

PUB. 161
SAILING DIRECTIONS
(ENROUTE)



SOUTH CHINA SEA
AND THE GULF OF THAILAND



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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.

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.

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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.

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

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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.

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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.

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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 website.

NGA Maritime Division Website (Special Warnings)

http://164.214.12.145/warn/warn_j_query.html

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:

People's Republic of China Sailing Directions.

Various port handbooks.

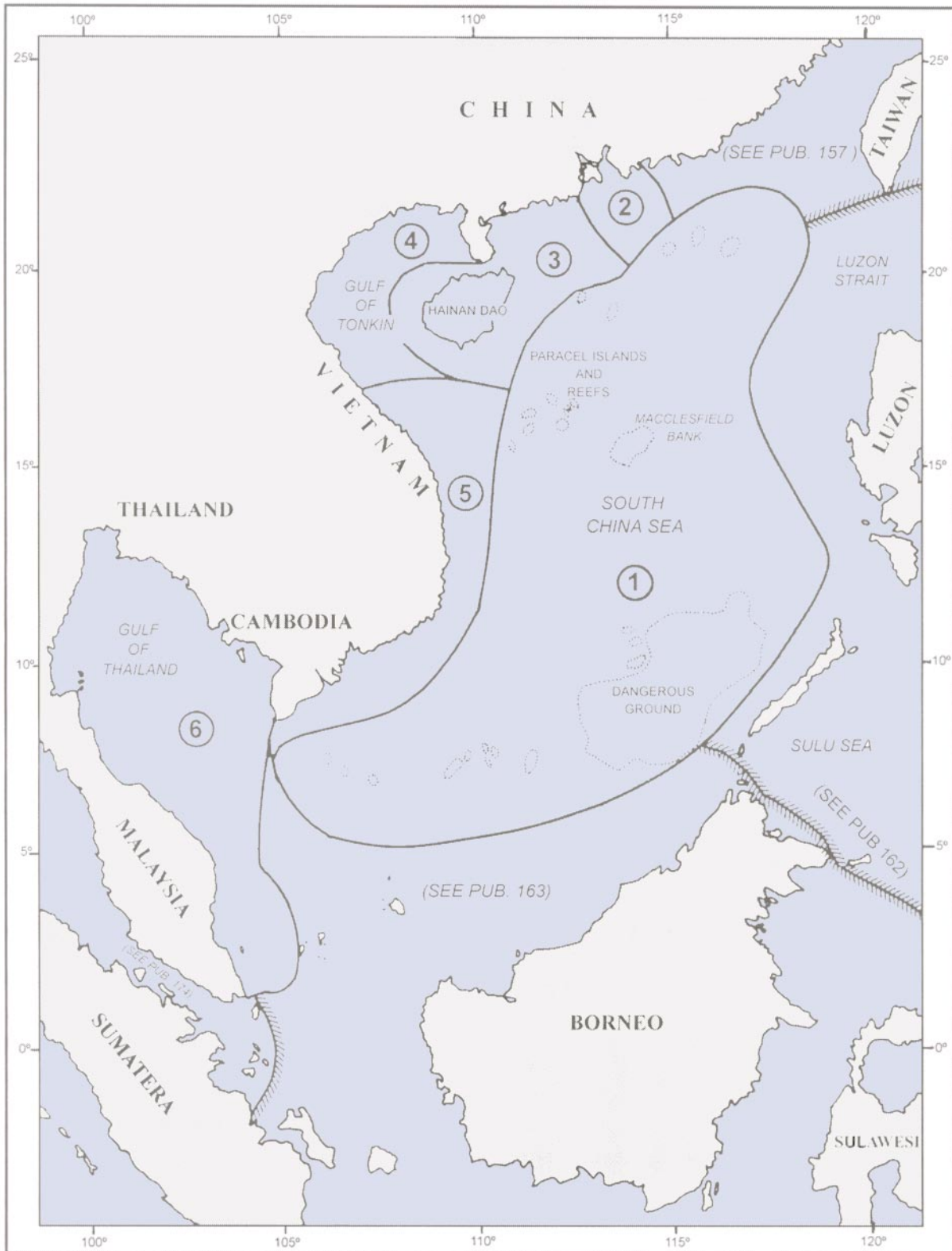
Reports from United States Naval and merchant vessels and various shipping companies.

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

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

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SECTOR LIMITS — PUB. 161

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	northeast	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		

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

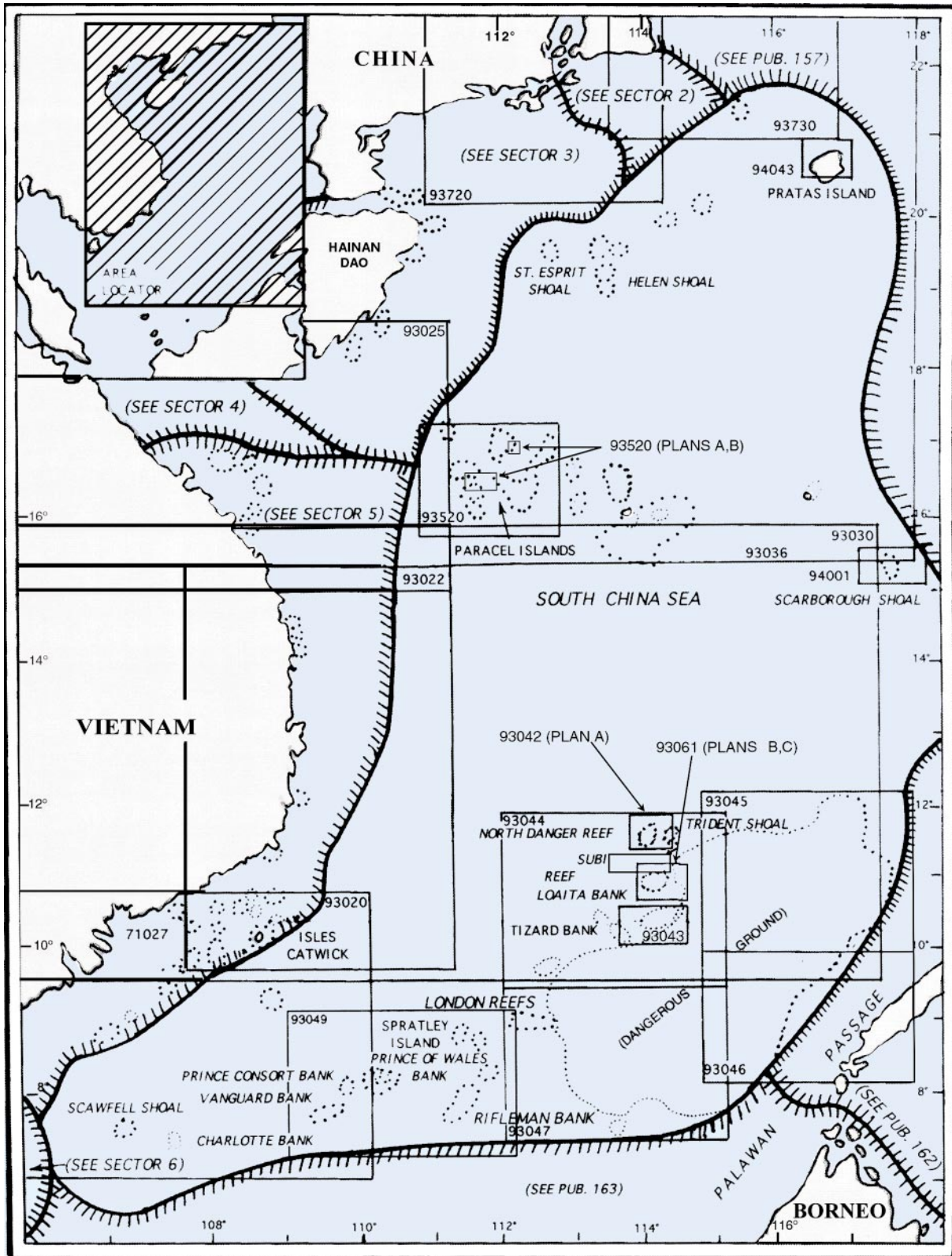
D/F	direction finder	MF	medium frequency
R/T	radiotelephone	HF	high frequency
GMDSS	Global Maritime Distress and Safety System	VHF	very high frequency
LF	low frequency	UHF	ultra high frequency

Navigation

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

Miscellaneous

COLREGS	Collision Regulations		
IALA	International Association of Lighthouse Authorities	No./Nos.	Number/Numbers
		PA	Position approximate
IHO	International Hydrographic Office	PD	Position doubtful
IMO	International Maritime Organization	Pub.	Publication
loa	length overall	St./Ste.	Saint/Sainte



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.
SECTOR 1 — CHART INFORMATION

SECTOR 1

THE SOUTH CHINA SEA—CENTRAL PART

Plan.—This sector describes the central part of the South China Sea, from Pratas Reef to Scawfell Shoal, about 1,100 miles SW, including Dangerous Ground. The description is from NE to SW.

General Remarks

1.1 Winds—Weather.—Typhoons occur mostly from July to November, but have developed at other times. Most are found N of 15°N when passing through the South China Sea and follow W to WNW track lines. Typhoons have been known to form in the South China Sea and move on a NW to NE course out of the area.

Typhoons of the western North Pacific Ocean are tropical cyclones and do not differ from the cyclonic storms of other tropical waters. The winds of the typhoon blow counterclockwise and incline toward the center of low-barometric pressure.

The Northeast Monsoon is much stronger and more persistent than the Southwest Monsoon. Over the open sea the Northeast Monsoon is rarely interrupted, while the Southwest Monsoon is often weak and irregular. Winds from the E and SE, which may last for 1 or 2 days, are usually the winds that break the storm system.

The change from one monsoon season to another is not abrupt, but takes place in a series of surges extending over a period of 4 to 6 weeks. Transitional months may vary slightly with latitude. The Northeast Monsoon starts earlier and lasts longer in the N latitudes, and the Southwest Monsoon starts earlier and lasts longer in the S part of the area.

Advance warning of an approaching tropical depression or typhoon may be had by observing such items as swell, barometric pressure, cloud cover, and squall activity.

Tides—Currents.—In the open sea, tidal currents are overshadowed by the monsoon drifts. In the vicinity of the land or on banks and shoals, the tidal currents must be considered. Moreover, when near the banks and shoals, there is apt to be a deflection of the monsoon currents as well as a marked increase in velocities.

September is the transition month, commencing the SW set of the Northeast Monsoon currents in the W areas of the South China Sea. This current reaches its maximum velocity and constancy in the months of December and January. The time of the onset of the Southwest Monsoon varies, so that in some years the transitional stage may be up to the middle of May.

On the average the NE current of this monsoon attains its greatest velocity and constancy from June to August.

The foregoing remarks are strictly averages for the entire area. Some degree of variation is noted such as between the S and N areas of the South China Sea, as well as between the E and W portions.

Also of profound effect on the current is the proximity of tropical storms that will produce a marked difference from the normal flow.

The South China Sea

1.2 The central portion of the South China Sea is entered from the N through the Luzon Strait and Taiwan Strait, from the S through the Singapore Strait, and from the E from the Sulu Sea. This area is bounded on the E by the Philippines, on the S by the island of Borneo, on the W by Vietnam, and on the NW and N by China.

Care should be taken not to violate restricted waters or to approach too closely to the shores of the countries bordering the South China Sea without clearance from the proper authorities. Additionally, jurisdictional disputes at times involve the islands in the open sea area and may cause a conflict should a vessel approach too closely.

The choice of routes and passages in the South China Sea must take into consideration the monsoon season, as well as the size and power of the vessel.

Most dangers in the South China Sea are surrounded by deep water, thus rendering soundings useless when approaching them. The approach toward a danger should be made with the sun astern so as to make shoal water or breakers readily distinguishable.

It is considered only probable that all dangers have been located, except in the areas indicated as unsurveyed on the chart, and the positions of many dangers may be as much as 2 or 3 miles in error. Additionally, many reported dangers have not been confirmed, hence their existence and exact location are in doubt. It is prudent to give these types of dangers a wide berth. With the exception of North Danger Reef, Tizard Bank, and the W side of Pratas Reef, the central part of the South China Sea has not been wire dragged.

Accurate fixes are essential before attempting any passages that diverge from the recommended routes. All navigational equipment should be exploited to the fullest extent; however, navigators must depend mainly on lookouts aloft and favorable weather when in the vicinity of reefs or possible dangers. Vessels intending to enter lagoons should be assisted by lead boats equipped to lay temporary buoys.

There are no ports, with the exception of some offshore marine terminals, and only a few protected anchorages within the limits of this sector.

Pipelines lead between structures within a field, between the various fields, and to the shore collecting stations. Gas pipelines contain high pressure flammable natural gas. Navigation is restricted and anchoring or trawling is prohibited in these areas.

Vessels causing damage to a pipeline by anchoring or trawling risk prosecution, fire hazard, and loss of buoyancy to the vessel.

Floating or fixed drilling rigs may be encountered in some areas covered by this publication. The emitted flares from these structures may be seen from distances exceeding 20 miles.

Buoys and lighted buoys associated with drilling operations are frequently moored in the vicinity of the rigs. The positions

of these rigs and buoys are subject to change, and where known, the changes are promulgated by NAVAREA XI Radio Navigational Warning Messages.

Permanent platforms, structures, and buoys are usually charted. These structures exhibit lights (Mo (U) 15 seconds) and sound fog signals (Mo (U) 30 seconds). Numerous below-water obstructions, some marked by buoys, lie in the gas fields.

The limits of the gas fields are charted, but not all of the features are contained within a field. Special care should be exercised when navigating in the vicinity. Anchoring within a gas field is prohibited, except where designated.

Fishing is a major industry and one of the main sources of food in many countries bordering the South China Sea. There is little evidence of fish migration, but certain grounds have seasonal fishing due to their exposure to the Northeast Monsoon and the Southwest Monsoon. Traps, seine and drift nets, lines, lures, and bottom trawls are used.

Sizes of craft vary from rowing or sailing boats (3m in length), to larger, powered craft. In the coastal waters, the fishing fleet may number from 3 to 50 vessels, with net and line fishing out to the 10m curve, and trawling in deeper waters.

Enormous fleets of fishing junks are met off the coast of China. As a rule, the junks have their smallest sail forward. Large trading junks have five masts, with two small sails aft.

Chinese junks do not carry the regulation lights.

Vessels fishing for squid may be encountered in the vicinity of the Taiwan Strait, principally from July to October. Bright lights may be shown at night to attract the fish.

Fish havens and Fish Aggregating Devices (FADS) are generally established within 5 miles of the shoreline and are markedly frequented by fishing vessels. Fish traps have been reported well offshore despite their generally being set in fairly shallow waters. Marine farms may be moored up to 30 miles offshore and may be attended by service vessels. As their placement may be temporary, they are not necessarily charted.

Pratas Island

1.3 Pratas Island (20°42'N., 116°43'E.), lying on the W central edge of Pratas Reef, lies 160 miles SE of Hong Kong and constitutes a danger to vessels en route between Manila and Hong Kong or transiting the Taiwan and Singapore Straits.

Pratas Island is composed of sand, covered with scrubby brush, and attains a height of about 12m to the top of the vegetation. There is a small settlement with a weather station located near the center of the E part of the island.

Landing is possible on the S side of the E extremity of Pratas Island. The shallow inlet at the W end of the island is accessible to small boats only. A reef, which dries, extends off the W side of the island with several detached coral patches being found between this reef and the main reef to the NW.

Pratas Reef is a classic example of a coral atoll, being roughly ring-shaped and about 13 miles in diameter. The lagoon within the reef is coral-studded with depths of up to about 16m. The N, S, and E sides uncover and are steep-to; the W side has submerged dangers through which a channel leads into the lagoon.

The lagoon entrance channel leads from a position about 3 miles S of the W end of Pratas Island in a NE direction for about 4 miles. The channel is reported to have depths of over

2.7m, but crosses charted areas of lesser depth. Buoys and range beacons mark the fairway. It is bordered on the N by a white sand spit and passes to the SE of the ordnance dumping area within the reef.

Several wrecks lie stranded on Pratas Reef. One of these wrecks lies about 7.5 miles, bearing 050°, from the E extremity of the island. A light is shown from a position near the SE extremity of Pratas Island and an airfield control tower stands about 0.5 mile WNW of the light. In hazy weather, the island is seldom seen beyond 5 or 6 miles, and the breakers on the reef may not be seen until within 1 mile.

In fair weather, anchorage in the swept area to the W of the island is available to vessels with prior clearance. The anchorage has various depths and a sandy bottom. A vessel of light draft might anchor on the reef, in the middle of the channel entrance, in a depth of 5.5m, or cross the reef and anchor inside the lagoon.

Caution.—During the strength of the monsoons, vessels should pass leeward of the reef because the currents invariably set with the wind. The weather is frequently thick and hazy near the reef and soundings give no warning of close approach to it. A wide berth is recommended.

A 9.2m patch lies 3 miles WSW of the W end of the island.

Currents and rips have been reported to be strong in the sector extending 20 to 50 miles NW through NE and E of Pratas Reef and are sometimes mistaken for breakers.

Circular ammunition dumping areas are located about 5.25 miles SW, 1 mile SW, and 1.75 miles SSE of the SE point of Pratas Island.

1.4 Huizhou Oil Terminal (21°21'N., 115°25'E.) consists of two offshore oil platforms and three tanker mooring buoys established 90 miles SE of Hong Kong. A platform and tanker mooring buoy, which lies about 14 miles NE, are connected by a submarine pipeline.

Xijiang Terminal (21°18'N., 114°59'E.), developed 20 miles W of Huizhou Oil Terminal, consists of three offshore tanker mooring buoys connected by a submarine pipeline. Pilotage is compulsory; the pilot boards by helicopter no less than 4 miles from the terminal. Vessels should notify agents and the terminal with an ETA 96 hours, 72 hours, 48 hours, 24 hours, and 12 hours prior to arrival.

Caution.—Several well heads, with varying depths best seen on chart, exist in the area around these terminals.

1.5 Vereker Banks (21°00'N., 116°00'E.) consists of two steep-to coral banks 45 miles NW of Pratas Reef. Heavy tide rips and overfalls have been reported in this area. During the month of February, the set of the current in the vicinity of the banks varies between WSW and WNW. At times it sets to windward although, with calms or light SW winds it sets between SSE and ESE. Normal rates of drift are 0.2 to 1 knot.

North Vereker Bank has a least known depth of 11m (1972), with general depths of 60 to 90m over the remainder of the bank. About 2 to 3 miles of deep water separates North Vereker Bank from South Vereker Bank, which has a least known depth of 58m.

A well head, with a depth of 4.1m, lies 30m off North Vereker Bank and is charted.

A well head, in a depth of over 100m, lies 28 miles N of Vereker Banks, in position 21°38'N, 116°03'E. The associated production platform and SPM form Lu Feng Terminal, which is enclosed by a restricted area. Exploration for oil is taking place in this vicinity.

Lan Shui Terminal (Liuhoa Field) (20°50'N., 115°41'E.) (World Port Index No. 57775) is a purpose built Floating Production Storage and Off-loading vessel (FPSO).

Caution.—A restricted area extends a radius of 2 miles around Jiazi Offshore Platform in position 21°22'15"N, 116°09'25"E. The platform 3 miles N of it has been removed and the restricted area withdrawn.

1.6 Saint Esprit Shoal (19°33'N., 113°03'E.) is an isolated coral shoal, with a least depth of 10.8m, lying 35 miles W of the customary track from Hong Kong. Strong rips have been observed in the vicinity of the shoal. Currents generally set with the wind.

Helen Shoal (19°12'N., 113°52'E.) lies 50 miles SE of Saint Esprit Shoal and 15 miles E of the usual route from Hong Kong. The shoal is steep-to, breaks in bad weather, and is charted with a least depth of 10.2m. A depth of 18.3m has been reported to lie 6 miles SE of the shoal.

Strong rips have been observed in the vicinity of Helen Shoal, but upon further investigation deep water was found.

The current is little affected by the shoal and usually sets with the prevailing monsoon.

The Paracel Islands

1.7 The Paracel Islands (16°40'N., 112°20'E.) are made up of the Amphitrite Group, the Crescent Group, and several off-lying islands and coral reefs lying W of the main Hong Kong-Singapore route. The islets are of low elevation; some are covered with trees or vegetation.

Navigation through the area presents little difficulty in fair weather provided a good lookout is kept, preferably high on the mast. Breakers are often visible on many of the reefs and above-water rocks. The use of radar is encouraged as many wrecks lying stranded on the surrounding reefs are radar conspicuous.

In poor weather, unless seeking anchorage, the Paracel Islands should be avoided. Currents generally correspond to the prevailing monsoon, but with a light wind, continually change direction over the reefs attaining a rate of 2 knots. Anchorages, though available, are mostly open and offer only slight protection when leeward of the islands.

1.8 North Reef (17°06'N., 111°30'E.) is the northwesternmost danger in the area. The reef is about 7 miles long on its E-W axis, 2.5 miles wide at its broadest width, and steep-to. Rocks break the surface all around the edge of the reef and at certain times the breakers on the reef can be heard at a considerable distance. A boat passage on the SW side of the reef is marked on its E side.

North Reef is reported to be a good radar target, possibly due to the breakers and wreckage on the reef.

The **Amphitrite Group** (16°53'N., 112°17'E.) is the northeasternmost cluster of islands, reefs, and shoals in the Paracel Islands and consists of two parts separated by a deep channel

3.5 miles wide. The N portion has two main reefs bisected by Zappe Pass. Several small islands stand on these two reefs.

The S portion consists of Woody Island and Rocky Island, which lie upon a common reef.

Zappe Pass is about 0.5 mile wide between the reefs and has a least known depth of 4.6m. It is available only for small craft during favorable conditions. With a fresh breeze, breakers extend across the pass and there is usually a strong current running through it.

West Sand is a low sandy cay lying near the W extremity of the northernmost reef. **Tree Island** (16°59'N., 112°16'E.) lies 4 miles E of West Sand and about 1 mile from the E extremity of the reef. The island is covered with mangrove bushes, surrounded by a white sand beach, and has a palm tree near its center.

Tides—Currents.—Currents of 6 to 7 knots have been reported E of the Amphitrite Group during springs.

1.9 North Island (16°58'N., 112°18'E.) lies 2 miles ESE of Tree Island across Zappe Pass. A reef extends nearly 0.5 mile NW from North Island and 4 miles SE. Several small buildings stand on the island.

To the SE of North Island lie Middle Island, South Island, and **South Sand** (16°56'N., 112°20'E.). Anchorage may be taken, in depths of 20 to 29m, SSW of North Island and Middle Island, over a bottom of sand. A depth of 20m lies 3 miles NE of South Sand.

1.10 Woody Island (16°50'N., 112°20'E.) lies 9 miles SSE of Tree Island in the Amphitrite Group; it is the southernmost and largest of the islands. It is about 1 mile in length, covered with trees, and surrounded by a white sand beach. Guano is shipped from the island.

Aspect.—Two mooring buoys lie close N of Woody Island.

In the vicinity of the settlement on the island are a square tower, two temples, a meteorological station, and several large buildings. On the S side of the island stands an observation tower and four whip antennas situated about 0.3 mile N of this tower.

A light is shown from a white round stone tower with black bands. Landing can be effected on the SW side of Woody Island. This island is connected to Rocky Island to the NE by an overhead cable. There are depths of 14.6m 5 miles SSE of Woody Island.

Anchorage.—During S winds, anchorage can be taken in a position about 0.5 mile from the reef fringing the N side of Woody Island, in a depth of 24m, sand. In NE winds there is good anchorage about 0.5 mile off the SW shore of Woody Island, in 33 to 37m, sand.

Rocky Island, 14m high, lies on the same drying reef as does Woody Island. There are a few houses on the S end and a concrete pier on the N end of the island.

Two red mooring buoys, No. I and No. II, lie outside the 20m curve, 0.8 mile NW of Rocky Island. A depth of 14.6m exists in approximate position 16°46'N, 112°21'E.

Iltis Bank (16°46'N., 112°13'E.), with depths of 10.6 to 14.8m, lies 7 miles SW of Woody Island. The bank is about 3 miles long, 1.5 miles wide, and is fairly steep-to.

Caution.—Caution is advised when anchoring due to the lack of shelter available and imperfect surveys of the area.

The Crescent Group

1.11 The Crescent Group consists of several low sand islets and numerous reefs which form a crescent open to the S. They lie 45 miles SW of the Amphitrite Group.

The principal islands are covered with thick vegetation and have been reported to be visible from 10 miles. The lagoon, partly enclosed within the islands and reefs, is about 20 square miles in extent and provides suitable shelter for most classes of vessels.

Caution.—Navigation at night between the islets of this group is dangerous.

1.12 The **Duncan Islands** (16°27'N., 111°43'E.) is actually two coral islets joined by a sand spit and surrounded by a coral reef that is steep-to. It lies on the SE horn of the crescent and is separated from Drummond Island to the E by the SE lagoon entrance channel which is deep and about 1.5 miles wide. A rock, with a depth less than 1.8m, lies close SE of the E island.

Drummond Island, covered with mangroves and bushes, is 3m high and lies on the SW tip of a continuous reef that extends NE about 4 miles, then curves NW about 4 miles to Observation Bank.

Observation Bank constitutes the N extremity of the Crescent Group. It is a sand cay on a reef about 2 miles long oriented in a SE-NW direction. A detached reef extends about 3.2 miles WSW from the N end of the main reef. The area of the lagoon within the bight of this detached reef and the reef stretching NE and NW of Drummond Island is foul.

1.13 **Pattle Island** (16°32'N., 111°36'E.), 9m high, is covered with brush and mangroves. A reef surrounding the island extends about 1.7 miles NE. On either side of the reef there is a clear channel. Boats can land at LW in a bight on the S side of the island, taking care to avoid the rocks close to shore.

There is a large three-story building in the center of the island with another large building close E. Atop the W building is a skeleton tower surmounted by a flag staff.

A prominent pylon stands about 0.1 mile WSW of the buildings and a conspicuous shrine lies on the SW extremity of the island. There is a meteorological station and a well from which water is available on Pattle Island.

A rock jetty, 183m long, is usable by small boats and extends from the E side of the island, terminating seaward in a small T-head. A red building is situated at the root of the jetty. Depths alongside the face of the T-head range from 1.5 to 2.7m at HW.

The climate at Pattle Island is precarious after a rainfall, when a noxious gas arises from the guano deposits.

Robert Island lies 2 miles SW of Pattle Island. It is 8m high, fringed by a reef, and covered with vegetation. There is a conspicuous observation tower on the S end of the island. Landing can be effected on its E side and well water can be obtained here.

A bank, with depths of 4m and less, extends about 0.8 mile N from Robert Island and another bank, with depths of 1 to 6m, lies within 0.3 mile of the shore on the SE side.

