banc de Pracel reported that dangers were seldom met, with where the color of the water suggested their presence; sounding constantly revealed dangers that the lookout had not seen.

Unless vessels proceeding through Mozambique Channel are bound to some part of the coast within the bank, they should keep outside it altogether. If soundings show that they are over its W or outer edge, they should at once haul to the W into deeper water.

A wreck, dangerous to navigation, was reported to lie 4.2 miles W of Vulture Rock (16°13'S., 44°20'E.).

12.5 Ile Chesterfield (16°19'S., 43°58'E.) is a reddish bank of sand, with a chain of dark rocks on its W part and a large black rock, 0.3m high, in its middle. It should be given a wide berth, particularly at night.

Vessels can anchor in a position about 1 mile NW of Ile Chesterfield. The depths are 15 to 18m, and the bottom of sand and shells is moderately good holding ground.

Nosy Vao (17°29'S., 43°45'E.), a low and dark-colored islet, has a beach of white sand, and has been seen in clear weather at a distance of 10 miles. Anchorage can be taken in a position N of Nosy Vao, in 14m; a vessel anchored there is well-sheltered from winds from the S and W.

The **Riviere Marotondro** (16°47'S, 44°20'E) has cliffs located 5 miles N of its mouth; the upper part of the cliffs is red while the lower part is white.

Anchorage, with good holding ground, is available all along the coast, between Cap Saint-Andre and Tambohorano (17°30'S., 43°57'E.), but the presence of off-lying dangers makes approach difficult.

Iles Barren lie on the S part of Banc de Pracel. All the islands appear as a strip of white sand, surmounted by a dark knoll, and can be seen at a distance of 10 to 12 miles.

The part of Banc de Pracel, on which Iles Barren lie, is considered very dangerous; many of the shoals on it do not show in good weather.

Anchorage can be taken off **Nosy Maroantaly** (18°25'S, 43°55'E), with the NW extremity of Nosy Maroantaly bearing 219° and the SW extremity of Recif Croissant (Hrrandriaka Croissant) (18°22'S., 43°55'E.) bearing 335°. The depth in this position is 13m, and the bottom, of mud, is good holding ground. This anchorage is always to be preferred in bad weather to the open roadstead off Maintirano.

12.6 Nosy Androta (18°29'S., 43°48'E.) has at its highest part a clump of casuarina trees, with their tops at an elevation of 35m, that have often been mistaken for a vessel under sail.

Nosy Lava (18°35'S., 43°45'E.) is the southernmost and largest of the Iles Barren. Anchorage can be taken off Nosy Lava. In the recommended position, the E extremity of the island bears 180° and the N extremity of Nosy Andrano (18°33'S., 43°51'E.) bears 294°. The depth here is 13m, sand.

The Riviere Sambao flows into the sea on either side of Nosy Voalavo. Vessels can obtain anchorage about 5 miles W of the mouth of the Riviere Sambao, in 11m.

Helodrano Ankoritiky (Baie de Koraraika) is entered between a point at the mouth of Riviere Manabbo Maty (17°36'S., 43°56'E.) and Cap Bepoaka (Tanjona Mandatsakoro).

Anchorage can be obtained in Baie de Koraraika NW of Cap Bepoaka.

Directions.—There are two principal channels by which a vessel may pass through Iles Barren.

The N channel lies SE of Boursaint Shoal and NW of Harandriaka Lockwood (18°32'S., 43°46'E.) and Nosy Androta; the breakers over Harandriaka Lockwood assist in identifying the entrance to this channel. If a vessel is bound for Maintirano, a lookout must be kept for Surprise Shoal.

The S channel, access to which is more difficult, lies E of Purdy Sand, then between Nosy Lava and Banc Simpson, when course must be altered NNW to pass W of Nosy Maroan-

taly and into the S approaches to Maintirano.

Cap Bepoaka (Tanjona Mandatsakora) is a steep cliff, with uniformly flat ground in the vicinity, though a short distance S the land rises slightly to two flat hills; when seen from the N, it appears dark against the background. The reddish-white color of the cape makes it conspicuous in the sunlight.

A conical sand dune, 19.2m high, rises about 3 miles S of Cap Bepoaka and about 0.5 mile inland. A large white dune, 21m high, rises about 3 miles farther S, and a large gray dune, 24m high, rises about 4.5 miles farther in the same direction. This gray sand dune is a mark useful to vessels proceeding to the roadstead off Maintirano; it rises about 4 miles N of the town.

Maintirano (18°04'S., 44°01'E.)

World Port Index No. 47420

12.7 Maintirano is very small port and consists of a town and an open roadstead.

Winds—Weather.—The roadstead is recommended only in good weather. It is generally calm in the morning, but winds from the S rise in the afternoon and make communications difficult.

Tides—Currents.—The tidal currents in the vicinity off the roadstead off Maintirano set generally N at velocities of 1.5 to 2 knots at springs. A current, often strong, sets E toward Banc du Nord.

Off **Maintirandmaty** (18°10'S., 44°02'E.), the outgoing current attains a velocity of about 0.5 knot at half tide, and then sets SW; the incoming current attains about the same velocity a little before half tide, and then sets E.

Depths—Limitations.—The least depth in Passe du Nord is 4.5m; the least depth in Passe du Sud is 8.2m. It was reported (1970) that a shoal, with a depth of 1.6m, lies about 3.7 miles NNW of the lighthouse at Maintirano.

Aspect.—The most conspicuous objects in Maintirano are the customhouse, a white building with a red roof; the lighthouse; the Residency; and the flagmast. A wreck, which covers and uncovers, lies almost 1 mile WSW of the flagmast. From Passe Du Nord, only the lantern of the light tower can be seen above the trees. Sarodrano Beacon stands on the coast about 6.8 miles S of Maintirano. The beacon is conspicuous, particularly in the afternoon.

Signals.—There is a signal station situated at Maintirano.

Anchorage.—Large vessels anchor approximately 3.5 miles SW of the town, in 9 to 11m, mud bottom. In bad weather, the anchorages in Iles Barren and in the vicinity of Banc du Nord are preferable.

Good anchorage, in 18m, can be obtained 0.5 mile NE of Banc du Nord; it is well-sheltered from the heavy SW swell.

Directions.—It is better to arrive off Maintirano in the afternoon, as objects on the coast are then easier to make out; it is not advisable to arrive at or leave the roadstead off Maintirano at night.

Vessels bound from the N and W for the roadstead off Maintirano should pass S of Banc de l'Quest and N of Banc de l'Emile-Heloise, Bancs du Vaudreuil, and Banc Bayfield.

Vessels capable of safely passing over a least depth of 4.5m

can proceed through Passe du Nord by steering 156° for the signal mast near Maintirano. When a position has been reached from which the large gray sand dune about 4 miles N of the town bears 047°, course should be altered to 194°, which leads to the anchorage area.

Vessels can proceed through Passe du Sud from a position SE of Banc du Nord by steering 117° for Sarodrano Beacon to a position from which the signal mast bears 042°. A course of 042° from this position should be followed to a position from which the beacon bears 146°, course should then be changed to 000° for the anchorage area.

Maintirano to Morondava

12.8 Maintiranomaty (18°10'S., 44°02'E.) is a small town situated about 6 miles S of Maintirano. Anchorage can be taken in good weather off Maintiranomaty, in 10m; small vessels can anchor, in 6m. When the high seas of other than good weather are met with, it is better to take shelter in the anchorage off Nosy Maroantaly or in that off Nosy Lava.

Cap Kimby (Tonjona Kimby) (18°53'S., 44°15'E.) shows a dark mass marked with several white patches.

The **Riviere Manambolo** (19°03'S., 44°15'E.) is often called the Behanjavilo Mouth. A military station stands about midway between the N and S outlets of the Riviere Manambolo. Anchorage has been taken off the N outlet of the Riviere Manambolo in a position from which the military station bore 114°, the middle of Behanjavilo Mouth bore 055°, and a clump of coconut trees bore 140°. The depth was 7.9m and the vessel was 2 miles outside the breakers.

Soahazo (19°20'S., 44°24'E.) is a town marked by a building with a zinc roof and a lookout station that shows above the trees. Anchorage has been taken off Soahazo, in 9m, in a position with the lookout station bearing 075°. Ilot Indien lies on the S side of the mouth of the Riviere Tsirbihina. Huts on Ilot Indien are a mark for the delta.

Anchorage can be taken off the delta. Small vessels can anchor W of Tsimanandrafozana, 2 miles offshore or 1 mile from the breakers, in depths of 5 to 7m. For larger vessels, there is good holding ground farther seaward, in depths of 13 to 22m, with the clump of coconut palms 0.5 mile S of Tsimanandrafozana, bearing between 060° and 065°.

A vessel anchored in a position with the clump of coconut trees bearing 108°, and subsequently in a position from which the trees bore 122°, in 10m. In the latter position, the vessel was only 0.2 mile from the edge of the bank.

The Riviere Kerindy flows into the sea through an outlet lying about 10 miles SSE of Ilot Indien.

The village of Bosy stands on the S side of the river just within the outlet. Anchorage has been taken in a position about 1 mile WNW of the village, in 7m.

Numerous banks, reefs, and shoals lie off the coast between Soahazo and the outlet of the Riviere Morondava (20°20'S., 44°15'E.). Shoals and dangers other than those discovered probably exist, and the area should be navigated with caution.

It is said that schools of fish frequenting the shoal areas create observable eddies in the water, and that flights of birds pursuing the fish are indications of such shoal areas.

Morondava (20°17'S., 44°18'E.)

World Port Index No. 47430

12.9 Morondava is situated on the W coast of Madagascar, on Nosy Miandroka. The port consists of a town and an open roadstead where ocean-going vessels can anchor.

Tides—Currents.—At the anchorage off Morondava, the tidal current is slack about 1 hour after HW and LW. The flood current sets N, attaining a velocity of about 0.8 knot at springs 1 hour before HW; the ebb current sets SW, attaining a velocity of about 0.5 knot 1 hour before LW. At neaps, the currents are weak and variable and set sometimes N, sometimes S, at a velocity of 0.25 knot.

Southwest winds cause a NE surface current, which attains a velocity of 1 knot, and continues for several days after these winds have ceased to blow.

The tidal currents increase in strength toward the delta of the Riviere Tsiribihina (19°48'S., 44°24'E.).

Aspect.—The principal landmarks in Morondava and its vicinity are a water tower, 29m high, from which a light is exhibited; two aluminum-colored tanks, near the middle of the town, standing about 0.5 mile W of the water tower; Betaolampia Light, standing 8 miles SSW of the water tower; and the anchorage beacons, described below.

Two range beacons stand 0.2 mile apart, with the rear beacon standing about the same distance N of the water tower; in line bearing about 129.5°, the beacons lead to the N anchorage. A beacon, 6.1m high, stands near the coast 0.7 mile W of the water tower and in line with it bearing 080°, provides an anchorage mark.

Two range beacons stand near the coast, 1.7 miles SW of the water tower. The front beacon is 4m high and the rear is 13.1m high; in line bearing 132°, these beacons lead to the S anchorage.

Pilotage.—Pilotage is not available at Morondava.

Anchorage.—Anchorage can be taken, in 6.7 to 9.7m, mud and sand, about 1 mile from shore, on the 129.5° range. Mariners are cautioned that a heavy swell often occurs in the roadstead.

Anchorage can be taken, in 10 to 10.9m, at the intersection of the 132° range and the 080° range.

Anchorage can also be taken in a position abreast of Lovobe. The holding ground is good; the sea is usually not as high as in the position N of the light, and boats can land without difficulty. The position is inconvenient for communicating with Morondava.

Directions.—Vessels proceeding to the roadstead should give the coast a good berth until some of the marks for the area have been identified. A good approach to the roadstead is with Morondava Light bearing 102°.

Morondava to Morombe

12.10 Cap Ankarana (Tanjon Ankarana) (20°29'S., 44°09'E.) is a white sandy formation. Pointe Andriambe, a short distance S of the cape, is black and rocky, and appears from some directions as an islet. Pointe Ambatomisiotaka (Lohtanjon Ambatomisiotaka), about 9 miles S of Cap Ankarana, is a conspicuous projection.

Belo-Sur-Mer (20°45'S., 44°01'E.) (World Port Index No. 47440) is situated 7 miles SW of Lohtanjon Ambatomisiotaka, on the outer N side of the estuary of the Riviere de Belo. The port is very small and consists of a village and an open roadstead.

Tides—Currents.—Off the estuary of the Riviere de Belo, the tidal current is slack at LW. The flood current, which sets ENE, attains a maximum velocity of about 0.8 knot, 1 hour before HW; the ebb current attains a maximum velocity of 0.25 knot at half tide, when it sets NNW.

Aspect.—Belo-sur-Mer can be identified at a distance by a conspicuous clump of tall trees and by a white chapel.

Anchorage.—Anchorage can be obtained in convenient depths off Belo-sur-Mer, with the white chapel bearing 165°.

Caution.—Numerous sand banks, some of them drying and all of them subject to shifting, lie off the entrance of the estuary. Vessels anchor off the entrance seaward of the banks.

12.11 Anchorage can be obtained E of **Nosy Andriangory** (20°50'S., 43°45'E.). In the recommended anchorage position, the N extremity of the island bears 270° and the S extremity bears 232°. The depths in this position are 18.3m and the bottom, of sand and shells, is moderately good holding ground. The island affords only moderate shelter from heavy seas from the W and SW, and the anchorage should be regarded as desirable only in good weather. This anchorage should be approached by way of the channel S of the islands. Note that Banc du Vaudreuil lies in the W part of this channel.

In the vicinity of **Nosy Andriamitaroka** (21°04'S., 43°41'E.), the flood current sets SE at a velocity of 0.5 knot; the ebb current sets W at the same velocity.

Anchorage can be taken in a position from which the N extremity of Nosy Andriamitaroka bears 280° and the S extremity bears 254°. The depth in this position, which is about 0.8 mile E of the island, is 16.4m; there is shelter from W and SW winds. This anchorage should be approached by way of the channel N of the island.

Ankoba (21°07'S., 43°52'E.) is a small village. A conspicuous white sand dune rises on the coast 5 miles SSW of Ankoba. Anchorage can be taken off Ankoba, in 6 to 7m, in positions 1 mile and 1.5 miles offshore. A vessel anchored here is not sheltered from seaward, but the sea is rarely very heavy.

Mouillage d'Ampasilva is 15 miles wide between Ankoba and Pointe Marohata (21°17'S., 43°36'E.). The village of Andranopasy stands on the shore at the head of the bay. Vessels can proceed to an anchorage position among the sand banks lying off the village after passing over a shoal with a depth of 7.9m.

In Mouillage d'Ampasilava, the incoming current sets E from 3 hours before to about 3 hours after HW, attaining its maximum velocity of 0.75 knot about 1 hour 30 minutes before HW. The outgoing current, which runs from the other half of the tidal cycle, attains its maximum velocity of 0.5 knot at LW.

Anchorage can be taken, in 8m, good holding ground, with the flagpole in the village of Andranopasy bearing 158° and distant 3 miles.

During strong W winds, anchorage should be taken E of Nosy Andriamitaroka rather than in the above position or at least in a position farther seaward, but on the same bearing, in greater depths where the seas are less steep.

Small vessels can proceed closer to the shore on the 158° bearing and anchor, in 6m. The approach to Mouillage d'Ampasilava can be made from the N by way of the inshore route or from the W by passing N of Nosy Andriamitaroka.

Caution.—Between Morondava and **Mouillage d'Ampasilava** (21°15'S., 43°43'E.), the inshore route is very difficult, and care should be taken as there are many dangers. The discharge from rivers often causes discolored patches of water, and whereas banks and shoals in this vicinity rarely cause discoloration of the water, all such discolorations should be regarded as dangerous. All vessels, unless small and with local knowledge, should keep W of the off-lying dangers.

Ambohibe (21°21'S., 43°31'E.) is a village with a mission, a chapel with red roofs, and several buildings that are useful landmarks.

Morombe (21°45'S., 43°22'E.)

World Port Index No. 47450

12.12 Morombe is situated close NE of Cap Morombe, midway between Pointe Andefitra and Cap Tsingilofilo (Helodrano Tsingilofilo) SSW. The port is very small and consists of a town and an open roadstead.

Tides—Currents.—The MHW interval at Morombe is 6 hours. Spring tides rise 3.8m; neap tides rise 2.5m.

The N current begins 3 hours before HW by the shore and continues until 3 hours after HW, when the S current begins. The tidal currents are strong in Passe du Sud; their direction may vary on either side of the range line. In the channels the current is slack at the times of HW and LW.

At the anchorage off Cap Morombe, at springs, the flood current has been observed to set SSW, attaining a maximum velocity of 1.75 knots about 1 hour before HW, and the ebb current to set ENE, attaining a maximum velocity of 1.25 knots about 2 hours before LW.

Depths—Limitations.—Vessels drawing 7.9m may proceed through Passe du Sud toward Cap Morombe. The least depth in the route through Passe du Nord to Town Anchorage is 6.1m.

Aspect.—A ridge of hills, from 1 to 3 miles S of Pointe Andefitra, attains an elevation of 45m and can be identified by its whitish jagged cliffs with black patches.

Cap Morombe rises to a sand dune, backed by a ridge of low hills.

The courthouse, with a conspicuous red front, stands on the coast 0.4 mile NE of Cap Morombe.

Vessels approaching from the N usually first sight the high sand hills of Pointe Andefitra, and to the S of these hills, the range beacon on Cap Morombe. A beacon stands 0.5 mile S of the courthouse.

Range lights are occasionally exhibited on Cap Morombe; the lights are in line bearing 133°.

A beacon stands on the SW end of Nosy Be, and is the front mark of a range line for an anchorage; the rear range mark is on the edge of the reef, 0.2 mile NNW.

A beacon stands nearly 1.5 miles ENE of Nosy Lava Light and on the reef which extends from the islet.

Passe du Sud is marked by Buoy MB1, on the W side, and by Buoy MB2, on the E side; both are moored 0.6 mile SE of the beacons on Nosy Be. Buoy MB4, moored 0.8 mile farther SE,

marks a depth of 4m on the E side of the fairway leading to the principal anchorage.

A pipeline extends 0.2 mile NW from tanks on the coast, close NE of the front range light; there are two mooring buoys near the end of the pipeline.

Signals.—There is a signal station at Morombe.

Anchorage.—The anchorage area, known locally as Cape Anchorage, lies WNW of Cap Morombe. In the recommended position the beacons on Nosy Be are in line bearing 345°, and the front range beacon on Cap Marombe is in line bearing 097° with the beacon E of it. This is the only anchorage position in the harbor available at any stage of the tide to vessels drawing more than 7.9m. Care must be taken not to anchor in positions S of the parallel of the cape.

Town Anchorage is accessible only with a flood tide. In the recommended anchorage position the depth is about 6.4m, with the Residence bearing 133° and Pointe Andefitra bearing 044°.

Both anchorages afford secure shelter and good holding ground. Strong SW winds in the afternoon raise a choppy sea.

Between Cap Tsingilofilo (Helodrano Tsingilofilo) and Pointe Lamboharana (Lohatanjona Bevary) a range of mountains in the interior is divided by a large opening with perpendicular sides; the formation is a useful mark.

Directions.—Vessels proceeding toward Morombe and places in the vicinity should not depend upon marks on the coast in making a landfall. The islands are difficult to distinguish from seaward, but the lighthouse on the summit of Nosy Lava is a useful mark.

Vessels approaching from the S should pass W of Recif Morisson (21°48'S., 43°12'E.) and W of the reef N of it. Note that these reefs are not always marked by breakers and special care is necessary in their vicinity. In using Passe Sud, a vessel must keep W of the off-lying dangers until the lighted beacons on Cape Morombe are in line 133°.

A course of 133°, with the lighted beacons in line, should then be steered through the fairway of Passe Sud. When the range beacons on Nosy Be are in line bearing 345°, course should be changed so as to keep this range astern. This course leads to the anchorage.

Vessels may proceed through Passe Nord by making good a course of 129° so as to pass about 1 mile NE of Nosindolo and about 1.6 miles SW of Nosy Andramona. When a position has been reached from which the front beacon of the range beacons on Cap Morombe bears 186°, a course of 186° can be steered for the beacon to a position about 1.8 miles from the cape. The least depth passed over on this portion is 6.1m.

Cap Anchorage can then be reached by way of Passe Sud by following the directions already given to a position from which Nosy Trozona bears 275° and is in line with the S extremity of Nosy Lava. A course of 095° should then be steered, keeping this range astern, toward the red-roofed building of the Norwegian Mission. When Pointe Andefitra (21°39'S., 43°25'E.) bears 044°, it should be steered for on that bearing, and anchorage taken when the Residence bears 133°.

Caution.—The approach toward Cap Morombe is difficult because of the off-lying dangers and lack of useful marks. Many of the islands in the vicinity are difficult to distinguish from seaward.

Tetes de Nosindolo, a coral shoal with a least depth of 6.7m, lies 3 miles WSW of Nosy Andramona.

L'Arete, a coral shoal with a least depth of 2.1m, lies 4 miles NW of Morombe.

Nosy Tsipoy, an islet 1.5 miles S of Nosy Trozona, has several trees on it. A large rock, 1.2 miles SSE of Nosy Tsipoy, serves to mark the E edge of the reef extending N from Cap Tsingilofilo.

Nosy Ratafanika, 18m high, lying 2.7 miles S of Nosy Tsipoy, is rocky and wooded; there are several islets and rocks between it and Cap Tsingilofilo.

Morombe to Toliara

12.13 Cap Saint Vincent (Tanjona Andefitra) (21°57'S., 43°16'E.) is marked by two conspicuous dunes separated from one another by a distance of about 1 mile; the N dune is pointed and 11.9m high.

Nosy Andrahombava (Nosy Andranombala), rising to a conspicuous sandhill, 10.7m high, and covered by bushes, makes a good landmark.

There is anchorage E of Nosy Andranombava, 0.3 mile offshore, in 16m, sand and shells, good holding ground, with the N extremity of the islet bearing 294° and the S extremity bearing 243°; it is well-sheltered from the W swell. A vessel approaching this anchorage should pass between Recif Rogier and Nosy Andranombala, or pass S of Harandrika Parson (Recif Parson).

Pointe Andavadoaka is marked by a large black perforated rock. A cairn on the summit of a hill, about 1.5 miles N of the point, is conspicuous.

12.14 Nosy Hao (22°05'S., 43°11'E.) does not stand out clearly when viewed against the coast. A reef extends 1.7 miles S from the islet.

Anchorage can be obtained 0.6 mile E of Nosy Hao, in 11 to 15m, fine sand and shells, good holding ground, with the N extremity of the islet bearing 325° and the S extremity bearing 245°.

The anchorage is sheltered from the W swell, but is exposed S and the sea from that direction is often heavy; in such circumstances, the anchorage off Nosy Andrahombava (Nosy Andranombala) is preferable.

The anchorage off Nosy Hao can be approached, by a vessel coming from the N, between Recif Rogier and Nosy Andranombala, and then on a S course.

Baie de Fanemotra is entered between **Pointe Lamboharana** (22°12'S., 43°14'E.) and Pointe Antsamotra, 1 mile SSE, and opens out into a basin which mostly dries; the entrance is shallow and narrowed by reefs.

Pointe Lamboharana is moderately high, with a conspicuous little peak at its S extremity. Pointe Antsamotra consists of a white cliff, S of which rise some bare hills.

Baie de Fanemotra affords sheltered anchorage to small vessels with local knowledge, in 5m, 0.9 mile NE of Pointe Antsamotra, but the swinging room is limited.

12.15 The Riviere Manombo (22°58'S., 43°28'E.) flows into the sea. The village of Manombo stands on the NW side of the river mouth and is visible from some distance seaward; N of it is a temple, with a red roof, and a church.

On Colline Ambohibe, NE of the mouth of the Riviere Ma-

nombo, overlooking the village, is an old lookout station which serves as a landmark.

There is good weather anchorage off the mouth of the Riviere Manombo, in 7 to 8m, sand, with good holding ground. A vessel of moderate size has anchored 1.7 miles offshore and 0.6 mile from the coastal reef, in 29m, with the temple near Manombo bearing 044°.

Pointe Tony (23°00'S., 43°28'E.) has a conspicuous hill, with sharply-defined steps, that shows above the trees; the hill rises about 1 mile N of the point. This hill is sometimes called Butte de Tony.

12.16 Baie de Ranobe (Helodrano Ranobe) lies within the barrier reef between Pointe Tony (Butte de Tony) and a point 10 miles SE. It is the best anchorage along this coast for a considerable distance. At HW, a considerable sea is raised at the anchorage during SW winds.

Tides—Currents.—The tidal currents are strong in Passe Fanandomotra, with strong eddies, but are weak within Baie de Ranobe, where the velocity does not exceed about 0.8 knot. The flood current sets N, and attains its maximum velocity at half tide, when it starts to decrease, but runs until 1 hour after HW.

The ebb current also attains its maximum velocity at half tide and sets S, ceasing at LW.

Depths—Limitations.—Passe Fanandomotra has a navigable width of 0.2 mile and a least depth of 7m.

Aspect.—A hill of remarkable shape rises from the SE entrance point of the bay. A conspicuous casuarina tree stands on a sand hill, on the shore of the bay, in a position about 5.5 miles SE of Pointe Tony.

A beacon stands on the shore of the bay. This beacon, bearing 040° and in line with the fall of Manombo Hill, leads through Passe Fanandomotra.

Anchorage.—In the position in Baie de Ranobe recommended for ocean-going vessels for anchoring, Pointe Tont (Butte de Tony) bears 339° and the conspicuous casuarina tree on the sand hill bears 057°. The depth in this position is 10m; the bottom is mud.

Directions.—The beacon and the hill mentioned above are at some distance from the outer part of Passe Fanandomotra, so that considerable reliance must be placed on navigation by eye and by use of soundings.

The best time for entering, having regard to the position of the sun for seeing the reefs, is about 1 hour before LW, and for leaving, at about HW.

Caution.—Baie de Ranobe is encumbered by coral reefs, which even at HW, are easily seen by the discoloration of the water.

Toliara (Tulear) (23°22'S., 43°40'E.)

World Port Index No. 47460

12.17 Toliara is situated on the SW coast of Madagascar. The port is very small and consists of a town and a secure natural harbor sheltered by Le Grand Recif.

Winds—Weather.—Southwest winds prevail all year round. When the winds freshen in the afternoon from 1200 to 1900, landing in boats becomes difficult, as elsewhere along this

coast. The rainy season in this region is from November to March.

Tides—Currents.—The incoming tidal current sets SE. During the dry season, at springs, the flood current sets SE through Passe du Nord, and NE through Passe du Sud, with the currents meeting off Pointe Kilibe (23°26'S., 43°44'E.).

The reverse occurs during the ebb current and an eddy may be experienced in Passe du Nord, setting SE close inshore between Banc de Nosy Vato (23°22'S., 43°39'E.). Off Mahavatsy Pierhead, the tidal currents are weak. The currents conform generally to the direction of the main fairway, except when the reef is covered; cross sets may then be experienced.

The tidal currents are strongest off the N end of Le Grand Recif, where at springs they attain a velocity of 2 knots.

The tidal currents at the anchorages are not felt as much as those described above; they attain a velocity of 1.25 knots at springs.

Depths—Limitations.—The fairway leading through Passe du Nord has a least depth of 12.8m, mud. It is difficult to distinguish in bad weather, and care must be taken not to confuse it with the mouth of the Riviere Fiherenana, 1.5 miles N of the fairway. Passe du Sud has a least depth of 12.8m in the fairway. This channel passes close NW of a shoal, with a depth of 8.7m, lying 0.6 mile W of Nosy Tofara (23°31'S., 43°43'E.).

Five anchor berths, in depths of 6 to 12m, lie W and SW of Pointe Mahavatsy.

Mahavatsy Pier consists of a 1,320m long causeway with an L-shaped pier, 150m long, with a depth alongside of 8.0m. Tankers may dock at this pier.

Banc Mareana which dries, extends 1.5 miles offshore between **Pointe Befotaka** (23°24'S., 43°42'E.) and Pointe Kilibe, about 2.5 miles SE. Roche Microbe, on the E side of the fairway 2.2 miles NW of **Pointe Sarodrano** (23°30'S., 43°44'E.), dries 0.6m. Nosy Tafara, a reef which dries 0.6m, lies midway between the S end of Ilay Harandriaka Lehibe (Le Grand Recif) and Pointe Sarodrano, 2.5 miles E.

Aspect.—The gap between the hills, indicating the valley of the Riviere Fiherenana, can be identified by a vessel coming from the N. The most conspicuous object first sighted when Toliara is approached from the SW is Mont Maina (La Table), with a flat summit 163.7m high, 8 miles ESE of Pointe Anosy. As Toliara is neared, the water tower in the middle of the town is first seen, then the radio masts on the E side of the town, and then the Norwegian Church, easily identified by its two square towers and red roof. There is another water tower near the airfield 4 miles SE of the town. Pointe Barn Hill (23°33'S., 43°45'E.) is 61m high and consists of white limestone cliffs, which are conspicuous when in sunlight.

Mahavatsy Beacon, 14m high, stands on the coast 1.5 miles ESE of Pointe Anosy. The beacon is difficult to see in the morning, but a tank farm nearby helps to identify it.

Beacon E stands on the coastal reef 0.4 mile W of the root of Mahavatsy Pier. Buoy TU2 and Buoy TU4, which mark the coastal bank on the NE side of the fairway, are moored 1.2 miles NW and 0.1 mile SW, respectively, of Pointe Anosy.

Pilotage.—Pilotage is compulsory. It has been reported (1996) that the port captain and the pilot can be contacted on VHF channel 16.

Directions.—It is advisable to approach Passe du Nord during the morning; in the afternoon the SW wind blows up the

sand, and one of the most useful marks, Mont Mahinia, is often not visible.

Vessels with drafts up to 10m may safely anchor in the harbor; the jetty has a maximum safe draft of 9.3m alongside.

During bad weather, the entrance to Passe du Nord is difficult to distinguish, and care must be taken to avoid confusing it with an indentation N of Pointe Ansoy. To avoid this confusion, it is advisable to identify Ilay Harandriaka Lehibe S of the entrance on the parallel of Mont Mahinia, and then to proceed N until the entrance to the pass can be made out.

Passe du Nord should be entered by keeping the leading lights near Pointe Anosy in line bearing 114°. Maintain this course until Beacon C and Beacon D are in line bearing 148°. This range should be followed to a position from which Mahavatsy Beacon bears 088° and is in line with Beacon E. This range leads to an anchorage position.

Vessels proceeding to the inner anchorage position follow the directions just given to the position from which Mahavatsy Beacon bears 088° and is in line with Beacon E. From this position a course of 112° should be steered to round the SE extremity of Banc de Mahavatsy, on which course the vessel will pass between the bank and the 4.9m patch about 0.1 mile SE. After rounding the bank, a course of 043°, with Beacon E in line with the E radio mast, should be steered to the inner anchorage position.

Passe du Sud should be approached by steering 039° for Mont Mahinia to a position from which Pointe Sarodrano bears 100°. Course should then be changed to 357°, which leads between Ilay Harandriaka Lehibe and Roche Microbe. Note that Passe du Sud should be attempted only by vessels with local knowledge because of the numerous shoal heads and patches. Passe du Sud is recommended only to vessels with local knowledge.

Anchorage.—The anchorages in Rade de Toliara are safe in all seasons, but a choppy sea is often experienced in the afternoon. Five anchor berths, in 6 to 12m, mud or sand, lie W and SW of Pointe Mahavatsy.

A vessel awaiting instructions from the harbor master can anchor temporarily, with Mahavatsy Beacon in line with Beacon E, bearing about 088°, and the Norwegian Church bearing 053°, in 12.8m, good holding ground; vessels are prohibited from anchoring N of the alignment.

Small vessels with local knowledge, with a draft not exceeding 4.9m, can obtain anchorage nearer the town, with ample swinging room, E of the S end of Banc de Mahavatsy, in 6 to 7m. A vessel making this anchorage should pass between Buoy No. 3 and Buoy TU6 or between Buoy No. 5 and Buoy TU8, and anchor with Beacon E in line with the E radio mast, bearing 043°; and Pointe Anosy Rear Range Light bearing 318°; this berth is 0.2 mile W of Mahavatsy Pier Head. Approximately 1.8 miles from the above position, with Pointe Anosy Beacon still bearing 318°, is a stranded wreck, with the hull and masts clearly visible. Vessels should stay clear and not mistake the wreck for a vessel at anchor.

Caution.—Le Grand Recif (Ilay Harandriaka Lehibe), the N extremity of which lies 1.5 miles WNW of Pointe Anosy, extends parallel with the coast for 10 miles and dries.

Many shoal patches, with a least depth of 1.8m, lie in the channel between Le Grand Recif and the coastal reef.

Banc de Mahavatsy is a shallow spit extending 1.2 miles SE

from Pointe Anosy.

Toliara to Tanjon-i Vohimena (Cap Sainte-Marie)

12.18 Helodrano Inantosony (Baie de Saint-Augustin) is entered between **Pointe Sarodrano** (23°30'S., 43°44'E.) and a point 6 miles SSW.

Tides—Currents.—Along the S side of Baie de Saint-Augustin, the flood current sets E at a velocity of 0.25 knot; the ebb current sets W at a velocity of 0.5 knot.

Depths—Limitations.—The depths in the bay are great, except within 1 mile of the shore.

Aspect.—The village of Solara (Saolary), standing on the S shore of the bay 2.5 miles WSW of Pointe Ampasimanoro, the S entrance point of the Riviere Onilahy, can be identified by a church at its W end. Rocher Tente, 4m high, lying close offshore 0.5 mile E of Saolary, is a white rectangular rock and is not easily seen. From Pointe Ampasimanoro, white cliffs which are conspicuous when in sunlight extend 1 mile WSW to a gap formed by the entrance of Lovokampy Valley. Two stone beacons stand 0.5 mile S of Rocher Tente; the beacons in line bear 171°.

Anchorage.—During the trade winds, from April to October, vessels should anchor with Pointe Ampasimanoro bearing 068° and on the alignment of the two stone beacons, bearing 171°, in 9.4m; or closer inshore, in 5.5m, with the church at the W end of Sadlary bearing 229°. At other seasons, vessels should anchor in 20m, with Pointe Ampasimanoro bearing 081° and Rocher Tente bearing 158°. There are often heavy rollers at this anchorage.

Small vessels with local knowledge can obtain more secure anchorage between November and March, within Passe du Sud at Toliara, between the reefs off Pointe Sarodrano.

Directions.—A vessel coming from the N and bound for Baie de Saint-Augustin, identify Mont Mahinia and the delta of the Riviere Fiherenana; then the white cliffs at the head of the bay can be seen.

From the S, the valley of the Riviere Onilahy, with the surrounding high land, is distinctive, as it is the first valley N of Cap Andriamamao (25°00'S., 44°05'E.).

Caution.—A narrow spit, with depths of less than 4.8m, extends 0.8 mile SW from Pointe Barn Hill (23°33'S., 43°45'E.). A shoal, with a least depth of 12m, lies 3.5 miles W of Saolary and 1.2 miles offshore; the sea breaks on it in bad weather.

12.19 **Nosy Ve** (23°39'S., 43°36'E.), lying 2 miles NW of Lahatanjon' Anakao (Pointe Anakao), is a low-lying white sandy islet, covered with brushwood, with a clump of trees near its N end; there are the ruins of an old settlement on the islet.

The channel between Nosy Ve and the coast affords anchorage sheltered from winds between the S and W. The best berth is in 10.1m, sand and coral, moderate holding ground, with the N extremity of Nosy Ve bearing 253° and the SE extremity bearing 195°; a good scope of chain should be veered. Vessels at anchor are liable to swing continually because of changes in the wind and tidal currents, which sometimes cause the anchor

to drag.

Nosy Ve lies on the E side of a reef, which is about 2.5 miles in extent, N and S. A coral bank, over which the sea breaks heavily in bad weather, extends 1.2 miles NNE from the N extremity of the reef. Mariners must beware of this reef at HW.

Anse Itampolo lies about 2 miles NE of **Pointe Angorotany** (Itampolo) (24°43'S., 43°55'E.), the S entrance point of Helodranon'i Salapaly (Baie de Salapaly). The cove can be identified by Colline Hatokaliotso, a rounded hill with gradual slopes in the second range of hills, which should not be confused with another rounded hill, with steep slopes, also in the second range, N of Anse Itampolo. This second range of hills disappears behind the first when the coast is approached.

Immediately N of a point on the S side of Anse Itampolo, an old military outpost, consisting of a two-story building and a red house, stands on a sand hill. Several hundred meters N of the outpost, the sand hills decrease in elevation, and some clumps of trees, which in the morning look like boat's sails, border the coast. Several villages can be seen in the neighborhood.

A small vessel with local knowledge making the anchorage in Anse Itampolo should approach with the old outpost bearing 093°; after passing close to the coastal reef forming the S side of the cove, steer 140°, keeping within the shelter of the reef, and anchor with the outpost bearing 059°, distant 0.9 mile, in more than 9m. This anchorage is sheltered from wind and swell, except from between WSW and N, when it is dangerous to anchor here. Port d'Androka affords shelter and is situated close S of **Cap Adriamano** (25°00'S., 44°06'E.). The directions for entering and the anchorage are indicated on the chart.

Port Cruizer, at the NW end of Baie de Minirodu, is approached between the SE end of the coastal reef, which extends from Port d'Androka, and an isolated reef marked by breakers. Small vessels with local knowledge can steer for a white sandhill on the W point of the bay and anchor, in 7.9m, with the conspicuous fall of the sandhill bearing 315°, the S extremity of the coastal reef bearing 175°, and the isolated breakers bearing 107°. This anchorage is not sheltered from wind and swell between the SSE and SSW.

Toraka Toxer (Banc Toxer) (25°12'S., 44°13'E.) has a least depth of 2.5m. In good weather, the sea only breaks over this patch occasionally. Vessels coming from seaward should not approach the coast until Nosy Manitsa, 3.5 miles E of Banc Toxer, bears 135°.

Banc de l'Etoile fronts the coast from **Lohatanjona Fenambosy** (Pointe Fenambosy) (25°15'S., 44°21'E.) to Tanjon'i Vohimena (Cap Sainte-Marie). Vessels with local knowledge can pass over Banc de l'Etoile and anchor, if necessary, during offshore winds, in 26 to 29m, 2 or 3 miles offshore.

Recifs de l'Etoile (25°21'S., 44°18'E.) lie on the NW side of the bank; the sea only breaks over the N reef in bad water, but it always breaks over the S reef. It is advisable to give the reefs a wide berth. In 1979, there was a conspicuous stranded wreck on the S end of Recifs de l'Etoile.

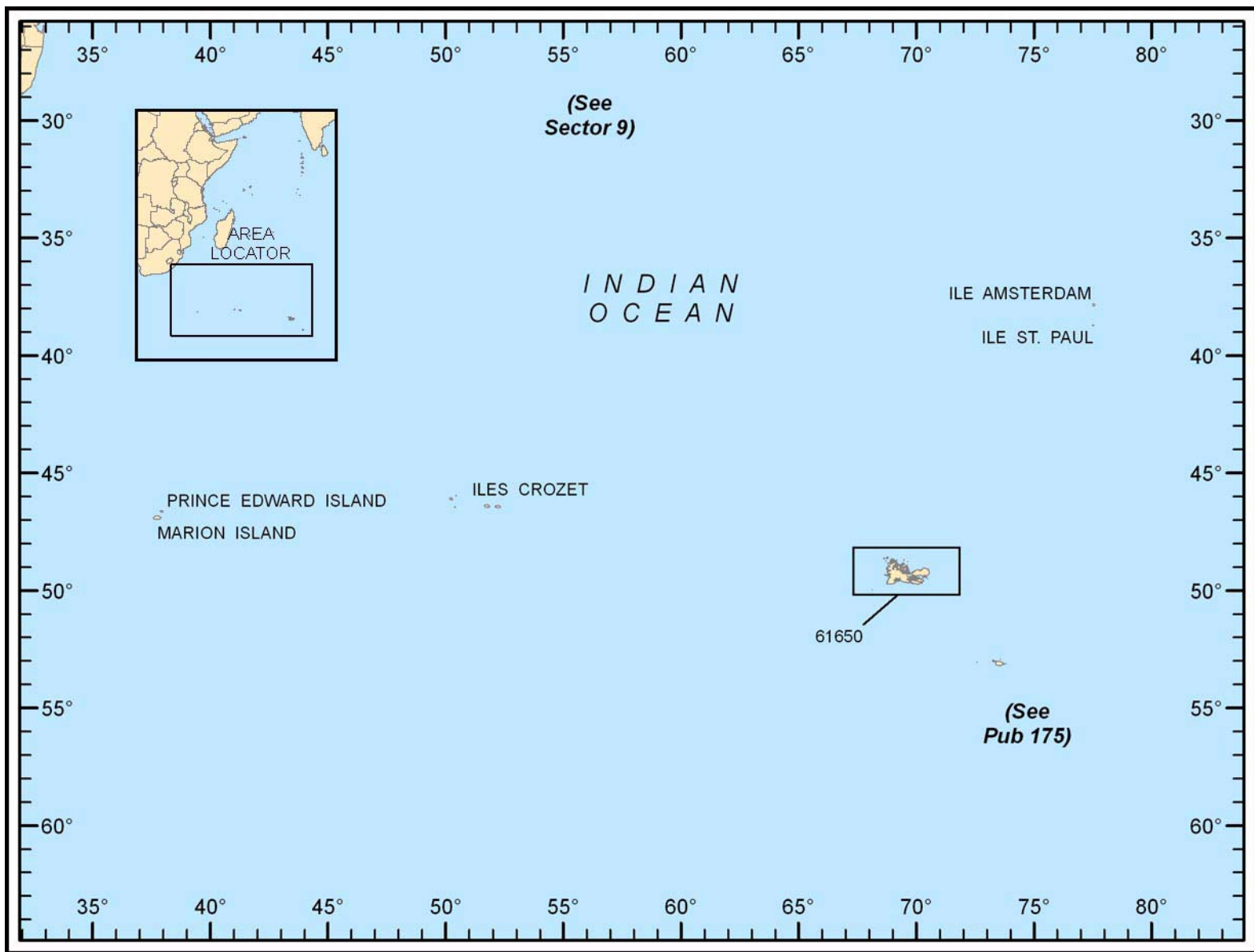
Caution.—Toraky Ny Kintana (Banc de l'Etoile) is imperfectly surveyed; mariners are advised to navigate with caution.