Caution.—Anchorage is not recommended in the area due to the coral bottom.

1.14 **Antelope Reef** (16°27'N., 111°35'E.), which partially dries, forms the SW horn of the crescent. A sand cay is located on the SE extremity of this reef.

The lagoon entrance, between Duncan Island and Antelope Reef, is about 5 miles wide and deep. There is a 3.7m patch and an 8.5m patch located 3.5 and 2.8 miles W, respectively, of Duncan Island.

Anchorage.—There is a good choice of anchorages within the lagoon to suit any prevailing conditions. Depths range from 7.3 to 12.8m over the coral heads to 20.1 to 47.6m in the more open portions. There is good shelter during the Northeast Monsoon, but a swell can develop during the strength of the Southwest Monsoon. The tidal current in the SE entrance to the lagoon has been observed to be about 1.5 knots, but within the anchorage the tidal current is inappreciable.

Anchorage can be taken near the reef off the N side of Duncan Island, in 18 to 27m, where there are broad patches of sandy bottom.

Money Island (16°27'N., 111°30'E.), 6m high and brush covered, lies at the W end of a reef which is separated from the SW horn of the crescent by a channel about 1.5 miles wide. Several sand cays lie E of Money Island on the same reef. The island is reported to be a good radar target.

Reefs and Islands

1.15 **Dido Bank** (16°49'N., 112°53'E.), with a depth of 23m, is steep-to with depths of 146m and more around it.

Lincoln Island (16°40'N., 112°44'E.) is the easternmost island of the Paracel Islands and lies 40 miles W of the main Hong Kong-Singapore route. The island is 5m high and brush-covered, about 1.25 miles long, and fringed by a drying reef.

A tower stands on the NE end of the island; the NE face of the island is bluff. It is reported that water can be found on Lincoln Island and that the island is a good radar target.

Anchorage.—Anchorage can be taken leeward of Lincoln Island about 0.5 mile offshore, in 18m, coral.

Caution.—Mariners are advised not to cross the bank which extends 14 miles S, then 5 miles WSW from the SE end of the island as it has not been completely examined. This narrow coral bank is studded with rocks. A wreck, reported to be radar conspicuous, lies stranded on the bank about 1.8 miles SE of the SE extremity of the island.

A 15.1m patch and a 13.2m patch lie about 1 mile S and 1.5 miles W, respectively, of the S end of this coral bank. Further shoaling in this vicinity appears highly probable because of the irregular bottom, with visible coral reefs running E and W.

Another bank, with depths of less than 18m, extends about 1.2 miles NW from the island.

1.16 **Pyramid Rock** (16°35'N., 112°39'E.), 5m high and cone-shaped, is located 7.2 miles SW of Lincoln Island. When seen from a distance, this islet could be mistaken for a junk.

A 12m patch and 16.5m patch lie 6.5 miles and 10 miles WSW, respectively, of Pyramid Rock in the area close N of Neptuna Banks. Another patch of 20m lies 2 miles SSW of the above 16.5m depth.

Bremen Bank lies 15 miles N of Bombay Reef; it is 14.5 miles long and ENE-WSW oriented, having a least depth of

11.4m near its SW end. In 1954, the bank was reported to be extending W.

Jehangire Reefs lie about 5 miles ENE of Bremen Bank. There are three detached patches with the least depth being 12.8m on the SW part of the S patch. The depths among the patches are very irregular.

Bombay Reef (16°02'N., 112°31'E.), the southeasternmost known danger of the Paracel Islands, is a steep-to reef 10 miles long E and W that surrounds a rock-strewn lagoon. The sea breaks on the reef where there are several rocks awash, four above-water rocks, and the remains of many old wrecks. The stranded wreck on the NE extremity of the reef was reported to be radar conspicuous up to 15 miles. A light is shown from the SW extremity of this reef.

Caution.—Caution is necessary when navigating in the vicinity of Bombay Reef.

There is a 1.2m bore at HW which resembles breakers on a reef between Bombay Reef and Vuladdore Reef.

Vuladdore Reef lies about 35 miles NW of Bombay Reef. It is 7 miles long, a little over 2 miles wide, and has a few rocks above-water. At times, the sea breaks heavily over this reef.

1.17 Discovery Reef (16°14'N., 111°40'E.) takes the form of a large atoll lying about 20 miles WSW of Vuladdore Reef. The reef is steep-to and marked by heavy overfalls. Several above-water rocks lie on the reef which has barely 3.7m of water over any part of it. Boats can enter the lagoon through channels on the N and S sides of Discovery Reef, the narrower channel being the one on the N side. A stranded wreck lies on the S side of the reef.

Passu Keah (16°03'N., 111°46'E.) is a sand cay located on the W end of a steep-to reef which is 5 miles long in an E-W direction. It is located about 8 miles S of Discovery Reef.

Triton Island (15°47'N., 111°12'E.) is the southwesternmost danger in the Paracel Islands. It is a sand cay about 3m high and less than 1 mile in diameter. The surrounding reef is steep-to, with at most 1.8m of water over it; it extends about 1 mile N and NE and about 0.5 mile in other directions. The island is a breeding place for birds. In 1986, a square white building was reported to be conspicuous near the center of the island.

Caution.—Triton Island is extremely difficult to distinguish when approaching the Paracel Islands from the SW. A wide berth to the W is recommended. It has been reported that Triton Island has not shown on radar when vessels have been as close as 1 mile.

Macclesfield Bank

1.18 Macclesfield Bank (15°45'N., 114°20'E.) is a submerged atoll about 75 miles long on its NE-SW axis and about half that wide at its broadest part. Its W edge lies about 35 miles SE of the main Hong Kong-Singapore route.

Caution.—Caution should be exercised in the vicinity of Macclesfield Bank. Although the bank can usually be seen from aloft due to the fact that in heavy weather the sea along its edge is high and confused, the W part of the reef and lagoon have been only partially examined. Shoals other than those charted may exist. It is recommended that vessels pass either well W or E of the bank.

The coral rim of Macclesfield Bank, with an average width of 3 miles, has depths of 11.8m at Pygmy Shoal on the NE end of the bank and depths of 11.6 to 18m elsewhere. Many other shoals lie around the rim with their depths best seen on the chart. Within the lagoon, Walker Shoal is the shallowest known danger, with a depth of 9.2m.

1.19 Truro Shoal (16°20'N., 116°43'E.), with a depth of 18.2m, lies 110 miles E of Pygmy Shoal. In 1983, the position of the shoal was reported to be doubtful.

Scarborough Reef (Scarborough Shoal) (15°08'N., 117°45'E.) consists of a narrow belt of barely submerged reef enclosing a lagoon. On the belt are scattered rocks which are visible at a considerable distance. A score or more of these rocks, standing 1.5 to 2.5m high, are found on the SW corner of the reef with South Rock, the highest of these scattered rocks, on its SE extremity. In 1986, the reef was reported to lie 2 miles N of its charted position. Scarborough Reef Light is shown from the NE side of the reef.

Close N of South Rock is a channel about 0.2 mile wide with general depths of 7.3 to 9.2m leading into the lagoon.

This channel is encumbered with reef patches as shallow as 2.7m; the lagoon is almost completely filled with subsurface coral heads at about 15m intervals.

A radar-conspicuous stranded wreck, used as a bombing target, is located on the SE side of the reef in approximate position 15°05'30"N, 117°50'00"E. Fishing vessels frequent the reef.

The ruins of an iron tower stand close to the above channel opening. A line of breakers marking the reef has been seen at a distance of 10 miles. Currents in the vicinity of the reef vary with the monsoons, setting NE during the Southwest Monsoon, and in a W or NW direction during the Northeast Monsoon.

Dangerous Ground

1.20 In the SE part of the South China Sea lies an oblong area about 52,000 square miles in extent, known as Dangerous Ground. Dangerous Ground is a large area to the NW of the Palawan Passage which is known to abound with dangers. No systematic surveys have been carried out in the area, and the existence of uncharted patches of coral and shoals is likely.

Sovereignty over some of the islands in Dangerous Ground is subject to competing claims which may be supported by a force of arms. Vessels are warned not to pass through this area.

The area is studded with sunken reefs and coral atolls awash. The major axis of the area bears about 045°-225° for a distance of 340 miles with a maximum breadth along its minor axis of 175 miles. For the approximate limits of Dangerous Ground, the appropriate charts should be consulted.

Squalls frequently arise temporarily reducing visibility to zero. The sea is usually a greenish-blue color with a transparency to depths of 24 to 42m, and on clear days with the sun behind the observer at an altitude of more than 30°, it is possible to make out the bottom clearly at a depth of 29m.

Sunken reefs may not show discoloration when the sun is low, the sea is mirror like, or the sky is overcast. Close to shoal water, discoloration may not be apparent, but the flow of currents against the wind may cause a belt of rips.

Occasionally the presence of an atoll may be detected by reflection of the discolored water on the underside of clouds directly above it. At low tide, drying patches and rocks are more easily located. With a gentle or moderate breeze, breakers become visible, marking reefs awash.

Winds—Weather.—During the Northeast Monsoon, there are very few squalls and these are of short duration. The weather is comparatively dry and fair with prevailing winds from the NE. Little or no swell was observed during the Northeast Monsoon. When circumstances require, this is the best season for navigating in the region of Dangerous Ground.

The onslaught of the Southwest Monsoon brings increasing cloud cover and squall activity. The wind velocity ranges from a dead calm to a strong breeze, becoming variable in direction.

As the Southwest Monsoon gathers strength, the sea becomes rough and the sky overcast. A fresh SW breeze, accompanied by a moderate to rough SW sea and heavy rains, prevails during the middle months of this monsoon. A moderate SW swell may arise that is usually greater in the W than in the E of Dangerous Ground.

There are many days during the Southwest Monsoon when it is impossible to obtain celestial observations. Considerable atmospheric disturbance to long wave radio broadcasts may be experienced. The high humidity may cause some damage to radio apparatus.

Tides—Currents.—Accurate information on ocean currents is not available in the region of Dangerous Ground.

Caution.—Throughout the area of Dangerous Ground, vessels must rely heavily on seaman's eye navigation and should not normally enter the area other than in daylight.

Radar is of little value. The reefs rise abruptly from ocean depths, hence, soundings give no warning. An uncharted sounding of less than 1,100m should at once call for extreme caution. Difficulty may be experienced with celestial observations because of false horizons. In April or May, during fair weather, mirages are frequently encountered.

Vessels are cautioned not to enter the area other than in an emergency. Little advantage can be had in deviating from the recommended routes in the South China Sea to cross this area in view of the extensive dangers to be encountered. Due to the conflicting dates and accuracy of the various partial surveys of Dangerous Ground, certain shoals and reefs may appear on one chart, but not on another regardless of the scales involved.

Charted depths and their locations may present considerable error in the lesser known regions of this area. Avoidance of Dangerous Ground is the mariner's only assurance of safety.

1.21 North Danger Reef (11°25'N., 114°21'E.) is a steep-to coral formation lying to the NW of Dangerous Ground. It is about 8.5 miles long and encloses, but does not shelter, a lagoon. This lagoon is remarkably flat in the inner portions where it has been wire dragged to a depth of 18m, with the exception of an isolated coral head, wire-dragged to a depth of 14.6m, in about the center of the lagoon. The surrounding reef is shallow and variable in width. There are many dangers with depths of less than 9.2m. All known dangers are plainly visible in suitable conditions of light.

North Reef, at the NE end of North Danger Reef, dries in patches. The sea breaks heavily on its weather side during the Northeast Monsoon. North Pass separates North Reef from

North East Cay, but is recommended only for small craft entering the lagoon.

North East Cay (11°27'N., 114°21'E.) is about 0.4 mile long in a NE-SW direction and fringed by a drying reef extending 0.5 mile NE. It is 3m high, 91m across at its widest point, and covered with shrubs. A light is shown close NE of North East Cay. Shira Islet, a conspicuous hummock, lies about 0.2 mile SE of the observation spot on the SE end of North East Cay.

Middle Pass separates North East Cay from South West Cay. The pass is about 0.75 mile wide and has been wire dragged to a depth of 6.4m in its middle part.

Tidal currents, having a rate of about 1.8 knots, have been experienced in this pass.

South West Cay, located toward the SE part of a drying reef, is thickly wooded. A mast stands near the center of the cay and a gray metal tripod supports a radar reflector on the NE end of South West Cay. Landings have been effected on the SE side of the cay and are possible during the Southwest Monsoon. There are a few buildings on the cay. The cay is marked by a light.

West Pass is divided into two parts. The N part lies between Jenkins Patches and South West Cay and is wire dragged to 10m through its center to the lagoon. Jenkins Patches have a least known depth of 3.7m and occasionally break. The S part of West Pass separates Jenkins Patches from South Reef. This pass is dragged to 8.4m and is about 0.5 mile wide.

1.22 South Reef (11°23.3'N., 114°17.9'E.), at the SW end of North Danger, dries in patches. A rock, that dries 1m, stands on the SE side of the reef. The sea breaks heavily on the weather side of this reef during the Southwest Monsoon. Both this reef and North Reef appear greenish-white and can be easily distinguished in fine weather.

The remainder of the encircling reef, to the E then N of South Reef to North Reef, contains two more passes and several named shoals.

South Pass, dragged to 8.5m, is about 0.5 mile wide and is separated from East Pass by Sabine and Farquharson Patches. East Pass, about 1.2 miles wide, has clear depths of 7.7 to 9.3m. Day Shoal, which always breaks in rough weather, and Iroquois Ridge lie N and NW, respectively, of East Pass.

Tides—Currents.—The tides are almost entirely diurnal, with a large diurnal inequality.

The currents near and within North Danger Reef seldom exceed 1.5 knots. The currents appear to be mainly seasonal, depending on the prevailing monsoon and there is very little relation between the tides and the currents. Near the reef, currents having rates of a little over 1 knot may be experienced, with the direction depending on the prevailing wind.

Anchorage.—Ships have anchored about 0.5 mile S of North East Cay during the Northeast Monsoon and 1.25 miles SSE of South West Cay after proceeding through West Pass. Throughout the lagoon there is good holding ground, coral sand. There is little shelter, however, as the depths over the sunken rim of the atoll are too great to restrict the seas.

Trident Shoal (11°28'N., 114°40'E.) is a submerged coral atoll lying 16 miles E of North Danger Reef. A reef, awash, lies at the N end of the shoal. Depths of 3.9m and 7.3m lie E and W, respectively, of this drying reef. No entrance to the lagoon can be recommended due to the lack of complete information concerning the atoll.

Lys Shoal, with a least depth of 4.9m, is steep-to and lies to the SSW of Trident Shoal.

Thitu Island and its adjacent reefs consist of several dangerous patches upon two coral banks extending 12 miles in an E-W direction and separated by a deep narrow channel.

1.23 Thitu Island (11°03'N., 114°17'E.) lies near the SW part of a drying reef on the E end of the W of the two coral banks. It is 4m high and overgrown with grass and scrub brush.

A light is shown from the SW end of the island near a palm grove and a well is found near the beach through the palms. Occasionally, fishermen inhabit the island as it is possible to effect a landing during the Northeast Monsoon in the middle of the W side where there is an opening in the fringing reef.

Anchorage can be taken outside the reef, about 1 mile SW of the island, in a depth of 18m, from which position the reef is visible.

The W reefs of Thitu Island are composed of several drying reefs and shoal patches. A sand cay lies on one of these drying reefs about 3.5 miles W of the island. Entrance to the lagoon can be taken through the passage to the E of the sand cay, with a least depth of 9m in the center of the channel. Many of the surrounding reefs are marked by breakers.

The E reef, its W edge lying about 0.7 mile E of Thitu Island, is a mass of drying coral and shoal water. This reef extends about 4.5 miles in a NE direction.

Subi Reef (10°54'N., 114°06'E.) is located 14 miles SW of Thitu Island. It dries, surrounds a lagoon, is steep-to, and usually breaks. There is no apparent entrance into the lagoon.

Loaita Bank, comprised of shoals, reefs, an island, and two sand cays that lie on the perimeter of a lagoon, is about 20 miles in length on its NE-SW axis which extends to the NW of Dangerous Ground.

1.24 Loaita Island (10°41'N., 114°25'E.), 2m high, is on a drying reef at the S edge of Loaita Bank. The island is covered with mangrove, bushes, trees, and coconut palms.

Two reefs lie about 5 miles NW of Loaita Island, with a sand cay on the N drying reef, and a stranded wreck marking the reef to the SW. Between these reefs and the island are several shoals, some with least depths of 5.5m.

About 2.3 miles ENE of the island is a reef, which partially dries, and 4.5 miles farther to the ENE, lies Lankiam Cay, a sand cay in the middle of another drying coral patch. Two drying reefs lie 3.2 miles ENE and 4.5 miles NE, respectively, from Lankiam Cay.

Least depths of 7.3m have been found along the NW edge of Loaita Bank, NW of the SW drying reefs of the bank. No known depths of less than 11m are found N of a position about 1 mile N of the easternmost drying reef and for a distance of about 7.5 miles along the E edge of the bank to its N extremity.

Anchorage can be taken on Loaita Bank with Loaita Island bearing 260°, distant 0.4 miles. The reef is visible from this position.

Tizard Bank, 30 miles S of Loaita Bank, is over 30 miles in length. It consists of a lagoon bordered by shoals of irregular depth, and by reefs which dry. There are islets on two of the reefs and a sand cay on another. Several coral heads with depths of 6.8 to 12.8m lie in the lagoon. Fishermen from

Hainan Dao visit the islands annually around December and January, and leave at the commencement of the Southwest Monsoon.

Caution.—There are several passes through the fringing reefs and the lagoon within, each of which contain numerous dangers which require local knowledge.

These entrances should be used only under the most favorable conditions of light, sea, and weather.

Depths of up to 3.7m less than charted can be expected over the coral shoals and that the shapes of the drying reefs have also changed considerably. Mariners should navigate with extreme caution in this vicinity.

1.25 Namyit Island (10°11'N., 114°22'E.), on the S side of Tizard Bank, about 12 miles S of Itu Aba, is 18m high and covered with small trees and brush. It lies on a reef which extends a little over 1 mile W and 0.5 mile E.

Gaven Reefs (10°12'N., 114°13'E.) is comprised of two reefs which cover at HW and lie 7 miles W and 8.5 miles WNW, respectively, of Namyit Island. They are the SW dangers of Tizard Bank. The N of the two reefs is marked by a white sand dune about 2m high.

Anchorage can be taken, in 13 to 18m, between Sand Cay and the drying reef to the W. Vessels having local knowledge can anchor in convenient depths within the various passes of Tizard Bank, having due regard for conditions of wind and sea.

Caution.—An ammunition dumping ground lies about 6.7 miles N of Itu Aba Island.

1.26 Itu Aba Island (10°23'N., 114°22'E.), 2m high, lies on the NW corner of Tizard Bank. It is surrounded by a reef that usually breaks and on which a wreck lies stranded. The island is covered with scrub brush and trees whose tops are about 30m high. There are a few buildings, some in ruins, and a tower-like structure on the island. A lookout mast stands near the E end, and a concrete landing jetty, with a depth of 0.6m at its head, near the SW end of Itu Aba Island.

A reef, which uncovers 0.6m, lies 2 miles E of Itu Aba Island. A grass-covered sand cay, 3m high, lies on the reef rim about 4 miles further to the E. There are a few trees between 5 and 10m high on the cay.

Petley Reef, which dries 0.9m, is about 1 mile in extent and lies on the N side of Tizard Bank. Eldad Reef, 7 miles ESE of Petley Reef, is the easternmost drying reef of the group. The reef is 4.5 miles long with the middle section having a depth of about 1.2m, located at the NE end of the reef.

Western Reef (10°16'N., 113°37'E.) lies 36 miles W of Gaven Reefs. It contains submerged rocks, with depths of 1.8 to 5.5m, is steep-to and dangerous.

Discovery Great Reef (10°01'N., 113°52'E.) is a long, narrow atoll that lies with its N end about 18 miles SE of Western Reef. The reef rim has several drying rocks on it of which one, called Beacon Rock, stands on its S end. There is no apparent entrance into the lagoon. This atoll is reported to be visible at a distance of 9.5 miles from a height of 21m.

Discovery Small Reef (10°01'N., 114°01'E.), lying 10 miles E of the S extremity of Discovery Great Reef, is a round, steep-to, coral patch which dries.

Dangerous Ground—East and North of Tizard Bank and Loaita Bank

1.27 Menzies Reef (11°09'N., 114°48'E.) lies at the NE end of a ridge of foul ground that is an extension of Loaita Bank. It is awash at LW and the least depth on the reef, which extends 13 miles SW, is 3.7m.

Between the NE end of Loaita Bank and the SW end of the reef extending from Menzies Reef is a narrow passage having a least known depth of 32.9m.

West York Island (11°05'N., 115°00'E.) is covered with trees and bushes and has some tall coconut palms on its S end.

The reef fringing the island extends 1.25 miles farther off the N side than elsewhere.

Irving Reef (10°52'N., 114°55'E.), located 12 miles SSW of West York Island, dries in patches and encloses a small shallow lagoon. A sand cay lies near the N end of the reef. A narrow channel, with a least depth of 12.8m, separates Irving Reef from a small reef to the WSW.

Southampton Reefs consist of **Livock Reef** (10°11'N., 115°17'E.) and **Hopps Reef**, about 5 miles NE. Livock Reef, the larger of the two, encircles a lagoon and has a few isolated rocks on it which may be visible at HW.

Jackson Atoll (10°30'N., 115°45'E.) consists of a nearly circular atoll about 6 miles in diameter enclosing a clear, deep lagoon. Five reefs, each with drying patches, lie on the rim of the atoll. There are four main entrances into the lagoon.

The NE and E entrances are the deepest, each having a width of about 1.2 miles and depths of 16.2 and 16.8m, respectively, between the shoals.

Anchorage, with good holding ground, can be obtained anywhere within the lagoon over a bottom of sand and coral, but it provides no shelter during inclement weather.

1.28 Nanshan Island (10°44'N., 115°49'E.), 2m high, is sandy and covered with coarse grass and a few coconut trees. Fishermen frequent the island. Depths of 12.8 to 21.9m are found S of Nanshan Island, however, there is a possibility of there being less water than this in the vicinity.

Flat Island lies 5 miles N of Nanshan Island. It is a low, sandy islet with a fringing reef extending about 2 miles NE and SE from it.

A large bank, with reported but unconfirmed depths of 46m, extends 8 miles SE from Flat Island and Nanshan Island. Vessels engaged in fishing may be sighted on this bank.

Hopkins Reef (10°49'N., 116°05'E.) lies 15 miles E of Flat Island and is steep-to, shoal, and breaks heavily. Baker Reef and Iroquois Reef lie 7 miles SE and 12 miles SSE, respectively, from Hopkins Reef. Both reefs have drying patches.

These three reefs mark the approximate W limit of Amy Douglas Bank. Hirane Shoal, with a depth of less than 1.8m, lies 18 miles NE of Baker Reef. There are many shoals and reefs, with depths of less than 18m, between Hirane Shoal and Baker Reef.

Hardy Reef, which dries and has a narrow strip of sand in the middle, lies 31 miles S of Iroquois Reef.

Caution.—Directions can not be given concerning Dangerous Ground E to Lord Auckland Shoal and N to Sandy Shoal. The area is relatively unexamined, subject to conflicting reports, and considered dangerous to navigation.

1.29 Sandy Shoal (11°02'N., 117°38'E.), the position of which is doubtful, lies about 15 miles NNW of Seahorse Shoal.

Seahorse Shoal (10°50'N., 117°47'E.) is considered to be part of Palawan Passage, being the N danger on its W side. It is a pear-shaped reef about 8 miles long in a NNE direction and 3 to 4.5 miles wide. It has a least charted depth of 8.2m on the reef and 31m in its lagoon.

Between Seahorse Shoal and Lord Auckland Shoal, 35 miles SW, lies a 16.5m patch in approximate position 10°38'N., 117°38'E that is sometimes referred to as Fairie Queen; its position is doubtful.

Lord Auckland Shoal (10°20'N., 117°19'E.) has a least depth of 14.6m and lies about 15 miles N of Carnatic Shoal; its position is doubtful. Carnatic Shoal has a least depth of 6.4m and lies just within the E edge of Dangerous Ground; its position is also doubtful.

Dangerous Ground—South of 10°N

1.30 Half Moon Shoal (8°52'N., 116°16'E.) lies 26 miles WSW of Royal Captain Shoal and consists of a narrow reef, partially awash, that encloses a lagoon. The lagoon affords good shelter to small craft and has an average depth of about 27m, although it contains several coral heads with depths of as little as 0.3m.

The entrance to the lagoon is on the SE side of the reef, about 0.4 mile SW of the inclined rock, 1m high, lying on the E side of the coral belt. The pass is about 200m wide and 12.8m deep between the main reef to the S, and the sunken rock to the N. During the strength of the Northeast Monsoon, entry may be impossible. There is a tidal rise of about 1.2m over Half Moon Shoal.

Bombay Shoal (9°26'N., 116°55'E.), located 47 miles SW of Carnatic Shoal, consists of a steep-to reef which completely encloses a lagoon. Depths of 29 to 33m, sandy bottom, are found in the lagoon. On the reef are several rocks which dry about 0.6m. Madagascar Rock, which dries 0.6m, lies near the NE extremity of the reef. Two stranded wrecks lie on the NE side of Bombay Shoal. There is a tidal range of about 1.2m over the shoal. A NE flood current was observed in the vicinity of Bombay Shoal.

1.31 Royal Captain Shoal (9°01'N., 116°40'E.) stands just E of the charted limit of Dangerous Ground, about 27 miles SW of Bombay Shoal. This shoal consists of a narrow unbroken steep-to reef which encloses a lagoon. Depths of 27 to 31m, sand and coral, are found in the lagoon which is also encumbered with coral heads.

Although there is no entrance into the lagoon, small boats can cross the reef at HW under favorable weather conditions. Numerous coral heads and a few drying rocks are found on the reef. Observation Rock, which dries 1.2m, lies on the NW extremity of the reef and conspicuous stranded wrecks are found on the SW and NW corners of the reef. A westerly set of 0.8 knot has been experienced in the vicinity of the shoal.

Investigator Northeast Shoal (9°10'N., 116°25'E.), located 19 miles NNE of Half Moon Shoal, is a coral atoll with an enclosed lagoon. It dries in places and a few rocks may be visible at the W end even at HW.

The lagoon is probably accessible to boats at HW. Anchorage has been taken off the W end of the shoal, in a depth of 46m, about 0.2 mile from the edge of the reef.

Sabina Shoal (9°43'N., 116°36'E.) is a coral atoll 12 miles long on its WNW-ESE axis enclosing a lagoon. On the E half are a number of reefs awash and on the W portion depths over the reef are 3.7 to 18.3m. Sabina Shoal provides unprotected anchorage off its steep-to reef. Three rocks awash lie in an arc from N to ENE, 6 to 8 miles off Sabina Shoal.