Anse Lavanono (25°24'S., 44°54'E.) lies NW of Tanjon'i

Vohimena (Cap Sainte-Marie). Anchorage is available with local knowledge. A vessel has obtained anchorage, sheltered from E winds and swell, in 12m, good holding ground of sand,

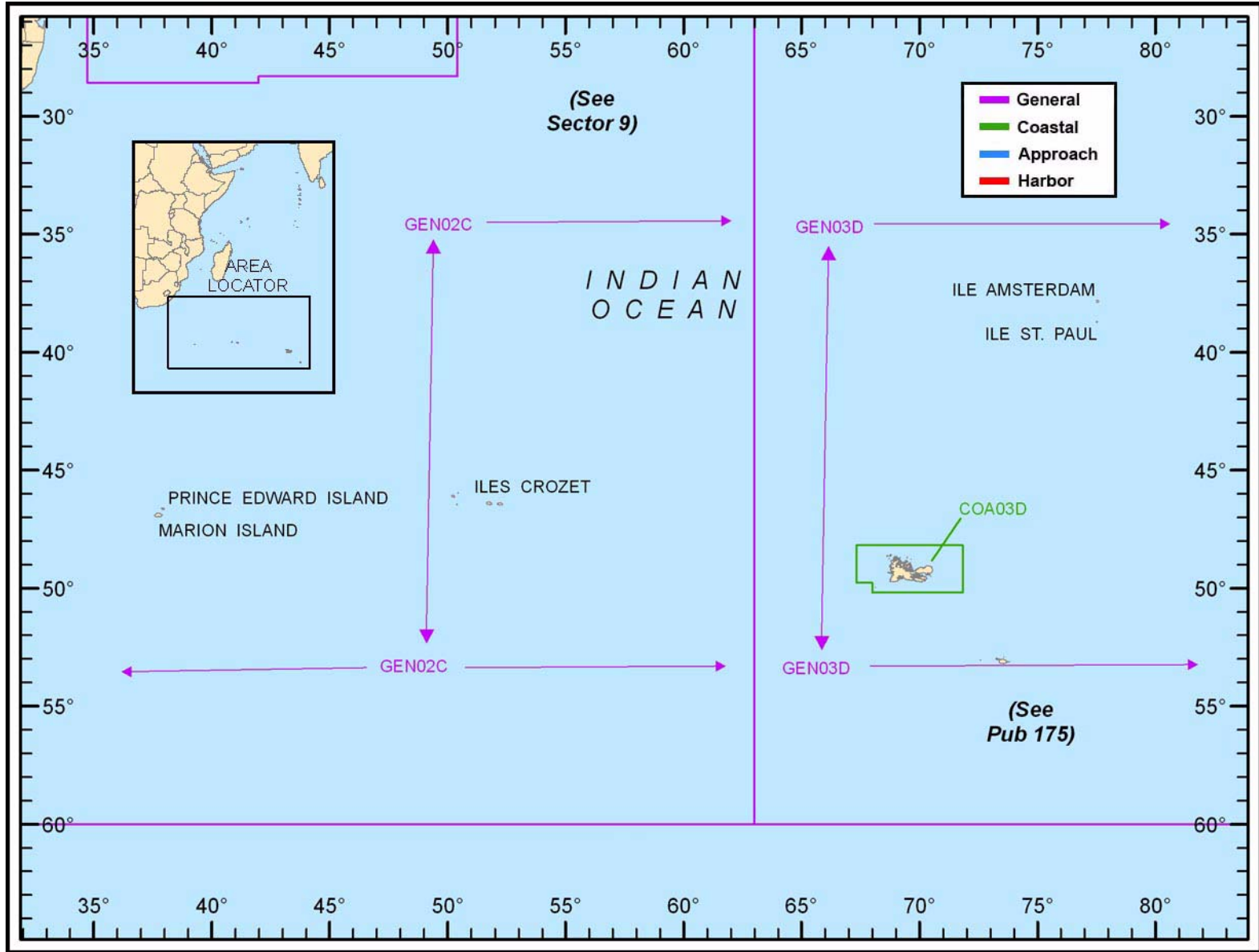
with Cap Sainte-Marie bearing 135°, distant 2 miles.

Tanjon'i Vohimena (Cap Sainte-Marie) (25°35'S., 45°08'E.) is described in paragraph 10.46.



Additional chart coverage may be found in NGA/DLIS Catalog of Maps, Charts, and Related Products (Unlimited Distribution).

SECTOR 13 — CHART INFORMATION



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SECTOR 13

SOUTH INDIAN OCEAN—THE PRINCE EDWARD ISLANDS, ILES CROZET, ILES KERGUELEN, ILE SAINT-PAUL, AND ILE AMSTERDAM

Plan.—This sector describes the islands in the S part of the Indian Ocean, including the Prince Edward Islands, Iles Crozet, Iles Kerguelen, Ile Saint-Paul, and Ile Amsterdam.

The Prince Edward Islands

13.1 The Prince Edward Islands are a pair of islands which are the twin peaks of a sunken volcano. The two islands are Marion Island, the northernmost, and Prince Edward Island.

Marion Island (46°53'S., 37°43'E.), the larger of the two Prince Edward Islands, appears from the N as a cluster of ragged nipples, with one table-topped peak slightly higher than the boot. The slopes of the island are broken by numerous volcanic cones, some with the red volcanic ash still showing near the summits. The sides of the hills are thickly studded with lava boulders, rising above the vegetation of rank, boggy moss.

Cape Crozier (46°57'S., 37°35'E.), the W extremity of Marion Island, lies about 2.3 miles NW of Vrystaat Point; when seen from the W it appears as a low dark-colored point against the lighter background.

13.2 Cape Hooker (46°59'S., 37°50'E.), the SE extremity of Marion Island, lies about 10 miles E of Cape Crozier. It is a flattish ledge about 61m high. A very conspicuous hummock rises about 2 miles N of Cape Hooker. Marion Island rises to an elevation of 1,230m near its W central part, with another similar elevation about 0.8 mile ENE.

Ships Cove (46°51'S., 37°50'E.) indents the N shore of Marion Island, about 5 miles ESE of Boot Rock. Anchorage can be obtained about 0.3 mile offshore, in a depth of 29m.

There is a passage 11 miles wide between Marion Island and Prince Edward Island, which are under the sovereignty of the Republic of South Africa.

A vessel found temporary anchorage, in 38m, 1 mile W of Aldebert Reef (Solglimt Blinders) (40°51'S., 37°52'E.), and 0.5 mile offshore, with Boot Rock bearing 289°, about 5.1 miles distant, rocky bottom. Strong currents were observed at this anchorage.

Transvaal Cove (46°52'S., 37°51'E.) is about 0.7 mile S of Duiker's Point. At the N end of the cove is the meteorological station, consisting of 14 white and silver buildings, one of which has a conspicuous roof painted in black and white checks. The station is well-lit at night.

Anchorage.—Anchorage can be found, in depths of 46 to 55m, good holding ground, but a vessel should put to sea should pressure fall with a veering wind.

Directions.—If approaching Marion Island from the NW, steer SE to pass between the islands and to pass at least 2 miles N of Solglimt Blinders; this reef may not break in very calm conditions. When East Cape bears 180°, alter course to 180°; Solglimt Blinders will be cleared by 1.5 miles. Then approach the anchorage on a course of 249°, with McMurray's Kop, a prominent volcanic cone which may be snow-covered in win-

ter, ahead and in line with the Ballon Tower. The anchorage, in a depth of 32m, about 0.3 mile offshore and clear of kelp, is reached when about 1.8 miles ENE of McMurray's Kop summit.

13.3 Prince Edward Island (46°38'S., 37°56'E.) lies 11 miles NNE of Marion Island. When sighted from the W, this island presents a rounded summit, 672m high, with the land sloping gradually to South Cape, but more abruptly N. On the N extremity is a wedge-shaped peak, which appears from a distance to be detached from the island. This peak is slightly higher than Ross Rocks, a number of rocky islets which lie within 0.5 mile N of this extremity and show up very dark against the land.

Ship Rock, 197m high, stands close off the N extremity of the island.

The W and SW coasts of the island are precipitous. Within the SW point is a precipitous cliff, rising to an elevation of 457m within 0.3 mile of the sea. On the E side of the island is Cave Bay, which was formerly used by sealers as a temporary anchorage, in a depth of 18m.

Landing can usually be made in Cave Bay when the wind is between the S and NNE through W; the best landing place is in the center of the beach with anchorage available, in a depth of 27m, about 0.3 mile offshore. There is a 14m shoal lying 1.5 miles E of East Cape, close S of Cave Bay.

Iles Crozet

13.4 Iles Crozet lie between the parallels of 45°57'S and 46°30'S, and between the meridians of 50°10'E and 52°20'E.

The archipelago is composed of two groups of volcanic islands about 50 miles apart. The W group consists of one main island, Ile aux Cochons, and two small islets, Iles des Apotres and Iles des Pingouins. The E group consists of Ile de la Possession and Ile de l'Est. Ile aux Cochons first appears to observers approaching from the N as a number of peaks.

The islands have been under French sovereignty since 1924.

Tides—Currents.—In passing through the channel between Ile aux Cochons and Iles des Apotres, a current setting toward the rocks and breakers off the W side of the latter islands must be guarded against.

Caution.—Many sunken dangers, not always charted, exist in the vicinity of these islands.

13.5 Cap Verdoyant (46°05'S., 50°16'E.), a useful mark, projects from the middle part of the E shore of Ile aux Cochons and is the E extremity of the island. A conspicuous rock S of the cape appears as a truncated cone.

Anchorage.—The anchorages are off the E shore of Ile aux Cochons and are consequently exposed to E winds. Such winds, said to be an infallible sign of bad weather, are infrequent, but when they do blow, they acquire such force as to

jeopardize vessels at anchor; vessels must hasten seaward at the first sign of these E winds.

The anchorages can be approached by rounding either the N or S end of Ile aux Cochons.

Anchorage can be taken in Mouillage de la Meurthe off the entrance of Tournyol du Clos, close S of Cap Verdoyant, in a position with the right fall of the cape bearing 284°, distant about 0.4 mile. The depth is 30m and the bottom is rock, with a thin layer of black sand.

Anchorage can also be taken off the entrance of Crique Loniewsky, in a depth of 24m, black mud, with Les Cinq Geants bearing 315°, distance about 0.6 mile.

13.6 Iles des Apotres (45°36'S., 50°25'E.) consists of Grand Ile, Petite Ile, Ile Donjon, and nine pinnacle rocks. The nine pinnacle rocks are from 15 to 122m high; the southernmost is perforated.

Iles des Pingouins (46°28'S., 50°20'E.) lie 18 miles SSE of Ile aux Cochons. The principal island is composed of barren, volcanic rock; it is 360m high and quite inaccessible. The cliffs on the N and W sides of the island resemble the vertical walls of a fortress.

Rocher de l'Arche, 76m high and connected to the NW extremity of Iles des Pingouins by a low isthmus, appears to be separate from that island.

Submerged rocks, on which the sea breaks heavily, extend 1.5 miles SE from Iles des Pingouins. A submerged rock, the position of which is doubtful, has been reported to lie 3.5 miles ESE of Iles des Pingouins.

Caution.—Iles des Pingouins has been reported (1988) to lie 2 miles N of its charted position.

13.7 Cap Vertical (46°21'S., 51°41'E.), the N extremity of Ile de la Possession, is conspicuous. Cap de la Heroine is the W extremity of the island and breakers exist 2 miles offshore SW of Cap de la Heroine.

A conspicuous high perforated rock lies off the NW shore of the island, about 1 mile N of Pointe des Moines, the W extremity of Ile de la Possession. Vessels approaching the island from the W during fog can identify the high perforated rock before the island itself can be made out.

Baie du Marin is a wide bight in the SE shore of Ile de la Possession; it is open to the SE, but offers shelter from winds between the SSW and NNW. Baie du Navire is a recess at the head of Baie du Marin.

Anchorage.—Anchorage can be taken in Baie du Marin and, by smaller vessels, in Baie du Navire. The outer anchorage, in 40m, is marked by the intersection of two lighted ranges. Baie Americaine is a semicircular indentation in the NE shore of Ile de la Possession. Anchorage can be taken in the bay without difficulty. The bay is entered, and an anchorage site selected, by keeping midway between the kelp on either side. A vessel will be in depths of 9m or more as close as 0.3 mile from the head of the bay. The recommended position is in 22m, sand and shell, good holding ground, with Rechecker la Armadillo bearing 017°, distant 0.2 mile.

Caution.—East winds are rare, but they are a sure sign of bad weather. Vessels should put to sea at the first indication of such winds.

13.8 Ile de l'Est (46°25'S., 52°08'E.) is a mass of precipitous volcanic mountains, with jagged summits, rising in a succession of cliffs to an elevation of 1,090m at Mont Marion-Dufresne, a snow-covered peak.

The SW extremity of Ile de l'Est terminates in a high rock in the form of a triangular pyramid. Depths of 20 to 24m are found 1.4 and 2.4 miles SE, respectively, of this point.

On the S side of the island are high red cliffs and broad streams of lava. Three rocks, 2 to 3 miles apart, lie from 0.1 to 0.3 mile off the S coast. The sea breaks furiously on every part of the W and S sides.

Temporary anchorage can be taken, in 24 to 27m, off the N and NE shores of Ile de l'Est, which, from the appearance of the vegetation growing close to the water's edge, can seldom be washed by heavy seas. The temporary anchorage must be approached with caution because of the off-lying irregular unexplored depths.

On the N side of the island, temporary anchorage is also possible, in 35m, 0.5 mile from the coast, at the opening of Baie du Naufrage (Baie de l'Aventure) (46°23'S., 52°12'E.).

Iles Kerguelen

13.9 Iles Kerguelen, including all off-lying dangers, lie between the parallels of 48°27'S and 50°00'S, and the meridians of 68°25'E and 70°35'E. There are more than 300 islands and islets in the whole archipelago, which is under the administration of the French Government. When viewed from the sea at a distance, the islands present a remarkable jagged outline of sharp peaks, which is most striking when observed from the S.

Tides—Currents.—The ocean current immediately around Iles Kerguelen is generally affected by the wind or the aftereffect of the wind. The tidal currents are appreciably felt, in some places setting strongly against the wind.

Caution.—Icebergs, some of them large and dangerous, have been seen in the vicinity of Iles Kerguelen.

13.10 Mont Campbell (49°04'S., 70°19'E.) is a useful mark by reason of its truncated conical appearance; it rises from a low, marshy plain, and is unmistakable. Mont Peeper (49°12'S., 70°25'E.) and Mont Bungay (49°19'S., 70°26'E.) rise from the same plain; they, like Mont Campbell, are conspicuous from the E. These comparatively low hills are often visible when the high masses inland of them are enveloped in fog.

Ilot du Rendez-Vous (48°27'S., 68°48'E.) lies in the approach to Iles Kerguelen from the NW in position; it is a useful landfall mark.

Ile Roland lies nearly 6 miles S of Ilot du Rendez-Vous. Crique Esnault is an indentation on the E side of Ile Roland. Indifferent anchorage may be obtained, in 18m, over a bottom of sand, in Crique Esnault.

Ile de Croy lies about 5 miles WSW of Ile Roland. A cove where small vessels might anchor indents the SE shore of Ile de Croy.

Baie de l'Oiseau is entered between Cap Francais (48°40'S., 69°04'E.) and Pointe de l'Arche, about 1 mile SSE. The flood tidal current sets NW off the entrance. Table Mount, the highest hill on the N side of Baie de l'Oiseau, is 411m high, and a

useful mark.

Mont Havergal rises to a height of 551m on the S side of the bay; it is conspicuous from the NE. Mont Havergal is a huge, imposing mass of blackish rock, resembling a human head from some directions, and towering conspicuously above the other summits nearby.

Anchorage.—Anchorage can be taken in Baie de l'Oiseau. The area available for anchoring is about 1 mile long and has depths of 10.9 to 28m. The bottom is fine black sand except toward the shore, off which in places are kelp-covered rocks. A good berth is in 16m, about 0.3 mile from the head of the bay, which is marked by a level beach of fine black sand.

The recommended position is near a rivulet and a cascade. Good ground tackle is required as squalls from the W rush down the valley at the head of the bay with tremendous force. Changes of weather are sudden.

Baie de la Dauphine is entered between Pointe de l'Arche and Cap Ligneville, about 1.5 miles S. Anchorage, considered safe and good, in 33m, can be taken at the head of the bay. The mud bottom is good holding ground. The kelp must be avoided and NE wind raise a considerable swell.

13.11 Baie Clemenceau (48°44'S., 69°03'E.), extending about 5.5 miles SW, is entered between Cap Ligneville and Pointe d'Anieres, about 2.3 miles ESE. Good anchorage, in 20m, can be taken at the head of Baie Clemenceau. As in the case of Baie de la Dauphine, NE winds raise a considerable sea.

Baie de Recques is entered between Pointe d'Anieres and Pointe Pringle (Pointe des Roches), about 2.8 miles SE.

Ile Guerite lies about 0.5 mile E of Pointe d'Anieres. A rock resembling a sentry box stands on its summit.

A rocky patch, marked by kelp, lies in the middle of the entrance of Baie de Recques. The recommended channel leading into the bay passes S of the rocky patch.

Anse du Jardill is entered on the SE side of Baie de Recques, between Pointe Cristal, 6 miles SW of Pointe d'Anieres, and a point 0.5 mile farther SW; then it extends in a S direction for 2 miles. An islet, fringed by foul ground, lies close offshore, 0.5 mile SW of the SW entrance point.

Pointe du Museum lies about 4.3 miles SW of Pointe Cristal, where Baie de Recques divides into two arms; Port Edmond Perrier is the W arm and Anse de l'Excursion is the E arm.

The anchorages in Baie de Recques are much better than that in Baie de l'Oiseau and are not exposed to such violent winds. They are, however, not so easy of access.

Safe anchorage can be obtained in Anse du Jardin, in 25m, good holding ground, with the entrance points almost in line bearing 000°, a waterfall on the W side bearing 252°, and a point on the E side, resembling an islet, bearing 037°.

Anchorage.—Anchorage can be obtained, in 20m, mud, 0.3 mile N of Pointe du Museum. Port Edmond Perrier affords good anchorage to small vessels, in 20m, 0.8 mile SW of Pointe du Museum.

Baie du Brise-Lames is entered between Cap Ferron, about 1.5 miles SSE of Pointe Pringle, and Pointe Lucky, about 2.3 miles SSW. Ilot Cezembre lies close off the SE shore in a position about 2 miles from Pointe Lucky. Good anchorage can be taken in Baie du Brise-Lames, in 30m, somewhat less than 1

mile W of Ilot Cezembre.

13.12 Baie Blanche (48°49'S., 69°11'E.), which contains several good harbors, is entered between Pointe Lucky and Pointe Cox. Baie Caille is a recess in the NW shore of Baie Blanche lying about 4.8 miles from Pointe Lucky. It is preferable to anchor, in 18m, on the S side of the bay rather than on the N side, where the depths decrease rapidly. Baie du Phoque is a recess in the NW shore of Baie Blanche lying close SW of Baie Caille.

Anchorage.—Anchorage can be obtained, in 18m, in Port Matha at the head of Baie Blanche, 0.3 mile W of Pointe Maunoir, the N entrance point.

Baie du Repos, SSW of Baie Blanche, is reported by sealers to afford good anchorage.

Roches Glass is a chain of black islets which stand out clearly, even in misty weather.

13.13 Ile Howe (48°50'S., 69°25'E.) lies with its N extremity about 8 miles WSW of Roches Glass. The shores of Ile Howe appear to vessels approaching from the N as light-colored, pale yellow or brown cliffs. Iles Dayman lies about 2 miles ENE of the NE extremity of Ile Howe. Port Fuller, an area along the E shore of Ile Howe, affords secure anchorage from the prevailing W winds. Depths of 27m are available.

Port Fallieres is a small harbor formed between the SW shore of Ile Howe and the NE shore of Ile McMurdo; it can be entered without difficulty from the W, but not from the E. Well-sheltered anchorage can be taken, in 20m.

Baie Rhodes is entered between Pointe Oakeley (48°51'S., 69°30'E.) and Cap Neumayer. Roche Bird is difficult to distinguish; it should not be approached within 0.2 mile of its E side. The safest approach to Baie Rhodes from the NE is between Roches Glass and Roche Bird. The approach S of Roche Bird is obstructed by kelp which may cover shoal patches.

13.14 Port Mary (49°00'S., 69°19'E.) lies on the W side of Baie Rhodes, about 7.5 miles within the entrance. The harbor is backed by hills from which, during gales, heavy squalls blow first from one direction and then from another. The best anchorage is in 11m, soft mud bottom, in the middle of the harbor. A vessel of deep draft entering the harbor should keep close to the N entrance point and to the N side in order to avoid a patch, with a depth of 7.3m, amongst the kelp.

Port Credner (49°02'S., 69°17'E.), entered 1.5 miles S of Port Mary, is suitable for small vessels. The entrance lies N of an island which fronts the anchorage, at which there are depths of 18m.

Port Helene (49°04'S., 69°16'E.) is entered 2.5 miles S of the entrance of Port Credner. The harbor is easy to access and affords good anchorage, in 25m. The harbor is subject to squalls during W winds.

Baie d'Orvilliers is entered between Pointe St. Vincent de Paul and Pointe Bassuet, 0.5 mile to the NE, and affords anchorage to small vessels, in 17m. Large vessels can anchor, in 35m, in the entrance of Port Jules Girard, with Pointe Roghe-neuf bearing 007°, the E extremity of Ile Bethel bearing 012°, Pointe St. Vincent de Paul bearing 217°, and Pointe Bossuet bearing 162°.

Mont Palliser rises near Cap Neumayer (48°57'S., 69°34'E.);

from some directions its summit appears table-shaped.

Port Sunday (Port Dimanche) is entered 2.5 miles S of Cap Neumayer. The best anchorage is about 0.5 mile from the head of the harbor, in 20m. The anchorage at Port Sunday is subject to heavy W squalls, and it has never been used much. Port Cook, on the N side of Port Sunday near the entrance, is reported to be easy to access, in spite of the rocks off its entrance. It affords much better anchorage than that in Port Sunday, in 9 to 13m.

13.15 Anse Pingouin (48°59'S., 69°38'E.) affords shelter from the prevailing W winds, in 14m, but the bank suitable for anchorage is rather steeply shelving. Should E winds set in, a vessel can easily run to Port Palliser, SW. The cove can be approached by way of the channel between Pointe de Langle (48°58'S., 69°39'E.) and Rochers Frossard, but the best approach is from the E, passing between Ilots Bobzien and Ile Francis.

Anchorage.—Anchorage can be obtained, in 25m, with the N extremity of Ilots Bobzien bearing 067°, and the S extremity of the islets bearing 117° and just obscuring the small Ile Francis. Port Palliser, the head of Anse Pingouin, affords excellent anchorage W of an islet off the S side of the harbor. The bottom is sand, except under the kelp.

Port du Milieu and Baie des Astronomes are entered within a distance of 2 miles S of Anse Pingouin. Both Port du Milieu and Baie des Astronomes afford good anchorage, but a reef of rocks extends completely across Port du Milieu 0.5 mile within its entrance, and there are numerous islets and some foul ground at the head of Baie des Astronomes. They should both be approached by way of the channel between Ilots Bobzien and Ile Francis.

13.16 Port Roland Bonaparte (49°02'S., 69°39'E.) consists of the narrow channel lying between Ile Maroon and the mainland S. The fairway N of the foul ground, extending from the S side of the E entrance, has depths of 15m. A shoal, with a least depth of 1.8m, lies 0.2 mile off the S side of the harbor 0.9 mile within its E entrance.

Anchorage.—Anchorage can be obtained by small vessels, in 8 to 10m, near the middle of the harbor, 0.5 mile within the E entrance.

Baie du Hopeful (49°05'S., 69°34'E.) is entered about 3 miles SSW of Port Roland Bonaparte; it is one of the best shelters in Iles Kerguelen.

Anchorage.—Anchorage can be taken, in 18m, in Mouillage Bon Abri, at the head of Baie du Hopeful. Anchorage can also be taken, in 20m, close off Cascade de la Lozere, by laying out hawsers to iron moorings secured in the rock. This position is well-sheltered from the N and W winds, but is exposed S.

13.17 Baie le Verrier (49°07'S., 69°34'E.), entered between Pointe Araud and Ile Violette, 0.5 mile S, is similar to Baie du Hopeful in shape and direction, but anchorage can only be obtained near its head, where there is a narrow steep-to bank, with a depth of 8.8m, the remainder being too deep. Both Baie du Hopeful and Baie le Verrier are fronted by banks of kelp, through which a vessel should pick the way where it is thinnest.

Golfe des Baleiniers is the extensive area between Presqu'île

Joffre and Presqu'île Courbet.

It is advisable when proceeding into the inner part of Golfe des Baleiniers, either to keep close to Presqu'île Joffre or else to pass S of Roche du Chenal (49°08'S., 69°45'E.). A mid-channel course can then be followed through Chenal Clery in deep water to avoid the foul ground off some of the projections on the S shore of Presqu'île Joffre.

13.18 Ile Henry (49°06'S., 69°42'E.), flat-topped and precipitous on all sides, is easily identified and a useful mark for the inner part of Baie des Baleiniers.

Baie du Yacht Club is a narrow inlet leading off the S part of Baie de la Baleine. The entrance to the bay is very constricted by the rocks projecting from the SE point of the entrance. In the approach channel, which is about 200m wide, depths vary from 13 to 31m.

Anchorage.—Anchorage can be taken in a bight W of foul ground extending about 0.2 mile SW from Ile aux Prions, the largest islet, in the outer part of the inlet. The depths are 18m and the bottom is mud.

Port Fleuriais is a cove entered on the NW side of Baie de la Baleine and on the SE side of the isthmus, which connects Presqu'île Joffre with the mainland. Foul ground extends a short distance from Pointe Marcq, the E entrance point.

The cove provides the best anchorage in Baie de la Baleine, in 12 to 15m, being protected by high hills from the prevailing winds.

Baie de la Marne, the SW head of Baie de la Baleine, affords good anchorage, in 11 to 22m, in its NW part; elsewhere the depths are too great.

Port Rosa (49°08'S., 69°23'E.), entered on the NW side of Presqu'île Hoche, is a small cove affording anchorage, in 6 to 12m, with perfect shelter from all winds. The cove is open N, but is sheltered from that direction by the heights of Presqu'île Joffre.

Port Louison lies on the E side of Presqu'île Hoche. It provides good, safe anchorage, but is open to any swell that may fetch into Baie du Sondeur during E winds, and during W or SW winds the squalls are sometimes extremely violent.

Anchorage.—Anchorage can be obtained, in 25m, very sticky mud and good holding ground, 0.2 mile SSE of the E of three islets off the N side of Port Louison.

13.19 Baie Keller (49°11'S., 69°23'E.), which is deep, lies 1.3 miles SW of the SE extremity of Presqu'île Hoche. Anse Suffren and Baie Chanzy lie on the N and S sides of the inlet, respectively.

Good and well-protected anchorage can be obtained close E of the islet lying in mid-channel off the entrance of Anse Suffren and Baie Chanzy; a large vessel should moor, as this anchorage is restricted. A vessel proceeding to Baie Chanzy can pass on either side of this islet.

Anse Suffren provides excellent, but restricted anchorage, in 9 to 13m, good holding ground.

Baie Chanzy is deep, except on its W side, where good anchorage can be obtained. To reach the Anse Suffren anchorage and that of Baie Chanzy coming from Baie du Sondeur, a vessel may either pass between Presqu'île Hoche and Iles du Passage, or pass between Ile du Port and Iles du Passage, then into Baie Keller, which is deep. In the second case, hug the W point of Ile du Port to avoid the dangers projecting SE from the E ex-

tremity of the easternmost of Iles du Passage.

Ile du Port, located at the WSW extremity of Golfe des Baleniers, is marked by two summits, the highest of which is 293m in the W part of the island.

13.20 Baie Cachee (49°13'S., 69°26'E.) lies 1.8 miles S of Baie Keller and W of Iles Borda, which lie S of Iles du Passage; it affords good anchorage, in 10m, in its middle.

Bassin de Boulogne lies on the N side of the narrow isthmus, Halage du Doris, which connects Presqu'ile Fanny with the mainland. The entrance of the basin is only 90m wide and encumbered with kelp, but has a least depth of 5m. Within the basin there are depths of 8 to 20m, but a rock, awash, lies close off its S side.

Port d'Hiver lies between Presqu'ile Carnot and Presqu'ile Fanny. Pointe Laure lies on the N side of the harbor, 0.5 mile within the entrance. Ilot Py lies close off the N side of the harbor, 1.5 miles W of Pointe Laure. Ilot Guibon lies close off the S side of the harbor near its head.

Anchorage.—Good anchorage can be obtained, in 14.6m, mud, 0.7 mile WSW of the W extremity of Ilot Py, and E of the narrow entrance of a lagoon; this anchorage is known as Port de l'Eure.

There is another anchorage, in 18m, 0.4 mile S of the three islets off Pointe Laure.

Anchorage can also be obtained in the bight on the S side of the harbor, S of Ilot Py and E of Ilot Guibon.

Directions.—The best approach to Port d'Hiver is by way of Baie du Hillsborough and Chenal du Chasseur. Petit Mont Ballon (49°14'S., 69°23'E.), bearing about 265°, leads up Chenal du Chasseur. If proceeding to the E anchorage, pass S of the three islets off Pointe Laure, but if proceeding to the inner anchorage, pass N of them. A vessel can proceed from Port d'Hiver to Baie Irlandaise by way of Passe Husker, but care is necessary to avoid the sunken rocks off its S entrance.

13.21 Baie Doumergue is the area between the E side of Ile du Port and Iles Challenger to the E. There are four anchorages in Baie Doumergue, but they are all more or less exposed to E winds. These anchorages each lie off a long stretch of sandy beach. One of them, Anse Risler, is entered 1.5 miles S of Cap Chabrilat, between Pointe Raoux and Pointe Bats. The S of these anchorages lies close SW of Pointe Marmite, the SE extremity of Ile du Port, and is protected on its S side by Ile Bellouard and Ile Colomban. This harbor was formerly used by seal hunters, and is the only one of the four anchorages which can be recommended.

Foul ground extends a short distance from the N and NW sides of Ile Bellouard, restricting the NE entrance to the anchorage to a width of 0.2 mile.

Baie du Hillsborough lies on the S side of Golfe des Baleniers and is entered between Iles Challenger and Pointe du Chien (49°15'S., 69°51'E.), 7 miles E. There is no difficulty in approaching Baie du Hillsborough. Mont Campbell (49°04'S., 70°19'E.) and Sommet Cheminee (49°12'S., 70°00'E.) are good landmarks. Iles Challenger, Roche du Chenal, Ile Henry, and the entrance to Chanal Clery are also easily distinguished.

Baie Irlandaise is entered between Cap Kersaint (49°15'S., 69°44'E.) and the E extremity of Ile du Canard, 3.5 miles WNW. It extends 12 miles W, separating Presqu'ile Carnot

from Presqu'ile Bouquet de la Grye. Two groups of reefs are found in the middle of the E entrance to the bay. Passage can be effected either N or S of these dangers. Ile du Corbeau lies between Ile du Canard and the E extremity of Presqu'ile Carnot.

During N winds, anchorage can be obtained, in 18m, off the SE side of Ile du Corbeau. Anchorage can also be obtained at the extreme head of the bay, but here the depths shoal very abruptly to the loose rocks brought down by the glacier W.

These anchorages, although they afford some protection, are not good, because of the violent squalls experienced and the bad holding ground.

Bras de la Fonderie is entered between Cap Allaire (49°16'S., 69°48'E.) and Cap Kersaint (49°15'S., 69°44'E.), about 1.5 miles W. On the NW side of the outer part are Port Pigeon and Port Couvreur, both of which afford protection from all winds.

Port Couvreur is entered between Pointe Poste, 0.3 miles S of Cap Kersaint, and Pointe des Trois Bergers, 0.5 mile farther S.

Anchorage.—Anchorage can be obtained, in 22m, 0.2 mile E of Ile aux Canards, which lies close off the extremity of a small projection extending E from the head of the harbor.

A vessel anchored, in 31m, 0.4 mile ESE of Pointe des Trois Bergers. It reported that this is the most sheltered anchorage in Iles Kerguelen and is capable of accommodating several vessels.

Large vessels may anchor, in about 30m, ESE of Pointe des Trois Bergers, with Ile des Trois Bergers bearing 305° and the E side of Ilot Mierry (49°17'S., 69°43'E.) bearing 205°.

13.22 Bassin de la Gazelle (49°18'S., 69°41'E.), probably the best harbor in Iles Kerguelen, is entered by a narrow channel S of Pointe Alnet. The entrance, which is scarcely visible until close to it, has depths of from 16.5 to 25.6m. A cairn on the N side, 3.4m high and painted black, is visible against a background of gray rocks from Bassin de la Gazelle.

Anchorage in Bassin de la Gazelle is presently prohibited (1974) because of the presence of mines.

Directions.—When entering Bras de la Fonderie, steer for Mont de la Valdivia, bearing 215°, which lies 1.3 miles S of Bassin de la Gazelle.

In clear weather, Pyramide Noire, 820m high, 12.5 miles SW of Mont de la Valdivia, will be seen just W of that mountain, when passing E of Roche du Chenal and Recif Bas. When 1 mile E of Recif Bas alter course so as to pass in mid-channel up Bras de la Fonderie. If proceeding to Bassin de la Gazelle, continue in mid-channel until abreast an islet lying N of the entrance, then steer gradually W and pass in mid-channel through the narrow entrance.

Baie du Beau Temps leads off generally W from the W part of Bassin de la Gazelle. Islets lie in about the middle of the connecting channels; depths of 12.8 to 16.4m can be followed through the channel, S of the islets. There is anchorage for two small vessels in Baie du Beau Temps, but N and NW winds raise sufficient sea to be dangerous for boats. Rocks, awash, exist in several places.

Port Kirk and Anse de Vulcan are entered on the SE side of Baie du Hillsborough, between Cap Allaire and Pointe du Chien, 4.5 miles NE; both of these inlets are open to N winds.

Port Kirk is full of kelp, but contains no known dangers.

There are depths of 18.3m, 1.5 miles within the entrance, and of 5.5m near its head.

In the middle of the entrance of Anse de Vulcan, there is a reef covered with kelp; the position of the reef is approximate. There are depths of 13m on each side of the reef. There is good anchorage, in 9 to 15m, within the reef, but it would be very unsafe when a N swell is running.

13.23 Port Elisabeth is entered on the E side of the entrance of Baie du Hillsborough, between Pointe du Chien and a point 0.7 mile ENE; it provides moderately safe anchorage. The harbor is narrow and accessible only to small vessels. The harbor is full of kelp, but anchorage can be obtained, in 5.8m, in the inner part of the harbor, 0.1 mile offshore, S of Mont Bayley.

Baie Bayley is entered on the NW side of Peninsule Courbet between Pointe de la Breche (49°10'S., 69°56'E.) and Pointe Mowbray, 1 mile farther NE. Pointe de la Breche has a conspicuous fissure visible from the W. This bay has not been thoroughly examined, but anchorage can be obtained, in 15m, with the W entrance point bearing 300°, and the E entrance point bearing 015°.

Baie Charrier is entered between a point 1.5 miles ENE of Cap Daniel (49°08'S., 69°58'E.) and Cap Listenois, 1.3 miles farther NE.

A small vessel might anchor, with favorable winds, in Baie Charrier. Baie Charrier may be approached from the NE, either by proceeding midway between Iles Kent and Roches du Desespoir, or by a route sufficiently S of the latter to avoid a rocky shelf extending from them. A course of 143°, passing SW of a conspicuous rock, leads into the bay.

Anchorage.—Anchorage can be taken, in 6m, with Ilot Cagne bearing 288°, the conspicuous rock bearing 338°, and Ilot Abbot bearing 000°.

Baie Accessible is entered between Pointe Scott (49°06'S., 70°06'E.) and Cap de Chartres, 6 miles farther ENE. This bay contains two moderately secure anchorages, one in Baie des Cascades, in its SW part, and the other in Anse Betsy, in its SE part.

Baie des Cascades affords anchorage, in 11 to 37m, but is open to NE winds, which send in a heavy swell. Anse Betsy lies on the W side of the SE part of Baie Accessible.

13.24 Between **Cap Digby** (49°05'S., 70°32'E.) and Cap Sandwich, 5.8 miles S, there is a bay on the E side of Peninsule Courbet. This bay is full of kelp, but during W winds, anchorage is available, in 25 to 30m, 2 miles S of Cap Digby and 4 miles ESE of Mont Bungay.

Baie Norvegienne is entered between Pointe Morne (49°22'S., 70°27'E.) and Pointe Suzanne, 3.5 miles S. This bay is full of kelp, however; the best anchorage is 0.3 mile SSW of Pointe Morne, but care should be taken to avoid a sunken reef lying close inshore, 0.8 mile W of the point.

During W winds, a vessel may anchor on the alignments of the summits of Mont Peeper and Mont Bungay, good holding ground, about 1.4 miles from Pointe Morne.

Baie du Morbihan lies mainly between Peninsule Courbet and Presqu'île Ronarch to the S. The SW part of this area is taken up by an archipelago of flat-topped islands of various sizes. Passages between the islands are usually deep.

Baie de l'Aurore-Australe is entered on the N side of Golfe du Morbihan, between Pointe Guite (49°25'S., 70°17'E.), 6.5

miles W of Pointe Suzanne, and Pointe Molloy, 8 miles farther WNW.

Range lights are exhibited from a pair of white beacons 1 mile N of Pointe Molloy. These lights, in line bearing 314.5°, lead to an anchorage, in 18m, located 0.6 mile SE of the front range light.

13.25 Port-aux-Francais (49°21'S., 70°13'E.) is a small inlet in the middle of the coast between Pointe Guite and Pointe Malloy. A conspicuous church stands 0.6 mile W of the head of the inlet.

Directions.—The E side of Baie de l'Aurore-Australe is encumbered by kelp which extends 1.5 miles SW from Ilot Chaner, but the anchorages can be approached, in depths of 27 to 37m and clear of all known dangers, by steering for Pointe de l'Epave, 2.3 miles ENE of Pointe Molloy, bearing 000° until the range beacons come into sight, having regard to a rock, awash, which lies 0.7 mile S of that point.

Two lighted beacons are located on the SE shore near the head of the inlet. The lighted beacons, in line bearing 058°, mark the approach to the anchorage. The lighted beacons on the NW shore, in line bearing 329°, indicate the most favorable position for anchoring.

Anchorage.—Anchorage may be obtained, in 27m, black basaltic sand bottom, good holding ground, on the alignment of two pairs of lighted range beacons, bearing 058° and 329°. Two radio masts, each 72m high, conspicuous and marked by a quick flashing white light, stand 0.7 mile NE and 1 mile NNE of the front beacon of the E pair of the range beacons.

Ile Murray, marked by a light, is the largest of several islands lying off the NE shore of Presqu'île Ronarch. A large vessel can anchor with sufficient maneuvering room about 1 mile E or NE of the island. A vessel is sheltered here from the W swell.

13.26 Port Navalo (49°30'S., 70°13'E.) is located within a number of islands lying off the N side of Presqu'île Ronarch and is one of the best anchorages in Iles Kerguelen. It is convenient for a vessel arriving off the entrance of Passe Royale in the evening and not wishing to proceed farther in before daylight.

Anchorage.—A vessel anchored midway between two fields of kelp, in 22 to 26m, bottom of black mud good holding ground, with the lighthouse on Ile Murray bearing 085°, distant about 1 mile, and Pain de Sucre (49°33'S., 70°15'E.) bearing 174°. A strong W gale was experienced here without dragging. Anchorage, in a depth of about 26m, may be obtained on the W side of the harbor 0.3 mile E and 0.5 mile NE of Ilot Sharbau.

Directions.—The best approach to Port Navalo appears to be from the N between Ile de l'Antares and Ilot Boyle, about 1 mile W. Approaching the harbor from Passe Royale, a vessel passed, in a least depth of 20m, 0.2 mile W of Ile de l'Antares. The vessel then steered for Pain de Sucre until clear of the kelp extending from Ile de l'Antares, when it altered course towards Ile Murray, passing between the fields of kelp extending from Ile de l'Antares and from Presqu'île Ronarch. These two fields of kelp are separated by a clear space more than 0.5 mile wide from N to S.

Caution.—A depth of 8m lies about 5 miles E of Cap de la Geologie, the NE extremity of Presqu'île Ronarch.

13.27 Port des Iles (49°28'S., 70°04'E.) lies in the central part of Baie du Morbihan, 11 miles within the entrance. It is a well-protected anchorage formed between a group of four islands. Except for the channel from the SW, between Ile du Cochon and Ile du Cimetiere, which is shallow and blocked with kelp, the channels leading into the harbor are safe and deep, the dangers being marked by kelp.

Baie de l'Observatoire (49°25'S., 69°54'E.) lies 7 miles WNW of Port des Iles. It is a narrow inlet 1 mile long, with depths from 7 to 16m, black sticky mud and excellent holding ground. Two vessels rode out numerous gales in this anchorage, and also in Baie Supply, similar to Baie de l'Observatoire, and lying WSW of the W end of Ile Longue.

Port Jeanne d'Arc (49°32'S., 69°49'E.) lies on the S side of Chenal de Port Jeanne d'Arc, 7.5 miles WNW of the SE extremity of Ile Longue. On a plateau 2.3 miles W of the port is Le Dome Rouge, a conspicuous reddish-colored mountain, 350m high.

Anchorage.—Anchorage can be obtained in any part of the harbor, but the holding ground is not good, and a vessel should keep main engines ready in bad weather. The holding ground appears to be better near the S side than near Ile Longue. Squalls, with wind speeds reaching as much as 78 knots, have been reported at Port Jeanne d'Arc.

Directions.—The safest route into Golfe du Morbihan from seaward, for vessels with a draft of less than 20m, passes about 1 mile S of Roche Harston. From a position between that rock and Roche Balfour, make good a course of 270° for the N end of Ile Suhm. When the entrance range bears 314.5°, change course to that bearing.

If proceeding to Port des Iles, pass N of Ile Haynes, which lies about 1 mile NW of the N extremity of Ile Suhm. From the entrance of Golfe du Morbihan to Port des Iles, the depths vary from 28 to 56m; within Port des Iles, the depths are irregular.

If proceeding to Baie de l'Observatoire or Port Jeanne d'Arc, pass midway between Ile Haynes and Ile Suhm. If proceeding to Baie de l'Observatoire, pass S of Ile du Cimetiere, then N of Ile Greak, Ile Penn, and Ile Mayes. If proceeding to Port Jeanne d'Arc, steer through Passe de l'Hydrographie, then round the E end of Ile Longue, taking care to avoid Roches du Dr-Green, as well as the shoals lying off the E end of Ile Longue.

13.28 Port du Ketch (49°29'S., 69°54'E.) lies between the SE extremity of Ile Australia and Ile du Chateau; it affords anchorage, in 16.4m. Bras Bolinder is the W bay formed between Presquile Ronarch'h and Presqu'ile Jeanne d'Arc.

Baie Greenland is entered between **Mac Lear** (Cap Maclear) (49°38'S., 70°17'E.) and the NE side of Presqu'ile Jeanne d'Arc, 2.5 miles SW. Cap Mac Lear is a useful mark when approaching Iles Kerguelen from the S.

Anchorage.—Anchorage can be obtained in the middle of the bay, but kelp should be avoided. The bay is subject to sudden violent squalls. The S side of Iles Kerguelen is as well-sheltered as the E side from the prevailing W winds, at least during the S hemisphere summer.

13.29 Cap du Challenger (49°44'S., 70°05'E.) is a ragged point, with two pinnacle rocks of considerable height close to its extremity.

Baie des Swains is entered between Cap Alphonse Rio (49°39'S., 69°38'E.) and the SW extremity of Presquile Jeanne d'Arc, 6.8 miles E.

Anse du Volage, the E arm at the head of Baie des Swains, affords good and secure anchorage, in 18m or less, soft mud.

Baie d'Audierne is entered between Pointe de Penmarch (49°37'S., 69°25'E.) and Cap Dauphin, 15 miles WSW. Because of Roche Andre (49°40'S., 69°14'E.) and the other dangers in the bay, it should be approached with great caution. The dangers are in such an exposed position that the existence of kelp over them cannot be relied upon.