Caution.—Caution is advised as the shoal has not been closely examined.

1.32 Boxall Reef (9°36'N., 116°10'E.), lying 18 miles SW of Sabina Shoal, is an isolated drying reef. It contains neither a lagoon nor any rocks of distinctive character.

Second Thomas Shoal (9°49'N., 115°52'E.) lies 35 miles W of Sabina Shoal. It is 11 miles long N-S, and surrounds a lagoon having depths of up to 27m which may be accessible to small boats from the E. Drying patches are found E and W of the reef rim.

1.33 Mischief Reef (9°55'N., 115°32'E.) is a circular coral atoll about 4 miles in diameter. The reef, which is awash and has several drying rocks, encloses an extensive lagoon containing an average depth of 26m. The SW part of the lagoon is free of dangers and affords good shelter, but the NE part is encumbered with coral heads with depths of less than 1.8m. Many of these heads are pinnacles, which are difficult to detect even with good lighting conditions.

There are three entrances to the lagoon along the S and SW sides of the atoll, two of which are boat channels.

South Entrance, the westernmost, has a navigable width of 37m and is 300m in length, with depths of over 18.3m. The axis of the deepest water, clearly defined in good light by its deep blue color, lies in a slight curve, approximately parallel to the edge of the reef on the W side commencing in a direction of about 005°, then curving N and terminating in a direction of about 354°. The reef on the W side is steep-to and on the E side is slightly shelving. Care is necessary since the tidal currents are strong at times, and set nearly across the entrance. At neap tides, a tidal current of 1.5 knots was observed.

South Entrance is accessible to vessels under 91m in length. Temporary buoys should be laid at the ends and middle of each side to assist conning. Vessels should enter with good headway keeping slightly W of the center of the deepest water.

Caution.—It was reported (1995) that the area within a 60 mile radius of Mischief Reef has been declared prohibited to all vessels.

1.34 First Thomas Shoal (9°20'N., 115°57'E.) is 5 miles long in an E-W direction. This reef, on which a few isolated rocks about 1m high have been observed, dries and entirely encloses a shallow lagoon.

Alicia Annie Reef (9°24'N., 115°26'E.) lies 26 miles W of First Thomas Shoal with its axis in a N-S direction. The reef, which dries, completely encloses a lagoon, however, there is no entrance to it. At LW, the N and S ends of the atoll are well above-water and the entire edge of the reef dries about 0.3m.

At the N end, a spit which appears to be white sand, dries 1.2m. Several large and a few small rocks mark the SE corner

of the reef. The outer edge of the rim of the reef is steep-to and breakers were observed on the NE side with a moderate NE breeze.

Union Atoll (9°45'N., 114°25'W.), 70 miles WNW of Alicia Annie Reef, extends in a NE-SW direction and encloses an incompletely examined lagoon about 28 miles long and up to 7.5 miles wide. There are numerous entrances through the reefs and an anchorage lies within. The rim of the atoll contains numerous drying reefs and several small cays.

Johnson Reef (9°42'N., 114°17'E.), of brown volcanic rock with white coral around the inner rim, is located at the SW end of Union Atoll. Johnson Reef partly encloses a shallow lagoon entered from the NE. The largest rock on the reef is about 1.2m high. Several other rocks show above the water on the SE part of the reef; the remainder of the reef is reported to be covered.

Discolored water was reported (1992) to lie SW of Johnson Reef in position 9°32.5'N, 114°02.0'E.

Collins Reef, a small reef with a coral dune at its SE part, lies 1.5 miles NNW of Johnson Reef. It is separated from Johnson Reef by a relatively deep channel with a coral bottom.

1.35 Sin Cowe Island (9°52'N., 114°19'E.), a reef-fringed cay, 4m high, lies on the NW side of Union Atoll. There are some buildings on the island and a beacon at its NE end.

Whitsun Reef (9°58'N., 114°39'E.) is triangular in outline and lies at the NE end of Union Atoll. Rocks on the reef uncover at LW and the reef is marked by breakers in winds of moderate force.

Grierson Reef, a small cay lying 5 miles SW of Whitsun Reef, is formed by sandy beaches with two black above-water rocks to the S.

The W lagoon is accessible only to small boats and has depths of 5.5 to 14.6m interspersed with coral shoal heads.

Lansdowne Reef, a shoal with a white sand dune, lies 6 miles NE of Johnson Reef.

1.36 Bittern Reef (9°14'N, 113°40'E) is reported to be circular in shape and to be of volcanic origin. It does not contain a lagoon and is entirely covered with water. It is considered very dangerous because no breakers show and its sides are very steep-to. Its greatest diameter is estimated at less than 0.5 mile. According to a Japanese survey, the least depth on the shoal is 0.9m and the discoloration of Bittern Reef is visible from the bridge for about 3.5 miles, and from the masthead for about 4.5 miles with a high sun behind the observer.

Allison Reef (Alison Reef) (8°50'N., 114°00'E.) is a drying atoll-reef about 11 miles long in a general NW-SE direction forming a lagoon which appears to be shallow and foul. It lies with its W end about 13 miles SE of Pearson Reef. On the N side in a position about 2.5 miles W of the W end there is an entrance 0.35 mile wide with a depth of 9m. The side is strewn with small rocks. At LW, some of these uncover about 0.9m.

The S side consists of a number of isolated drying patches between which there are narrow channels with depths of about 9m. At HW, Allison Reef does not uncover, but it can be located by the breakers, which can be seen at a distance of 5 or 6 miles on a clear day.

Anchorage is possible off the SE and W ends of Allison Reef, in a depth of 60m, or along its S side and off the N entrance to the lagoon, in depths of 9m.

Cornwallis South Reef (8°45'N., 114°13'E.), 8 miles ESE of Allison Reef, consists of a drying reef enclosing a lagoon which is open to the S.

The entrance is about 0.2 mile wide and contains several coral patches. Depths of 9m are found within the lagoon, but it has not been closely examined. There are some small drying rocks on the SE side of the reef which breaks in a NE wind.

Cornwallis South Reef remains identifiable at HW.

1.37 Pearson Reef (8°59'N., 113°42'E.) is a drying steep-to atoll about 5 miles long in a WSW direction and 1 mile wide. It encloses a lagoon to which there is no apparent entrance.

There is a sand cay on the NE extremity of the reef. On the NW side of the reef is a stranded wreck.

Anchorage can be taken 0.2 mile off the NE end of the reef, in a depth of 27m.

Pigeon Reef (Tennent Reef) (8°52'N., 114°38'E.) is a triangular-shaped drying atoll completely enclosing a lagoon which appears to be accessible to boats at HW. There is no entrance. The reef is brown in color and appears to be of volcanic origin with a lining of white coral around the inside of the rim.

Commodore Reef (8°22'N., 115°14'E.) is an atoll about 7 miles in length, and extends E and W lying about 47 miles SE of Pigeon Reef. It dries 1.5m on its W end, and in patches elsewhere around its circumference. The reef forms two lagoons with a sand cay 0.5m high on the neck between them.

The E lagoon has not been closely examined, but appears to be shallow and full of rocks. The encircling reef is completely covered at HW, except for the sand cay near the middle and a rock 0.3m high at the E end.

1.38 Investigator Shoal (8°10'N., 114°40'E.), an irregular atoll formation, lies with its E extremity about 25 miles SW of the W end of Commodore Reef. The shoal, which extends in an E-W direction for 18 miles with a width of 8 miles, is surrounded by a coral reef on which there are a few drying sections, but over the larger part of which there are depths of 5.5 to 18.3m.

Large fishing vessels enter the lagoon in fine weather through a channel near the middle of the N side of the reef to anchor in depths probably over 46m, although little or no shelter is provided by the atoll.

The S side of the reef is steep-to with an apparent entrance at its SE end that is 0.2 mile wide and 37m deep, except for two patches with a depth of 11m. The W end of the reef breaks and has a few isolated rocks which may be visible at HW. There are two drying rocks on the S side of the shoal.

Currents, with velocities up to 1 knot, are reported on all sides of Investigator Shoal.

Ardasier Reef (7°38'N., 113°56'E.) is the W extremity of Ardasier Bank, which lies 14 miles NNE of Swallow Reef.

This reef, which dries, encloses a shallow lagoon which is probably accessible to boats at HW. The reef is steep-to except on its E side, where it joins Ardasier Bank.

Ardasier Bank extends 37 miles ENE from Ardasier Reef. It is surrounded by a fringe of coral, over which there are depths

of 3.7 to 18.3m. The depths in the center of the bank are believed to be from 37 to 55m, though unexamined.

Fish aggregating devices may be encountered in the vicinity of and SW of Ardasier Bank.

Tides—Currents.—Currents in the area S of Investigator Shoal and Ardasier Reef appear to set to the W.

Currents, with a velocity of up to 1 knot, are reported on all sides of Ardasier Bank. The tides are diurnal, with a range of about 1.5m.

Caution.—Vessels are advised to avoid the vicinity of Ardasier Bank and navigate with caution, especially near the middle of the N side where depths of 40 to 49m show no apparent discoloration.

1.39 Erica Reef (Enloa Reef) (8°07'N., 114°08'E.), lying WNW of the N end of Ardasier Reef, is an oval drying reef that encloses a shallow lagoon. A few drying rocks lie on the E side of Erica Reef and may show at HW. No entrance or anchorage has been found.

Mariveles Reef (8°00'N., 113°56'E.), about 6 miles long in a general NW-SE direction, lies about 7 miles W of Erica Reef. It dries, encloses two lagoons, and has a sand cay 2m high on the neck between the lagoons. A few isolated rocks may be just visible at HW.

Dallas Reef (7°38'N., 113°48'E.) is about 5 miles long E-W and dries entirely, enclosing a small lagoon. A line from Dallas Reef to Barque Canada Reef marks a portion of the approximate SW limit of Dangerous Ground.

Barque Canada Reef is a long narrow reef, nearly all of which dries. It extends about 15 miles NE from a rock 4.5m high in position 8°05'N, 113°14'E.

The lagoon within the reef appears to be fairly deep, but is inaccessible. At the NE end of the reef there is a group of rocks 2m high. This N part is not as steep-to as the S part and temporary anchorage may be taken in favorable weather.

U.S.S. Pigeon Passage

1.40 In 1937, the U.S.S. Pigeon conducted a survey of Dangerous Ground and developed a 10 mile wide channel clear of dangers, except for a shoal patch charted 19 miles SSW of Alicia Annie Reef.

A deep-draft vessel might navigate the passage by day, in comparative safety; under optimum conditions, the passage might be negotiated at night.

Directions.—From position 8°40'N, 116°30'E, the recommended track leads on a course of 291° for 208 miles to position 9°55'N, 113°15'E, then on a course of 327° for 71 miles to position 10°55'N, 112°35'E.

Caution.—Caution should be exercised when using the passage, as the shoal patch mentioned above lies about 3 miles SSW of the track. Due to the nature of the area and the age of the surveys for the passage, less water or dangers in addition to those charted may exist.

Soundings of less than 1,100m are charted near the recommended track SSE and SSW of Alicia Annie Reef. Soundings of less than 1,280m are charted near the recommended track S of Discovery Great Reef.

Islands and Reefs Southwest of Dangerous Ground

1.41 Fiery Cross Reef (North West Investigator Reef) (9°35'N., 112°54'E.), about 14 miles long NE-SW, is steep-to and composed of coral patches, several of which dry. The largest drying patch is located at the SW end of the reef and supports a prominent rock, 1m high. With the exception of this rock, the reef covers at HW.

A dangerous wreck lies 4 miles SW of the NW extremity of the reef. Breakers occur on Fiery Cross Reef with even a slight swell and make it visible from a distance of several miles.

Anchorage has been taken about 0.2 mile from the reef, with the prominent rock bearing 062°, distant 0.7 mile, in a depth of 24m.

London Reefs consists of four reefs on a line between **Cuarteron Reef** (8°54'N., 112°52'E.) and **West Reef** (8°51'N., 112°11'E.). Caution is necessary when navigating in the vicinity of London Reefs as they are all steep-to, rendering soundings of little value. They should not be approached with the sun ahead, as it becomes difficult to recognize the shoaling water and breakers.

Cuarteron Reef is the easternmost of the London Reefs. Several rocks, 1.2 to 1.5m high, lie on the N side of the reef.

The shallow lagoon within the reef has no entrance.

Currents at Cuarteron Reef are apparently diurnal, their rise being 1.8 to 2.1m. The tidal currents along its N side set W during the flood and E during the ebb.

East Reef (8°50'N., 112°35'E.) encloses a lagoon with depths of 7.3 to 14.6m and lies about 16 miles WSW of Cuarteron Reef. Numerous coral heads encumber the lagoon.

A sharp rock, 0.9m high, lies near the W end of the reef; more rocks are visible at the E and S parts of the reef. East Reef is marked by heavy breakers.

1.42 Central Reef (8°55'N., 112°21'E.) lies 14 miles NW of East Reef. Although awash, it is not always marked by breakers. At the SE part of the reef there is an entrance to a shallow lagoon and at the E and SW ends of Central Reef lie two small, white sand cays.

West London Reef (Hsi Chiao), the westernmost danger of London Reefs, is marked by a light and has several detached coral patches around its edges. The N side of the reef is marked by breakers making it visible on the approach from the N, but the S side is difficult to make out, especially in calm weather.

There is a sand cay, 0.6m high, on the E side of the reef. A lagoon, with depths of 11 to 14.6m but having many coral heads, is enclosed by West Reef.

1.43 Spratly Island (Storm Island) (8°38'N., 111°55'E.), grass covered, 2.4m high, flat and less than 0.5 mile in extent, is located about 22 miles SW of West Reef, on the S end of a coral bank over 1 mile long.

The island has a margin of white sand and broken coral and is surrounded by drying ledges and coral heads. A cairn, 5.5m high, stands near its S point.

The E side of the island is steep-to, having depths greater than 18m when beyond 0.1 mile from shore. Depths of less than 14.6m and 5.5m extend 0.5 mile NE and N, respectively, from the island. To the W and SW, depths of less than 5.5m are

found up to 0.2 mile off the island before the bottom falls away steeply.

Tides—Currents.—A tidal rise and fall of 1.6m has been reported at Spratly Island. The tidal current sets SW during the rising tide at the NE of the bank, and from SE to NE during the falling tide.

Anchorage.—Anchorage can be taken after gaining proper clearance on the banks either NE or SW of the island. Anchorage has been taken on the bank in a position about 0.6 mile NE of the island, in 18.3m, sheltered from SW winds.

Ladd Reef, 15 miles W of Spratly Island, is a drying reef 3 miles long and 1 mile wide. The reef encloses a lagoon which, for all practical purposes, has no entrance. The reef is marked by a light.

1.44 Amboyna Cay (Anbo Shozhoa) (7°52'N., 112°55'E.) lies near the SW edge of the Dangerous Ground. This cay is about 2m high with a sand beach, broken by coral, and rubble. Coral ledges which partly dry and on which the sea breaks when there is a swell, extend 0.2 mile offshore in places.

An obelisk, 3m high, stands on the SW part of the cay. The cay is also marked by a light, which has a racon.

Coral banks, on which the sea breaks heavily, extend 0.5 mile NW and 1 mile NE from the island with depths of 7.3m to a distance of over 0.3 mile offshore on the latter bank. A reef, having depths of 3.7 to 4.6m, is reported to lie about 0.8 mile NW of the cay.

The W and SW part of Amboyna Cay is fringed by steep-to reefs to a distance of 0.3 mile. The W and SW reefs gradually shoal from depths of 7.6m at 0.2 mile offshore to 1.5m at 27m offshore. About 0.1 mile S of the island, the fringing reef has a depth of 7m.

Tides—Currents.—Tidal currents, with a maximum rate of 1.5 knots, were observed near Amboyna Cay. The current sets N on the rising tide and W on the falling tide.

Anchorage.—Vessels can obtain sheltered anchorage during the Southwest Monsoon, in a depth of 9m, on the reef extending NE from the cay. Additionally, it is reported that anchorage can be taken farther to the NE, in 14.6m, with the center of the cay bearing 224°, distant 1 mile. To the E, a survey ship anchored, in 11.9m, about 0.4 mile from the center of the island; to the W, anchorage can be taken, in 9.5m, with the cay bearing about 109°, distant 0.3 mile.

Caution.—Caution is required when anchoring as the reefs are extremely steep-to.

Swallow Reef, 60 miles SE of Amboyna Cay and formed of a belt of coral surrounding a shallow lagoon, is 3.8 miles in length, E and W, and 1.2 miles in width. At its E and SE part are some rocks 1.5 to 3m high, the highest of which is in position 7°23'N, 113°49'E. Breakers usually mark the reef; a wreck lies stranded (1959) on its W end. By day, Swallow Reef has been sighted at 8 miles. Swallow Reef is reported (1986) to have extended in area.

1.45 Royal Charlotte Reef (6°57'N., 113°35'E.) lies 29 miles SSW of Swallow Reef and is nearly rectangular in shape and about 1 mile long. Several boulders, 0.6 to 1.2m high, lie near its SE side and some rocks, awash, lie on its NE side. An area of foul ground surrounds Royal Charlotte Reef and

extends as much as 8 miles from the edge of the reef. Breakers have been reported over this reef.

1.46 Anoa Natuna Marine Terminal (5°13.2'N., 105°36.4'E.) is a Floating Production, Storage, and Offloading (FPSO) vessel.

Aspect.—A converted tanker is permanently moored to a Single Point Mooring (SPM) buoy. A well head platform feeds the FPSO through a pipeline and stands 1 mile NW of it. The platform can be identified by its gas flare from a considerable distance. The FPSO displays a white flashing Morse (U) light at the bow and the stern, as well as a red flashing Morse (U) light at the bow and the masthead.

Pilotage.—Pilotage is compulsory and the berthing master boards vessels at the anchorage. Vessels berth at the terminal during daylight only.

Regulations.—Indonesian Government regulations are strictly enforced. The Indonesian flag should be flown by day throughout the vessel's stay at the terminal. Port facilities are not available. However, emergency medical services can be arranged.

Anchorage.—Anchorage is recommended within a radius of 0.75 mile from position 5°12'N, 105°38'E.

Caution.—A rectangular restricted area of 3 miles by 2 miles has been established surrounding the terminal. Vessels are not allowed to enter a prohibited area within the restricted area around the terminal without the berthing master on board.

Anchoring within the restricted area is prohibited. There are no facilities for bunkers, fresh water, provisions, or reception of dirty ballast.

1.47 Rifleman Bank lies 70 miles W of Amboyna Cay, with Bombay Castle, its N end, lying in position 7°56'N, 111°42'E. The bank extends 28 miles S from Bombay Castle and has a maximum breadth of 15 miles, with many shallow patches of sand and coral around its edges. A light, situated S of Bombay Castle, marks the E side of the bank.

Bombay Castle has a depth of 3m and breaks in all but the finest weather. Johnson Patch., with a depth of 7.3m, lies on the W side of Rifleman Bank; Kingston Shoal, with a depth of 11m, lies at the S end; and Orleana Shoal, with a depth of 8.2m, lies on the E end. The remaining areas between and

within these shoals have depths of 7 to 82m, however, the existence of undiscovered dangerous shoals in this area should not be discounted.

1.48 Prince of Wales Bank (8°09'N., 110°30'E.) has a least depth of 7.3m found on its W side. The bank is of coral and its depths are very irregular. The bank is marked by a light on its NE side.

Alexandra Bank, marked by a light and lying about 2 miles SE of Prince of Wales Bank, has a least depth of 5.5m over coral bottom that is distinctly visible.

Grainger Bank, with depths of 11 to 14.6m, lies about 16 miles SW of Alexandra Bank. The coral bottom of the bank is visible over nearly all the bank. The bank is marked by a light.

Prince Consort Bank (7°55'N., 109°58'E.), 30 miles WNW of Grainger Bank, has a least depth of 18m near its NW edge.

The bottom is of sand and coral. Depths of 22 to 24m are found on the W edge of the bank, which is marked by a light.

Vanguard Bank lies 30 miles SSW of Prince Consort Bank and 60 miles SE of the main Hong Kong-Singapore route.

The least depths found are two 16m patches near the N end of the bank. Lights mark the N side of the bank.

An 18m shoal lies 10 miles SSE of the center of Vanguard Bank. Another shoal, with a depth of 13m, lies 25 miles W of the SW end of the same bank and a shoal with a depth of 7.5m lies 10 miles SSW of the 13m patch.

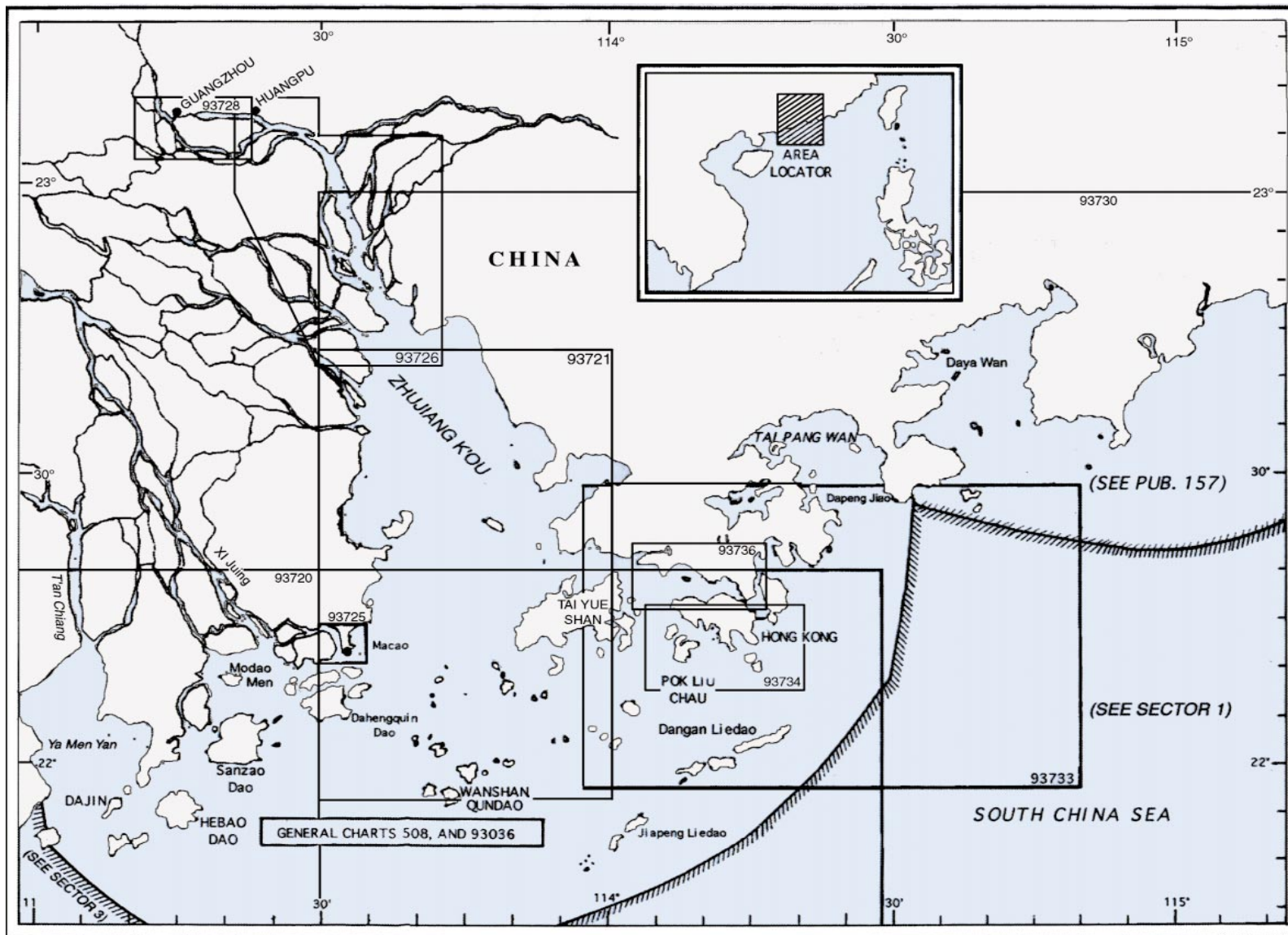
It was reported (1990) that a depth of 12.3m lies close W of the 13m depth.

1.49 Charlotte Bank (7°08'N., 107°36'E.) is the southernmost danger on the W side of the main Hong Kong-Singapore route. The bank is about 4 miles in extent, with a least depth between 8.5 and 11m.

A depth of 33m lies 80 miles S of Charlotte Bank in position 5°47'N, 107°30'E.

Scawfell Shoal (7°18'N., 106°52'E.), lying about 45 miles WNW of Charlotte Bank, has a least depth of 9.1m, coral, near its center.

A reef, 0.5 mile in diameter, lies in position 7°35'30"N, 106°24'00"E. Three dangerous wrecks, with depths of 29m, 20m, and 23m, lie SSW of this reef, at distances of up to 60 miles from the reef.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.
SECTOR 2 — CHART INFORMATION

SECTOR 2

COAST OF CHINA—DAPENG JIAO TO DAJIN, INCLUDING HONG KONG AND MACAU

Plan.—This sector describes the SE coast of China between Dapeng Jiao (Ta P'eng Chio), to the E of Hong Kong, and Dajin. The description is ENE to WSW including Hong Kong, Macau, the Zhujiang (Chu Chiang), the Xijiang (Hsi Chiang), and the T'an Chiang.

General Remarks

2.1 Winds—Weather.—The region covered by this sector has distinct seasonal changes due to the effect of monsoonal transition. The Northeast Monsoon blows from the N through E from as early as September to as late as May, but is strongest from October to March. The Southwest Monsoon is usually felt from April to September. The transition months occur during spring and fall.

During the winter, the area is subject to frequent outbreaks of cold, dry air caused by the dominant Asian continental anticyclone. Between January and March, temperatures fall quite low and have reached freezing in the upper reaches of the rivers and in the higher elevations of Hong Kong and the mainland. December is generally the driest month of the year.

Spring marks the transition from the Northeast Monsoon to the Southwest Monsoon. Temperatures fluctuate widely from day to day, bringing cloudiness and increased precipitation, along with coastal fog and drizzle. To the SW of Hong Kong, the wind reaches Force 7 or more 3 or 4 days a month in April and May.

Summer comes with the onset of the Southwest Monsoon. Extensive precipitation and hot, humid weather prevail. June is the wettest month of the year. Typhoons occur mostly between July through September. These storms bring gales, high winds and heavy rains. Squalls, including arch squalls, have been reported as violent at times off the deltas of Hsi Chiang and the Chu Chiang.