Fjord Larose is the E recess at the head of Baie d'Audierne.

Anchorage.—Anchorage can be obtained, in 9m, near the head of Fjord Larose, 3 miles NW of Doigt de Ste. Anne (49°34'S., 69°23'E.), but it is restricted and difficult to access.

Directions.—If proceeding to Anse du Volage, pass between the SW entrance point of Anse aux Ecueils and Ile Leon Lefevre, which lies close SE of it, and then between the NE entrance point of the same bay and the islands lying NE of Ile Leon Lefevre. The least depth found was in the narrows between Ile Leon Lefevre and the peninsula, 75m high, NW, was a depth of 22m in mid-channel and 16.5m close to the kelp.

13.30 Baie de la Table is entered between Pointe de l'Océanographie (49°36'S., 69°14'E.) and the S of Ilots Joubin, 2.5 miles E. There are several good anchorages in Baie de la Table, but great caution is necessary because of the islets and sunken rocks on both sides of the entrance and the fairway between, which is about 1.3 miles wide.

A vessel may anchor, in 35m, at the head of Baie de la Table off the entrance of a fjord named Portes Noires.

Baie de la Mouche is entered 3.8 miles N of Cap Dauphin. Anchorage can be obtained, in 9 to 25m, at the entrance or farther in at Port du Sprightly, a cove on the E side of Baie de la Mouche, 1.8 miles within the entrance, but it is not recommended. Fierce N squalls are experienced here at times.

Cap Dauphin (49°41'S., 69°03'E.) rises steeply to Mont de Volz. Anse du Gros Ventre lies about 5.5 miles WSW of Cap Dauphin. A vessel has anchored in this cove.

Cap Bourbon (49°43'S., 68°47'E.), the SW extremity of Iles Kerguelen, is low but rises to Pic St. Allouarn.

13.31 Port de l'Enfer (49°31'S., 68°51'E.) consists of a cave in the face of a cliff, the entrance of which is 30m high and shows up like a gateway. To the S of Port de l'Enfer, at elevations varying from sea level to over 213m, many jets of steam, issuing from hot springs, have been observed. The shore should not be approached closer than 5 miles between Cap Bourbon and Port de l'Enfer.

Baie Bretonne is entered between Port de l'Enfer and Cap Louis (49°21'S., 68°39'E.), 10.8 miles NW. Baie du Loon, 3.5 miles E of Cap Louis, affords excellent anchorage, free from kelp, in 18m, in its NE corner. There is a sunken rock 0.3 mile W of the W entrance, which is the only navigable entrance.

Anse Mallet is entered midway along the W side of Ile de l'Ouest. There are depths of 37m in the entrance and 7.3m near its head. Good anchorage can be obtained, in 22m, halfway up the inlet.

Anse du Monument lies on the N side of Ile de l'Ouest, 2.8 miles E of Cap Rosnevet and is very small, but has a depth of

14.6m. Foul ground extends a short distance from the W entrance point. The monolith formation, from which the cove derives its name, is very impressive.

13.32 Anse du Duncan is entered 0.8 mile SE of Cap de l'Abri (49°20'S., 68°47'E.), the NE extremity of Ile de l'Ouest and on the W side of the N approach to Detroit de la Marianne. Good anchorage can be obtained, in 12 to 13m, sand, good holding ground, 0.4 mile from the head of Anse du Duncan. Attention should be paid to the rocks in the entrance approaches.

Detroit de la Marianne, the central part of which is known as Port Curieuse (49°22'S., 68°49'E.), lies between Ile de l'Ouest and the mainland E.

Detroit de la Marianne is sheltered from all winds and is the warmest place on the W side of Iles Kerguelen. Outside the strait the cold is usually intense, especially when the wind blows off Glacier Cook.

Small vessels can obtain anchorage in Port Curieuse, but the channel is often encumbered with ice which has calved from the numerous glaciers which descend to the coast in this vicinity.

The tidal currents in the N entrance are very strong, setting S during the rising tide and N during the falling tide.

About 0.5 mile S of the N entrance, the strait contracts to a width of only 15m. Within a depth of 22m and when approaching the entrance from the N, it is difficult to make out. The broken water over Roche Loranchet can be seen as the strait is approached.

The fairway through the S entrance is 0.2 mile wide and safe, with depths of 26 to 35m. The sea breaks heavily over the dangers on both sides.

Secure anchorage, with good holding ground, can be obtained, in 31m, sand, in the middle of the strait, 0.4 mile S of the narrows. The anchorage is well-sheltered from all winds.

Baie Francaise is the extensive bight between Cap Rosnevet (49°20'S., 68°43'E.) and Cap Bon Espoir, 6.5 miles NE. At its head are Baie du Tonnerre and Anse de Quiberon.

Baie du Tonnerre (49°20'S., 68°53'E.) is entered between Pointe Richard, 2.3 miles E of Cap l'Abri, and Pointe Berger, 0.8 mile N of Pointe Richard. A reef, the outer part of which is sunken, extends 0.5 mile N from Pointe Richard, leaving a narrow passage, with a least depth of 8m, leading into the harbor.

Anchorage.—Anchorage can be obtained, in 18 to 42m, 0.5 mile within the entrance and close off the N side of the harbor. This anchorage is partly protected by the reef extending N from Pointe Richard, but the prevailing W winds and ice calving from the glaciers render it insecure.

13.33 Anse de Quiberon (49°16'S., 68°54'E.) is entered between a point which rises to Les Deux Cones, 2 miles SE of Cap Bon Espoir, and a point 2 miles farther SSE. This bay is open to the prevailing W winds and can therefore hardly be considered a safe anchorage. Foul ground extends 0.5 mile off the N entrance point and an islet and a submerged rock lie close off its S entrance point. Submerged rocks lie close off the N side of the bay in places; an above-water rock lies close off its head.

Crique du Sac a Plomb (49°15'S., 68°54'E.), an almost circular basin, is entered on the N side of Anse de Quiberon by

way of a very narrow channel. In the middle of the entrance of this channel is a rock, on which the sea breaks, and which should be left on the starboard hand when entering. Anchorage can be obtained, in 18 to 27m, mud, off the head of Crique du Sac a Plomb.

Baie Invisible is entered 1 mile S of Pointe Pages (49°10'S., 68°48'E.). The entrance of this bay consists of a very narrow break in the cliffs, quite indistinguishable by a stranger, but within, the bay opens out into a considerable basin. Good anchorage can be obtained, in 47m, a short distance S of a stream. The swell in the entrance is frequently very heavy.

Baie de l'African, which has not been closely examined, is entered between Pointe Pages and Pointe de Tromelin, 1.2 miles NNE. Anse du Cirque, on the S side of the bay, affords excellent anchorage, in 20 to 26m. The SE arm of Baie de l'African is open W and, though the holding ground is good, it is not recommended as an anchorage. The Riviere Penfeld, the NE arm, though well-sheltered, affords only restricted anchorage, in 47 to 55m, mud, at its extreme head. Anse du Cirque is the best anchorage in Baie de l'African.

Baie de Benodet is entered 2.5 miles SE of Cap Marigny (49°06'S., 68°46'E.). This bay affords anchorage, with excellent shelter, in 30m. Vessels entering the bay should pass E of a chain of reefs lying about 1 mile SW of the entrance.

Caution.—A danger area, 1.7 miles wide and 2 miles long, is centered 2.5 miles SW of Cap Marigny.

13.34 Baie Inconnue is entered N of Pointe Farman (49°02'S., 68°48'E.). The entrance is about 0.2 mile wide, but is encumbered with rocks; within, the bay opens out and provides anchorage, in 20m, mud. The best anchorage, in 13m, mud, is in a cove on the E side. The coast between this bay and Pointe du Cuir Sale (48°58'S., 68°51'E.) should be given a berth of at least 2 miles.

Baie Rocheuse, entered E of Pointe Blieriot (48°58'S., 68°52'E.), trends S for 3 miles and terminates at a sandy beach. Anchorage off the beach is poor, but elsewhere in the bay it is good, if kelp be avoided. The best berth, in 20m, is halfway up the bay and nearer its W side; there is a rock, awash, a short distance E of this anchorage.

Ile Saint-Paul and Ile Amsterdam

13.35 Ile Saint-Paul (38°43'S., 77°33'E.) and **Ile Amsterdam** (37°50'S., 77°30'E.), two isolated islands of volcanic origin, are French possessions. From April to October, they should be approached with great caution as strong W winds are then prevalent. As the islands are steep-to, soundings give little warning when approaching in thick weather. Midway between the islands lies a seamount, with a least depth of 9m.

These islands have been declared sanctuaries for the preservation of all forms of wildlife.

Access to these islands is prohibited except in special case. The Chief Administrator may authorize access with a written request received at least 3 months in advance, except in special circumstances.

13.36 Ile Saint-Paul (38°43'S., 77°33'E.) attains an elevation of 271m and a considerable part of its area is occupied by a circular basin, formed by the crater of an extinct volcano. The

NE side of the crater has broken down. In clear weather, Ile Saint-Paul is visible from a distance of 60 miles.

There are no trees on the island, but it is covered with grass and bushes, the latter sometimes being 2.1m high. Rocher Quille (Ninepin Rock), a formation of lava in horizontal layers, lies on the NW side of the entrance of the basin. The island is visible in clear weather from 30 miles.

From April to October, the island should be approached with great caution as strong W winds are then prevalent. As the island is steep-to, soundings give little warning when approaching in thick weather. There are no known dangers more than 0.1 mile offshore.

Winds—Weather.—Winds from directions between the NE through N to NW raise a heavy sea in the vicinity of Ile Saint-Paul. Winds from directions between the NNW and NW blow parallel with the NE shore of the island, and vessels can lie in safety at the anchorage NNE of the entrance to the basin.

With SW winds, terrific squalls blowing down the sides of the crater appear to alternate with sudden calms, these often abrupt alternations are very dangerous.

Squalls from the SE are rare, but if one comes a vessel should put to sea immediately. Ile Saint-Paul is too small to provide much shelter from W squalls to vessels moored off its NE shore.

Tides—Currents.—Nearly 1 mile off the NE side of Ile Saint-Paul, the flood current sets NW from LW to 2 hours after HW, or for 8 hours, and the ebb current sets SE from 2 hours after HW to LW.

About 0.4 mile off the NE side of the island, the flood current sets SSE from LW to HW and the ebb current sets NNW from HW to LW; the currents attain a velocity of 1 knot at springs.

Anchorage.—There is anchorage off the basin entrance with Rocher Quille bearing 282°, distant almost 0.3 mile, in depths of 23 to 32m. Anchorage is also available with Rocher Quille bearing 322°, distant 0.4 mile, in depths of 12 to 17m. A better berth, most frequently used except during E winds, is 0.3 to 0.4 mile E of Rocher Quille, in depths of 23 to 30m, black sand, good holding ground. A vessel anchored, without dragging, during 45 knot winds from the SSE, with Pointe Smith (Schmith Point), the NW extremity, bearing 065°, distant 0.4 mile. Anchorage should not be taken in any position in which Rocher du Milieu or Ilot Nord is shut in or open W of Rocher Quille.

13.37 Ile Amsterdam (37°50'S., 77°33'E) has a verdant aspect. It is said to be visible up to 60 miles.

From April to October, the island should be approached with great caution, as strong W winds are then prevalent. As the is-

land is steep-to, soundings give little warning when approaching in thick weather. There are no known dangers more than 0.1 mile offshore.

Pointe d' Entrecasteaux, on the W side, 2.5 miles NW of Pointe Vlaming, the S extremity, is conspicuous because of its pointed summit and jagged edges. Pointe Vlaming, when bearing 112°, appears as a precipitous bluff. The coasts of the island are generally free of dangers, except near the points, which are bordered by breakers; a rock lies about 0.2 mile offshore about 1 mile S of the NW extremity of the island. Above-water rocks lie 1.7 miles SSE of the NE extremity of the island; the existence of these rocks is doubtful.

A meteorological station, with a flagstaff, is permanently established close SW of Pointe Hosken (37°49'S., 77°35'E.), the NE extremity of the island. Between the station and Pointe Goodenough to the W, is Chaussee des Otaries, the only beach on the island.

Winds—Weather.—The prevailing wind is from the W.

Tides—Currents.—The tidal currents are strong off the coast; vessels seldom lie head to the wind.

Anchorage.—The anchorages off Ile Amsterdam are temporary only.

The safest anchorage, known as Mouillage du Ribault (Mouillage du Pingouin), is 0.7 mile SE of Pointe Hosken, in depths of 25 to 40m, good holding ground of black sand.

A vessel should anchor 0.3 mile offshore on the alignment of two beacons with white daymarks, from which lights are occasionally exhibited, bearing 244°, and with a pointed above-water rock in line with the extremity of a conspicuous landslide, bearing 171°.

North of the meteorological station, Mouillage du Gonio has depths of 35m, fair holding ground. A vessel anchors on the alignment of two beacons with white daymarks, from which lights are occasionally exhibited, bearing 224.5° and with the flagstaff bearing 165°.

There is good temporary anchorage, sheltered from N winds, 0.3 mile off the SE coast of the island, in 25 to 31m, good holding ground, with Pointe Vlaming bearing 255°, distant 1.2 miles.

Anchorage is available by day off Pointe Eboulement (37°50'S., 77°36'E.), about 1.3 miles SSE of Pointe Hosken, with Pointe Eboulement Cliff and a pointed black rock, in line bearing 170°. This anchorage is available to vessels with a maximum length of 130m. The current sets generally parallel with the coast, either NNW or SSE.

During N swells, a vessel may anchor in calm water, in 25 to 30m, good holding ground, about 1 mile S of the crater Le Fourneau, which rises nearly 0.8 mile WSW of Cap Novara (37°52'S., 77°36'E.).

AFRIKAANS

AFRIKAANS	English	AFRIKAANS	English
A			
agter, op die agterskip	astern	koppe	mountain
ankerplek, ankergeld	anchorage	koppie	hill, mountain
B		krans	hill, mountain
baai	bay, inlet	krantz	mountain
baken	beacon	kus	coast
berg	hill, mountain	L	
blou	blue	laagwater	low water, ebb current
boot	boat	lig	light
bult	hill, mountain	loods vir mariniers	pilot
D		loop	stream
donker	black	M	
drift	hill, mountain	meer	lake
dryftou	buoy	mis	fog
duin	mountain	mont	mountain
dyk	mole	N	
E		nek	isthmus
ebgety	ebb current	newel	fog
eiland	island	noorde	north
eilandjie	islet	O	
end	mountain	oewer	bank
G		onraad	danger
gebergte	mountain	ooste	east
geel	yellow	opening	entrance, inlet
gety, eb en vloed	tide	opsy, in die dwarste	abeam
gevaar	danger	oseaan	sea
glans	light	P	
H		pas	pass
hawe	port, harbor	piek	hill, mountain
hawehoof	pier, quay, mole	pier	pier
heuwel	hill, mountain	plato	plateau
hinderpaal	bar	poort	port (harbor), pass
hoek	point, hook, headland	poortjie	pass
hoogte	mountain	punt	point, hill, mountain
hoogwater	high water, flood current	R	
I		rand	hill, mountain, ridge
ingang	entrance, port (harbor)	randjies	hill
inham	inlet	rante	mountain
K		reeks	mountain
kaai	quay, wharf	rif	reef
kaap	cape	rivier	stream
kanaal	canal, channel	riviermond	mouth of river
klip	hill, mountain	rooi	red
kloof	ravine	rots bank	reef
kolk	lake	rots	rock, mountain
kop	hill, mountain	rotse	hill
kopjes	mountain	rug	hill, mountain
		S	
		sandbank	bar
		see	sea

AFRIKAANS	English	AFRIKAANS	English
seeboei	buoy		
seehoof	pier		
seestraat	channel		
skarp	escarpment		
skip	boat		
skool	shoal		
skuit	boat		
somber	black		
spits	mountain		
spruit	stream		
strand	coast, beach		
stroom	current, stream		
suide	south		
swart	black		
		T	
		tand	mountain
		tepel	mountain
		trop	shoal
		V	
		veld	plain
		vlakte	plain
		vloedgety	flood current
		vooruit	ahead
		W	
		wal	bank
		weste	west
		wit	white

ARABIC

ARABIC	English	ARABIC	English
A			
ab, abu	father, chief	asfel.....	low
abar, abyar, abiar	wells	ash.....	the
abiadh, abyadh, abiad.....	white	asharet-dabab	fog signal
abraaq.....	hill, rock	ashtum.....	channel
adel, aleb	sloping hill	asif	river
aeg	sand dune	asifa, asifah	gale, storm
aezraq, azraq	blue	asraq.....	blue
aghbar.....	gray	assaka.....	settlement
aghbas	dark (color)	aswad	black
ahal.....	black	atama.....	beacon
ahmar, ahmer.....	red	atha	ruins, monument
aich, aik.....	hard bank	atiq	old
ain, oyun	well, fountain	atlal	ruins
air	fortress	atta	bank
ajaj.....	sand storm	atta metawel.....	bar
ajfar	well	auwil	first, beginning
akaba, acol	wilderness	awama zat nur	light buoy
akbar.....	bigger, biggest, older (of two)	awama zat sofara.....	whistle buoy
akhal.....	black	awamet-garas	bell buoy
akhdhar, akhdar, akdar	green	awari	shoal
al.....	the	awawa	buoy
ala.....	height, higher	ayn	well
ala wara	astern	azraq, azreq.....	blue
alam.....	hill, cairn	B	
alama.....	beacon	bab	strait, entrance
alama bi shaki jaras.....	bell buoy	baboor, babur	steam vessel
alama noor.....	light buoy	badiyat	desert
alama sabaya	buoy	bahat	well
alawi.....	islands	bahr ali	high water
alou.....	height	bahr	channel, river, lake, sea, bay
amam.....	ahead	bahr shaban.....	deep water
amara.....	building	bahr wati	low water
ameeq, amik, amiq.....	deep	bahrat	wadi, watercourse
amin	village	bahraya	pool, lake, pond
amir	prince	bahri	south
amshi deladel	slow	bahri-bahri-gharbi.....	south-southwest
amwaj.....	breakers	bahri-gahri-sharqi	south-southeast
amwaj kubra.....	breakers	bahri-gharbi	southwest
anak	cliff	bahri-sharqi.....	southeast
aqabar.....	wilderness	baida	desert
aqabat.....	hill	baidha	white
ar	the	bakhira	steam vessel
ara al bahr.....	low water	balad	country, region, town
arab.....	arabs	balam	boat
araja.....	sand dune	band	dike
arbi	arab	bandar	bay, port, harbor, open roadstead, chief town
ard	land, earth, ground	bandera	flag
areg.....	sand dune	barq	hill
ari	shoal, shallow	barr.....	headland, earth, sandbar, bank, shore
arich	boundary	barr ramleh.....	sandbank
arq	sand dune hills	barusi, barrosi	anchor
asar	ruins, mountains	basta	tower
asfal.....	lower	batbit	whirlpool
asfar.....	yellow	bati	slow

ARABIC	English	ARABIC	English
baura.....	anchor	darba	squall
bawara.....	heavy anchor used in kuwait	dau	light
bayda.....	white	dawamir dakhil el behr	rock (sunken)
behr neksan	half tide	dawamir kharej el behr	rock (above water)
behr seneh	high water	dawhat.....	bay, cove, port
behr yari.....	ebb	debab.....	fog
beida.....	white	dekeh el amwal	quay
beit, bait	house	dekhil, dekhul, dekhla.....	entrance, passage
beiyat.....	shoal that dries	dekka hak el mal	wharf
bejir	desert	dekka hak en nazul	pier
beros.....	anchor	dekka saghir.....	jetty
berriyah	desert	derbeh ghefleh	squall
bheira	lake	deym	village
bid	well	dhabab.....	fog
bidat	canal	dhayyeg.....	narrow
bilad	town, country	dihr.....	coast
bir, biar.....	well	dira	compass
birba, baraby	ancient temple	disha.....	hill
birka, birkah	pool, pond, small lake	diyik	narrow
bofa abu nur	light buoy	djal	small hill
boghaz.....	strait, entrance channel	djebel	hill, mountain
boja abu jeras	bell buoy	djenub	south
boja.....	buoy	djezira	island
boja musaffira	whistle buoy	djouf.....	dry
borg, bordj, burj	fort, tower, castle	dohat, doha, duhat, dawhat	bay, cove, port
boya abu nakus.....	bell buoy	duar	encampment
boya.....	buoy	dulay	hill
boya en nur.....	light buoy	E	
boya es siti	whistle buoy	egeidet.....	sand hill
bu	chief	el nedd	tide
bughaz	gulf, strait	el	the
buhaira	lake	erg	sand dune
bukah et tin.....	mudbank	ezba.....	village
bum	large dhow	F	
bura, buroosi	anchor	faluka, feluka, filuka.....	boat
burayq	hills	fanar	lighthouse, beacon
burg, burj, burt	tower	fanus nur	light
busla, bussala	compass	faregh	broad, level, wide
but	boat	farsh	plain (noun)
butaira	small dhow	fasht	reef, shoal, islet
buy	fort, tower	fisa	fast
buz.....	cape	fosma	channel, passage, entrance
C		fulk.....	small boat
casbah.....	citadel, fortress	G	
chegag	ruin	gaan baded	arm of the sea
chemal	south	gala	castle, tower, fort
cherk.....	east	galawa	basin
D		gamb yamin	starboard side
dabab.....	fog	gamb yasar.....	port side
dahal raml	sandbank	gami	mosque
dahar.....	peak	ganub	south
dahl.....	bank	ganub-ganub-gharb.....	south-southwest
dahl tin	mud bank	ganub-ganub-sharq	south-southeast
dahra.....	north	ganub-gharb	southwest
daig, daiq, daiyaq	narrow	ganub-sharq	southeast
dakka.....	wharf, pier, quay, jetty	gar	small flat hill
dala-dala.....	slow	gara, garrat.....	lake
dar	house, settlement	garar al bahr.....	bottom