Autumn is usually sunny and dry. In the area to the E of the deltas of Xi Jiang and Zhu Jiang the wind reaches Force 7 or more 6 or 7 days per month from October through January. Autumn brings the transition from the Southwest Monsoon to the Northeast Monsoon.

Tides—Currents.—Offshore of the deltas to the Hsi Chiang and the Chu Chiang, as well as seaward of Hong Kong, the tidal current on the raising tide is governed principally by the prevailing wind. With strong E winds, it sets WNW; with SW winds it sets N. The tidal current on the falling tide sets mostly in a SW direction.

The principal ocean currents are also caused by the monsoons. The SW current caused by the Northeast Monsoon is more persistent than the NE current of the Southwest Monsoon.

At their strongest, these currents average about 1.5 knots. During the transition of the monsoons, the currents become quite variable in both speed and direction.

Local winds will also affect the currents. When a moderate or strong wind has been blowing steadily in any general

direction for a day or more, a change in current speed and direction can be expected. The effect of the wind in generating a current is not immediate, nor does a reduction in wind speed or change of wind direction result in an immediate cessation of current. Although the wind may have ceased in one region, the current may continue to flow as the result of winds in nearby areas.

The coastline between Dapeng Jiao and Tung Lung Island, 17 miles SW, is extremely irregular and indented by numerous bays and coves. Inland, lofty hills and rugged mountains predominate throughout. With few exceptions, the mountains rise abruptly from a shoreline whose near shore areas are largely steep-to. At the head of several of the larger inlets, wide margins of drying mud flats extend well off the coastline. Offshore, the area is generally deep and largely clear of dangers to navigation. Tai Pang Wan (Mirs Bay), with its several inlets, is the largest body of water within the E portion of the sector. Leung Shuen Wan Hoi (Rocky Harbor) and Ngau Mei Hoi are smaller indentations in the coastline. These three areas comprise the E portion of the Hong Kong New Territories which extend to the N and E shores of Tai Pang Wan.

Between Tung Lung Island and Dajin Island, 73 miles WSW, are the approaches to Hong Kong, the Zhu Jiang Kou, and the Xijiang. This area is encumbered with numerous islands and dangers which lie up to 22 miles seaward of a line joining Tung Lung Island and Dajin Island. Victoria Harbor and Macau are the two ports closest to the sea, while Huangpu and Ts'ang-wu can be reached by lengthy river transits of the Zhu Jiang Kou and Xijiang, respectively.

The Zhu Jiang Kou is entered to the E of Tai Yue Shan, (which is located to the W of Hong Kong) or from sea via the recommended route W of Wenwei Zhou, as is shown on the chart. The proper clearances must be obtained from Chinese authorities before attempting to navigate the river. The Xijiang, whose branches form a common delta with the approaches to the T'an Chiang, is entered from seaward between Dahengquin Dao and Sanzan Dao. Modao Men, on the E side of the delta, is the principal entrance. In its lower reaches, the W side of the Xijiang is connected by several creeks with the T'an Chiang. Yamen Wan is the entrance channel to the T'an Chiang.

Oil Field Development Areas.—Numerous structures usually carrying lights and associated unlit objects and submerged obstructions, sometimes marked by buoys, exist in the Oilfield Development Areas enclosed by pecked lines on the charts. As these installations are not all charted, special caution should be exercised by vessels navigating in the vicinity. The authorities have established a 500m safety zone around each installation. Vessels should not enter these zones.

Mine dangers.—The danger to surface ships from mines of the 1939-45 war is almost nonexistent. The risk to surface navigation from these mines is now considered no greater than normal navigational hazards. Despite the years, these mines still continue to constitute a risk to ships anchoring, trawling, or conducting seabed operations.

Caution.—Numerous acts of piracy have been reported, usually by small gangs of armed men in fast boats. Laden vessels with low freeboard are particularly vulnerable.

On most banks fronting the shores of the coastal areas covered in this volume, fishing stakes and enclosures are encountered in depths of 5 to 10m, and sometimes in greater depths, particularly near a tributary. These enclosures are constructed of trees firmly driven into the banks, and interlaced with branches, etc., and form a hazard to vessels navigating at night in the area. These enclosures last for many years, and to those with local knowledge are good landmarks.

Mariners are advised that these features are numerous off the coast of Borneo and may also be encountered off any coastline covered by this volume.

Dapeng Jiao to Tung Lung Island

2.2 Dapeng Jiao (22°27'N., 114°30'E.) is a reef-fringed, steep-sided point which, fronted by a low off-lying rock, rises to a lofty summit close inland. It is the E entrance point of Tai Pang Wan (Mirs Bay).

Anchorage.—**Tai Pang Wan** (Dapeng Wan) (Mirs Bay) (22°32'N., 114°23'E.) is a large, sheltered body of water whose regular E shoreline contrasts sharply with the W shore, which is composed of extensive inlets and islet-sheltered anchorages. Vessels seeking shelter from winds of the Northeast Monsoon season anchor, in 12.8m, within Ping Chau Hoi, a roadstead encumbered by fishing stakes, which lies between the mainland and Ping Chau, a hilly, well-populated island. Several designated anchorage areas, best seen on chart, have been established in Tai Pang Wan. Anchorage No. 2 lies on the E side of the bay, while Anchorages Nos. 3, 4, and 5 lie in the NE, N, and NW ends of the bay, respectively. There are general depths of 18m throughout the bay. Anchorage No. 4 is the pilotage anchorage.

Caution.—A number of uncharted marks and buoys are moored in the bay.

2.3 Gau Tau (22°28'N., 114°25.5'E.), a 26m high rock, lies in the middle of the entrance to Tai Pang Wan 2.25 miles NE of Tuen Tsui. A light is shown from Gau Tau.

A spoil ground, approximately 0.75 mile square, lies 1.5 miles N of Gau Tau Light.

Breaker Reef, which dries 1.5m at the center where the sea generally breaks, lies 0.5 mile SW of Gau Tau Light. South Gau, a detached islet 18m high and surrounded by foul ground, lies 1.5 miles SW of Breaker Reef. A lighted beacon stands on the edge of the rocks N of South Gau.

Tai Tan Hoi Hap (Long Harbor) (22°27'N., 114°21'E.) and Chek Mun Hoi Hap (Tolo Channel) are two well-sheltered inlets approached through deep-water channels passing NW and S of Chek Chau (Port Island).

Caution.—A boom restricts Chek Mun Hoi Hap. The boom lies about 0.5 mile W of Heung Lo Kok, the S entrance point of Chek Mun Hoi Hap.

2.4 Chek Chau is a high, steep-sided island 6 miles NNW of Tai Lom Tsui, the rocky, steep-to W entrance point of Tai Pang Wan. Vessels anchor, in 9.2 to 14.6m, within Tai Tan Hoi Hap, where they are sheltered from all but N winds which send

in a heavy swell. Vessels also enter Chek Mun Hoi Hap and, passing NW of low-lying mid-channel dangers, proceed to the entrance to **Sha Tin Hoi** (Tide Cove) (22°26'N., 114°13'E.) where they anchor, in 5.9 to 7.4m, sheltered from all winds.

Double Haven (22°32'N., 114°18'E.) and Crooked Harbor are two small deep-water roadsteads which, lying NW of the entrance to Chek Mun Hoi Hap, are sheltered from most winds by the high, steep-sided hills of the mainland and by a series of hilly, steep-sided off-lying islets. Crooked Harbor is conveniently entered from the N. Double Haven is entered from Crooked Harbor or through Wang Mun Hoi (Deep Pass), a narrow, deep-water passage in the NE part of the roadstead. Vessels anchor, in 11 to 12.8m, mud, in either Double Haven or Crooked Harbor. Care must be taken to avoid the submarine cable and pipeline crossing the channel connecting the two.

Yantian (22°35'N., 114°16'E.) (World Port Index No. 57857) is located near Sha Tau. There are four berths, three of which can accommodate vessels of 1,000 dwt; a vessel of 3,000 dwt can be accommodated at the fifth and last remaining berth. Two additional berths to handle tankers of 10,000 and 100,000 dwt are planned for construction in Yantian Harbor.

There are depths in the channel of 16 to 22m. The depth of water available in the harbor is 20m. The deep water approach to these berths is along the recommended track, 262°, to the vicinity of No. 3 Lighted Buoy.

Pilotage.—Pilots can be requested by calling Yantian Port Control on VHF channel 16. The pilot boards in the Shenzhen E Port No. 5 Anchorage or in the Daya Wan No. 2 Quarantine Anchorage.

2.5 Leung Shuen Wan Hoi (Rocky Harbor) (22°20'N., 114°19'E.) is a deep-water, well-sheltered area whose principal seaward entrance lies between Sha Tong Hau Shan and Tiu Chung Chau. Vessels seeking shelter from winds of the Northeast Monsoon season anchor in mud in a position N of Wok Tuk Pai, an isolated pinnacle rock about 1 mile N of Sha Tong Hau Shan. During the Southwest Monsoon season, they anchor in mud in a position N of Chi Chau, a small, steep-sided islet close E of Tiu Chung Chau.

Aspect.—The coastline between the W entrance point of Tai Pang Wan and Tung Lung Island is extremely irregular and indented by a large island-cluttered embayment which contains the mostly landlocked water areas of Leung Shuen Wan Hoi and Ngau Mei Hoi.

Pilotage.—Pilots for Leung Shuen Wan Hoi, Ngau Mei Hoi, and Tai Pang Wan and its environs can be obtained at Victoria Harbor, Hong Kong.

2.6 Ngau Mei Hoi (Port Shelter) (22°20'N., 114°17'E.) is a convenient roadstead lying within a large, islet-cluttered body of water which, having its principal entrance between Tiu Chung Chau and the mainland coast SW, recedes well inland in the shelter of surrounding steep-sided lofty hills.

Ngau Mei Chau lies just within the entrance, while Kiu Tsui Chau lies near the head. Vessels seeking refuge within Ngau Mei Hoi anchor, in 14.6 to 16.4m, mud, in a position about 0.8 mile WNW of the N extremity of Ngau Mei Chau. They anchor, in 11 to 12.8m, mud, within the N part of Sai Kung Hoi, a largely landlocked roadstead between Kiu Tsui Chau and the mainland to the W. Vessels having a moderate draft

proceed through the passage E of Kiu Tsui Chau and anchor, in 7.4m, mud, in a position close N of the N extremity of the island.

Caution.—A Firing Danger Area exists N of 22°16'N, and E of Fo Shek Chau. When in use, the limits are marked by buoys with red flags and the perimeter is patrolled by small craft.

2.7 Victor Rock (22°18'N., 114°26'E.) is an isolated pinnacle rock with a depth of 5.5m and constitutes a danger to vessels proceeding S and SW from Tai Pang Wan. The summit of Tung Lung Chau aligned with the NW extremity of Hok Tsai Pai lying close N of Pak Kwo Chau, bearing 245°, leads 0.5 mile NW of the rock. The summit of Nam Kwo Chau, bearing 242°, leads clear of Victor Rock to the SE by 0.2 mile.

Kwo Chau Kwan To (Ninepin Islands) (22°16'N., 114°21'E.) is a group of steep-to islands and reefs just N of the E approach to Hong Kong. Pak Kwo Chau and Nam Kwo Chau are the largest of the islands, with the latter being slightly smaller, but of higher elevation with a height of 116m. The islands are separated by Hoi Tam Hua, a channel 0.2 mile wide. North Rock, an islet with a rock which dries 2m close N of it, lies to the NE of Pak Kwo Chau.

Tung Kwo Chau, 66m high and appearing like a sugarloaf from the NW or SE, lies 1.2 miles E of Pak Kwo Chau. Islets lie off the NE, W, and NW shores of Tung Kwo Chau.

North Rock and Tung Kwo Chau are covered by the red sector of the light on the N end of Pak Kwo Chau, bearing between 212° and 299°.

One Foot Rock (22°15'N., 114°22'E.), with a depth of 0.3m, lies 0.7 mile S of Tung Kwo Chau. Fat Tong Point, the tip of the peninsula 0.5 mile SW of Yi Bluff (22°16'N., 114°18'E.) and in line with the S extremity of Nam Kwo Chau, bearing 278°, leads S of One Foot Rock.

Soundings are of little use in locating these dangers. Caution is advised when approaching them, especially in adverse weather.

Approaches to Hong Kong

2.8 Regulations.—Several IMO-approved Traffic Separation Schemes have been established in the waters of, and adjacent to, Hong Kong.

A mandatory Vessel Traffic Service is in effect for all vessels entering Hong Kong. See paragraph 2.23, “Victoria Harbor (Hong Kong)—Regulations” for details and reporting points.

Special regulations are in effect for vessels entering Hong Kong. See paragraph 2.23, “Victoria Harbor (Hong Kong)—Regulations” for details.

Directions.—The entrance channels normally used by vessels calling at Hong Kong are approached from the E or SE. Vessels approach through Lam Tong Hoi Hap (Tathong Channel), which is the main channel leading into Hong Kong harbor from SE, and extends from TCS No. 1 Lighted Buoy (22°13.2'N., 114°14.0'E.) to **Lei Yue Mun** (22°17.1'N., 114°14.3'E.).

Approach can also be made through the channel between Po Toi Group and S of Hong Kong Island entering East Lamma Channel; or an approach from Lema Channel (22°06'N., 114°14'E.) leads into either East Lamma or West Lamma Channel.

It is recommended that vessels stay at least 5 miles SE of Jiapeng Liedao and Dangan Liedo, then pass the NE end of Dangan Liedo keeping the same distance. When within 3 miles S of Po Toi Island, proceed NW into East Lamma Channel.

The W approach is through Lantau Channel (22°08'N., 113°54'E.), leading ENE into West Lamma Channel. The NW approach into the same channel is made from N of Lantau Channel.

2.9 Po Toi Group (22°11'N., 114°16'E.) is a group of islands and rocks centered 2 miles SE of Hong Kong.

Waglan Island (Wang Lan Island) (22°11'N., 114°16'E.), the easternmost island of the group, consists of two rocky islets separated by a narrow boat channel. Waglan Island lies within a restricted area. The island is 30m high at its N end, and is covered by green shrub or moss on the W face of its S end. The cliff face, on the N side of the island, has been painted white and the mark can be seen from W through N to E. The island is reported to be a good radar target from distances of up to 30 miles.

A signal station is situated on Waglan Island. The station may be contacted by VHF or visual signals may be exchanged. Storm signals are displayed here.

A dangerous wreck, marked by a lighted buoy, lies 3.5 miles SE of Waglan Island Light.

Sung Kong, steep and covered with small bushes, lies 0.9 mile W of Waglan Island. An islet, 27m high, lies close off the NE end of Sung Kong. Fury Rocks, the highest being 4.5m, are a group of rocks lying 0.3 mile NW of Sung Kong, with depths of 12.8m to 24m in the fairway between. Foul ground extends up to 0.1 mile off the rocks.

Caution.—Two wrecks, with reported depths of 19.9m and 23.5m, lie 0.8 and 0.5 mile NNW of Waglan Island Light, respectively.



Waglan Island from N

2.10 Po Toi Island (22°10'N., 114°16'E.), the southernmost and largest of the group, is barren and rock fringed in places, rising to 238m high at its NE part. The SE extremity of the island was reported to be a good radar target at 25 miles.

Lo Chau Pak Pai (Castle Rock), 15m high and surrounded by a narrow rocky ledge, lies 1.5 miles NW of the light on the S extremity of Po Toi Island.

Lo Chau Island (Beaufort Island), off the NW end of Po Toi Island, is the closest of the group to Hong Kong. It is steep-sided, rock-fringed in places, and rises to a flat 272m summit.

Caution.—An explosives dumping ground, best seen on the chart, is located in the passage between Lo Chau Island and Po Tai Island.

In addition to the dangerous wreck already described above, three other dangerous wrecks lie at the E end of Lema Channel. One is marked by a lighted buoy moored 4 miles ESE of Po Toi; two are unmarked and lie 5 miles SE of Po Toi.

2.11 Dangan Liedao (Tan-Kan Lieh-Tao) (22°01'N., 114°12'E.) is a chain of islands and rocks extending 14 miles in a NE-SW direction. The four major islands of the chain are separated by relatively deep, narrow channels.

Dangan Dao (Tan-Kan Tao) (22°02'N., 114°12'E.) is the largest and northeasternmost island of the group. The E face of the island was reported to be radar conspicuous at 30 miles. A watch tower stands near the W end of the island, and some prominent brick buildings stand on the NW side. Eddies are charted off the NW end of the island.

Tan-Kan T'ou Wan is entered on the N side of Dangan Dao, 1.5 miles W of the island's NE extremity. The bay affords anchorage for small vessels, in 14.6m, good holding ground, and affords shelter during the Northeast Monsoon. Er Zhou (Erh Chou), 475m high, is the highest and most central of the group. It lies close SW of Dangan Dao, and appears flat-topped from most directions.

Round Island, 40m high, lies close N of the NE end of Er Zhou. The island has four distinct peaks, the highest of which rises to 377m.

Xidan Dao (Hsi-tan Tao) (21°58'N., 114°08'E.), 133m high at its E end, is the southwesternmost island of the group. Mosquito Rock, which breaks, lies 0.15 mile S of the SW end of the island. Danuei Jiao (Iroquois Rock), a pinnacle with a depth of 10m, lies 1.2 miles NW of the same point.

Taitami Channel (21°57'N., 114°06'E.) separates Dangan Liedao from Jiapeng Liedao. The channel is about 4 miles wide and 33 to 37m deep, with the exception of Lih-Sin P'ai, a rock which breaks occasionally.

Jiapeng Liedao (Chia-P'eng Lieh-Tao) (21°52'N., 114°00'E.) is a chain of rocks and islands extending 10 miles SE from O-yen Shih to Wenwei Zhou.

O-yen Shih (21°56'N., 114°03'E.), 39m high, is a small islet lying about 1 mile N of **Beijian Dao** (Pei-Chien Tao) (21°53'N., 114°02'E.). On the SW end of Beijian Dao are two conspicuous peaks that rise almost perpendicularly to a height of 300m, and are known as Ass's Ears. Several coves indent the NE and S coasts of the island. Islets lie off the N, NE, E, and S shore of the island. A high, white rock known as Kuei-T'ou Shih lies off the E side of the island, and a rock awash lies midway between it and the shore.

2.12 Miaowan Dao (Miao-Wan) (21°56'N., 114°01'E.), an island 240m high, lies close SW of Beijian Dao. Two islets, the highest being 62m high, lie close off the S end, and two sunken rocks, of which the outer one breaks, lie off the NE end of Miaowan Dao. Bai Pai (Pai-P'ai), 24m high, lies about 1 mile off the W side of the same island.

Between Miaowan Dao and Wenwei Zhou lies a square area encompassing six islands and islet clusters. These islands are Ch'an Chou, 90m high, located at the NW of the square; Huang-mao Chou, 66m high, 0.75 mile farther SW; P'ing Chou, 27m high, 0.75 mile SE of Huang-mao Chou; Hung-sha Chou, 66m high, about 0.5 mile NE of P'ing Chou; and Shih Chou, 35m high, fringed with rocks. Shih Chou lies about 1 mile off Hung-sha Chou.

Wenwei Zhou (Wen-wei Chou) (21°49'N., 113°56'E.), 29m high, is the southwesternmost island of the Jiapeng Liedao group. Several sunken rocks lie up to 0.1 mile off the islet. A light is shown and a racon transmits from the light on Wenwei Zhou.

Caution.—Several dangerous wrecks lie in the approaches to Zhujiang Kou. Wrecks lie about 3 miles and 10 miles WNW of Wenwei Zhou Light. Another wreck lies approximately 13 miles WSW of Wenwei Zhou Light.

2.13 Wailingding Dao (Wai-ling-Ting) (22°06'N., 114°02'E.) is a rugged island that rises to 343m near its center. A natural boat harbor indents the W side of the island. Needle Rocks, 1.5m high, lie close together about 0.15 mile SW of the NW end of the island. Vessels should give a wide berth to the dangerous rocks lying 0.8 mile E of the N extremity of this island.

Sanmen Liedao (San-men Lie-tao) is a group of islands and rocks centered 3 miles SSW of Wailingding Dao.

A spoil area is charted 3 miles N of Wailingding Dao.

Henggang Dao (Heng-Kang Chou) (22°02'N., 114°01'E.), the southernmost island, has a rounded hill, 145m high, at its S end, and a small drying reef on its E end. Chu-wan-t'ou, 72m high, lies close N of Henggang Dao. A rock lies close N of Chu-wan-t'ou.

Sanmen Dao (San-men) (22°03'N., 113°59'E.), 20m high, lies 0.7 mile NW of Henggang Dao. A small bay indents the W side of the island and affords anchorage to small vessels, in depths of 11 to 18.3m, mud. Rocks lie off the N and NE coasts of Sanmen Dao, between it and Sanmen Chou, about 0.5 mile to the NE.

Hei Zhou (Hei Chou) is 100m high and the northwesternmost island of the group. It lies 0.5 mile NW of Sanmen Dao. A group of islets and rocks, the highest called Yuangang, 45m high, lies within 0.3 mile NW of Hei Zhou, and a sunken rock lies close SE of Hei Zhou.

Toulu Zhou (22°04'N., 113°56'E.), located 2 miles W of Yuangang, is quite high and surrounded by rocks.

Ai Zhou (22°03'N., 113°55'E.) is comprised of two islands, separated by a narrow channel with a depth of 7.3m, that lie about 2 miles SW of Toulu Zhou. To the W of the W island is a rock that dries 1.2m, and to the N of the same island lies a sunken rock. The E island rises to a height of 226m and has a rock that dries 1.5m close off its N extremity.

Hong Kong Island

2.14 Hong Kong Island (22°16'N., 114°12'E.) reverted to the People's Republic of China and is no longer under British jurisdiction as of July 1, 1997. Hong Kong is now considered a Special Administrative Region of the People's Republic of China.

The island is 9 miles long and 6 miles wide at its greatest dimensions. It rises steeply from the sea to a central ridge of hills with a height of over 549m in the NW part. The N shore of the island is relatively smooth and forms the S shoreline of Victoria Harbor while the W, S, and E sides of the island are indented by numerous bays of varying sizes. As the island is mountainous and rugged, land for building purposes is obtained largely by reclaiming the surrounding bays or by leveling hills. The natural vegetation is mostly grass and bushes, with small trees in sheltered places.

Hok Tsui (22°13'N., 114°16'E.) is the SE extremity of Hong Kong Island. It is marked by a light and has two conspicuous radio towers situated about 0.8 mile NW on Hok Tsui Shan (d'Aguilar Peak). Close off its SE side lies a green islet, Kau Pei Chau. Between Hok Tsui and Hak Kok Tau, a point 3.2 miles N, the island is indented with several small bays and fronted by a few islets. These bays are rock-fringed and suitable for use only by small craft.

Chai Wan (22°16'N., 114°15'E.), a bay with three bights, extends between a position about 0.3 mile NW of Hak Kok Tau Light and Pak Sha Wan at the SW of Lei Yue Mun 1.7 miles farther NW. Portions of the bights within Chai Wan are relatively shoal and foul. Numerous areas of construction and reclamation are in progress in this area.

2.15 Tai Tam Bay (22°14'N., 114°14'E.) extends N into Hong Kong Island about 2.5 miles between Hok Tsui and Wong Ma Kok (Bluff Head). The bay is clear of dangers to 0.1 mile offshore and has depths of 11 to 14.6m in its outer part, while gradually shoaling toward its head. Vessels anchor within the bay, in 11m, mud, off the village situated at the head of the bight at the NW part of the bay. Caution is advised when anchoring within the bay, as numerous fishing stakes obstruct the N part of it.

To the E of the light on Wong Ma Kok stands a satellite tracking station with conspicuous dish aerials and radio masts. About 0.2 mile N of the SW entrance point of the bay stands a supplementary storm signal station.

Chek Chue Wan (Stanley Bay) (22°12'N., 114°12'E.) is the bight indenting the island to the W of the Stanley Peninsula. Chung Hom Kok is the W entrance point of the bay and is a rocky barren promontory 128m high with a conspicuous boulder at its summit. A prominent yellow mast, from which storm signals are shown, stands at Chek Chue (Stanley), the village at the head Chek Chue Wan.

Chung Hom Wan, to the NW of Chek Chue Wan, is fronted by the island of **Ngan Chau** (Round Island) (22°13'N., 114°11'E.). This island is fringed by a rock ledge with a few drying patches and depths of less than 5.5m up to 0.2 mile offshore. A light is shown from the S end of the Island.

Tsin Shui Wan (Repulse Bay) (22°14'N., 114°11'E.), a bay entered 1 mile NNE of Ngan Chau, provides anchorage, in 10m, SW of the island of Tong Po Shan (Tung Ku Chau).

Sam Shui Wan (Deep Water Bay) is entered between Tong Po factory standing with some conspicuous chimneys near it. A small landing pier is situated at the head of the bay.

Caution.—Due to the existence of submarine cables in Sam Shui Wan, anchoring is not advisable.

2.16 Heung Kong Tsai (Aberdeen Harbor) (22°15'N., 114°11'E.) provides good shelter from a typhoon. From the E side of Western Breakwater, reclaimed land forms the N shore as far as Deep Pass Point, about 1 mile E. There are three power cables which span overhead across the W entrance with a vertical clearance of 27m, close E of the breakwater. A submarine pipeline is laid 0.2 mile SW from the coast W of Western Breakwater, from which a light is shown.

Three artificial islands are situated 0.3 mile S of the Deep Pass Point; submarine cables lie between each island and connect to the coast E.

Heung Kong Tsai Hoi Hap (Aberdeen Channel) leads N to Heung Kong Tsai, between Hong Kong Island and Ap Lei Chau. The channel is narrow and dangerous and is not recommended.

The islands of Ap Lei Chau and **Ap Lei Pai** (22°14'N., 114°09'E.) fill most of a bight indenting Hong Kong Island, that extends from Sham Shui Kok to the NW entrance of Shek Pai Wan, about 2.3 miles NW. Ap Lei Chau is steep and barren, rising to 195m at Yuk Kwai Shan (Mount Johnston) at its S-central part.

Assistance Rock, covered 2.7m, lies about 0.1 mile SW of the bight on the SE extremity of Ap Lei Pai.

Heung Kong Tsai (Aberdeen Harbor) is entered through a channel bound from the S by Fo Yeuk Chau, an island with an arched roof building near its summit, and on the N by Hong Kong, W of Pollux Rock.

The small harbor is well-sheltered, but used mostly by small vessels and fishing craft, as the breakwater extending SSE into the harbor from the N of Fo Yo Kok and the overhead cables (vertical clearance 26.8m) E of the breakwater limit access to Aberdeen Docks. Supplementary storm signals are shown from the police station in Aberdeen.

Anchorage can be taken off the harbor entrance, in a depth of 9.2m, about 0.2 mile NNW of Fo Yo Kok.