ARABIC	English	ARABIC	English
garf	cliff	hawa	wind
garib	boat	heb	coast
gazr	ebb	helkat	circular
gedid	new	hesah hesah	gravel
gezfret	island	hilla	village
ghalah	deep	hiqab	cliff
ghamiq	deep	hirab	abeam
gharb el jinub el gharbi	west-southwest	hisar	fort, castle
gharb, gharba, gharbi	west	hisn	fort
gharb-ganub-gharb	west-southwest	hiza	abeam
gharb-shamal-gharb	west-northwest	hod	basin, pool, small lake
gharbi-bahri-gharbi	west-southwest	hor	creek, shallow marsh
gharbi-janoob-gharbi	west-southwest	houd	basin
gharbi-qibli-gharbi	west-northwest	hubub	sand storm
gharig	deep	humra	red
ghaubu	sandstorm	husen, husun	tower, castle
ghazir	deep		
ghobar	fog	I	
ghubbat	gulf, bay	ibn	son, descendent
ghubra	sandstorm	ilwat, ilwet	region
ghurmac	peak	imarah	seat of governor
gidan	bank, sandbank	imi	hill
giddam	ahead	irq	dune
gisr, gusur	bank	iswid	black
gizan	dune	izbit, izbet	village
gour	small flat hill	J	
goz, gowaz	high sand hill	jabal, jebel, jibal, gebel	mountain, hill
gubba	dome	jadwal	canal, stream
guddam	ahead	jam, jamia	mosque
guebli	south	janoob, janub	south
guennar	peak	janoob-janoob-gharbi	south-southwest
gumruk	customhouse	janoob-janoob-sharqi	south-southeast
gunn	bay	janoob-sharqi	southeast
H		jazair	islands
habba	squall	jazirat	island, islet
habia	peak	jazr	ebb
habub	sand storm	jebel el hejer	cliff
hadd	boundary, limit, sandspit, reef	jebel kayem	peak
hadjara, hagar, hajar	stone, rubble	jejirah saghir	islet
haggag	long projecting ridge	jenub-gharbi	southwest
hagiz	bar, mole	jenub-sherqi	southeast
hair	pearl bank	jezr	ebb
hait	wall	jilf	cliff
hajar balyin	rock (above water)	jinub el gharbi	southwest
hajar mugatta	rock (sunken)	jinub el jinub el gharbi	south-southwest
hajari	stony	jinub el jinub esh shargi	south-southeast
hajirah	town	jinub esh shargi	southeast
hajiz	mole	jinub	south
hajr	rock (above water or sunken)	jisr, jusur	bridge
halat, hala	sandbank, islet	jorf	cliff
hamra	red	jubayl	mountain
hanouck	low	junub	south
haram, ahram	pyramid	jurf	cliff
hasa, hasba	gravel		
hassar, hissar	rock	K	
haswa	gravel	kabat	rocky shoal, group of rocks
haudh	basin	kabir	large

ARABIC	English	ARABIC	English
kad.....	shoal, spit	kom	mound
kafab.....	cliff	kothon	port, anchorage
kafr, kufur, kefr	village	kubbah	dome
kalah.....	fort	kubbat	deep bay, inlet
kalat.....	castle	kubbeh	beacon
kalig	canals	kubry, kabary	bridge
kanisa, kenisa, keniseh, kineesa.....	church	kuddam	ahead
karm	artificial mound	kudiat	small hill
karn	summit, peaked hill, point	kuh	hill, mountain
kasar	shoal	kusbat, kut.....	citadel, fortified town
kasba	citadel, fortified town		
kasim.....	territory, political division	L	
kasr bahr.....	breakers	liman	port, anchorage
kassar	rock (above or below water), rocky islet	lisan.....	head, headland
kassara.....	breakers		
katah, katat.....	rocky shoal, group of rocks, sunken rock	M	
kateh el behr.....	bottom	ma hali	fresh water
kathib	dune	ma mutawasid	half tide
katib	paint	madd	current, flood
kaud.....	dune	madd galeel.....	half tide
kebar, kebir.....	large	madd kabir.....	spring tide
kef, kaf	mountain, rocky point, coast	madd kamel	high water
keruky	sketch, plan	madd qawi.....	spring tide
keryah.....	village	madina	town
keshem	watercourse	madiq	strait
khadra.....	green	madkhal	inlet, entrance
khala.....	country	mael behr	salt water
khaleej.....	gulf	maftul	tower
khalfa	sandstorm	maghreb	west
khaliij	gulf, bay	mahal nuzul	landing place
khaltj	gulf, bay, estuary, canal	mahatta	station (railway)
khan.....	inn, hotel, bazaar	mahgar	stone quarry
kharium	sandspit	majaz.....	pass, marine channel
khashm	mouth of river	majra	canal, channel
khatar	danger	makalla	channel
khawr	inlet, channel	makan ara.....	shoal
khelij	gulf	makan en naze	landing place
kheter	danger	makhila	fog signal, storm
khijem	encampment (tents)	makhraj	canal
khirs	barren land	mal, malih	salt, brackish
khod	shallow, ford	malka	stream confluence
khor.....	river channel, cove, bay, estuary, inlet, ravine	mamarr.....	passage
khuba.....	mudbank	manara	lighthouse
khudra	green	manfad, manafid	pass (defile)
khul kebir	flood tide	mantakat	zone
khul	spring tide, flood	manzal.....	settlement, landing place
kibli	south	maqam	tomb
kidan.....	bank, sandbank	marabut	monument or tomb
kidif nes.....	dune	marakat	soft bottom shoal
kidwa.....	small mound	marfaa	harbor
kimmat	peak	marjan	coral
kinar	boundary, border, limit	markab shera.....	sailing vessel, ship
kinisa, kinis	church	markeb, markib shiraa	sailing vessel, ship
kinisat, kinizat.....	sandbank	marsa, marza.....	anchorage, roadstead
kita	rocky shoal, group of rocks	marso	harbor
kitif en nes.....	sandbank	marso keshef	roadstead
kola.....	hill	marso saghir.....	basin
kom en nes	dune	masab	mouth of river

ARABIC	English	ARABIC	English
masafa, masafah.....	range	naliya	compass
mashriq.....	east	natur	tower
masjid, maskid, masgid.....	mosque	nebi	tomb
maskan	house	neis.....	sand
masura	pipe	nes hesah.....	gravel
maten.....	plateau	niwat	steep-to shoal, coral reef
matla.....	east	noor	light
matmor	silo	noww	squall
mauj, mauja.....	wave	nuksan el behr.....	low water
maya hilwa.....	fresh water	nuqta	point
mayeh.....	current	nur.....	light
medauwar.....	circular	nusf madd	half tide
medina.....	city, town		
medkhal, medkhel.....	passage, entrance	O	
meena	port (harbor)	ouarour.....	steep mountain
megjrib	west	oued	river
menarah.....	lighthouse		
mengar	nose, head, point	Q	
mensla	channel	qa al bahar.....	bottom
mersa.....	roadstead, anchorage	qa	bottom
mesjid.....	mosque	qabr	tomb
mina kharga.....	roadstead	qad	reef
mina	port, harbor, mole	qadim, qadima	old
minar, manar	minaret, tower	qafa	astern
minara	lighthouse	qala, qalaa	fort, prominent peak, castle
minqar	nose, head, point, headland	qaleel al ghur	shallow
miqra	channel	qanaya.....	rivulet
mirjan	coral	qantara	bridge
mirsa.....	port	qara	small dark hill
miyah	water	qaranasla	peak
moga.....	wave	qarn	point
moghreb	west	qarya	village
moiya aria	low water	qasar.....	above-water rock, rocky islet
moiya hilwa.....	fresh water	qasr, qusur	port, large house
moiya kebir	high water	qibli.....	north
moiya	shoal, shallow	qibli-gharbi	northwest
moj	wave	qibli-qibli-gharbi.....	north-northwest
morgan	coral	qibli-qibli-sharqi	north-northeast
mosque.....	mohammedan church	qibli-sharqi.....	northeast
mowyah hali.....	fresh water	qubba	dome
mowyahel behr.....	salt water	quddam	ahead
moya azb	fresh water	qur.....	hills
muaskar	military camp	quwayrat	hill, mountain
mudawwar.....	circular		
muhassan.....	fortified	R	
mukhaijan.....	encampment	rabban	pilot
mukhtqa	anchor	rais el marsa.....	captain of the port
murjan, murgan	coral	rais, reis.....	captain of a vessel
murshid	pilot	rakat	shoal, hard bank
mustanqa	marsh	raml, ramla.....	sand
muzik	strait	ras	cape, point, head, hill, peak
		ras el jebel.....	peak
		ras fel	mole
		raseef al mina.....	pier
		raseef.....	jetty, wharf, quay
		rasif, rasyf	pier, quay, wharf
		reeh	wind
		rif	coast
N			
nadd wafi.....	spring tide		
nahiyah.....	district		
nahr, anhar	river		
najwa	shoal, spit		
nakhl, nakhil, nikhl	palm tree, date grove		

ARABIC	English	ARABIC	English
rig	shallow bank, reef, shoal, flat	sharq-shimal-sharq	east-northeast
rih	wind	shatt ramli	sandbank
rod	small watercourse	shatt.....	river, river bank, coast
rooma	bar	sheb, shib	reef
rubban	pilot	sheikh, shaikh, shaykh.....	chief elder
rud	river	sherm	cove, creek
rujm.....	cairn, hill	shimal el garbi	northwest
ruqq.....	reef, shoal	shimal esh shargi	northeast
S			
saaina bakhur ya.....	steam vessel	shimal esh shimal el garbi	north-northwest
sadd	bar, obstruction, barrier, dam	shimal esh shimal esh shargi	north-northeast
sadd min at tin.....	mudbank	shimal	north
safina shara iya.....	sailing vessel	shur	low clay hill
safra.....	yellow	sidi, sedi	tomb
sagal	gravel	sif, sifa	coast, sandy beach
sagala	port (side)	sifi	low
sahah, sahra, sahary	desert, plain	sigala.....	port (side), wharf, mole, jetty, landing place
sahel, sahil.....	beach, coast, shore	sikha.....	road
sakh, sakhr	rock	soda.....	black
sakhra fog alma.....	rock (above water)	suffara ad dabab.....	fog signal
sakhra	rock (above water)	suffara sabayya	whistle buoy
sakhra taht al ma	rock (sunken)	sura	speed
sambuk	sailing vessel	surkh, sorkh	red
sanjak	starboard side	T	
sanjaq	flag	tabb	dune
saqya, saqiye, saqyat.....	canal	tabia, tabya.....	fort, tower, castle
sar, sareea, sari	fast	tabr.....	canal
satah	shallow	taht	under, below, beneath
sawa sawa.....	abeam	tall, tell, tulul	hill
sawahil	coast guard	taraf.....	point
sawiyah	point	tarf.....	cape
sedd	mole	tarsana.....	arsenal
sedjaa	muddy	taufan	storm
seghir.....	little	tawil	long
seil	watercourse	tayyar	current
serih.....	speed	thaghr.....	port (harbor)
sfer	yellow	tiligraf	telegraph
shaab	coral	tin	mud
shab	rocky shoal, reef	tira.....	channel
shabura	fog	tiyar.....	current
shakhis	stake, pole	touffik	hamlet
shamal	north	tufan en nes.....	sandstorm
shamal-gharb.....	northwest	turab	storm
shamal-shamal-gharb	north-northwest	turah	mud
shamal-shamal-sharq	north-northeast	turiq.....	canal, channel
shamal-sharq	northeast	U	
shamandura bi fanus	light buoy	uad	river, stream
shamandura bi suffara	whistle buoy	udd	bank, sandbank
shamandura	buoy	ust	middle, center
sharg el jinub esh shargi.....	east-southeast	W	
sharg esh shamal esh shargi	east-northeast	wad, wadi.....	mouth of river, channel, watercourse
shargi, sharqi.....	east	wahl	mud
sharm.....	inlet	war	rock (sunken)
sharq-bahri-sharqi	east-southeast	wara	astern
sharq-ganub-sharq.....	east-southeast		
sharq-janoob-sharqi	east-southeast		
sharq-qibli-sharqi	east-northeast		

ARABIC	English	ARABIC	English
wast	middle, center	yesar el merkeb.....	port side
wed.....	river	yisar	port side
werayi.....	astern	Z	
wust el madd.....	half tide	zab.....	oasis
Y			
yameen al markib.....	starboard side	zaimah.....	boat
yamin	starboard side	zarqa	blue
yasar al karkib	port side	zawia, zawiya.....	house, monastery
yemin el merkeb.....	starboard side	zerga.....	blue
		zoba ah ghefleh.....	squall
		zoubaa.....	storm

FRENCH

FRENCH English

A

abri, abrite shelter, sheltered
 aiguille needle
 aimante magnetic
 amer landmark, beacon
 anse bay, creek
 appontement wharf, pier, quay
 argile clay
 arriere port outer port
 atterrissage making land, landfall
 aval downstream, seaward
 avant port outer port
 azur blue

B

babord port
 baie bay, gulf
 balisage beaconage
 balise beacon
 banc bank, sandbank
 barre bar
 basse mer low water
 basse shoal
 bassin a flot wet basin or dock
 bassin basin, dock
 bassin d'echouage tidal basin where vessels ground
 bateau de sauvetag lifeboat
 blanc, he white
 bleu, bleue blue
 bois wood
 bouche mouth of a river
 bouee a cloche bell buoy
 bouee a sifflet whistle buoy
 bouee buoy
 bouee lumineuse light buoy
 boussole compass
 brisant, brisants shoals, breakers
 brise-lames breakwater
 brouillard fog, mist
 brume fog

C

caboteur coaster
 cale de radoub marine railway
 canal channel, canal
 cap cape, headland
 champ-de-tir firing range
 chapelle chapel
 charbon coal
 chasse a rapid discharge of water from
 reservoir to clear out a channel
 chateau castle
 chaussee bank, causeway
 chemin de fer railroad
 cheminee chimney

FRENCH English

chenal channel
 clocher steeple
 coffre mooring buoy
 colline hill
 compas compass
 coquilles shells
 cote coast
 courant current, stream
 courant de flot flood tidal stream
 courant de jusant ebb tidal stream
 crique creek
 crue freshet or flood

D

darse basin
 detroit strait, narrow
 digue breakwater, mole
 douane customhouse
 droit right (side)
 due d'albe dolphin

E

echelle scale
 echelle de maree tide gauge
 ecluse lock of a canal or basin
 ecueil rock, breaker
 eglise church
 encablure cable's length
 entree entrance, mouth of a river
 epave wreck
 epi small jetty, groin
 escarpe bluff
 est east
 etale (of tide) slack, (of wind) settled
 etang lake
 etiage low-water mark of a river
 etier a creek which can receive small vessels;
 conduit by which water enters a saline.

F

falaise cliff
 fanal harbor lighthouse
 feu light
 feu permanent a light constantly burning and unwatched
 fine fine
 fleche spire
 fleuve river, stream
 flot flood
 foc jib (sail)
 fond bottom
 forme de radoub drydock
 fosse ditch, a deep

G

galets shingle
 gare station

FRENCH	English	FRENCH	English
gauche	left (side)	onde	wave
golfe	gulf	oriental	eastern
goulet	narrow entrance	ouest	west
grande	great	P	
gravier	gravel	passee	pass, fairway, channel
greve	sandy beach	patente de sante	bill of health
gril de carenage	gridiron	pertuis	opening or strait
gris	gray	petit	small
gros	coarse	phare	lighthouse
guet	watch-house	pic	peak
H		pierre	stone
haut-fond	a shoal	pignon	gable
haute mer	high water	pilote	pilot
havre	harbor	pin	pine or fir tree
houle	swell	piton	peak
I		plage	shore, beach
ile	island, isle	plateau	tableland, or flat below water
ilot	islet	pleine mer	height water
J		pointe	point
jaune	yellow	pont	bridge, deck
jetee	jetty	port	port, harbor
jusant	ebb	presq'ile	peninsula
L		Q	
lac	lake	quai	quay, wharf
large	broad, wide	R	
M		rade	road, roadstead
madrague	tunny net	rafale	squall
marais	swamp, marsh	raz (bas breton)	a name given to a violent tidal stream in a narrow passage
maree descendante	falling tide	recif	reef
maree montante	rising tide	redoute	fort
maree	tide	riviere	river
massif	main group of mountains	roche	rock
mat	mast	rocher	rock
mer	sea	rond	round
meridional	southern	rouge	red
mole	mole, pier	ruisseau	rivulet
molle	soft	S	
mont, montagne	mountain	sable	sand
morne	hill	salines	salt-water lagoons, salt works
mortes eaux	neap tides	seche	dry shelf, flat
mouillage	anchorage	septentrional	northern
moulin	mill	seuil	sill (of a dock)
musoir	pierhead	sommet	summit
N		sud	south
niveau	level	T	
noeud	knot	temps	time, weather
noir, noire	black	terre-plein	leveled ground, platform
nord	north	tete	head
nouveau, nouvel	new	tour	tower
O		tourelle	small tower, turret
occidental	western	tribord	starboard

FRENCH		English	FRENCH		English
	U				
usine		factory	vent		wind
	V		vert		green
vase		mud	vieux, vieil, vieille		old, ancient
			ville		town
			vive-eau.....		spring tide

MALAGASY

MALAGASY	English	MALAGASY	English	
A				
abo.....	high	manga	blue	
afiafy	mangroves	masay	small, little	
alao.....	sand	mati	dead	
ambato.....	rock	mavo	grey	
ambo.....	high	mena	red	
ampanalana	isthmus	morotsangan	cliff	
ampasimena	red sand	mpanamory	pilot	
andilana.....	isthmus	mpanjaka.....	chief	
andrefana.....	west	N		
ankora.....	shells	nosi, nosy	island	
antitra	old	O		
aombi	cattle	oni, ony	river	
atsimo.....	south	orompasika	sandspit	
atsinanana.....	east	oronjia.....	sandspit	
avaratra.....	north	orontani, orontany.....	cape, peninsula	
B				
bajina.....	sand	R		
be.....	large, great	rati, ratsi	bad	
bongo	mountain, plateau	riana	torrent, cascade	
F				
fariky	lake	rofia.....	palm trees	
fasika, fasina	sand	rova	fort	
filao	raffia palm, casuarinas, fish	S		
fotaka	mud	saha	river	
foti, fotsi, fotsy.....	white	seranana	port	
H				
harama.....	coral reef, rock	soa.....	good	
honko	mangroves	T		
hory	bay	tafiana	harbor, anchorage	
J				
jia	sand	tambohondrano	sandbank	
K				
keli, kely.....	small, little	tampolo.....	lagoon	
kiborintany	hill	tanambe.....	town	
L				
lalandriaka.....	stream	tanana.....	village	
lava.....	long, high, tall	tanga	mangroves	
lehibe.....	large, great	tani	country, land	
loha.....	head	tani kely, tanikeli.....	isthmus	
lohasaha	valley	tanjona	cape	
lovoka.....	bay	tany mandrevo	mudbank	
lovokeli, lovokely.....	cove	tendrona	point	
M				
mainti	black	todiana, toliana	port, anchorage	
maitso.....	green	tondro.....	finger	
malandy.....	white	tsiraka	point	
mandry	quiet	V		
Z				
			valavo, voalavo	rat
			vao	new
			vato	rock
			vato.....	rock, generally above-water
			vava, vavo	mouth of river
			vohitra.....	mountain
			vori.....	pound
			zanabongo.....	hill

PORTUGUESE

PORTUGUESE	English
A	
a, as	definite article
alto.....	high, hill
alto-fundo	shoal
altos, alturas	heights
amarelo.....	yellow
ancoradoura.....	anchorage
angra.....	inlet, bay
areia.....	sand, beach
arquipelago.....	archipelago, islands
arrebentacoes.....	breakers
arroyo	stream
atalaia	lookout station
atol.....	atoll
azul.....	blue

B

bacia	basin
bahia.....	bay
baia.....	bay
baixa.....	shoal
baixinha.....	small shoal
baixio, baixo.....	shoal
baixo.....	low
balisa, baliza.....	beacon
banco	bank
barra	bar, entrance of river or bay
barranca.....	ravine, gully
barranco.....	cliff
barreira	cliff of red or white clay
barreta	small opening in reef
boca.....	mouth, entrance, cove
boia.....	buoy
bombordo	port
boqueirao.....	short narrow channel between banks
braco-de-mar	arm of the sea
branco.....	white
bravo.....	exposed to heavy seas

C

cabeca.....	shoal head
cabeco	summit, peak, hill
cabo.....	cape, also a cable
cachoeira	waterfall
cais	quay, wharf
cala	channel
calhao	detached above-water rock
canal	channel or strait
capella	chapel
casa.....	house
castello	castle
chamine	chimney
cidade	city, large town
cimo.....	summit, crest

PORTUGUESE	English
cinco.....	five
cinzento.....	gray
colina.....	hill
coqueiral	coconut grove
cordao	ridge, line of reefs
coroa	drying bank of sand or mud
costa	coast
cruz	cross

D

dentro	inner or landward
doca.....	dock
doca secca	drydock
dois.....	two
dunas	sand dunes

E

encarnado.....	red
enseada.....	bay
entrada.....	entrance, fairway, cove
espigao	sharp point of land treeless
esporao	groyne
estado	state
estaleiro.....	shipyard
este	east
estreito.....	narrows, narrow channel, strait
estuario.....	estuary

F

faleja	cliff
farol.....	lighthouse
farolete	lighted beacon
fora.....	outer or seaward
fortaleza	fortress
forte.....	fort
fox	mouth of river
fundeadoiro	anchorage
furo.....	natural channel between rivers

G

golfo.....	gulf
grande	large, great

I

igarape.....	narrow or shoal inlet
igreja	church
ilha	island
ilheu, ilhota	islet
ilhote	large rock, stack, skerry
istmo	isthmus

L

lago	lake
lagoa.....	shallow lake
laje.....	submerged rock, rocky ledge

PORTUGUESE	English
leste	east
luz.....	light

M

malha.....	patch
mar	sea
mato.....	scrub land, wood
medano.....	extensive shifting bank at river mouth
meio.....	middle
meridional	southern
moinho	mill
moita	thick isolated clump of trees
molhe.....	mole, breakwater
montanha.....	mountain
monte.....	mountain, mount
morro.....	hill, rock

N

negro	black
nordeste	northeast
nordeste	northwest
norte	north
novo.....	new

O

o, os	the
outeiro	hill

P

parana.....	reach of a river
parcel.....	shallow patch
passagem	pass, passage
pedra.....	rock
penha.....	rocky peak
pequenho	small
pharo	lighthouse
pico.....	peak
planalto.....	headland
plano inclinado.....	marine railway
ponta.....	point of land
pontal.....	point of land or promontary
ponte.....	bridge
pororoca	bore
porto	port

PORTUGUESE	English
praia	beach
preto	black

Q

quatro	four
quebra-mar	breakwater
quebrada.....	cut, steepvalley

R

recife	reef
restinga.....	ridge, spit
riacho	stream
rio.....	river
risca.....	shoal awash
roca (or rocha).....	rock
rochedo	rocky place
rocher	rock, rocky place

S

saco	cove
san.....	saint
seco	dry
septentrional.....	northern
serra.....	mountain range
sudoeste, sudueste.....	southwest
sueste.....	southeast
sul.....	south

T

terra.....	land
torre.....	tower
trapiche	wharf or pier
tres.....	three

U

um,	one
urca	a bank which dries

V

varadouro	landing place
velho	old
verde	green
vermelho	red
vigia	lookout
vila, villa	village

SOMALI

SOMALI	English	SOMALI	English
A		H	
aradi	peak	har	mountain range
aro	peak	I	
B		illin.....	entrance
D		J	
biyogal	lake	jar	cliff
bur yar	hill	jori.....	bay
but	mountain	K	
byo galen.....	lake	kur.....	hill
D		kurum.....	hill
deked	wharf, harbor	M	
doh	channel	masajid.....	mosque
dud	forest, mound, embankment	R	
G		rasi	cape
gashirad.....	island	rubad	marsh
gumbur	hillock		

SWAHILI

SWAHILI	English	SWAHILI	English
	B		
bandar, bender	port, harbor	mnara	tower
		mnto	river
		mwamba.....	shoal
	F		N
fungu	bank, shoal	ngome	castle
	G		P
geneza	castle	pwani	coast
	J		R
jiwe mwamba.....	rock	ras	cape, point
	K		S
kazika	half-tide rock	shaka	islet
chor	creek		U
kilima	hill	uadi	river
kisiwa	island	upulu	channel
	M		W
mlango	channel, entrance	wadi	river
mlima	mountain		

How to use the Index—Gazetteer

Geographic names of navigational features are generally those used by the nation having sovereignty and are listed alphabetically. Diacritical marks, such as accents, cedillas, and circumflexes, which are related to specific letters in certain foreign languages, are not used in the interest of typographical simplicity.