Between Shek Pai Wan and Shek Tong Tsui, the W extremity of Hong Kong Island 2 miles NW, the main island is indented by Waterfall Bay, Kong Sin Wan (Telegraph Bay), and Sandy Bay. The latter bay is almost completely reclaimed. The coast is fringed with rocks within 0.3 mile of the shore.

2.17 Lamma Island (Pok Liu Chau) (22°12'N., 114°08'E.) is a very irregularly shaped island with bays indenting it on all sides. It is relatively steep-to and rises to about 350m high, giving good radar returns from 12 miles. The hills on the island present a barren appearance. Most of the fringing dangers lie within 0.15 mile of the shore, the outermost being two rocks that dry 0.6 and 2.1m off the NW extremity of the island.

Of the three large bays that indent the E coast of Pok Liu Chau, only the southeasternmost is not used for anchoring, as it is open to the swell from seaward.

Sok Kwu Wan (Picnic Bay), which nearly bisects the island on its NE side, affords good anchorage for small vessels, in 11 to 12.8m. The bay is clear of dangers in its outer part. A concrete jetty, 60m long with a depth of about 5.8m at its head, projects NW from the S shore about 0.2 mile from the head of the bay where a ferry landing is situated.

A prohibited area, marked by buoys, lies within the bay.

Luk Chau Wan indents the NE side of Pok Liu Chau to the NW of Luk Chau, a small island about 68m high. The bay provides good shelter during the Southwest Monsoon.

Anchorage can be taken in Luk Chau Wan, in 9.2 to 11m, good holding ground.

A submarine power cable crosses Luk Chau Wan between positions 0.2 mile SSW and 0.6 mile WNW from the summit of Luk Chau.

Ha Mei Wan (22°13'N., 114°06'E.) is the largest bay on the W side of Lamma Island.

A powerplant, with two conspicuous chimneys, stands on reclaimed land E of **Po Lo Tsui** (22°13'N., 114°06'E.). A jetty, 320m long, is situated W of the powerplant where coal carriers berth. Hong Kong Electric Company can accommodate vessels of up to 100,000 dwt with a maximum length of 264m. The dock has a depth alongside of 16.5m. Approach to the berth is made through a channel, 260m wide with a dredged depth of 15.7m, entered 1.75 miles S of Po Lo Tsui. The channel is marked by lighted buoys. Anchoring off the jetty and the turning area is prohibited.

A passenger jetty lies close NE of Po Lo Tsui.

2.18 Tsing Chau (Green Island) (22°17'N., 114°07'E.) lies off the NW extremity of Hong Kong Island across Sulphur Channel. The island is 91m high, rock fringed, shows a light from its SW part. Green Island Cement Company operates a facility having a pier able to accommodate vessels of up to 55,000 dwt, with a dredged depth alongside of 10m.

Ngong Shuen Chau (Stonecutters Island) (22°19'N., 114°08'E.) is the S extremity of a peninsula created by extensive and continuous land reclamation. A large basin containing several jetties lies at the E end of Ngong Shuen Chau. The basin has a least depth of 4.4m and is protected by two lighted breakwaters which form the entrance on its NE side. The basin is approached via Yau Ma Tei Fairway, which leads N from Central Fairway at position 22°18'N., 114°09'E and passes W of Kowloon, then NW to the NE of Ngong Shuen Chau.

Tung Lung Island (22°15'N., 114°17'E.) lies across Tai Miu Wan to the S of the mainland and E of Hong Kong Island. It is over 230m high and very steep on its seaward side. A white mark has been painted on the steep black cliffs of Lam Tong Mei at the tip of the peninsula extending S from Tung Lung Island. Nga Ying Pai, 3.7m high, is the outermost of a group of rocks extending about 0.1 mile SW from the island. A light is shown from this rock.

Tai Miu Wan (Joss House Bay) (22°16'N., 114°17'E.) is a small bay bounded on the S by Tung Lung Island and on the N by the mainland. Fat Tong Mun is the E entrance to the bay, but is only usable by small craft as the W entrance is much more accessible. Although anchorage is foul in the outer part of the bay, small vessels can find good anchorage, in 10.1m, in its inner part, with the N extremity of Tung Lung Island bearing 121° and the SE side of Tit Cham Chau, the larger of the two islands in the NW entrance of the bay, bearing 238°.

Fat Tong Chau (Junk Island), 98m high and covered with grass and a few scattered trees, is located about 1 mile NNW of Tit Cham Chau in the SE part of Tseung Kwan O. The island is joined to the mainland by an extensive area of reclaimed land. There are three islets off its S extremity, the largest of which is marked by a light.

A shoal, with depths of 3m, lies between 0.2 and 0.4 mile ESE of Fat Tong Chau Light. A submarine power cable crosses the W entrance to Fat Tong Mun.

Tseung Kwan O (Junk Bay) (22°17'N., 114°16'E.) is a large indentation of the mainland that is entered between Fat Tong Chau and Lei Yue Mun Point, about 1.4 miles NW. This bay shoals gradually toward its head where a considerable amount of reclamation is being done.

Caution.—Depths in Tseung Kwan O are considerably less than charted N of a position 1.5 miles within the entrance. A shoal, with a least depth of 3m, exists between 0.1 and 0.2 mile NE of Lei Yue Mun Point.

A disused spoil ground extends about 0.1 mile seaward along this part of the coast.

This bay provides good shelter during typhoons, and in addition to the charted Dangerous Goods Anchorage, vessels may anchor, in 8.2m and 7.3m, N and NE, respectively, of Fat Tong Chau.

Hong Kong—Entrance Channels

2.19 Lam Tong Hoi Hap (Tathong Channel) is the main channel leading to the E entrance of Victoria Harbor. When entered from seaward, the channel leads S of Tung Chau Lung Island, NW between Lam Tong Mei and Hok Tsui, and NNW between Hong Kong Island and the mainland to Lei Yue Mun.

A Traffic Separation Scheme has been established in Lam Tong Hoi Hap, and is best seen on the appropriate chart. This traffic scheme is IMO-adopted and Rule 10 of the International Regulations for Preventing Collisions at Sea (1972) applies. For details on Vessel Traffic Service Reporting Points, see paragraph 2.23, “Victoria Harbor (Hong Kong)—Regulations.”

Tai Long Pai, a group of rocks, lies 1 mile SW of Nga Ying Pai. Shoal water extends up to 0.1 mile off the light structure situated on the rocks.

Bokhara Rocks (22°13'N., 114°16'E.) lie 1.3 miles S of Tai Long Pai, on a bank with a least depth of 4.4m.

Lei Yu Mun (22°17'N., 114°14'E.) is the short, narrow pass leading from the N end of Lam Tong Hoi Hap to the E entrance of Victoria Harbor. It is about 0.2 mile wide, with depths of over 18.3m lying 137m and 82m from the N and S sides, respectively. It is well-marked by lights and clear of dangers.

Sheung Sz Mun (22°12'N., 114°15'E.) is a deep pass leading between the mouth of Tai Tam Bay and the island of Lo Chau. After passing Hok Tsui, W-bound vessels should round Wong Ma Kok, remaining N of Oliver Shoals and clear of Chesterman Rock.

Chesterman Rock (22°11'N., 114°12'E.), marked by a lighted buoy, has a least depth of 13.7m and lies 0.7 mile WSW of Bluff Head.

Caution.—Mariners are advised to keep a safe distance from Chesterman Rock and Oliver Shoals; rapids and irregular shoals form in the area.

A wreck, with a least depth of 16.4m, lies in the inbound lane of Tathong Channel TSS, 0.6 mile S of Tathong Point Light.

2.20 Tung Pok Liu Hoi Hap (East Lamma Channel) (22°14'N., 114°08'E.) leads between Hong Kong Island and Lamma Island in a NW direction to the W entrance of Victoria

Harbor. It is the most convenient route to the mooring buoy berths in Victoria Harbor when approaching Hong Kong Island from the E or SE. The channel has fairway depths of over 18m.

A Traffic Separation Scheme governs traffic movements in East Lamma Channel, which is best seen on the appropriate chart.

Lamma Patch (22°15'N., 114°07'E.), with a depth of 7.5m, lies to the NE of Pak Kok on the Traffic Separation Line and is marked by buoys. A 14.6m patch lies in the outbound lane of the scheme, 0.5 mile SE of Lamma Patch.

Caution.—Large concentrations of fishing vessels frequent the approaches to Tung Pok Liu Hoi Hap.

Dangan Shuidao (Lema Channel) is entered from the E between Dangan Liedao and the Po Toi Group, or from the SW between Dangan Liedao and Sannen Liedao. The channel has depths of 18.3 to 36.6m, and is clear of dangers.

Caution.—This channel has been closed to foreign shipping by China.

2.21 Sai Pok Liu Hoi Hap (West Lamma Channel) (22°11'N., 114°03'E.) is entered between the islands of Cheung Chau on the W, and Lamma Island on the E. An extensive bank, with a least charted depth of 6.4m, extends across the islands mentioned above and is best seen on the chart.

Shek Kwu Chau (22°12'N., 113°59'E.) is the southwesternmost island bordering West Lamma Channel. It has two peaks, the higher one being on the NW end of the island and 183m high. A group of drying rocks lie off the NW shore. In 1993 shoal depths were reported 1 mile SSE and 1.8 miles SE of Shek Kwu Chau.

Cheung Chau, 2.5 miles ENE of Shek Kwu Chau, consists of two hilly areas joined by a narrow neck of land that supports a large fishing village. The hill to the N is about 109m high. A conspicuous meteorological observatory and storm signal station stand 0.3 mile NE of the S extremity of the island. Storm signals are also displayed from another mast 0.5 mile NE. The cliff face at the NE end of the island has been painted white.

Cheung Chau Rock, which dries 2.1m and is marked by a light, lies about 0.3 miles E of the E end of Cheung Chau.

Hei Ling Chau and **Chau Kung To** (22°16'N., 114°03'E.) are two islands lying 3 miles N of Cheung Chau Rock. The former is 188m high near its center with three rocks, the highest 3.7m high, lying about 0.2 mile offshore abreast the S part of the W coast of the island, while the latter is 105m high at the cliff on its E side. Supplementary storm signals are shown at the NW extremity of Hei Ling Chau. A conspicuous pavilion stands on the NW extremity of the island. Construction of a typhoon shelter on the island began in 1995.

A shoal, with a depth of 3.5m, lies about midway between Chau Kung To and Datum Rock to the NE.

2.22 Kau Yi Chau (22°17'N., 114°04'E.) rises steeply to 117m and is rock-fringed. It is the northernmost island on the W side of West Lamma Channel. The area between this island and Douglas Rock, which is awash at LWS and Siu Kau Yi Chau (Sui Kau Island) about 1 mile W, is a dumping ground.

In 1984, a depth of 5m was reported to lie 0.4 mile N of Douglas Rock.

An exposed wreck has been reported to lie off the E coast of Kau Yi Chau, and a second wreck showing masts above water lies 0.1 mile farther SE.

Peng Chau (22°17'N., 114°02'E.) and Tai Pak, close W, lie between the previously-mentioned islands and Tai Yue Shan. Peng Chau is crescent-shaped and rises to a height of 46m in the N and 107m in the S. These parts are joined by a low isthmus that contains a lime works. The cove on the E coast is shoal. A radio mast is conspicuous from the NE end of the island.

West Lamma Channel continues N of a line between Kau Yi Chau and Tsing Chau (Green Island) to Tsing Yi or Kap Shui Mun. Pun Shan Shek (Bunsansiak Rock) is the northwesternmost danger in the channel.

Victoria Harbor (Hong Kong) (22°18'N., 114°10'E.)

World Port Index No. 57840

2.23 Victoria Harbor lies between the N side of Hong Kong Island and the mainland of China. The harbor has an area of about 23 square miles, with complete facilities for ocean-going vessels of up to 110,000 dwt, including shipbuilding and repairs. The limits of Victoria Harbor are defined on the E by a line between the lights marking the NW end of Lei Yue Mun and on the W by a line from Shek Tong Tsui to the W coast of Tsing Chau (Green Island), to the SE side of Tsing Yi, then to the NW extremity of Tsing Yi and due N to the mainland.

Winds—Weather

The Northeast Monsoon normally begins during September. It prevails from October until mid-March, but can persist until May. The early winter is generally dry and sunny, with cloud cover and rainfall becoming more prevalent after January. Coastal fog and drizzle occur about 4 days a month in early spring during breaks in the monsoon. Vessels can, on occasion, find fair visibility in Lema Channel and East Lamma Channel when Lam Tong Hoi Hap is fogbound.

The Southeast Monsoon can occur from mid-April until September, but is not as strong as the Northeast Monsoon. This season is generally rainy, hot, and humid.

Gales and typhoons can occur from May to November, but typhoons are most likely to occur between July and September and vessels should be prepared to seek shelter during this period. Special moorings are equipped to handle vessels within Victoria Harbor during typhoons.

Tides—Currents

The tidal rise is 2.2m at springs, and 1.6m at neaps.

Tidal currents in the fairway and harbor between Lei Yue Mun and Tsing Chau set W with a rising tide and E with an ebb tide, changing direction at LW and HW.

Depths—Limitations

Tung Pok Liu Hoi Hap provides the deepest approach from seaward to Victoria Harbor, and provides access to the deep-

water berths at Tsing Yi Chau. Aside from Lamma Patch, which has already been described in paragraph 2.20, the channel shows a least charted depth of 16.5m to a point about 0.8 mile SSW of Tsing Chau (Green Island). From this point, the channel traverses Kellett Bank, which will be described later.

The controlling depth in Victoria Harbor is 11m through the Northern Fairway and Lam Tong Hoi Hop.

Northern Fairway is the principal fairway for all merchant ships entering Hong Kong harbor from W approaches; it has a least depth of 10.1m. The channel connecting East Lamma Channel with Northern Fairway runs W of the Western Quarantine Anchorage, then E along the N limits of Dangerous Goods Anchorage on the N section of Kellett Bank.

Anchoring is prohibited in this passage. The channel is marked by Kellett Lighted Buoy, Quarantine Lighted Buoy, and Northern No. 4 Lighted Buoy; the latter marks the W limit of Northern Fairway. The channel then leads SE between Northern No. 2 Lighted Buoy and Northern No. 3 Lighted Buoy for a distance of 1.5 miles and enters into Central Fairway.

Rambler Channel, located between Tsing Yi Chau and the mainland E, provides access to some of the principal deep-water berths of the port. The N end of the channel is obstructed by a bridge with a vertical clearance of 17m; passage N of the bridge is not recommended for ocean-going vessels.



Rambler Channel

Tsing Yi, the area N of Tsing Yi Chau, is reached by passing W and N of Tsing Yi Chau. Several oil berths are situated here.

The channel is dredged to a depth of 11.5m as far as the oil terminal at the NE end of Tsing Yi.

The main container berths for the port are situated on the E side of Rambler Channel, at the Kwai Chung and Stonecutter's Island Container Port which consists of eight private terminals. Each berth has a length exceeding 300m and alongside depths of 12.2 to 14.5m. There are a total of 19 container berths for ocean-going vessels in Victoria Harbor.

A bulk coal berth, situated on the W shore of Pok Liu Chau, is approached from West Lamma Channel via a fairway dredged to a depth of 15.5m in 1981. The jetty reportedly will accept vessels up to 290m in length, with drafts of 13m.

Tuen Mun, a utility company terminal having facilities for the handling of coal, can accommodate vessels up to 140,000 tons, with maximum drafts of 17m.

China Cement Company has three berths at Tap Shek Kok. The main jetty, which can accommodate vessels up to 60,000 dwt, has a length of 270m, with an alongside depth of 14m. The auxiliary jetty is 275m, with an alongside depth of 14m. The third jetty is for lighters and has a depth of 4.5m.

There are grain terminals at Kennedy Town and Kwun Tong.

There are eight tanker berths, with lengths of 61 to 250m and alongside depths of up to 18.3m. Vessels up to 110,000 dwt can be accommodated at the terminal situated on Tsing Yi Island. The Shell Terminal at Ap Lei Chau can accommodate vessels up to 100,000 dwt with a maximum draft of 18.3m. Special regulations are in effect for vessels proceeding to berths at Tsing Yi or Kwun Tong.

Numerous wharves and piers intended for break bulk vessels line the shores of Victoria Harbor. Depths alongside the various piers vary between 5.3 and 10.5m.

Ocean Terminal consists of two passenger vessel berths, each having a length of 380m, and a depth of 11.5m at the outer berth and 9m at the inner berth.

There are ship repair and dry-dock facilities for vessels up to 150,000 dwt.

Caution.—Depths of up to 2m less than charted have been reported (1996) in Northern Fairway.

Southern Fairway is entered through Sulphur Channel, which also merges into Central Fairway from the W, where Northern Fairway joins in from NW.

A rock, which uncovers 1.2m, lies 0.1 mile S of **White Point** (22°19.0'N., 114°08.4'E.). Another rock, with a depth of 1.8m, lies 0.1 mile WSW of the same point.

Central Fairway and Hung Hom Fairway, which connect with Eastern Fairway, pass through the central portion of Victoria Harbor. Hung Hom Fairway shows a least charted depth of 10m, while the other fairways possess greater depths.

The fairways in Hong Kong are usually very congested. Particular caution should be exercised when navigating at the junctions of fairways, particularly in the vicinity of position 22°19.0'N, 114°05.5'E, where traffic may converge from all directions.

Special regulations are in effect for Central Fairway. See "Regulations" for more information.

A bridge has been constructed in the channel close S of the Tsing Tsuen Bridge.

Aspect

Victoria Harbor is widest along its W harbor limit and narrows gradually E until the Kowloon Peninsula, projecting from the mainland toward Hong Kong Island, where it reduces its width to about 0.7 miles. Farther to the E, it widens slightly until beyond Tsat Tsz Mui (North Point) where it narrows again up to the E harbor limit at Lei Yue Mun. The N shore of Hong Kong Island and the shores of the Kowloon Peninsula are fronted by high buildings and backed by steep hills. Numerous piers project into the harbor from the shores of the mainland as well as from Hong Kong, Tsing Yi, and the other islands within the harbor limits. The W portion of the harbor contains most of the shore berths and mooring buoys, while the E portion is

filled by dockyards, a few piers and wharves, the former runway of the old international airport, and the Eastern Fairway.

The highest point overlooking the harbor is Victoria Peak, 551m high, with a tower near its summit, located 0.8 mile SSW of the Vessel Traffic Center (22°17.4'N., 114°09.0'E.). The S side of the harbor is indented by Victoria Basin, Tung Lo Wan (Causeway Bay), Quarry Bay, and Aldrich Bay, while the N shore is indented primarily by Kowloon Bay, Hung Hom Wan, and the Sam Shui Po area to the NE of Ngong Shuen Chau.

Chimneys at the power plants on the S side of Tsing Yi and about 0.5 mile WSW and 0.9 mile NNW, respectively, of North Point are conspicuous. The white spire of St. Andrew's Church is situated close W of the Royal Observatory on the Kowloon Peninsula. Close to the observatory stands a framework mast, 78m high, marked by a fixed red obstruction light.

Caution.—Dredging, reclamation, and construction works are continuously underway throughout the harbor.

Do not confuse the obstruction light on the tower at the Royal Observatory with the storm signals shown at that station.

The Macau Ferry Terminal is situated close NW of the signal station. Vessels may not enter or maneuver in the close vicinity, marked by buoys, of the terminal. Four sets of Traffic Control Lights are shown near the W extremity of Outer and Inner Piers at the ferry terminal, two on each pier. An outfall pipe extends 0.2 mile NNE from a position 0.2 mile W of the terminal. Positive identification of charted landmarks may be difficult at night due to the fact that the shores of the harbor are ablaze with light.

Pilotage

Pilotage in Hong Kong is compulsory for the following vessels:

1. Vessels of 3,000 grt or over.
2. Vessels of 1,000 grt or over proceeding to or from a wharf (as specified in Part 1 of the First Schedule) or container terminal (as specified in the Third Schedule of the Dangerous Goods (Shipping) Regulations).
3. Vessels of 1,000 grt or over carrying dangerous goods (as specified in IMO categories 1, 2, and 5).
4. Vessels of 1,000 grt or over proceeding to or from a government mooring buoy.
5. Vessels of 300 grt or over, as follows:
 - a. Vessels unable to proceed under their own power, maneuver with their own steering gear, or work with their own anchors.
 - b. Vessels that have any part of the hull structure removed or under repair which may affect the watertight integrity of the vessel.
 - c. Vessels at risk of causing injury to persons or damage to property, any other vessel, or the environment by virtue of the condition of the vessel or the nature or condition of the cargo.
6. Gas carriers as defined in Regulation 2 of the Merchant Shipping (Safety) (Gas Carriers) Regulations.
7. All vessels 5,000

Pilot services are available 24 hours throughout the year.

Pilots embark and disembark at the N end of the traffic separation scheme (TSS) in East Lamma Channel; near Ngau

Chau (Round Island), in East Lamma Channel, for vessels of 20,000 grt and over; off the turning buoy in Tathong Channel; or off Lau Kok Tsui (Black Point) in Urmston Road. Vessels are also met off the entrance to Chek Mun Hoi Hap (Tolo Channel). The pilots monitor VHF channel 11.

Vessels using the South Western Approach requiring a pilot, shall embark or disembark their pilot at Ngan Chau Pilot Boarding Station.

Oil tankers anchoring in the Kau Yu Chau Dangerous Goods Anchorage and hampered vessels entering and leaving through Weat Lamma Channel shall embark and disembark their pilot in the vicinity of Tsing Chau (Green Island).

Vessels may proceed directly to or from a pilot boarding place or a specified anchorage, provided the arrival information is delivered as required.

Vessels should adjust their speed to arrive at the pilot boarding station at the allocated boarding time and conform to the speed of other vessels in the channel, not overtaking vessels ahead unless directed to do so by the Vessel Traffic Center.

Regulations

Pre-arrival information.—All owners, agents, and masters or persons-in-charge of all vessels are required to report their arrival and movements of their vessels to the Vessel Traffic Center (VTC), call sign "MARDEP," when entering, leaving, or moving in the waters of Hong Kong, unless they are exempt under Hong Kong port regulations.

The owners, agents, or masters of these vessels which participate in the VTS shall apply for permission to enter the waters of Hong Kong by providing pre-arrival notifications to the VTC through fax, not less than 24 hours before the intended entry into the waters of Hong Kong from the sea or river trade waters or immediately after leaving their last port of call if the intended entry into the waters of Hong Kong is less than 24 hours after leaving such port. Vessels which are not participating in the VTS should also fax their pre-arrival notifications to the VTC.

The pre-arrival notification for all vessels should state the following information:

1. Vessel's name.
2. Call sign.
3. Flag.
4. Type.
5. GRT.
6. LOA (in meters).
7. Number of crew including master.
8. Purpose of call in Hong Kong.
9. Estimated maximum draft of vessel in meters upon arrival.
10. Any defects affecting maneuverability of seaworthiness, or special conditions of the vessel or its cargo.
11. Quantities and categories of dangerous goods on board including radioactive materials (insert "None" if applicable).
12. Name of agent in Hong Kong (insert "None" if no agent appointed and indicate whether an agent is to be appointed or whether the master is to act as agent).
13. Name of master of vessel.

14. Intended pilot boarding station if pilot is required (Note.—Pilots should be requested, through the agent, from Hong Kong Pilots Association).

15. ETA (expressed as "YY/MM/DD/hh/mm") at intended pilot boarding station.

16. Last port of call (state name of port and country or territory).

17. Height to highest point of vessel in meters above waterline on arrival.

18. Any other relevant information (if applicable).

Tankers should state the following information:

1. Vessels name.
2. Call sign.
3. Flag.
4. LOA (in meters).
5. Maximum draft.
6. Present dwt.
7. Date keel laid.
8. Cargo type; quantity (in tons); and whether for loading, discharging, transshipment, or transit.
9. ETA at intended pilot boarding position, special anchorage, or berth in the waters of Hong Kong.
10. ETD from intended berth in the waters of Hong Kong.
11. Intended berth.
12. In the case of a vessel carrying liquefied gas in bulk, details of any certificate of fitness with respect to that cargo, including number, name of person or body issuing the certificate, date of issue, date of latest survey and date of expiration, and type of liquefied gas carried.

13. In the case of a vessel carrying more than 2,000 tons of oil in bulk, details of any certificate of insurance, insuring against risk of pollution with respect to that cargo, including number, name of person or body issuing the certificate, date of issue, and date of expiration.

14. In the case of a vessel carrying (or to carry) any noxious liquid substances in bulk, details of any International Pollution Prevention Certificate with respect to that cargo, including number, name of person or body issuing the certificate, date of issue, date of latest survey and date of expiration, and indicating whether for loading, discharge, transshipment, or transit.

15. Whether a MARPOL surveyor is required.

16. Whether a fixed inert gas system is fitted in the vessel.

17. Whether a fixed tank washing system is fitted in the vessel tanks.

When permission to enter the waters of Hong Kong has been granted, the master of the vessel shall provide initial reports to the VTC on VHF channel 12 when the vessel is in the vicinity of the seaward limits of the Vessel Traffic Service.

Vessel Traffic Service.—A Vessel Traffic Service, mandatory for all vessels over 300 tons, is in effect for the waters of Hong Kong. Vessels 300 grt especially those participating in the VTS, are required to submit a Pre-Arrival Notifications (PANs) to the Vessel Traffic Center 24 hours prior to entering Hong Kong waters. Non-convention vessels entering or transiting the waters of Hong Kong are requested to send their notification by fax to the Harbor Patrol Section (HPS) of the Marine Department, not less than 24 hours before entry into

Hong Kong water, or before leaving the last port of call. Vessels are required to contact MARDEP by VHF as follows:

1. When entering the Eastern Approaches—VHF channel 12.
2. Upon entering the Western Approaches—VHF channel 67.
3. Within the harbor limits—VHF channel 14.

Once contact has been made and permission to proceed granted, vessels should relay the following report when passing the appropriate reporting points listed below:

1. Vessel's name.
2. Reporting point.
3. Time of passing point.
4. Speed.

The schemes established on W approach are, as follows:

1. North West Siu A Chau Traffic Separation Scheme between Fan Lau Lighted Buoy and Siu A Chau Lighted Buoy (22°12'00"N., 113°54'12"E.).

2. Precautionary Area No. 2, enclosing the junction of North Cheung Chau Traffic Separation Scheme and South Cheung Chau Traffic Separation Scheme, extends 1.25 miles E from Siu A Chau Lighted Buoy.

3. North Cheung Chau Traffic Separation Scheme extends from Precautionary Area No. 2, passing N of Cheung Chau to a position 2 miles WSW of Tsing Chau (Green Island). The separation line is marked by Southeast Lantau Lighted Buoy, Adamasta Rock Lighted Beacon, and Hei Ling Lighted Buoy.

4. South Cheung Chau Traffic Separation Scheme extends between the same points as North Cheung Chau Traffic Separation Scheme, but passes S of Cheung Chau. The separation line is marked by Shek Kwu Chau Lighted Buoy (22°10'48"N., 113°59'24"E.) and Cheung Chau Lighted Buoy (22°11'48"N., 114°03'12"E.).

5. Precautionary Area No. 1 extends from the NE extremities of North Cheung Chau Traffic Separation Scheme and South Cheung Chau Traffic Separation Scheme 1 mile NE to Southeast Kau Yi Chau Lighted Buoy (22°16'42"N., 114°05'30"E.).

All vessels with masthead or superstructure heights exceeding 30m above sea level must contact MARDEP Hong Kong when passing TCS1 Lighted Buoy and state the following:

1. Vessel name.
2. ETA at Lei Yue Mun.
3. Maximum height of mast or superstructure above sea level.

All vessels transiting the Western Approaches of Hong Kong, N and S of Lantau Island, should contact MARDEP on VHF channel 67.

All vessels should contact MARDEP on VHF channel 12 when passing Waglan Island and confirm the information in 1, 2, and 3 above.

All vessels should report when passing TCS4 Lighted Buoy to confirm ETA at Lei Yue Mun and request permission to proceed.

All outbound vessels should establish contact with MARDEP on VHF channel 14 prior to departure and provide the following information:

1. Vessel name.
2. ETD.
3. Maximum height of mast or superstructure above sea level.
4. Estimated time of singling up.
5. ETA at Lei Yue Mun.

Ten minutes prior to arrival at Lei Yue Mun, vessels should contact MARDEP and obtain permission to proceed. If the ETD or ETA Lei Yue Mun varies from that reported to MARDEP, that vessel should immediately contact MARDEP and obtain permission to proceed. Any vessel lacking VHF capability should enter and depart via East Lamma Channel.

In order to reduce the risk of collision in the dredged cut N of Tsing Yi Chau, the following regulations are in force:

Vessels entering from seaward and proceeding to Tsing Yi shall inform MARDEP at least 1 hour in advance of the vessel's ETA at parallel 22°21'N. A vessel departing another berth for Tsuen Wan shall inform MARDEP at least 1 hour before departing the berth, as well as the vessel's ETA at the parallel mentioned above. An outbound vessel shall notify MARDEP at least 1 hour before departing the dock. If a vessel's arrival at the latitude stated or departure from the dock at Tsuen Wan varies more than 15 minutes from the ETA given to MARDEP, priority may be given to another vessel.

Ocean-going vessels are advised not to transit Central Fairway. Vessels having a valid reason to transit Central Fairway should seek permission from the Vessel Traffic Center (VTC).

Vessels intending to proceed directly to a berth from sea, or to depart from a berth directly to sea, shall enter or leave through the approach that is closest to its berth, as follows:

1. Lam Tong Hoi Hap (Tathong Channel)—berths to the E of Macau Ferry Terminal Buoy MFT1.
2. Tung Pok Liu Hoi Hap (East Lamma Channel) or Sai Pok Liu Hoi Hap (West Lamma Channel)—berths to the W of Macau Ferry Terminal Buoy MFT1.

Ocean-going vessels of less than 3,000 grt, which have obtained permission to transit Central Fairway from the VTC, are strongly recommended to employ a pilot.

The VTS Reporting Points are:

1. Eastern Approaches—Lam Tong Hoi Hap (Tathong Channel):
 - a. Lighted Buoy TCS1.
 - b. Hak Kok Tau (Cape Collision).
 - c. Lei Yeu Man.
2. Southeastern Approaches—Tong Pok Liu Hoi Hap (East Lamma Channel):
 - a. Waglan Island Light.
 - b. Lighted Buoy LCS1.
 - c. Lamma Patch.
 - d. Tsing Chau (Green Island).

Note.—Vessels contacting MARDEP from Waglan Island Light or the LCS-1 Lighted Buoy are to call on VHF channel 12.

Vessels contacting MARDEP from Lamma Patch or Tsing Chau (Green Island) are to call on VHF channel 14.

3. Southeastern Approaches—Sheung Sze Mun:
 - a. Waglan Island Light.
 - b. Chesterman Lighted Buoy.
 - c. Lamma Patch.

- d. Tsing Chau (Green Island).
4. Southwestern Approaches—Siu Pok Liu Hoi Hap (West Lamma Channel):
 - a. Cheung Chau Lighted Buoy.
 - b. Shek Kok Tsui.
 - c. Tsing Chau (Green Island).
5. Western Approaches—Adamsta Channel:
 - a. Fan Lau Kok.
 - b. Adamsta Rock.
 - c. Shek Kok Tsui.
 - d. Tsing Chau (Green Island).
6. Western Approaches—N of Tai Yue Shan:
 - a. Sha Chau.
 - b. Lighted Buoy CP1.
 - c. North West Ma Wan Traffic Light (southbound only).
 - d. Lighted Buoy MW (northbound only).
7. Northwestern Approaches:
 - a. Urmston Road pilot boarding position.
 - b. Lighted Buoy CP8.
 - c. Lighted Buoy CP1.
 - d. North West Ma Wan Traffic Light (southbound only).
 - e. Lighted Buoy MW (northbound only).
8. Kwai Chung Container Terminals.

Kwai Chung Marine Traffic Control Station (KCCS), a sub-station of the Vessels Traffic Center. The KCCS monitors, regulate, and coordinates all marine traffic within the Kwai Chung Basin. The basin area consists of waters bounded on the N by the Tsing Yi Bridge, on the S by a line joining the SW tip of Stonecutters Island to the SE tip of Tsing Yi Island, and on the E and W by the shoreline.

When vessel is to the W of Kwai Chung Container Terminal No. 8 it is required to contact "Kawi Chung Control" on VHF channel 74, which is monitored 24 hours.

While vessel is in the KCCS service area VTS, participating vessels or vessels engaged in special operations are required to:

1. Maintain continuous listening watch on VHF channel 74.
2. Report to KCCS on VHF channel 74 before getting underway, leaving their berth, when berthed or cease to be underway and when entering or leaving the KCCS service area.

Vessels not transiting the KCCS should avoid passing close to its boundaries. Local craft and river trade vessels of less than 300 grt are not required to report to the VTC or KCCS, however, while navigating in the KCCS service area, should as far as practicable keep a listening watch on VHF channel 74, give consideration to the safe navigation of other vessels, and not impede the safe navigation of deep draft vessels underway in the Kwai Chung Basin. Anchoring (except in emergency) and fishing are prohibited in the KCCS service area.

For the purpose of directing traffic, guiding small vessels in particular, a patrol launch is stationed in the KCCS service area. In inclement weather, the patrol launch may be suspended.

Vessels leaving or preparing to move within Hong Kong waters should report the following information at least 1 hour in advance, or, if subject to compulsory pilotage, then at least 3 hours in advance of departure:

1. Vessel's name and nationality.
2. Type and grt.
3. Length and draft.
4. Status of machinery and steering equipment.
5. Whether pilot is required.
6. ETD.

MARDEP should be informed of the time and location of pilot boarding or discharge; time, location, and estimated time of next movement upon the vessel's anchoring; and time of casting off or weighing anchor.

Vessels experiencing any of the stated conditions below are required to send an immediate report:

1. Any condition affecting navigation of the vessel, including fire on board, defective propulsion or steering equipment, excessive list, or inoperative VHF.
2. If any tow which vessel is towing cannot be controlled or can be controlled only with difficulty.
3. Concentrations of fishing vessels.
4. Reduced visibility or other adverse weather conditions.
5. Floating logs or other obstructions to navigation.
6. Any defect in a navigation aid.
7. Any defect on another vessel, likely to affect its navigation.

Dangerous cargo regulations—The following extracts concern dangerous cargo regulations:

1. It shall not be lawful for the master of any vessel carrying explosives to anchor within 500m of any other vessels or of any Government Explosives Depot without the permission of the Director of Marine. Vessels engaged in the transshipment of explosives shall show the International Code of Signals flag B by day, and shall by night show an all-round red light not less than 6m above the uppermost deck. If engaged in the transshipment of petroleum products having a flashpoint of less than 65.5°C, in lieu of the International Code of Signals Flag B, shall fly by day a red flag of not less than 1m square, with a white circular center 0.15m in diameter, at the foremast, and the International Code of signals hoist "SU7." The above signals are to be displayed until the Director of Marine is satisfied that the holds are clean and ventilated.
2. Vessels carrying dangerous goods, on arrival at Hong Kong, must anchor in one of the prescribed Dangerous Goods Anchorages, and must obtain permission from the Director of Marine before going alongside or shifting berth.
3. Except with the permission of the Director of Marine, no vessel carrying dangerous goods in category 5, classes 1, 2, or 3 shall enter or remain in that part of Hong Kong Harbor which is bounded by:
 - i. To the E—by a line drawn from a position on Hong Kong Island near **Pak Kok** (North Point) (22°17'42"N., 114°11'54"E.) in a 334° direction to the Kowloon Peninsula.
 - ii. To the W—
 - a. from a position on Hong Kong Island 22°16'36"N, 114°06'48"E, in a 329° direction to the W side of Tsing Chau (Green Island) and then on a bearing of 026° to the W side of Ngong Shuen Chau (Stonecutters Island.)

- b. from a position on the E side of Ngong Shuen Chau 22°19'24"N, 114°08'42"E, on a 000° bearing to the mainland.

4. Except with the permission of the Director of Marine, upon the hoisting of any local storm signal other than No. 1 or No. 3, every vessel having dangerous goods in categories 1 or 5 on board, shall proceed outside the harbor and remain outside until such signal is lowered.

5. The oil wharves at Kwun Tong, Ap Lei Chau, and Tsing Yi shall be berths to which vessels carrying dangerous goods may proceed with the permission of the Director of Marine; otherwise, such goods must be discharged or loaded in one of the dangerous goods anchorages.

6. All vessels, with keels laid on or after April 12, 1972, which are carrying chemicals in bulk, must be in possession of a Certificate of Fitness, in accordance with the IMO-adopted Code for the Construction and Equipment of Ships carrying dangerous chemicals in bulk, before such vessels enter or leave Hong Kong waters.

Storm regulations.—The following extracts concern storm regulations:

1. Every person in charge of a vessel shall comply with the requirements of the Director of Marine, who may order such vessel to anchor or secure in any place he may direct, or prohibit anchoring or securing in any place, and who may order the vessel to be removed to another place within the region.

2. Anchoring without the permission of the Director of Marine is prohibited in the approaches to the airport in Kowloon Bay, except when a Typhoon Signal, other than No. 1 and No. 3, is hoisted.

3. Except with the prior permission of the Director of Marine, no dead ship shall be anchored, moored, or secured at any place within the waters of Hong Kong nor except with such permission, shall any repairs be undertaken upon any ship which is so anchored, moored, or secured which will result in such ship becoming a dead ship. The expression "dead ship" means any ship exceeding 50m in length, other than a laid-up ship, which is unable to proceed under its own power; unable to maneuver with its own steering gear; unable to work its own anchors; or unable to maintain the watertight integrity of the ship.

4. Upon a local storm warning signal being hoisted, vessels at government buoys shall clear away anchors and cables, and bring main engines to a state of readiness for full power, and shall leave such buoys, if so directed.

5. Upon a local storm signal, other than No. 1 being hoisted, vessels at government buoys not being special typhoon moorings shall, within 2 hours, move to a typhoon anchorage or to a special typhoon mooring. The Director of Marine may at his discretion order a vessel to leave a special typhoon mooring.

6. Any ship within the waters of Hong Kong shall have on board at all times such number of crew as, in the opinion of the Director of Marine, is capable of carrying out all the duties which may reasonably be required to ensure the safety of the ship having regard to the circumstances pertaining thereto. Masters or agents requesting a buoy are advised to

ascertain whether it is considered safe for use in typhoon conditions.

7. Nothing in these regulations shall prevent any vessel which is already at a typhoon buoy from shifting to an anchorage if such is preferred.

Vessels may be directed to secure to designated mooring buoys in the event of severe weather. The majority of the mooring buoys are established in the vicinity of Kellett Bank, however, several mooring buoys are established E of Northern Fairway, close S of Yau Ma Tei Anchorage; N of Wan Chai and Causeway Bays; and in the central portion of To Kwa Wan. Class A buoys are painted white with black numbers, and are usable by vessels up to 183m in length. Class B buoys are black with white numbers, and are suitable for vessels up to 137m in length. Class A buoys are moored in depths of 5.1 to 12m; Class B buoys are moored in depths of 4 to 8.5m.

Vessels are required to moor using the ship's anchor cable. vessels may drop an anchor underfoot to lessen severe sheering. The anchor should be so placed as not to impair the efficiency of the mooring. Vessels must obtain permission to moor through the Marine Department Port Formalities and Dangerous Goods Office.

Reclamation projects, such as those in work in Central and Wan Chai (1997), may displace the mooring buoys from their charted positions.

Hei Ling Chau Typhoon Shelter (22°14'N., 114°02'E.), located W of Hei Ling Chau, is marked by lights and beacons at its entrance. The E boundary is marked by dolphins. Vessels are advised to stay to the W of the boundary dolphins and not to use them for mooring. Fifteen mooring dolphins are located inside the shelter area.

Pollution.—The depositing of oil, rubbish, or other substances on the waters or the port is prohibited.

No vessel shall emit smoke in such quantities as to be a nuisance.

Reception facilities have been established on Tsing Yi Island for oily and chemical wastes as required under the International Convention for the Prevention of Pollution from Ships.

Speed restrictions.—Vessels shall not exceed a speed of 10 knots within the harbor limits; the speed limit for vessels 60m in length or over is 8 knots.

When underway in the entrance to or within a typhoon shelter, the speed restriction for all vessels is 3 knots.

Search and rescue.—The coastal radio station of the Global Maritime Distress and Safety System serves as the Maritime Rescue Coordination Centre for the waters of Hong Kong. Maritime search and rescue operations are coordinated by the Marine Department for Hong Kong and the area of the South China Sea N of latitude 10°N and W of longitude 120°E, excluding the immediate coastal waters of neighboring states.

Signals

Traffic signals.—Traffic signals, consisting of three red lights disposed vertically, are shown from signal towers situated on Ha Pong, NW Ma Wan, and Hoi Mei Wan. These signals are designed to control traffic when a vessel con-

strained by draft is transiting Ma Wan Channel. There is a local traffic control station at Ma Wan for the surveillance and control of traffic in the Ma Wan Channel.

Signal stations offering full communications facilities to vessels transiting the waters of Hong Kong are located on Waglan Island and at the Marine Department Headquarters. They may be contacted via radio or visual signals 24 hours. Weather signals are also shown from these stations.

Vessels entering/departing the port are required to identify themselves to the signal station on Waglan Island or Tsing Chau (Green Island). Initial contact with VTS may be made on VHF channel 12. Vessels switch to VHF channel 14 at Lamma Patch.

Vessels underway in any portion of the port shall identify themselves to any government vessel or warship if challenged.

While underway by day, a vessel shall display its national ensign, call sign, and well clear of any other hoist, the appropriate berthing signal (listed below).

Any vessel to which the letters L or K is made, via sound signal, flashing light, or signal hoist shall stop immediately and shall not proceed until authorized to do so.

Berthing signals.—Vessels are required to fly a signal by day indicating destination.

Hong Kong Berthing Signals	
Signal	Meaning
KC3	The wharf at Kwai Chung (Lot No. 3) belonging to Sealand Orient Ltd.
KC4	The wharf at Kwai Chung (Lot No. 4) belonging to Hong Kong International Terminals Ltd.
KC5	The wharf at Kwai Chung (Lot No. 5) belonging to Modern Terminals Ltd.
KC6	The wharf at Kwai Chung (Lot No. 6) belonging to Hong Kong International Terminals Ltd., S side.
KB	Kowloon Bay, when approaching from W.
PS	The anchorage off NE coast of Tai Yue Shan known as Pun Shan Shek Dangerous Goods Anchorage.
WE	Western Dangerous Goods Anchorage.
WQ	Western Quarantine Anchorage.
YT	Yau Ma Tei Anchorage.
OA	Yam O Bay Anchorage.
TA	Tolo Harbor Anchorage.
SA	Sham Shui Po Anchorage.
JA	Junk Bay Anchorage.
SM	Sham Shui Po Hard.
RH	Rocky Harbor Anchorage.
NB	Naval Base.

Hong Kong Berthing Signals	
Signal	Meaning
MW	The wharf at Connaught Road West, known as Hong Kong-Macau Ferry Terminal.
A with a number	Class A buoys.
B with a number	Class B buoys.
N with a number	Naval buoys.
TY	Floating docks at Tsing Yi Island.
KW	The wharves at Tsim Sha Tsui belonging to the Hong Kong and Kowloon Wharf and Godown Co. Ltd.
OT	The Ocean Terminal at Tsim Sha Tsui belonging to the Hong Kong & Kowloon Wharf & Godown Co. Ltd.
KT	The wharf at Kwun Tong belonging to the Shell Co. of Hong Kong Ltd.
AP	The wharf at AP Lei Chau belonging to the Shell Co. of Hong Kong Ltd.
TW	The wharf at Tsuen Wan belonging to the Hong Kong Oil Company Ltd.
TW	The wharf at Tsuen Wan belonging to Caltex Oil Hong Kong Ltd.
SW	The wharf at Sham Tseng belonging to Hong Kong Breweries Ltd.
KD	The wharves at Hung Hom belonging to Hong Kong United Dockyards Co. Ltd.
TD	The wharf at Quarry Bay belonging to Hong Kong United Dockyards Co. Ltd.
TS	The wharf at Quarry Bay belonging to the Taikoo Sugar Refining Co. Ltd.
NY	The wharf at Ngan Ying Chau belonging to China Resources Co. Ltd.
MO	The wharf at Tsing Yi Island belonging to Mobil Oil (Hong Kong) Ltd.
ET	The wharf at Tsing Yi Island belonging to Peninsula Electric Power Co. Ltd.
PO	The wharf at Tsing Yi Island belonging to Caltex Oil Hong Kong, Ltd.
EO	The wharf at Tsing Yi Island belonging to the Esso Oil Company Ltd.
GO	The wharf at Tsing Yi Island belonging to The Gulf Oil Company Ltd.

Hong Kong Berthing Signals	
Signal	Meaning
FO	The wharf at Tsing Yi Island belonging to the China Resources Co.
KC1	The wharf at Kwai Chung (Lot No. 1) belonging to Modern Terminals Ltd.
KC2	The wharf at Kwai Chung (Lot No. 2) belonging to Hong Kong International Terminals Ltd.
CW	China Resources Wharf, Chai Wan.
CM	China Merchants Wharf, Kennedy Town.
FE	Cement Wharf, Pok Liu Chau.
CO	Caltex Wharf, Tsing Yi.
BA	Kellett Bank Anchorage.
PA	Sok Kwu Wan Anchorage.
LA	Laid-up ship anchorage, N of Tai Yue Shan.
SD	Lok On Pai desalination plant.
LE	Hong Kong Electric Co. Wharf, Po Lo Tsui.
TE	China Light and Power Co. Wharf, Tap Shek Kok.
AD	Apple Floating Dock, Tsing Yi.
TC	China Cement Co. Wharf, Tap Shek Kok.
WD	Whampoa Floating Dock, Tsing Yi.
TD	Taikoo Floating Dock, Tsing Yi.
YD1	Yiu Lian No. 1 Floating Dock, Tsing Yi.
YD2	Yiu Lian No. 2 Floating Dock, Tsuen Wan.

Coastal Visibility Broadcasts for Hong Kong Waters.—When visibility in any part of Victoria Harbor or the approaches thereto is restricted by fog or mist to less than 2 miles, visibility reports are broadcast over Hong Kong Port Radio on VHF channel 12 at 15 minutes after every hour until such time as visibility has improved to more than 2 miles in all areas. The VHF broadcasts may be supplemented by TTT messages in some circumstances, particularly when visibility conditions in the E and W approaches differ significantly.

Visibility reports cover the following areas:

1. Waglan Island and Po Toi Island (Wang Lang Island and Po Toi Groupe).
2. Tathong Point (Lam Tong Mei).
3. Tathong Channel (Lam Thong Hoi Hap).
4. Kowloon Bay.
5. Bluff Head, Stanley Peninsula (Wong Ma Kok).
6. Victoria Harbor.
7. East Lamma Channel.
8. Tsing Chau (Green Island).

9. West Lamma Channel.

10. Cheong Chau Island.

The reports are broadcast in plain language in the following manner:

Visibility	Report
Less than 0.1 mile	Thick fog
Between 0.1 and 1 mile	Restricted visibility
Between 1 and 2 miles	Visibility in miles and tenths of a mile (e.g. 1.6 miles)
Between 2 and 5 miles	Moderate visibility
Over 5 miles	Good visibility

Lam Tong Hoi Hap and Lei Yue Mun provide access to Victoria Harbor from the E. Lam Tong Hoi Hap has a least charted depth of 11.5m off Fat Tong Chau, while Lei Yue Mun is deep and clear of dangers. Caution is advised in Lei Yue Mun, as the tidal currents within it may reach 3 knots. Vessels navigating this route to Victoria Harbor are restricted in masthead height, and are governed by special regulations due to the operations of the airport charted about 3 miles NE of Lei Yue Mun.

The W approaches to Victoria Harbor are obstructed by Kellett Bank, which has depths of less than 5m in places. This extensive shoal is crossed by three fairways, two of which are dredged.

The S end of Kellett Bank is traversed by Southern Fairway, which has a least charted depth of 7.3m.

There are mooring buoys situated over Kellett Bank. The channel is entered via Lau Wong Hoi Hap (Sulphur Channel) or North Green Island Fairway, which pass SE or N, respectively, of Tsing Chau (Green Island). North Green Island Fairway, which leads between Southern Fairway, close N of Kennedy Town, and Western Quarantine and Immigration Anchorage, should be used by shallow draft vessels only, as it has a least charted depth of 5.4m.

Anchorage

Quarantine Anchorage.—Vessels may request advance clearance and quarantine services by radio. These services are available around the clock at the Western Quarantine Anchorage. Services are provided at the Eastern Quarantine Anchorage from 0600 to 1800 daily. There are several additional quarantine anchorages which are best seen on the chart.

The two quarantine anchorages are situated within the waters of the port. Eastern Quarantine Anchorage is situated S of the airport, and has charted depths of 9.1 to 12.4m, mud, sand, and gravel. Western Quarantine Anchorage is centered about 1 mile S of Tsing Yi Chou, and offers depths of 7 to 18.7m, mud and shells.

A disused explosives dumping ground close W of the SW tip of the Tsing Yi extends into Ma Wan Fairway. The W side of the fairway is bordered by Ma Wan Anchorage, with depths of 10.4 to 32.5m. Vessels with an air draft of greater than 41m are not permitted within the designated anchorage areas located S

and W of Ma Wan Channel. A 6.8m shoal lies close N of Ma Wan Anchorage.

Dangerous Goods Anchorage.—Six dangerous goods anchorages are situated throughout the port area for vessels carrying commodities listed as dangerous by the Director of Marine. Western Dangerous Goods Anchorage adjoins the Western Quarantine Anchorage, and has depths of 6.3 to 9.2m, soft mud and shells. The anchorage is studded with mooring buoys.

Kau Yi Chau Dangerous Goods Anchorage extends S through W from the S shore of Kau Yi Chau. Reserved Dangerous Goods Anchorage lies 1 mile E of Kau Yi Chau. Both are best seen on the chart.

Tsuen Wan Dangerous Goods Anchorage is situated at the E end of that channel, N of Tsing Yi Chau. Depths at the center of the anchorage are 10 to 14.8m, but shoal patches lie at the SE corner of the area, and shoal banks extend from the shore on all sides. A Prohibited Anchorage Area lies at the S end of the anchorage.

Tseung Kwan O Dangerous Goods Anchorage is situated 0.9 mile NW of Fat Tau Chau. The least charted depth here is 12m, soft mud.

Rocky Harbor Dangerous Goods Anchorage (22°20'N., 114°20'E.) is situated in Leung Shuen Wan Hoi, which has already been described. The anchorage has charted depths of 7m, mud and requires local knowledge for its use.

Naval Anchorage.—A naval anchorage is charted just S of Central Fairway and is best seen on the chart. Large naval units often anchor N of Tsing Chau (Green Island), between the Prohibited Anchorage and Kellett Bank.

Typhoon Anchorage.—Anchorage on the N side of the harbor is preferable during typhoon season as the Kowloon Peninsula offers protection from NE winds. Along with the mooring buoys described below, shelter for small craft during severe weather is afforded by specially constructed Typhoon Shelter Harbors situated throughout the Hong Kong area. The Director of Marine should be contacted for details on these havens.

General Anchorage.—General anchorage is available in Sham Shui Po Anchorage which is situated between the N shore of Ngong Shuen Chau and Lai Chi Kok to the N and NE. Yau Ma Ti Anchorage, SE of Ngong Shuen Chau, has depths of 4.6 to 5.5m, but is available only to vessels up to 91.5m long.

Anchorage for vessels waiting to enter Hong Kong harbor are designated at:

1. Southeast Lamma Anchorage—1.25 miles SE of Yuen Kok Light (22°11'N., 114°09'E.).
2. South Lamma Anchorage—1.25 miles SSW of Yuen Kok, for vessels carrying dangerous goods.
3. Southwest Lamma Anchorage—SW of Yuen Kok.

All the above anchorage offer a least charted depth of 20m, soft gray mud with rocky bottom.

Prohibited Anchorage.—A prohibited anchorage fairway has been designated on the W side of the harbor. It leads from

the N end of Tung Pok Liu Hoi Hap (East Lamma Channel) along the W side of Kellett Bank to Tsing Yi. Its limits are charted.

A prohibited anchorage area for vessels with an air draft of more than 41m has been established in the vicinity of Ma Wan as follows:

1. West limit—a line joining Ha Pang Light and Tai Yue Shan at 114°01.7'E.
2. South limit—a line joining SW corner of Tsing Yi and Tai Yue Shan at 22°19.6'N.
3. East limit—a line joining Ting Kau and Tsing Yi at 114°04.6'E.

Many other prohibited anchorage areas are situated throughout the harbor; the charts are the best guide to their limits and locations.

Directions

The entrance channels normally used by vessels calling at Hong Kong are approached from the E or SE. Waglan Island Light, steered for on a bearing between 243° and 330° leads from seaward to a position where the Traffic Separation Schemes through Lam Tong Hoi Hap or Tung Pok Liu Hoi Hap (East Lamma Channel) may be reached.

If approaching Hong Kong from S of the usual shipping lanes, vessels should keep at least 5 miles seaward of Jiapeng Liedao and Dangan Liedao.

If bound for Lam Tong Hoi Hap from E, steer for the appropriate lane of the Traffic Separation Scheme, keeping a good lookout for traffic near the lane entrance.