Geographic names or their spellings do not necessarily reflect recognition of the political status of an area by the United States Government. Positions are approximate and are intended merely as locators to facilitate reference to the charts.

To use as a Gazetteer note the position and Sector number of the feature and refer to the Chart Information diagram for the Sector. Plot the approximate position of the feature on this diagram and note the approximate chart number.

To use as an Index of features described in the text note the paragraph number at the right. To locate this feature on the best scale chart use the Gazetteer procedure above.

Index—Gazetteer

	Position		Sec. Para		Position		Sec. Para	
	°	'			°	'		
A								
ADRIENS SHOAL	4	16 S	55 40 E	8.13	BAIE DE RANOFOTSY	25 09 S	46 45 E	10.44
AGALEGA ISLANDS	10	24 S	56 38 E	8.26	BAIE DE RIGNY	12 26 S	49 31 E	10.6
ALBATROSS ISLAND	16	15 S	59 35 E	9.16	BAIE DE SAINTE-LUCE	24 46 S	47 12 E	10.41
ALDABRA ISLANDS	9	25 S	46 22 E	9.21	BAIE DU HOPEFUL	49 05 S	69 34 E	13.16
ALDEBERT REEF	40	51 S	37 52 E	13.2	BAIE DU NAUFRAGE	46 23 S	52 12 E	13.8
ALIWAL SHOAL	30	15 S	30 50 E	2.19	BAIE DU TONNERRE	49 20 S	68 53 E	13.32
ALLIGATOR ROCK	4	24 S	55 46 E	8.17	BAIE KELLER	49 11 S	69 23 E	13.19
ALPHARD BANKS	35	02 S	20 51 E	1.14	BAIE LE VERRIER	49 07 S	69 34 E	13.17
AMBATALOBORONA	21	57 S	48 07 E	10.36	BAIE LOTSOINA	12 00 S	49 13 E	11.2
AMBATOMALAMA BEACON	15	48 S	46 22 E	11.28	BAIXO DA LAGOA	25 25 S	33 12 E	2.38
AMBODIFOTATRA	17	00 S	49 51 E	10.26	BAIXO DANAE	25 54 S	33 03 E	2.36
AMBOHIBE	21	21 S	43 31 E	12.11	BAIXO DE SANTO ANTONIO	16 12 S	40 08 E	3.28
AMBOHIBIRI	12	05 S	49 18 E	10.2	BAIXO DE SAO JOAO	26 21 S	32 58 E	2.35
AMBOHITRA	12	36 S	49 09 E	10.2	BAIXO DO PINDA	14 13 S	40 47 E	3.38
AMPANAVOANA	15	41 S	50 21 E	10.16	BAIXO INFUSSE	15 32 S	40 37 E	3.31
ANALALAVA	14	38 S	47 46 E	11.22	BAIXO MECADE	15 50 S	40 23 E	3.30
ANDOANY	13	24 S	48 17 E	11.14	BAIXO MEPANGA-PANGA	10 59 S	40 37 E	3.52
ANDRAMAHIMBA	12	13 S	49 10 E	10.2	BAIXO MIGUEL	16 31 S	39 53 E	3.25
ANDRAMAIMBO	12	13 S	49 10 E	10.2	BAIXO MUCALANGA	15 35 S	40 32 E	3.31
ANDRANO MISERANO	13	40 S	47 59 E	11.16	BAIXO MUSSIBARINDE	15 56 S	40 18 E	3.30
ANDRANOAOOMBI BAY	12	28 S	48 47 E	11.6	BAIXO NAMEZACO	15 22 S	40 39 E	3.31
ANDROMACHE SHOAL	3	51 S	54 50 E	8.20	BAIXO NANTAPA	16 04 S	40 12 E	3.28
ANGROSSY ROAD	15	15 S	50 29 E	10.14	BAIXO PINGUIM	11 05 S	40 39 E	3.51
ANKARAMISAMPANA	12	12 S	49 12 E	10.2	BAIXO SILVA	23 06 S	35 34 E	3.4
ANKAZOFOTSY	15	50 S	50 01 E	10.18	BAIXO ZALA	12 06 S	40 35 E	3.47
ANKETSABE	13	55 S	48 05 E	11.20	BAIXO ZAMBIA	22 46 S	35 35 E	3.5
ANOSIKELY	22	42 S	47 51 E	10.38	BAIXOS DA BOA PAZ	24 57 S	34 27 E	2.40
ANSE DE QUIBERON	49	16 S	68 54 E	13.33	BALEINE ROCKS	16 41 S	59 31 E	9.17
ANSE ETOILE	4	35 S	55 27 E	8.11	BALLON LOZA	14 38 S	47 49 E	11.23
ANSE PINGOUIN	48	59 S	69 38 E	13.15	BAMBOA	12 12 S	44 31 E	9.42
ANSE TSOA	12	17 S	43 46 E	9.35	BANC D'IFONTSY	17 53 S	49 32 E	10.31
ANTALAHA	14	54 S	50 17 E	10.13	BANC D'ANTETEZANA	17 49 S	49 33 E	10.30
ANTATAHA	14	54 S	50 17 E	10.13	BANC DE LA TOURMALINE	18 39 S	49 19 E	10.32
ARIADNE BANK	6	20 S	39 10 E	5.14	BANC DE LA ZELEE	12 27 S	46 14 E	9.47
ARLETT'S LEDGE	1	55 S	41 24 E	6.33	BANC DE NOSY VATO	23 22 S	43 39 E	12.17
ASSUMPTION ISLAND	9	43 S	46 30 E	9.22	BANC DU GEYSER	12 21 S	46 26 E	9.47
ASTOVE ISLAND	10	04 S	47 45 E	9.25	BANC DU LAPEROUSE	17 23 S	49 40 E	10.28
ATLAS REEF	34	37 S	20 21 E	1.16	BANC DU VAUDREUIL	19 30 S	48 56 E	10.33
AVE MARIA ROCK	4	19 S	55 49 E	8.16	BANC FRY	17 12 S	49 35 E	10.27
B								
BAGAMOYO ROADSTEAD	6	25 S	38 55 E	5.23	BANCO DE SOFALA	20 25 S	35 27 E	3.10
BAIA DE INHAMBANE	23	44 S	35 30 E	3.2	BANDARBAYLA	9 30 N	50 49 E	7.24
BAIA DE MAIAPA	10	57 S	40 34 E	3.52	BAR DE L'EST	3 47 S	55 50 E	8.2
BAIA DE SOFALA	20	11 S	34 43 E	3.9	BARAAWE	1 06 N	44 02 E	7.3
BAIA DO BAZARUTO	21	44 S	35 21 E	3.7	BARRA INHAMISSENGO	18 54 S	36 08 E	3.12
BAIE AMPANASINA	12	01 S	49 12 E	11.3	BASSAS DA INDIA	21 27 S	39 41 E	12.4
BAIE ANDRANOAOOMBY	12	28 S	48 47 E	11.6	BASSE DE JUDIE	21 27 S	39 41 E	12.4
BAIE BLANCHE	48	49 S	69 11 E	13.12	BASSIN DE LA GAZELLE	49 18 S	69 41 E	13.22
BAIE CACHEE	49	13 S	69 26 E	13.20	BATASA ROCK	34 17 S	18 29 E	1.4
BAIE CLEMENCEAU	48	44 S	69 03 E	13.11	BEACON ISLAND	4 37 S	55 31 E	8.9
BAIE DE BOUENI	12	53 S	45 06 E	9.47	BEDFORD BREAK	6 31 S	39 25 E	5.11
BAIE DE DIEGO-SUAREZ	12	16 S	49 18 E	10.3	BEIRA	19 50 S	34 50 E	3.11
BAIE DE L'AVENTURE	46	23 S	52 12 E	13.8	BEL OMBRE	20 31 S	57 24 E	9.14
BAIE DE L'OBSERVATOIRE	49	25 S	69 54 E	13.27	BELAMI	7 57 S	39 33 E	4.28
					BELO-SUR-MER	20 45 S	44 01 E	12.10
					BENARES SHOALS	5 15 S	71 40 E	8.30
					BENDER BEILA	9 30 N	50 49 E	7.24
					BET EL RAS	6 07 S	39 07 E	5.18
					BETANTY	25 34 S	45 32 E	10.45
					BIRD ISLAND	3 43 S	55 12 E	8.2

	Position				Sec. Para		Position				Sec. Para
	°	'	°	'			°	'	°	'	
J											
JANSEN'S ROCK	33	36 S	26	56 E	2.8						
JASIIRA TOOMBA	0	21 S	42	35 E	7.2						
JASIIRAD BISHIKAANI	0	26 S	42	31 E	7.2						
JESSER POINT	27	33 S	32	41 E	2.33						
JIDANA	3	50 S	39	40 E	6.18						
JIDDAWI SHOAL	6	04 S	39	11 E	5.16						
JIWE LA MPUPU	2	13 S	41	01 E	6.29						
J-SHA XAAFUUN	10	26 N	51	20 E	7.25						
JUBBA	0	15 S	42	38 E	7.3						
K											
KAAP HANGKLIP	34	23 S	18	50 E	1.8						
KALAD	5	53 N	48	53 E	7.20						
KALK BAY	34	08 S	18	27 E	1.7						
KANKADYA PATCH	6	44 S	39	19 E	5.6						
KANOGE	7	42 S	39	10 E	4.30						
KEISKAMA POINT	33	18 S	27	29 E	2.10						
KEISKAMA RIVER	33	17 S	27	29 E	2.10						
KENTON-ON-SEA	33	41 S	26	40 E	2.7						
KIFENNI	1	13 S	41	51 E	6.36						
KIKUNYA MOUTH	7	42 S	39	20 E	4.20						
KILIFI CREEK	3	38 S	39	52 E	6.19						
KILWA KIVINJE	8	44 S	39	23 E	4.17						
KILWA MAIN PASS	8	40 S	39	32 E	4.16						
KINYIKA	2	26 S	40	50 E	6.26						
KIPINI	2	31 S	40	32 E	6.25						
KIRK POINT	18	58 S	35	57 E	3.12						
KISIJU	7	25 S	39	20 E	4.30						
KISIMANI CHANNEL	8	02 S	39	34 E	4.27						
KISMAAYO	0	22 S	42	33 E	7.2						
KISWERE HAVEN	9	25 S	39	38 E	4.13						
KIWAHU BAY	2	04 S	41	12 E	6.32						
KIWAHU ISLAND	2	00 S	41	17 E	6.32						
KIWAHU KNOLLS	2	00 S	41	20 E	6.33						
KIZIMKAZI PATCH	6	28 S	39	33 E	5.10						
KNYSNA HARBOR	34	05 S	23	03 E	1.22						
KOMA ISLAND	7	32 S	39	24 E	4.30						
KROMBAAI	34	10 S	24	52 E	1.28						
KROMME BAY	34	10 S	24	52 E	1.28						
KRUISFONTEIN	33	57 S	24	41 E	1.25						
KUNDUCHI HARBOR	6	40 S	39	14 E	5.22						
KWAAI HOEK	33	43 S	26	38 E	2.7						
KWALE	6	23 S	39	17 E	5.12						
KWALE BAY	5	00 S	39	09 E	6.13						
L											
L'ILOT	4	36 S	55	54 E	8.19						
LA DIGUE	4	21 S	55	50 E	8.16						
LADY DENISON PENDER SHOAL	4	49 S	53	20 E	8.21						
LAMA SHAAQA	1	39 S	41	35 E	6.33						
LAMBASI BAY	31	23 S	29	54 E	2.17						
LAMU	2	16 S	40	54 E	6.27						
LAMU ISLAND	2	17 S	40	52 E	6.26						
LANGDON ROCKS	5	53 S	39	07 E	5.19						
LATHAM ISLAND	6	54 S	39	56 E	5.2						
LE CONE	15	03 S	47	15 E	11.16						
LE CONSTANT BANK	6	17 S	56	18 E	8.20						
LE GRAND BANC	12	18 S	49	27 E	10.3						
LEOPARD POINT	3	15 S	40	08 E	6.22						
LEVEN BANK	5	38 S	39	18 E	5.19						
LEVEN POINT	27	55 S	32	36 E	2.31						
LINDI	10	00 S	39	43 E	4.10						
LITTLE HEAD	1	57 S	41	19 E	6.33						
LOHATANJON' AMBOZOMENA	15	12 S	47	02 E	11.26						
LOHATANJON' ANDRONONA	12	56 S	49	52 E	10.8						
LOHATANJON' ANTSIRAKA	16	50 S	49	50 E	10.22						
LOHATANJON' ANTSITAKARAIFY	16	45 S	49	58 E	10.25						
LOHATANJON'I TAMPOLO	15	44 S	49	57 E	10.18						
LOHATANJONA EVATRA	25	00 S	47	05 E	10.42						
LOHATANJONA FENAMBOSY	25	15 S	44	21 E	12.19						
LOHATANJONA IHARANA	13	21 S	50	00 E	10.10						
LOHATANJONA TITINGO	16	42 S	49	46 E	10.22						
LOHATANJONA VOHIBATO	17	08 S	49	48 E	10.24						
LOURENCO MARQUES	25	58 S	32	35 E	2.37						
LUALA REEF	8	37 S	39	31 E	4.16						
M											
MAC LEAR	49	38 S	70	17 E	13.28						
MACHANGI	8	25 S	39	27 E	4.19						
MACOMA LIGHT	25	41 S	32	46 E	2.37						
MADAGASCAR REEF	33	23 S	27	21 E	2.10						
MADAXWEYNE	3	53 N	47	26 E	7.15						
MADUVI	7	55 S	39	33 E	4.28						
MAFIA ISLAND	7	50 S	39	48 E	4.21						
MAHABO	23	48 S	47	33 E	10.40						
MAHAJANGA	15	42 S	46	19 E	11.28						
MAHAMBO	17	29 S	49	28 E	10.29						
MAHANORO	19	55 S	48	49 E	10.34						
MAHE ISLAND	4	40 S	55	28 E	8.3						
MAHELA	20	58 S	48	27 E	10.35						
MAINTIRANO	18	04 S	44	01 E	12.7						
MAINTIRANOMATY	18	10 S	44	02 E	12.8						
MAITLAND HILL	33	26 S	27	09 E	2.9						
MAJUNGA	15	42 S	46	19 E	11.28						
MALINDI	3	13 S	40	08 E	6.23						
MALINDI POINT	3	15 S	40	07 E	6.22						
MAMBRUI POINT	3	06 S	40	10 E	6.24						
MAMELLE ISLAND	4	29 S	55	32 E	8.15						
MAMELLES DE NATTE	17	50 S	49	25 E	10.30						
MANA HAWANJA ISLAND	10	17 S	40	22 E	4.4						
MANAKARA	22	09 S	48	03 E	10.37						
MANANARA	16	10 S	49	46 E	10.19						
MANANJARY	21	15 S	48	20 E	10.36						
MANDA BAY	2	07 S	40	57 E	6.29						
MANDA ISLAND	2	16 S	40	57 E	6.28						
MANDA ROADS	2	16 S	41	01 E	6.29						
MANDA TOTO ISLAND	2	14 S	40	59 E	6.29						
MANGE	8	03 S	39	36 E	4.27						
MANTHLONETCHWA HILL	31	31 S	29	40 E	2.16						
MAPU PATCH	19	59 S	57	40 E	9.10						
MAPUTO	25	58 S	32	35 E	2.36						
MARBIXIS	8	57 N	50	30 E	7.23						
MARCUS BAY	34	40 S	20	15 E	1.16						
MAREEG	3	46 N	47	18 E	7.14						
MARGATE	30	52 S	30	22 E	2.18						
MARIANNE ISLAND	4	21 S	55	55 E	8.17						
MARIE LOUISE ISLAND	6	11 S	53	09 E	8.23						
MARION ISLAND	46	53 S	37	43 E	13.1						
MARKA	1	43 N	44	47 E	7.6						
MAROANTSETRA	15	27 S	49	49 E	10.20						
MAROTIA	16	02 S	45	23 E	11.27						
MARUTEZA POINT	12	24 S	48	46 E	11.6						
MASSUNDJI-MACULA	12	27 S	40	39 E	3.45						
MATUMBE MAKUPA	5	24 S	39	34 E	6.4						
MAURITIUS	20	15 S	57	35 E	9.9						
MAXECANE	22	31 S	35	31 E	3.4						
MAYOTTE	12	49 S	45	10 E	9.43						
MAZIWI ISLAND	5	30 S	39	04 E	5.25						
MBASHE POINT	32	15 S	28	55 E	2.12						
MBWAKUNI	6	22 S	38	59 E	5.24						
MBWAMAJI HARBOR	6	51 S	39	22 E	5.4						
MBWENI VILLAGE	6	35 S	39	08 E	5.23						
MCHENGANGAZI	5	06 S	39	52 E	6.3						
MCHINGA BAY	9	43 S	39	46 E	4.11						
MENAI ISLAND	9	42 S	47	31 E	9.23						
MEREGH	3	46 N	47	18 E	7.14						
MESALI GAP	5	14 S	39	36 E	6.6						
MGENI RIVER	29	49 S	31	02 E	2.25						
MIDA CREEK											