If bound for Tung Pok Liu Hoi Hap (East Lamma Channel) from the SE, round the N end of Dangan Liedao at least 5 miles off, taking care to avoid the dangerous wrecks charted about 6.7 miles E and 4.4 miles ESE of the light on Poh Toi Island. Keeping a sharp lookout for traffic, pass no more than 1.5 miles S of Poh Toi Island, and proceed to the appropriate traffic lane.

If bound for Tung Pok Liu Hoi Hap (East Lamma Channel) from the E, proceed as directed above, passing S of Waglan Island and Poh Toi Island.

If bound for the bulk berth in Sai Pok Liu Hoi Hap (West Lamma Channel), steer as directed for Tung Pok Liu Hoi Hap (East Lamma Channel) until S of Poh Toi Island. Keeping an eye out for traffic, steer to pass within 1 mile of Lamma Island. Round the island's S end, and proceed to the dredged channel off the island's W side. Except for a 10m patch located 0.2 mile off the island's SW extremity, the S end of Lamma Island is generally clear of fringing dangers, with deep water close off. The dredged cut to the dock is well-marked.

The channels traversing Kellett Bank in the W approaches to Victoria Harbor, though congested with moorings, are well-marked. The E approach through Lei Yue Mun has a greater concentration of local craft, coupled with a narrow channel and special regulations for passing the airport. A conspicuous chimney bearing 299° serves as an excellent steering mark when passing through Lei Yue Mun. Local authorities recommend anchoring outside the fairway in the event of reduced visibility, as passage through Lei Yue Mun is difficult in adverse weather.

Channels Leading from Hong Kong to Zhujiang Kou

2.24 Kap Shui Mun Fairway, and Ma Wan Fairway, to the E of it, are two of the channels leading to the Zhujiang Kou from the NW of Victoria Harbor. Kap Shui Mu Fairway is entered between Pun Shan Shek and Tsing Yi and leads between the NE end of Tai Yue Shan on the W and Tang Lung Chau and Ma Wan on the E. This channel has depths exceeding 18.3m and even though narrow, may be used by local traffic if the vessels do not exceed 10m in length, as it is the shorter route leading to the passage between the N of Tai Yue Shan and the mainland. Vessels greater than 10m in length can only proceed in a SE direction, since Kap Shui Mun is designated a special area.



Kap Shui Mun Fairway



Ma Wan Fairway

The Kap Shui Mun Bridge, linking Ma Wan and Tai Yue Shan, crosses Kap Shui Mun, with a maximum safe vertical clearance of 41m. Vessels with an air draft of more than 41m

will not be allowed to transit the channel. Ma Wan Fairway also has depths of over 18.3m and leads between the E sides of Tang Lung Chau and Ma Wan and the W side of Tsing Yi.

A lighted buoy marks a 6.4m depth 0.5 mile ENE of Tang Lung Chau Light. Attention is drawn to the existence of less than charted depths extending up to 0.2 mile NW of the lighted buoy.

The Tsing Ma Bridge, which links Ma Wan and Tsing Yi, crosses Ma Wan Fairway. The maximum safe vertical clearance is 53m. Vessels with an air draft of more than 53m will not be allowed to transit the area between Ma Wan and Tsing Yi.

The passage along the N shore of Tsing Yi from Tsuen Wan continues W and is intersected by Ma Wan Fairway NE of Ma Wan and by Kap Shui Mun Fairway NE of the N extremity Tai Yue Shan. The passage then leads W about 10 miles, bordered on the N by the mainland and on the S by the islands off the N shore of Tai Yue Shan where it becomes part of the Zhujiang Kou.

Caution.—Traffic may converge from all directions in the vicinity of the junction of the N end of Western Fairway, the SE end of Kap Shui Mun Fairway, the SE end of Ma Wan Fairway, and the W end of Northern Fairway. Particular caution should be exercised when navigating in this area.

Ma Wan and Tang Lung Chau are fringed with drying rocks, some of which lie as far as 0.3 mile E of the E side of Ma Wan. Foul ground connects Tang Lung Shun with Ma Wan, and extends up to 0.2 mile off the S point of the former.

From the mainland opposite Ma Wan, a pier extends into the strait. Caution is necessary in this portion of the channel, as docking or undocking may occur at the wharf at all hours.

A light is shown from a framework tower standing on Ngau Lan Tsui, the NE extremity of Ma Wan. Another light is shown from a tower standing on **Gemini Point** (22°21'48"N., 114°04'12"E.); the white sector of this light leads through Ma Wan Fairway. Both lights are shown day and night when a vessel constrained by its draft transits Ma Wan Fairway.

A bridge, with a vertical clearance of 53m, connects a point lying 0.5 mile ENE of Gemini Point and the NW extremity of Tsing Yi.

Ma Wan Traffic Control Center is located on Gemini Point. The positions of the restricted areas in Ma Wan Fairway are best seen on the chart.

Traffic signals, consisting of three red lights, disposed vertically, are shown day and night from towers situated at Ha Pang; Kau Po, the NW extremity of Ma Wan; and Hoi Mei Wan, 0.1 mile NE of Gemini Point. Traffic restrictions will also be passed by VHF and through patrol craft.

Waiting Areas have been established, as follows:

Area	Location
Waiting Area 1	0.8 mile WSW of Ha Pang Light and N of the deep water channel
Waiting Area 2	1.25 miles SW of Ha Pang Light and S of the deep water channel.
Waiting Area 3	0.4 mile E of Hoi Mei Wan Light.

Area	Location
Waiting Area 4	0.5 mile E of Tang Lung Chau and between Kap Shui Mun and Ma Wan Fairway.

When Ha Pang and NW Ma Wan signals are shown, a vessel is about to transit or is transiting Ma Wan Fairway westbound or northbound. On seeing the signals, all traffic approaching Ma Wan eastbound, except vessels of less than 20m in length and passenger ferries issued with a Speed Restriction Permit (SRP), should either proceed to Waiting Area 1 or 2 or, when considered safe to do so, to continue their passages by making use of Kap Shue Mun.

Vessels should avoid waiting in the zone between Waiting Areas 1 and 2 above, as this will obstruct the passage of large vessels following the deep water route.

When Hoi Mei Wan signals are shown, a vessel is about to transit or is transiting Ma Wan Fairway eastbound or southbound. On seeing the signal, all vessels approaching the restricted area from N of Tsing Yi, except vessels of less than 20m in length and passenger ferries issued with a Speed Restriction Permit (SRP), should wait at Waiting Area 3, taking care not to encroach upon the deep water channel close to the N shore of Tsing Yi. Vessels approaching the area from the S should wait at Waiting Area 4 or continue their passage by following Kap Shui Mun. If they prefer to wait, they should keep clear of Ma Wan Fairway and Kap Shui Mun.

Vessels that have entered the restricted area before the signal lights are shown should proceed with extreme caution and observe directions given by the patrol launch.

The tidal currents in the vicinity of Kap Shui Mun are strong, and at the sides of the channels cause eddies that are of sufficient strength to make navigation of small craft difficult.

Tai Yue Shan

2.25 Tai Yue Shan (Lantau Island) (22°16'N., 113°57'E.) is the largest of the islands in Hong Kong and extends NE to SW between the W side of Sai Pok Liu Hoi Hap (West Lamma Channel), and the E side of the outer Zhujiang Kou. The island is rather barren and rugged, with numerous peaks in excess of 250m high. The summit of Tai Yue Shan, in the S central part, is Lantau Peak, which rises to a height of 935m. Fishermen frequent the many bays and inlets along the jagged coastline of Tai Yue Shan as well as the islands off its shores.

The NE face of Tai Yue Shan forms the W side of Kap Shui Mun, previously described in paragraph 2.24. The coves indenting the E coast, which is about 8 miles long, have depths of generally less than 5.5m. Depths of less than 5.5m also extend S from the NE end of the island to the N side of Hei Ling Chau and Chau Kung Island.

An islet and several rocks, one of which dries and another sunken, encumber the very shoal channel between the NW end of Peng Chau and Tai Yue Shan.

A submarine power cable is laid from the NW point of Hei Liug Chau leading NW to Lantau.

A lighted buoy is moored close offshore on the S side of Ngan Kwon Wan, about 0.8 mile NW from **Castle Rock** (22°15'N., 114°01'E.).

A fresh water pipeline stretches from the NE entrance point of Ngan Kwang Wan to Hei Ling Chau, to Chau Kung, to Peng Chau, and then W to Lantau.

The SE extremity of the island lies 0.5 mile off the N end of Cheung Chau Island. The channel between Cheung Chau Island and Tai Yue Shan has depths of 3m in the fairway.

2.26 Adamasta Rock (22°13.5'N., 114°01.2'E.) is marked by a lighted beacon. The rock dries 1.2m and lies in the separation zone at the NE end of the channel. Adamasta NW lighted buoy and Adamasta SE lighted buoy mark the extent of the shoal water surrounding the rock. There is a depth of 3.9m lying 0.2 mile WNW and a 5.5m depth lying 0.5 mile NE of the rock.

Submarine cables, including a power cable and a water pipeline, are laid across Adamasta Channel. Southeast Lantau lighted buoy is moored at the SW end of the channel.

The S side of the island is indented by two shoal bights separated by a hilly promontory. The E side of the E bight is formed by a rugged peninsula which extends to the SE extremity of the island.

Rocky Islet, 29m high, lies 0.8 mile E of the W entrance point of the E bight. Mid Rocks, which dry 1.2m, lie about 1 mile NE of Rocky Islet.

The cliff at the SW extremity of Tai Yue Shan, from which a light is shown, is whitewashed for ease of identification.

Between the SW extremity of Tai Yue Shan and Peaked Hill, a small islet connected to Tai Yue Shan by a sandspit, about 1.2 miles N, with depths of less than 5.5m extends over 0.3 mile offshore. A 1m rock lies about 1 mile NNW of Peaked Hill.

Two shallow coves indent the island between Peaked Hill and Bluff Point about 2.5 miles to the NNE. Near the S end of Bluff Point there is a conspicuous police station and flagstaff. A pier about 52m long with a depth of 2.7 m to 3m along its inboard side extends SW from the shore near the flagstaff.

Supplementary storm signals are shown from the police station when local signals are displayed in Victoria Harbor.

Caution.—Dangerous wrecks lie 1.8 miles ESE, 2 miles NNW, and 4 miles N, respectively, of Bluff Point.

2.27 The Soko Islands (22°10'N., 113°55'E.) are a group of islands and rocks located toward the S end of a shoal with depths of less than 9.2m that extends 3.5 miles S from the S central part of Tai Yue Shan.

Tai A Chau, the southwesternmost of the group, rises steeply to 153m. A rock, that dries 1.5m, lies about 0.2 mile N of the N end of the island and an islet, 40m high, with a rock off its S end, lies about 1 mile ESE of Tai A Chau Light.

Siu A Chau, 122m high and the northernmost of the group, lies about 0.5 mile N of Tai A Chau. A shoal with depths of less than 5.5m, extends about 2 miles W from the W side of Siu A Chau. Four rocky islets, the highest 36m high, lie between the W ends of Siu A Chau and Tai A Chau.

Between Bluff Point and a small projecting point that forms the NW extremity of Tai Yue Shan 3.2 miles NE, the coast is indented by a shoal irregular bight.

Zhujiang Kou—North of Tai Yue Shan

2.28 Chi Shuimen is the fairway between Urmston Road and Kap Shui Mun which is bordered on the N by the China mainland and on the S by Tai Yue Shan and the islands off its N coast. The channel is part of the Zhujiang Kou and more than 1 mile wide with depths in excess of 12.5m in mid-channel.

Kwai Shek (22°21'N., 114°03'E.), at the W side of the N end of Kap Shui Mun, is the northernmost point of Tai Yue Shan. The coast, for about 1 mile SW of this point, is indented by two small bays separated by a narrow peninsula to the E of which is a conspicuous red cliff, 88m high. Immediately SW of these bays is a bight, at the W entrance of which lies Lu Keng Island. This island separates the bight from another small bay to the W.

Sui Mo To (East Brother) is an islet, 59m high, located 2.2 miles W of Lu Keng Island. There are depths of less than 5.5m within about 0.4 mile of the W and E sides of this islet. Tai Mo To (West Brother), an islet 65m high, lies 1 mile SW of Sui Mo To and has depths of less than 5.5m extending 0.6 mile W, 0.1 mile N, and 0.4 mile E of its shores. Both islands provide good radar returns at 13 miles.

Reef Islet, 9m high, lies 0.3 mile S of Sui Mo To and has a bank with a depth of 2.7m extending over 91m E.

2.29 Chek Lap Kok Island (Chu Lu Kok Island) (22°19'N., 113°56'E.) lies with Red Point, its N extremity, 1.2 miles WSW of Tai Mo To. The island is barren, 124m high, about 1 mile wide at its greatest breadth and extends 2.1 miles S from Red Point to within 0.3 mile of the entrance to Tung Chau Bay on Tai Yue Shan. Red Point has a remarkable rocky appearance.

Anchorage can be taken in the fairway E of Red Point and S of Reef Island, in depths of 10 to 15m.

The 5m curve extends ESE from Red Point nearly to Tai Yue Shan, leaving shoal depths in the bay enclosed by Chek Lap Kok Island and the NW coast of the larger island.

Sha Chau (22°21'N., 113°53'E.), 53m high, lies to the SE of a group of small islands and drying and submerged rocks which form the SW limit of Urmston Road. Lung Kwu Chau, marked by a light on its NW extremity, is two rocky islets connected by a drying spit that lies about 1.5 miles N of Sha Chau at the NW of this group of islets, on rocks. White Rock, Tree Islet, and Dulley Rock, about 1.5 miles SW of the light on Tung Kwo, mark the W limits of these dangers.

The NW coast of Tai Yue Shan from Lu Keng for about 6 miles WSW to Tung Chung Bay is steep. Between this bay and the NW point of the island is an islet 46m high, about 1 mile offshore.

Caution.—The actual depths across the bank between Sha Chau and Chu Lu Kok Island have not been verified. Less water than charted has been reported (1995) NW of Lung Kwu Chau.

A height restricted area has been established in the vicinity of the Tung Chung bridges, with a maximum permitted vertical clearance of 8m.

Restricted areas, designated 1 through 8, have been established around Chek Lap Kok Airport (22°18.5'N., 113°55.0'E.), Lung Kwu Chau (22°18.5'N., 113°53.0'E.), and Siu Mo To (22°20.2'N., 113°58.9'E.). Vessels are prohibited from entering

or passing through areas 1 through 4 without the permission of the Director of Marine. Vessels with air drafts greater than 15m and 30m are prohibited from entering or remaining in areas 5 or 6 and 7 or 8, respectively, without the permission of the Director of Marine. The areas are marked by buoys and lights and are best seen on the chart.

2.30 Between **Brothers Point** (22°21'N., 114°01'E.) and Black Point, the mainland coast trends W about 4.5 miles to Mong Hau Shek (Pillar Point), then 3.2 miles NW to Black Point. Tai Lam Chung and another small bay indent the shore to the W of Brothers Point and about 2 miles further W is Tsing Shan Wan.

A tank and a white building from which storm signals are displayed stand on the W shore of Tai Lam Chung, from which a jetty projects. The jetty has a length of 40m and alongside depths of 4.9m. A submarine cable extends from the shores of the bay to Tai Yue Shan; the cable landing is marked by beacons. About 1 mile N of the bay, two conspicuous chimneys stand near a wharf with alongside depths of 6.1m.

Anchorage.—Tuen Mun Immigration Anchorage, with depths of 4.8 to 7m and a mooring buoy at the NW corner, lies 1.5 miles ESE of Mong Hau Shek. The anchorage is for the clearance of river trade vessels operating between Pearl River Delta ports and Hong Kong.

Tsing Shan Wan (Castle Peak Bay) is 2.5 miles across its mouth from Mong Hau Shek to the opposite shore. Pak Kok Point, on which stands an obelisk, lies 1 mile ENE of Mong Hau Shek. This shallow bay is fronted by a bank with a depth of 5.8m; two rocks are charted off the bay's E shore. A light marking a sewer outfall lies 0.1 mile SSE of Pak Kok Point.

The coast trends SE from Tsing Shan Wan to Pillar Point, then NW to Black Point. The coast is reef-fringed in places, with depths of less than 5.5m extending up to 0.7 mile off the shore N of **Tap Shek Kok** (22°23'N., 113°55'E.).

A power plant and cement plant stand about 1.5 miles NE of Pillar Point, and are approachable through a marked channel dredged to a depth of 18.5m.

There are two conspicuous chimneys in the area; the NW chimney has an elevation of 220m and the SE chimney an elevation of 255m.

Urmston Road is the area between the latter coast and Tung Kwu. It affords anchorage for vessels proceeding upriver, but the tidal currents are strong.

Anchorage is available in the charted area W of Black Point, in charted depths of 11.2 to 17.4m, sand. Depths shoal rapidly W of the anchorage; a wreck is charted about 0.2 mile W of the anchorage's W boundary.

Zhujiang and Zhujiang Kou

2.31 The **Zhujiang Kou** (Zhujiang Estuary) generally encompasses the area between **Tuwu Chio** (22°05'N., 113°33'E.) on the W, the SW extremity of Tai Yue Shan on the E, and the numerous islands fronting the coast to the S, including Wanshan Quindao (Wanshan Ch'un-tao). The two main channels leading to the Zhujiang through the estuary are Lantau Channel from the E, and Tan-hsi Shui-tao from the SW. The Portuguese province of Macau lies on the NW side of the estuary on the China mainland. The major Chinese ports within

the Zhujiang are Huangpu and Guangzhou, which lie 60 and 77 miles, respectively, upriver from Macau.

Pilotage.—Pilotage for the Zhujiang (Pearl River) is compulsory and vessels are required to send their ETA 24 hours and 12 hours prior to arrival. Pilots for both Zhujiang and Macau board 1.7 miles W of Guishan Dao (paragraph 2.33), where the Quarantine Anchorage area is centered. Chinese customs, immigration, health, and other port officials usually board the vessel with the pilot.

Cargo activities are carried out at the quarantine anchorage. The depths are 9m and 15m with good holding ground, mud. Sichi Yan, a rock, awash, lies 2.3 miles W of Guishan Light.

Regulations.—Vessels are required to obtain permission of the proper authorities well in advance to enter the People's Republic of China. Chinese authorities prohibit foreign vessels navigating, anchoring, or fishing within territorial claimed waters.

Directions.—Vessels entering Zhujiang and Macau are to follow the directions given below:

1. From a position about 8.2 miles S of Wenwei Zhou Light (21°49'N., 113°56'E.), a vessel steers 318° to position 21°47'45"N, 113°49'32"E; then sets a course of 013° to position 22°00'00"N, 113°52'34"E from which course is altered to 334° to position 22°05'36"N, 113°49'36"E. Finally, steer 311° to the pilot boarding area (Quarantine Anchorage) keeping clear of the dangerous wreck in position 21°59'06"N, 113°52'00"E.

From SW, a vessel should steer to arrive at position 21°47'45"N, 113°49'32"E. and follow the directions as above.

2. Vessels sailing from Hong Kong to Zhujiang may follow a route through West Lamma Channel to a position 22°08'44"N, 113°55'30"E, then proceed through Lantau Channel, as safe navigation permits, on a course of 295° to arrive at 22°12'04"N, 113°47'41"E. Steer 204° to 22°10'36"N, 113°47'00"E and then S to the Quarantine Anchorage. In 1989, it was reported that vessels could pass S of Guishan Dao, thus avoiding the shoal water extending NW from Niutou Dao.

3. When departing Macau or Zhujiang Kou, the courses listed above should be followed in their reverse order. However, the directions given above are subject to change and any variation or changes are directed by the local authorities and broadcast by radio.

Caution.—Vessels should have little difficulty entering the estuary by day, however, in thick weather caution is necessary because the off-lying islands in the approaches are steep-to and soundings give insufficient warning.

Fish stakes have been established throughout the Zhujiang Kou and the Zhujiang (Pearl River) and must be avoided. Additionally, the channels, aids, and depths in the river are constantly changing. For these reasons, excessive reliance should not be placed upon the charted depths or features in this area.

No vessel should enter any of the channels, creeks, or tributaries of the Tan Jiang, Xijiang, and Zhujiang without a pilot. Permission to enter these waters must be obtained from the government of the People's Republic of China.

In the narrow channels, creeks, and tributaries of the Tan Jiang, Xijiang, and Zhujiang vessels should proceed at such a speed that the waves caused by their motion through the water

do not damage the river banks and shore installations. This is especially true in passing the numerous villages on both sides of the channels. Speed should be reduced when passing tows and heavily-loaded junks. A careful lookout must be kept for tows and junks hauling out from the river banks or coming out from the various tributaries or reaches.

Care must be taken in approaching the river banks because of a number of small groins extending out. Barriers have been built in some places, leaving only a narrow navigable channel.

Overhead telegraph cables, at varying heights above the level of the river, span the narrow channels, creeks, and tributaries. They are erected or removed without notice.

Reports indicate that vessels anchoring or transiting areas claimed by the People's Republic of China without prior permission, and/or outside of the recommended routes risk seizure and detention.

A restricted area has been established and is bounded by lines joining the following positions:

- a. 22°25'N, 113°49'E.
- b. 22°23'N, 113°50'E.
- c. 22°23'N, 113°51'E.
- d. 22°25'N, 113°51'E.

Foreign vessels are prohibited inside the line connecting the islands of Xiaowanshan Dao, Dawanshan Dao, Jiapeng Liedao, and Dangan Liedao.

2.32 Wanshan Quindao are the southernmost group of the numerous islands contained within Zhujiang Kou.

Dawanshan Dao (21°56'N., 113°43'E.), the outermost of Wanshan Quindao, is steep, bold, and rocky and features a conspicuous dome-shaped mountain in its NW part that rises to 447m. At the SW end of the island is a small inlet known as Wanshan Wan.

Aspect.—Xiowanshan Dao, with several rocks lying off its shores, rises to 254m WNW of Dawanshan Dao. A rock with a depth of 1.8m lies about 0.7 mile NW of the island's SW end. Yamu Pai, a steep-to rock which dries 1.8m, lies 0.5 mile N of the island's NE end. Xiaoputai, a small islet, together with two other islets form the W extension of Wanshan Quindao. Xiaoputai, 58m high, lies 5 miles NW of Dawanshan Dao. A racon transmits from Xiaoputai.

Huangmao Dao lies to the E of Xiaoputai and features a peaked hill rising to 99m. Bai Pai, an islet, lies 0.4 mile off the island's W side, with a drying rock close SE of it. Across a narrow channel to the E of Huangmao Dao lie two islands known as Dalie Dao and Xiaolie Dao, which are themselves separated by a narrow foul channel.

A drying rock lies 0.2 mile N of the N island, and a 4m patch lies 0.8 mile N of the same island.

Dongao Dao, 172m high, lies 1.2 miles ESE of Huangmao Dao. Nan-Sha Wan indents the SW side of the island, and affords shelter in Northeast Monsoon, but rocks with depths of less than 2m lie in the approaches to the bay. A dangerous wreck lies close W of Dongao Dao. Tung-ao Wan, a rock-fringed inlet, indents the NE side of the island. A rock with a depth less than 1.8m and another with a depth of 5.5m lies in the entrance to the bay. A rock, with a depth of 2.7m, lies 0.8 mile E of the NE extremity of the island.

Bei Yan, awash and steep-to, lies 0.3 mile NE of the same point.

Anchorage.—Anchorage, in 22m, mud, can be taken by small vessels off the entrance to the inlet.

2.33 Baili Dao (21°59'N., 113°45'E.) lies 1.5 miles SE of Dongao Dao, and rises to a height of 302m, with a conspicuous conical hill, 225m high, on its NE portion. The hills on the S part of the island are studded with black rocks. Baili Dao is rock-fringed in places and indented with several small inlets. About 2 miles N of the island lies Shagou Pai, which breaks, and about 0.5 mile N of the island's NW extremity lies Clio Rock, with a depth of less than 1.8m. House Islet, 33m high, and close E of which lies a sunken rock, lies 0.2 mile N of Baili Dao's N end.

Gui Zhou, 86m high, lies 0.75 mile E of Baili Dao, and has a rock, which dries 1m, close off its NW extremity.

Heng Zhou, 117m high, and Zhu Zhou, 175m high, lie 2 and 3 miles, respectively, E of Baili Dao. Zhu Zhou, which is marked by a light, is indented on its N side by a small inlet, and has a steep, rocky islet, 54m high, known as Chou-Tzu, off its SE side.

Anchorage, in a depth of 19m, may be taken in the S part of the channel between Heng Zhou and Zhu Zhou, with the light on Zhu Zhou bearing 095°, and about 0.1 mile distant.

Dongtou Shi, a rock which dries 1.8m, lies about 3.2 miles N of Heng Zhou. Sanya Pai, a group of rocks marked by a light, lies 5 miles N of the same island. Xiaozhizhu Pao and **Dazhizhu Dao** (22°07'N., 113°53'E.) are two islands at the SE end of Dahao Shuidao, which stretches 6.5 miles NW of the latter named island. Xiaozhizhu Dao is 109m high while Dazhizhu Dao is 265m high, with rocks, awash, off its E and SW extremities.

Guishan Dao (22°08'N., 113°49'E.), 234m high and inhabited, lies 2 miles WNW of Xiaozhizhu Dao. A light is shown from the islet, and a signal station is situated on the island's summit. A pilot station for Zhujiang Kou pilots is situated on the W side of Guishan Dao.

Caution.—A Prohibited Anchorage Area lies S of the island and is best seen on the chart.

2.34 Zhenxiangwei, 64m high, lies 0.75 mile off Guishan Dao's SE side, several dangers encumber the channel between them. The channel between Zhenxiangwei and Xiaozhizhu Dao is clear of dangers, and is sometimes used by vessels entering Lantau Channel from the S.

Zhongxin Zhou, 133m high, lies close N of Guishan Dao, with depths of less than 5.5m between them.

Niutou Dao (22°10'N., 113°48'E.), 141m high at its N end, lies NW of Zhongxin Zhou and is separated from it by Niutou Men, a passage about 0.2 mile wide. A rock with a depth of 5m lies about 0.2 mile off Niutou Dao's SW side, encumbering the W entrance of the passage. A 64m high islet lies close off the island's NW extremity.

A light is shown from the NW extremity of Niutou Dao.

Caution.—A dangerous wreck lies in the passage between Zhongxin Zhou and Niutou Dao.

2.35 Lantau Channel (Tai Yue Hoi Hop) leads into the central part of the Zhujiang Kou between the Soko Islands and Tai Yue Shan on the NE and Dazhizhu Dao to the SW. The

channel is nearly 2 miles wide at its narrowest portion, deep, and clear of dangers.