	Position				Sec. Para		Position				Sec. Para
	o	'	o	'			o	'	o	'	
PIETER BOTH	20	11 S	57	35 E	9.12	POINTE SARODRANO	23	30 S	43	44 E	12.18
PILOT PATCHES	4	42 S	55	20 E	8.4	POINTE SAZILEY	12	58 S	45	12 E	9.45
PITON DE SAMBIRANO	14	05 S	50	02 E	10.10	POINTE SCOTT	49	06 S	70	06 E	13.23
PITONS D'ANGONTSY	15	16 S	50	18 E	10.2	POINTE SUD OUEST	20	28 S	57	18 E	9.13
PLATTE ISLAND	5	52 S	55	24 E	8.19	POINTE TAFONDRO	13	24 S	48	22 E	11.12
PLETTENBERGBAAI	34	05 S	23	25 E	1.24	POINTE TAFONDRO	16	53 S	49	53 E	10.26
POINET ANTANANDAVA	15	50 S	46	19 E	11.28	POINTE TAKOANDRA	17	25 S	49	27 E	10.28
POINTE A LARREE	16	50 S	49	50 E	10.22	POINTE TAMPOLO	15	44 S	49	57 E	10.18
POINTE ACUA	12	45 S	45	03 E	9.47	POINTE TINTINGUE	16	42 S	49	46 E	10.22
POINTE AMBARARATA	15	11 S	46	57 E	11.16	POINTE TONY	23	00 S	43	28 E	12.15
POINTE AMBARIONAOMBY	13	26 S	48	21 E	11.13	POINTE TSINAYOUHI	12	23 S	43	52 E	9.36
POINTE AMBERO	25	07 S	46	50 E	10.44	POINTE VENUS	19	40 S	63	26 E	9.19
POINTE AMBODIVAHIBE	12	21 S	49	31 E	10.6	POIVRE ISLANDS	5	46 S	53	19 E	8.23
POINTE AMBOLIBOSO	14	10 S	48	00 E	11.20	POLICE POINT	4	48 S	55	31 E	8.6
POINTE ANDEFITRA	21	39 S	43	25 E	12.12	POMONI	12	16 S	44	24 E	9.41
POINTE ANGADOKA	13	30 S	47	59 E	11.16	PONTA ALGOA	23	39 S	35	26 E	3.4
POINTE ANGOROTANY	24	43 S	43	55 E	12.19	PONTA ALMANDIA	17	05 S	38	42 E	3.23
POINTE ANOROMBATO	15	43 S	46	18 E	11.28	PONTA BAJONE	15	15 S	40	41 E	3.31
POINTE ANSIRAKE	15	27 S	49	45 E	10.20	PONTA CALDERIA	16	39 S	39	30 E	3.24
POINTE AUX CAVES	20	11 S	57	24 E	9.13	PONTA CHICUQUE	23	47 S	35	21 E	3.3
POINTE BANDABOBA	12	42 S	45	08 E	9.44	PONTA CHILUELA	25	17 S	33	19 E	2.39
POINTE BARN HILL	23	33 S	43	45 E	12.17	PONTA CHINGUNE	20	37 S	34	53 E	3.10
POINTE BARON	12	22 S	48	58 E	11.5	PONTA CONGOLONE	16	05 S	40	06 E	3.28
POINTE BEFOTAKA	23	24 S	43	42 E	12.17	PONTA CUMPADJI	14	31 S	40	50 E	3.35
POINTE BESISTKA	15	50 S	46	22 E	11.28	PONTA DA BARRA	23	47 S	35	32 E	2.41
POINTE BLERIOT	48	58 S	68	52 E	13.34	PONTA DA BARRA FALSA	22	55 S	35	37 E	3.4
POINTE BLEVEC	17	08 S	49	48 E	10.24	PONTA DA MACANETA	25	52 S	32	45 E	2.37
POINTE BOUENI	12	54 S	45	04 E	9.47	PONTA DO DIABO	12	45 S	40	38 E	3.45
POINTE CAPUCINS	4	47 S	55	32 E	8.6	PONTA DO OURO	26	51 S	32	54 E	2.35
POINTE CORNARD	12	22 S	49	27 E	10.6	PONTA DUNDO	21	48 S	35	27 E	3.6
POINTE D'AMBODAY	13	13 S	48	15 E	11.11	PONTA INGOMAIMO	20	42 S	35	00 E	3.8
POINTE D'AMPANGALA	12	53 S	48	37 E	11.9	PONTA INHASSORO	21	35 S	35	15 E	3.7
POINTE D'ANKIFY	13	32 S	48	22 E	11.15	PONTA LESTE	18	53 S	36	17 E	3.12
POINTE D'ANTSIRAKARAIFY	16	45 S	49	58 E	10.25	PONTA LIBERAL	18	34 S	36	28 E	3.14
POINTE D'ESNY	20	25 S	57	44 E	9.14	PONTA LULO	14	09 S	40	36 E	3.39
POINTE DAPANI	12	59 S	45	11 E	9.47	PONTA MACALONGA	17	01 S	39	04 E	3.23
POINTE DE BEL AIR	20	53 S	55	37 E	9.4	PONTA MACHANGA	20	56 S	35	07 E	3.8
POINTE DE L'OCEANOGRAPHIE	49	36 S	69	14 E	13.30	PONTA MACOVANE	21	10 S	35	07 E	3.8
POINTE DE LA BRECHE	49	10 S	69	56 E	13.23	PONTA MACUTI	19	51 S	34	54 E	3.1
POINTE DE LA TABLE	21	19 S	55	49 E	9.5	PONTA MANCOME	14	07 S	40	37 E	3.39
POINTE DE LANGEVIN	21	23 S	55	39 E	9.5	PONTA MARIA LUIZA	13	43 S	40	34 E	3.40
POINTE DE LANGLE	48	58 S	69	39 E	13.15	PONTA MASIUANE	16	24 S	39	54 E	3.26
POINTE DE PENMARCH	49	37 S	69	25 E	13.29	PONTA MATIRRE	17	17 S	38	11 E	3.21
POINTE DE SABLE	15	44 S	46	18 E	11.28	PONTA MAUNHANE	12	58 S	40	35 E	3.42
POINTE DE VOHEMAR	13	21 S	50	00 E	10.10	PONTA METACAU	13	33 S	40	36 E	3.41
POINTE DES AVIRONS	21	14 S	55	20 E	9.6	PONTA MIASI	14	00 S	40	37 E	3.40
POINTE DES GALETS	20	54 S	55	16 E	9.8	PONTA NAMALUNGO	15	38 S	40	25 E	3.30
POINTE DES JARDINS	20	52 S	55	28 E	9.4	PONTA NANGAMBA	12	38 S	40	36 E	3.45
POINTE DU BOURBIER	21	01 S	55	43 E	9.4	PONTA NANGATA	14	11 S	40	41 E	3.38
POINTE DU CHIEN	49	15 S	69	51 E	13.21	PONTA NAPENJA	14	50 S	40	50 E	3.35
POINTE DU CRATERE	13	24 S	48	14 E	11.12	PONTA OLINDA	18	03 S	36	58 E	3.15
POINTE DU CUIR SALE	48	58 S	68	51 E	13.34	PONTA ONLUGUNE	14	41 S	40	50 E	3.35
POINTE DU DIABLE	20	20 S	57	47 E	9.14	PONTA PADJINI	25	20 S	33	14 E	2.38
POINTE DU NOUVEL HOPITAL	17	23 S	49	25 E	10.28	PONTA QUIRIMISI	12	12 S	40	31 E	3.47
POINTE DU SUD	4	48 S	55	32 E	8.6	PONTA ROMERO	12	57 S	40	30 E	3.43
POINTE EBOULEMENT	37	50 S	77	36 E	13.37	PONTA SANCUL	15	05 S	40	43 E	3.33
POINTE EVATRA	25	00 S	47	05 E	10.42	PONTA TANGALANE	18	01 S	36	59 E	3.17
POINTE FARMAN	49	02 S	68	48 E	13.34	PONTA UCAIA	12	12 S	40	34 E	3.46
POINTE FENAMBOSY	25	15 S	44	21 E	12.19	PONTA UIFUNDO	13	23 S	40	36 E	3.42
POINTE GUITE	49	25 S	70	17 E	13.24	PONTA ULU	11	24 S	40	28 E	3.49
POINTE HAMOURO	12	52 S	45	13 E	9.45	PONTA UTUCO	14	23 S	40	41 E	3.37
POINTE HOANI	12	15 S	43	40 E	9.35	PONTA VERMELHA	25	59 S	32	36 E	2.37
POINTE HOSKEN	37	49 S	77	35 E	13.37	PONTA ZAVORA	24	31 S	35	12 E	2.40
POINTE KILIBE	23	26 S	43	44 E	12.17	PORT ALFRED	33	36 S	26	54 E	2.8
POINTE KONGO	12	44 S	45	13 E	9.44	PORT COCKBURN	5	12 S	39	43 E	6.8
POINTE LAMBOHARANA	22	12 S	43	14 E	12.14	PORT CREDNER	49	02 S	69	17 E	13.14
POINTE LAVALOHALIKA	14	00 S	47	56 E	11.17	PORT CURIEUSE	49	22 S	68	49 E	13.32
POINTE LAVERDURE	20	25 S	57	46 E	9.14	PORT DE L'ENFER	49	31 S	68	51 E	13.31
POINTE LAZARE	4	46 S	55	28 E	8.4	PORT DE LA NIEVRE	12	16 S	49	16 E	10.5
POINTE M'VOUNI	11	53 S	43	30 E	9.33	PORT DE LA POINTE DES GALETS	20	55 S	55	18 E	9.7
POINTE MAHELA	16	42 S	49	45 E	10.22	PORT DES ILES	49	28 S	70	04 E	13.27
POINTE MANAKARA	15	12 S	47	02 E	11.26	PORT DU KETCH	49	29 S	69	54 E	13.28
POINTE MAROHATA	21	17 S	43	36 E	12.11	PORT DURNFORD	28	55 S	31	49 E	2.27
POINTE MAROMONY	14	39 S	47	27 E	11.24	PORT ELIZABETH	33	58 S	25	37 E	2.3
POINTE MIREMANI	12	21 S	43	39 E	9.37	PORT GEORGE	5	06 S	39	40 E	6.8
POINTE MORNE	49	22 S	70	27 E	13.24	PORT HELENE	49	04 S	69	16 E	13.14
POINTE N'GOUNI	11	44 S	43	13 E	9.32	PORT JEANNE D'ARC	49	32 S	69	49 E	13.27
POINTE OAKELEY	48	51 S	69	30 E	13.13	PORT KISH KASH	5	02 S	39	40 E	6.9
POINTE ORAVAKA	12	34 S	48	49 E	11.6	PORT KIUUYU	4	58 S	39	41 E	6.9
POINTE PAGES	49	10 S	68	48 E	13.33	PORT LOUIS	20	10 S	57	30 E	9.12
POINTE PIMENTS	20	05 S	57	31 E	9.11	PORT MARY	49	00 S	69	19 E	13.14
POINTE SADA	15	59 S	45	20 E	11.30	PORT MATHURIN	19	41 S	63	25 E	9.19

	Position			Sec. Para		Position			Sec. Para
	°	'				°	'		
PORT MKOANI	5	21 S	39 39 E	6.5	RAS DIMA	8	00 S	39 26 E	4.28
PORT NAVALO	49	30 S	70 13 E	13.26	RAS EL CHEIL	7	44 N	49 52 E	7.21
PORT NGQURA	33	48 S	25 42 E	2.5	RAS FUMBA	6	19 S	39 17 E	5.13
PORT RADAMA	14	05 S	47 57 E	11.20	RAS GABAH	8	08 N	50 04 E	7.22
PORT REUNION	20	55 S	55 18 E	9.7	RAS GOME LAHECUA	1	32 S	41 39 E	6.35
PORT ROLAND BONAPARTE	49	02 S	69 39 E	13.16	RAS HABU	11	21 S	43 25 E	9.30
PORT ROSA	49	08 S	69 23 E	13.18	RAS ILIG	7	48 N	49 50 E	7.21
PORT SAINTE MARIE	17	00 S	49 51 E	10.26	RAS KANDA	4	35 S	39 26 E	6.15
PORT SAINT-LOUIS	13	05 S	48 50 E	11.8	RAS KANKADYA	6	44 S	39 16 E	5.21
PORT SHEPSTONE	30	44 S	30 28 E	2.18	RAS KANKADYA	6	44 S	39 17 E	5.6
PORT SOUTH EAST	19	45 S	63 27 E	9.20	RAS KANZI	7	01 S	39 33 E	5.1
PORT ST. JOHNS	31	38 S	29 33 E	2.15	RAS KAZONE	5	04 S	39 08 E	6.11
PORT VICTORIA	4	37 S	55 27 E	8.10	RAS KIBUNGWE	9	52 S	39 48 E	4.11
PORT-AUX-FRANCAIS	49	21 S	70 13 E	13.25	RAS KIGOMASHA	4	53 S	39 41 E	6.10
PORTO BELO	17	42 S	37 11 E	3.18	RAS KILIFI	4	47 S	39 13 E	6.13
PORTO DE ANGOCHE	16	14 S	39 54 E	3.27	RAS KIMBIJI	6	59 S	39 33 E	5.1
PORTO DE BARTOLOMEU DIAS	21	10 S	35 07 E	3.8	RAS KINGOJI	5	17 S	39 40 E	6.6
PORTO DE CHILOANE	20	37 S	34 53 E	3.9	RAS KIPANOKI	8	57 S	39 32 E	4.15
PORTO DE DUARTE PEDROSO	14	13 S	40 33 E	3.39	RAS KISMANI	7	57 S	39 35 E	4.22
PORTO DE MOCAMBIQUE	15	02 S	40 44 E	3.33	RAS KITOKA	3	38 S	39 52 E	6.18
PORTO DE MOCAMBO	15	08 S	40 33 E	3.32	RAS KIYUU	4	53 S	39 52 E	6.3
PORTO DE MOCIMBOA DA PRAIA	11	20 S	40 20 E	3.50	RAS KIZIMKAZI	6	28 S	39 30 E	5.10
PORTO DE MOMA	16	46 S	39 14 E	3.24	RAS KORONJO	6	51 S	39 23 E	5.4
PORTO DE NACALA	14	32 S	40 40 E	3.36	RAS KWAWA	5	00 S	39 10 E	6.13
PORTO DE PEBANE	17	16 S	38 09 E	3.20	RAS LWALE	6	27 S	38 59 E	5.23
PORTO DE QUELIMANE	17	53 S	36 53 E	3.16	RAS MABBER	9	28 N	50 51 E	7.23
PORTO DO IBO	12	20 S	40 37 E	3.46	RAS MACHUISI	5	57 S	38 59 E	5.25
POTOPOTO HILL	12	21 S	48 59 E	11.5	RAS MASANGAMKUU	10	12 S	40 14 E	4.5
PRASLIN ISLAND	4	20 S	55 44 E	8.13	RAS MASONI	6	25 S	39 25 E	5.12
PRESQUILLE D'AMBATO	13	22 S	48 30 E	11.9	RAS MATUNDA	10	21 S	40 27 E	4.3
PRESQUILLE D'AMBATO	13	22 S	48 30 E	11.9	RAS MATUSO	8	55 S	39 33 E	4.14
PRESTGRAVE BANK	2	19 S	41 01 E	6.28	RAS MBANURA	9	55 S	39 47 E	4.9
PRINCE EDWARD ISLAND	46	38 S	37 56 E	13.3	RAS MBEMKURU	9	27 S	39 39 E	4.13
PRINGLE BAY	34	20 S	18 50 E	1.8	RAS MBISI	7	49 S	39 43 E	4.25
PROTEA BANKS	30	50 S	30 29 E	2.18	RAS MBWENI	6	12 S	39 12 E	5.13
PROVIDENCE ISLAND	9	14 S	51 02 E	9.26	RAS MICHAMVI	6	07 S	39 30 E	5.10
PUDDING HILL	28	53 S	32 00 E	2.27	RAS MITU MITU	2	09 S	41 06 E	6.30
PUMBAVU ISLET	8	30 S	39 29 E	4.19	RAS MKITA	6	19 S	39 18 E	5.13
PUNGUME	6	26 S	39 20 E	5.11	RAS MKUMBI	7	38 S	39 54 E	4.24
PUNTA DIGA	5	21 N	48 32 E	7.18	RAS MKYA	10	07 S	39 59 E	4.8
PUNTA UARSCIECH	2	26 N	46 01 E	7.11	RAS MOMPI	9	16 S	39 39 E	4.13
					RAS MWANA	2	34 S	40 36 E	6.25
					RAS MWANDA	5	53 S	39 13 E	5.20
Q					RAS NGOMENI	2	59 S	40 14 E	6.24
QOORIGA JUULA	1	01 S	42 00 E	6.37	RAS NGUMBE SUKANI	9	10 S	39 38 E	4.13
QUISSICO LIGHT	24	45 S	34 48 E	2.40	RAS NUNGE	6	24 S	38 54 E	5.24
QUOIN HILL	31	15 S	30 02 E	2.17	RAS NUNGWU	5	43 S	39 18 E	5.19
QUOIN POINT	34	47 S	19 38 E	1.13	RAS NYAMAKU	5	07 S	39 08 E	6.11
QUREEXANE	8	12 N	50 08 E	7.23	RAS OGADEN	0	27 S	42 29 E	6.34
					RAS PEMBAMNASI	7	09 S	39 32 E	4.31
					RAS POMBWE	8	17 S	39 19 E	4.18
R					RAS RASHID	4	37 S	39 24 E	6.14
RAAS CABAAD	6	18 N	49 05 E	7.20	RAS ROCUMBI	9	42 S	39 45 E	4.12
RAAS CUSBAD	4	34 N	48 01 E	7.16	RAS RUVURA	10	18 S	40 24 E	4.4
RAAS DAAY	1	11 N	44 08 E	7.4	RAS SAMANGA FUNGU	8	25 S	39 19 E	4.18
RAAS DIGA	5	21 N	48 32 E	7.18	RAS SHANGANI	6	10 S	39 11 E	5.17
RAAS DURDURA	9	05 N	50 39 E	7.23	RAS SHUKA	9	59 S	39 49 E	4.9
RAAS FILFILE	1	16 N	44 13 E	7.5	RAS SIF	2	01 N	45 20 E	7.9
RAAS GABBAC	8	08 N	50 04 E	7.22	RAS SIMBA URANGA	7	38 S	39 20 E	4.30
RAAS GARMAAL	8	32 N	50 19 E	7.23	RAS TENEWI	2	27 S	40 46 E	6.26
RAAS GUMBAX	10	00 N	50 54 E	7.24	RAS TIKWIRI	8	49 S	39 29 E	4.16
RAAS KAAF	1	51 N	45 01 E	7.8	RAS TUNDAUA	5	15 S	39 41 E	6.7
RAAS KAAMBOONI	1	39 S	41 36 E	6.33	RAS TWANA	7	48 S	39 27 E	4.20
RAAS MACBAR	9	28 N	50 51 E	7.23	RAS UKENJWI	5	02 S	39 40 E	6.9
RAAS OGADEN	0	27 S	42 29 E	6.37	RAS UPEMBE	5	28 S	39 43 E	6.3
RAAS SIINDHASS	1	21 N	44 18 E	7.5	RAS USO WA MEMBE	5	54 S	39 12 E	5.18
RAAS WARAFOOLE	1	24 S	41 44 E	6.35	RAS WASIN	4	39 S	39 24 E	6.14
RAAS XAAFUUN	10	26 N	51 25 E	7.25	RASSI DOUAMOUNGNO	12	39 S	45 06 E	9.44
RADE D'ANGONTSY	15	15 S	50 29 E	10.14	RAT ISLAND	4	40 S	55 32 E	8.8
RAME HEAD	31	48 S	29 21 E	2.13	RECIF CROISSANT	18	22 S	43 55 E	12.5
RAS ASIR	11	50 N	51 17 E	1.1	RECIF ISLAND	4	35 S	55 46 E	8.7
RAS ASSUAD	4	34 N	48 01 E	7.16	RECIF MORRISSON	21	48 S	43 12 E	12.12
RAS AUAD	6	18 N	49 05 E	7.20	RECIF VAILHEU	11	49 S	43 02 E	9.32
RAS AUDALLA	0	46 N	43 37 E	7.1	RECIFS DE L'ETOILE	25	21 S	44 18 E	12.19
RAS BIONGWE	2	23 S	40 49 E	6.26	RED MOUNT	12	48 S	45 06 E	9.47
RAS BUYUNI	7	08 S	39 33 E	4.30	RED SAND CLIFF	27	43 S	32 37 E	2.32
RAS BWECHANO	5	51 S	39 13 E	5.19	REEF POINT	32	51 S	28 07 E	2.12
RAS CHOKIR	6	49 S	39 10 E	5.7	REMIRE ISLAND	5	07 S	53 19 E	8.21
RAS DEGE	6	52 S	39 28 E	5.3	REMIRE REEF	5	05 S	53 21 E	8.21
RAS DEGE	6	52 S	39 29 E	5.8	RENOMMEE ROCK	4	27 S	55 51 E	8.17
					REQUIN BANK	4	34 S	55 22 E	8.5
					RICHARDS BAY	28	48 S	32 05 E	2.28

	Position				Sec. Para		Position				Sec. Para
	°	'	°	'			°	'	°	'	
V											
VATOMANDRY	19	20 S	49	00 E	10.32	WHALE ROCK	19	59 S	57	33 E	9.11
VEDETTE HILL	28	57 S	31	44 E	2.26	WHALE ROCK POINT	31	56 S	29	13 E	2.13
VICTORIA BAY	34	00 S	22	33 E	1.20	WHITTLE ROCK	34	15 S	18	34 E	1.4
VICTORY BANK	5	32 S	72	14 E	8.30	WIMBI REEFS	4	32 S	39	30 E	6.15
VIDAL BANK	2	18 S	41	04 E	6.28	WITELSBOS	33	58 S	24	06 E	1.25
VILA DO CHINDE	18	32 S	36	30 E	3.13	WIZARD ISLAND	9	44 S	47	39 E	9.23
VILHENA LIGHT	18	06 S	36	55 E	3.14	WOODY CAPE	33	46 S	26	20 E	2.2
VISHOEKBAAI	34	08 S	18	26 E	1.7	WUMI	7	45 S	39	36 E	4.29
VOHEMAR	13	21 S	50	00 E	10.9	Y					
VULTURE ROCK	16	13 S	44	20 E	12.4	YAMBE ISLAND	5	07 S	39	10 E	6.11
W											
WALKER BAY	34	30 S	19	17 E	1.10	YAMBWA NGOME	6	00 S	39	07 E	5.16
WALKER POINT	34	06 S	22	59 E	1.21	YORK SHOAL	34	09 S	18	36 E	1.7
WALTERS SHOALS	33	12 S	43	55 E	10.46	YSTERVARKPUNT	34	24 S	21	44 E	1.17
WAMI PATCHES	6	06 S	38	56 E	5.24	Z					
WARSHIHKH	2	26 N	46	01 E	7.11	ZANZIBAR HARBOR	6	10 S	39	11 E	5.17
WASIN ISLAND	4	40 S	39	22 E	6.14	ZANZIBAR ISLAND	6	07 S	39	21 E	5.9
WATERFALL BLUFF	31	26 S	29	48 E	2.16	ZOROASTER SHOAL	5	00 S	56	40 E	8.19
WEST NORTH ISLAND	9	39 S	47	34 E	9.24						
WETE	5	04 S	39	43 E	6.9						