Daxi Shuidao is a channel which leads into Zhujiang Kou, and leads off the W side of the estuary. The E side of the channel is the deepest, with shoaling reported on the W side. The fairway has charted depths of 7m, and is entered between **Dawo Shan** (22°05'N., 113°33'E.) on the NW, and Xiaoputai on the SE.

The islands on the W side of the channel are described with the W side of the estuary.

Datou Zhou (22°06'N., 113°42'E.) lies 5.5 miles NE of Xiaoputai. Dalu Dao, 97m high with a prominent rock on its summit, is a rocky islet lying 0.5 mile N of Datou Zhou. Dalu Pai, with a depth of less than 0.9m close NE, is an exposed rock 15m high, lying 0.8 mile NNE of Dalu Dao. Jishiling Pai, a 14m high islet, lies 0.2 mile E of Dalu Pai.

Anchorage have been established 2 miles NW and 3 miles SE from Datou Zhou.

Sanjiaoshan Dao, 150m high and rugged, with a 1.5m rock close off its S side, lies 0.8 mile N of the islet of Xilu. Depths of less than 5.5m extend up to 0.8 mile N of the island. Qing Zhou, 104m high and the northernmost island of the group, lies 0.8 mile NNE of Sanjiaoshan Dao.

Chitan (22°07'N., 113°46'E.), 72m high, with a rock close off its NW side, lies 3.2 miles E of Dalu Dao.

2.36 Sichi Yan (Four Feet Rock) (22°09'N., 113°46'E.), a rock awash, lies 1.5 miles NNE of Chitan. This obstruction lies quite near the pilot, quarantine, and cargo-handling anchorages. Another foul area exists 0.7 mile E of Sichi Yan.

The tidal currents are not very strong around the outer islands, but are variable and stronger in the channels leading into the Zhujiang Kou.

In Daxi Shuidao, the ebb current sets strongly S along the islands on the E side of the channel. The flood current sets mostly N to NW.

In Lantau Channel, the ebb current sets SE through the fairway. Strong eddies form, particularly in July and August, when the current attains a spring rate of 4.5 knots. The flood current sets NW, following the axis of the channel.

Freshets flowing out of the Zhujiang through Daxi Shuidao have an almost constant set from **Dahengqin Dao** (22°06'N., 113°33'E.), cross-channel, then along the islands to the W. The currents at this time attain a rate of 1 or 2 knots, particularly with E winds. At times there may seem to be a surface current setting to the E, but during freshets the undercurrent continues to set to the W.

The W side of the outer estuary is very shoal between Tu-Wu Chiao and Tung-Ku Chiao, about 18 miles N. Depths of less than 5.5m extend over 4.5 miles offshore, and probably farther. Reports indicate that this area has shoaled so much that charted depths of the area may be inaccurate.

The islands of Tapia and Coloane, which are part of the Portuguese province of Macau, lie in the S approach to that harbor, on the W side of Zhujiang Kou.

Ilha de Coloane (22°08'N., 113°34'E.), 171m high on its SW part, is the southernmost island of the province. A causeway connects the island with Ilha de Taipa, and shows navigational lights from its shores.

Ilha de Taipa (22°10'N., 113°33'E.), with an 11m high rock off its E extremity, lies 1 mile N of Ilha de Coloane. The island rises to a height of 158m and is joined to Macau by a bridge and causeway.

The channel W of these islands consists of drying mud flats which are navigable by small craft only. Ilha de Taipa and Xiaohengqin Dao to the W form the S side of a boat passage which connects the port of Macau and the Xijiang.

There is a deepwater port in the vicinity of Ponta de Ka-Ho comprising a 40m long container wharf and an oil terminal for tankers up to 1,200 dwt.

Macau Harbor (22°11'N., 113°34'E.)

World Port Index No. 57810

2.37 Macau Harbor and the city of Macau occupy the peninsula at the SE end of Aomen Dao (Macau Island). The port consists of two parts; the outer port is protected by breakwaters on the E side of the peninsula and the inner port on the W side of the peninsula is sheltered on the W by La-pa Shan. The port is frequented by small vessels, ferry boats, and local craft, while larger cargo vessels work freight from the anchorages rather than enter the harbor.

Tides—Currents.—The mean tidal range is about 1.8m. The tidal currents set strongly across the harbor entrance.

Depths—Limitations.—The 5m curve lies about 3 miles E of, and the 2m curve lies in close proximity to, the outer ends of the breakwaters. The channel to the outer harbor which leads between the breakwaters has a dredged depth of 4.4m on the range line. The channel leading S of the W breakwater and around the peninsula to the inner harbor is dredged to a depth of 3.5m up to the piers. The latter channel leads under a bridge in the causeway between Macau and Ilha de Taipa which has a vertical clearance of 30m.

Aspect.—Fortaleza da Guia, a prominent fort, stands on the summit of a hill overlooking the city of Macau from the E. A light, a signal station, and several yellow buildings are situated at or near the fort. Four radio masts, three of which are painted red and white, stand on a hill about 0.5 mile NE of the fort.

At the observatory, situated about 0.1 mile SW of the fort, is a luminous time signal. The signal, consisting of 37 lights on a post, indicates the exact local times of 2400, 0300, 0600, and 2100 by extinguishing the lights. The signal commences 4.5 minutes before the time.

The channels to both the inner and outer ports are marked by lighted and unlighted beacons and buoys. Range lights, aligned 305°, mark the dredged channel to the outer harbor.

Pilotage.—Pilotage is compulsory, and the pilot boards at the Pilotage, Quarantine, Loading, or Unloading Anchorage in Zhujiang Kou. Vessels should not attempt to proceed past the pilot station without a pilot on board due to the regulations in force in this area by Chinese authorities.

Signals.—Vessels using the Macau channels by day shall carry at the mast, two black spheres vertically arranged, and by night two green lights on the yard arm, similarly arranged.

The local storm signal code used in Macau is the same as used in Hong Kong.

Anchorage.—Anchorage in the fairways of the port is prohibited. Large vessels may anchor, in a depth of 7.3m, mud,

in a position 7 to 8 miles SE of Fortaleza da Guia or on the main entrance range 1.5 to 2 miles from the breakwater heads, in depths of 4.1m and 4.2m, respectively. Cargo is worked at these anchorages by lighters.

Directions.—If proceeding from Hong Kong to Macau, or vice-versa, vessels should use the appropriate Traffic Separation Scheme, as seen on the chart.

Caution.—Mariners are advised to obtain the latest and largest scale charts of the area before proceeding to Macau. However, even though these charts may be held, they may not reflect the correct depths throughout the area due to the continuous river estuary silting and lack of reports containing corrective information.

2.38 Chiwan Harbor (22°28'N., 113°52'E.) (World Port Index No. 57777) is situated on the E side of Zhujiang Kou and SW of the Nantou Peninsula. Chiwan, once a fishing village has now developed into a modern deep water port. The port can be regarded as an important gateway of sea transportation in S China.

Depths—Limitations.—The approach channel has a depth of 12.5m. The maximum allowable draft for the port was 11m in 1993. There are six berths with depths of 7 to 11m. The longest berth is Supply Boat Jetty, 520m in length with a depth of 7m alongside.

Kaifeng Container Terminal has two berths, with a combined length of 610m and an alongside depth of 14m.

The Chiwan Petroleum Service Base has seven berths totalling 515m of berthing space with alongside depths of 6.6 to 7.1m.

Mawan, a port for general cargo is situated close NW of Chiwan Gang. There is a 230m long berth with a depth of 11.4m alongside for vessels up to 30,000 dwt.

Shekou Gang, a general cargo port and offshore oil support base is situated 1.2 miles ENE of Mawan. Shekou has six berths, with depths alongside of 6 to 11m. Berth No. 3, the longest and deepest berth, is 180m long and has an alongside depth of 11m.

Pilotage.—Pilotage, available during daylight only, is compulsory for foreign vessels entering and leaving port. The pilot boards in position 22°23.7'N, 113°53.7'E. Pilotage is provided by Hong Kong and Shekou Pilots. Vessels should send their ETA 72 hours, 48 hours, and 24 hours in advance of their arrival at the port. Chiwan Harbor is equipped with VHF facilities and a coastal radio station. The port can readily contact inbound and outbound vessels. In addition, a dispatch network has been set up to provide wireless telephone and telex services to offshore drilling rigs.

Anchorage.—Anchorage can be obtained in designated areas, with depths of 7 to 13m, mud and sand, good holding ground. The designated anchorage areas lie S of Chiwan and are best seen on the chart.

Caution.—Lesser depths than charted have been reported (1996) in the S end of the designated anchorage area.

A wreck is reported (1997) to lie in position 22°26'19"N, 113°52'35"E.

2.39 Between Macau and Tonggu Jiao point about 7.5 miles N, the coast is indented by two small shoal bays. Xiang-

zhou Wan, the southernmost of the two has a group of islands off its S entrance point. Taipei (White Rock), the outermost danger fronting the bay, lies 2 miles NE of the bay's S entrance point, and is surrounded by drying rocks. Yeli Shan, a small islet, 71m high, lies 0.8 mile WSW of Bai Pai. A drying rock lies 0.7 mile W of Bai Pai.

Several small islets lie within 0.8 mile of **Changkeng Ding** (22°19'N., 113°36'E.), the point separating the two bays. The N bay is shoal.

Tonggu Jiao (22°23'N., 113°37'E.) is a rock-fringed point at the N extremity of the N bay. A 1.5m patch lies 0.5 mile SSE of the point. An islet and a drying rock located on a bank with depths of 1.5m lie about 0.5 mile NNW of the point.

The inner part of the estuary extends about 22 miles N of a line connecting Lan Kok Tsui (Black Point) on the E, and Tonggu Jiao on the W. The estuary above this point is up to 15 miles wide, constricting to the N. This body of water is encumbered with numerous shoals and banks which dry, and leave only narrow, shoal, and shifting channels toward the center of the estuary. Although small shallow-draft vessels navigate the maze of rivers and channels connecting the Zhujiang and Xijiang to the W, ocean-going vessels are confined to the reaches of the river.

Tides—Currents.—During the Northeast Monsoon, the night tide will be about 0.2m higher than the day tide; during the Southwest Monsoon the reverse is found.

Winds from the NW have been known to reduce depths by as much as 0.6m, while fresh SE winds have increased depths by the same amount.

The level of water in the estuary is likely to be highest in summer, especially after a heavy rainfall.

Directions.—Pilotage is compulsory for vessels proceeding N of the Pilot, Quarantine, Loading, or Unloading Anchorage. Vessels following the buoyed channel should navigate the lower reaches with particular caution as fishing stakes, dangerous wrecks, and other obstructions are charted in the reach between a point W of Peaked Hill, and Neilingding Dao. North of Neilingding Dao, the channel has a charted width of about 0.4 mile to a point 5.2 miles SSE of **Sanban Zhou** (22°43'N., 113°39'E.); then the channel widens.

Caution.—The lower reaches of the Zhujiang and Huangpu port areas contain military and naval installations.

2.40 Neilingding Dao (22°25'N., 113°48'E.) rises to a height of 339m in a conical peak. The E side of the island shows wooded slopes while the W side has a customs station situated on it. Several buildings are situated on the island. A light is shown from the NW point of Neilingding Dao. Nan Shazui, with depths of less than 1m, extends S of the island, while Fanshi Qiantan, with depths of 2.5m, extends up to 19 miles N of the island.

Inner Zhujiang Kou—West Side

2.41 Between Tonggu Jiao and Dajiaotou Dao, 22 miles N, the estuary is encumbered by drying banks extending from the shore and the islands that front them. Several channels available to shallow-draft vessels only, lead through the banks, W to the Xijiang and N to Guangzhou. Junk Fleet Entrance and Lung-hsueh Hai-Kou (Lankit Entrance) are the most transited.

Qi'ao Dao (22°25'N., 113°38'E.), an island rising to 184m at its SW end, lies 1 mile N of Tonggu Jiao. A light is shown from the island, and the fishing stakes off its NE side are usually marked by lights. Several rocks fringe the S side of the island.

Jinxingdan is the channel between the island and Tonggu Jiao. Small vessels may find anchorage, in a depth of 9.2m, mud, about 1.5 miles NW of Tonggu Jiao, but depths at the anchorage may be less than charted. Half-Tide Rock, awash and fringed with sunken rocks, lies 2.2 miles NW of Tonggu Jiao, and an islet surrounded by foul ground, lies 0.8 mile NW of the point. A shoal with a dangerous sunken rock at its NW end, extends about 1 mile WNW of the islet.

2.42 Junk Fleet Entrance (22°24'N., 113°41'E.), lying off the NE extremity of Qi'ao Dao, is a narrow, shoal, and unmarked channel leading through the mud banks fronting the W side of the estuary. From Qi'ao Dao the channel leads about 12 miles NNW to the entrance of Tan-Chou Shui-Tao, about 2 miles NE of Hengmen Dao, and is joined from the W by Hengmen, another tributary, at the same point.

Dajian Feng, 301m high, stands on the mainland about 1.2 miles WSW of Hengmen Dao. **Hengmen Dao** (22°34'N., 113°35'E.), 97m high, lies close NE of Dajian Feng.

Longxue Dao (Lankit Island.) (22°42'N., 113°38'E.) is 61m high near its SW extremity, where a small temple and some trees stand. The island lies at the SE terminus of a drying bank extending from several islands about 2.3 miles WNW of it.

Shanban Zhou (22°43'N., 113°39'E.) two small islets separated by a drying bank, lie 1.5 miles NE of Longxue Dao. The SE islet, which resembles an overturned boat, shows a light. Detached reefs lie up to 0.3 mile SE, E, and N of the N islet. A drying bank extends up to 0.3 mile NW, and SSW of the same island, off the island's W shore.

Caution.—Due to the lack of current information, the shoal nature of the channel, and the need for local knowledge as well as the restrictions placed upon foreign vessels in Chinese waters, vessels should not attempt any of the channels mentioned above without prior permission and a pilot aboard.

Inner Zhujiang Kou—East Side

2.43 Lan Kok Tsui (Black Point) (22°25'N., 113°54'E.) on the E side of the estuary, is the W extremity of a large, high peninsula, rising to a height of about 138m. A dangerous wreck, marked by a lighted buoy, lies in position 22°31'05"N, 113°48'56"E.

Hau Hoi Wan (22°28'N., 113°57'E.) is entered between Lan Kok Tsui and Mawan Xiajiao, about 4 miles NNW. The bay is mostly shoal, and studded with fishing stakes.

Dachan Wan (22°33'N., 113°53'E.), a shoal bay, indents the mainland on the N side of the peninsula forming the N shore of Hau Hoi Wan. Several islands lie off the mouth of the bay, the largest being Dachan Dao, 121m high, and the farthest W being Xiya, located about 6 miles NW of Mawan Xiajiao.

Huipeng Jiao (22°30'N., 113°50'E.), two islets close together on a drying sandbank, lie 0.8 mile S of Dachan Dao. The NW island is the higher of the two.

Dachan Dao, located 3.2 miles NW of Mawan Xiajiao, has a signal station situated at the NW end of the island. Xiaochan

Dao lies 1.5 miles N of Dachan Dao, and is nearly connected to it by a spit with depths of less than 1m.

Bai Shi (White Rock) and Fanshi Yu, 8m and 17m high, respectively, are two exposed rocks lying close together, 4.5 miles WNW of Mawan Xiajiao. Both rocks lie on the E extremity of Fanshi Qiantan (Fanshek Bank). This bank is over 21 miles in extent, about 4.5 miles wide at its widest part, and has a least charted depth of 1m S of Neilingding Dao. Fanshi Shuidao, the channel E of the bank, should only be attempted by shallow-draft vessels possessing local knowledge.

Between the N entrance point of Ta-ch'en Wan and Ch'uan-Pi Chiao about 14 miles NW, the E side of the estuary is fringed by a drying bank. Depths of less than 5.5m lie up to 5 miles offshore.

Zhujiang Entrance to Huangpu

2.44 The Zhujiang is navigable by ocean-going vessels to Guangzhou (Canton), about 17 miles above Huangpu (Wampoa). The main channel was reportedly dredged to a depth of 8.5m as far as Huangpu and has a depth of 9m at HW. South Channel and East Channel lead from Huangpu to Guangzhou. South Channel is the main channel and has a depth of 6m at HW. The channel is marked by beacons, buoys, and ranges, but depths within it are subject to change, and several dangers lie adjacent to it.

An extensive network of side channels permeate the Zhujiang delta, used mainly by fishing craft, junks, and other local traffic. Because of the restrictions placed on foreign vessels in Chinese waters, the shallow nature of the fairways, and the need for local knowledge, only the main fairways will be considered.

The passage from Pilot Quarantine Anchorage to Huangpu covers 63 miles through seven major channels. **Lingding Shuidao** (22°25'N., 113°45'E.) is the channel between Fanshi Qiantan shoal and the banks on the W side of the estuary. The channel is marked by lighted buoys.

Chuanbi Shuidao (22°42'N., 113°41'E.) lies at the Zhujiang entrance.

Humen Shuidao (22°46'N., 113°38'E.) is marked by lighted buoys.

Caution.—In 1995, construction of a bridge spanning the channel in the vicinity of Jinsuo Pai (22°47.5'N., 113°36.2'E.) began.

2.45 Nizhou Shuidao (22°54'N., 113°34'E.) and **Lianhuashan Shuidao** (22°58'N., 113°32'E.) channels are marked by range lights and lighted buoys.

Caution.—A stranded wreck lies close W of the charted track, about 0.8 mile W of the S extremity of La Sha.

Chisha Shuidao (23°02'N., 113°30'E.) extends 3 miles upriver from Dong Jiang, a tributary that flows into Zhujiang from NE, where Huangpuxingang is located. There are several mooring buoys and anchorages. The channel has reportedly been dredged to a depth of 8.5m.

Dahaozhou Shuidao (23°05'N., 113°28'E.) is marked by leading lights and lighted buoys from 2 miles ESE of Huangpu. This channel is the narrowest of all major ship channels, 70m wide, and has a least depth of 7.8m. Loaded ships of 20,000

ton can pass through this channel on a flood tide. However, a vessel requires a vertical clearance of 60m to pass under a hanging power cable.

2.46 Huangpuxingang (23°03'N., 113°30'E.) (World Port Index No. 57825) is situated close NW of Dong Jiang creek and the E bank of Zhujiang. Huangpuxingang is a new port complex of Huangpu, situated 4.5 miles NW. This port complex has a total quayside of 1,500m.

Wharf No. 1 through Wharf No. 8 can accommodate vessels between 20,000 and 35,000 tons, and have depths of 11.9m alongside. Additional berths are under construction close N of the wharves. Conspicuous silos stand W of the berths. Facilities are available for the handling of bulk solid, bulk liquid, break-bulk, and containerized cargoes.

A container and ro-ro terminal has two berths, with a total length of 471m and depths of 12m alongside. The terminal can accommodate vessels of up to 25,000 tons.

Tanker piers are situated 0.8 mile NW of the port area. Facing the port at midstream, there are anchor berths and several mooring buoys.

The port signal station stands in position 23°03'48"N, 113°30'00"E.

Tides—Currents.—During the winter months of the Northeast Monsoon, a high tide at night rises an additional 0.3m higher than a daytime high tide. During the Southwest Monsoon, this occurrence reverses. During the Southwest Monsoon, the rise of the river is visibly higher than during the Northeast Monsoon by 0.3m.

Wind effect on the water level in the region is significant. A fresh SE wind can increase the depth by 0.6m and decrease it by an equal amount during NW wind.

Tide gauges, showing the water level measured above the LLWS, are established, as follows:

1. Off Nizhou Shuidao (22°54'N., 113°34'E.).
2. Huangpu main wharf and dockyard.
3. At a jetty situated in position 23°04.5'N, 113°15.3'E. (2 miles S of Guangzhou).
4. At a jetty situated 0.2 mile N of Guangzhou Harbor.

The flood current usually reaches a velocity of 2.5 to 3.5 knots, and the ebb current a velocity of 2.5 to 4.5 knots, but may vary during freshets or drought conditions.

Aspect.—Chuanbi Shuidao, at the N end of Zhujiang Kou is the river entrance. From the river mouth, the fairway passes between the anchorage berths situated off the E bank at the river entrance, E of the islands in the lower reaches of the fairway, and over several shoal areas via a channel approximately 137m wide to the new port complex. The channel widens considerably at this point, but narrows again for vessels proceeding to Guangzhou. Huangpu port area is entered by a short reach off the main channel, marked by range lights.

Caution.—There have been extensive changes in the shoals encumbering the river, the channels traversing it, and the aids to navigation marking the channels. In addition, several sets of power cables span the channel to Guangzhou from a point over the Huangpu port area to Guangzhou itself. Local authorities should be consulted for the latest information on channel depths and vertical clearances before attempting passage to Huangpu or Guangzhou.

2.47 Ch'uan-Pi Chiao (22°45'N., 113°40'E.), the S extremity of Chueen-Pi Island, marks the S extremity of Chuanbi Shuidao. About 1 mile N of the point stands Tower Hill, on which a signal station stands. Nearly 2.4 miles W of Tower Hill lies Tai-Chiao Shan (Bower Point), on which stands a fort. The point is backed by a hill, 49m high, about 0.5 mile further W.

Anchorage.—In the Zhujiang, anchorages are used for pilots embarking or disembarking, quarantine, awaiting tide or for swinging a vessel around, or in the cases of draft restraint or terminal congestion. Anchorages are used also for working cargo. In addition to the anchorage W of Guishan Dao (paragraph 2.44) in the Zhujiang estuary, there are anchorage areas established in the river off **Xiaohu Jiao** (22°50'N., 113°34'E.), **Lianhuashan Shuidao** (22°58'N., 113°32'E.), and off Dahao Zhou.

The area off Shanban Zhou has 15 anchorage berths, numbered Berth S1 through Berth S15, in depths of 9.5 and 15m, mud and sand. A rock, with a depth of 10.5m, lies near the center of Berth S14. A dangerous wreck lies close SW of anchor Berth S14 and Berth S15.

The area off Dahao Zhou has anchorage berths D1 through D8 for handling dangerous cargo.

There are anchorages and mooring berths established around and in the port area, in depths of 7 to 12m, sand and mud, with swinging areas of 330m and 740m in diameter.

Permission to anchor must be obtained from the proper authorities at least 24 hours in advance, but vessels seeking typhoon shelter are permitted temporary anchorage with no prior notice.

Caution.—An area extending 0.5 mile E, and 1 mile N and S of Tai-Chiao Shan is reported to be prohibited to all merchant and fishing vessels.

Two islands named Shanghengdang and Xiahengdang lie 4.5 miles and 4.2 miles, respectively, N of Ch'uan-Pi Chiao. The islands and various dangers extending from or lying off them divide the river into two channels. Hu Men, the E channel, is used by ocean-going vessels, while the W channel is used only by local traffic. Foul ground, on which a small islet lies, extends between the islands, up to 0.2 mile E, 0.3 mile N, and 3 miles SE of those islands. Jinsuo Pai, which shows a light, lies 0.2 mile SE of Shanghengdang, and is surrounded by foul ground. A 6.5m patch and a rocky islet lie 0.2 mile SE and 0.3 mile S, respectively, of Jinsuo Pai.

2.48 Dahu Dao (22°50'N., 113°35'E.), 179m high, lies on the SW side of the channel, about 2 miles N of Shanghengdang. The N end of the island rises to a remarkable rounded mass of granite with sheer sides. A 3.7m patch lies 1 mile SE of the island.

About 4.5 miles N of Dahu Dao the channel traverses a heavily shoaled area where the fairways reduced to a width of about 137m. The fairway meanders across the river channel for about 15 miles to its terminus, 1 mile S of the Huangpu New Terminal complex, and is marked by lighted beacons, range lights, and buoys.

Second Bar Pagoda (23°00'N., 113°30'E.), with Linfo Fort close N of it, stands on a hill 108m high, on the W bank of the river. Conspicuous silos stand 3.5 miles NNW of the pagoda.

Huangpu (Wampoa) (23°05'N., 113°25'E.)

World Port Index No. 57820

2.49 Huangpu is the major port in S China devoted to foreign trade and is the largest transshipment terminal S of Shanghai. It is situated about 10 miles E of Guangzhou.

The harbor is divided into two sections, Dongji and Xiji. There are 45 berths totalling 5,000m of berthing length with alongside depths of 8.5 to 9m. In addition, cargo is handled at several anchorages, in the mid-current of Huangpu Shuidao (Whampoa Channel), in depths of 8 to 10m, mud and sand.

From 0.5 mile SSE of the N point on Dahaozhou, Chisha Shuidao leads NW into Tiezhuang Shuidao and branches NNW through Dahaozhou Shuidao into Huangpu Shuidao, where the two channels are separated by four sand banks or flat islands known as Hongsheng, Longchuan, Daji, and Diancao. Huangpu Channel runs N of these and Tiezhuang channel runs S. These channels meet again at **Honan-chou Tsui** (23°06'N., 113°14'E.) off the city of Guangzhou (Canton). The distance to Honan-chou Tsui from the dividing point at Chisha Channel through Tiezhuang Channel is 16 miles. Huangpu Channel is 13 miles. However, vessels do not proceed beyond the port of Huangpu when using the N channel, because low bridges cross this channel on the approach to Guangzhou.

A spit with depths of less than 5m extends about 0.4 mile ESE and 0.2 mile NE from Diancao Zhou, the easternmost flat island of the four mentioned before. From Huangpu, an overhead power cable spans across to Diancao Zhou and S over Tiezhuang Channel with a vertical clearance of 60m.

Yuzhu Qiantan, part of which dries, extends 0.3 mile close N of Daji Sha, a flat island W of Diancao. The navigable channel, Huangpu Shuidao, lies between this bank and the port of Huangpu.

Winds—Weather.—This area is dominated by long summers and short winters. The highest temperatures recorded are in July (39°C), and the lowest in January (0°C). Rainfall is heaviest between April and August. Fogs develop occasionally during the early morning hours in winter, but are generally short lived, dissipating soon after sunrise.

Winds, under the monsoon influence, are generally S and SE from April to July, and NE the rest of the year.

Typhoons occur in the summer and autumn, with winds generally of force 6 to 9, gusting to force 11.

Tides—Currents.—Tides are affected by a large diurnal inequality. The average rise of spring tides ranges from 2m in January to 3m in June and July. Tidal currents attaining velocities of 2 to 3 knots on the flood, or 2.5 to 4 knots on the ebb, may be experienced.

Aspect.—The main port area is fronted by several flat islands separating it from the main river channel. A signal station stands about 1 mile NW of the new port complex; a second stands on a 65m hill about 0.8 mile NW of **Yuchu** (23°06'N., 113°26'E.).

Signals.—Signal stations are available 1 mile NW of the new port complex and 0.7 mile N of the main portion of the harbor, from which storm signals similar to that flown at Hong Kong are displayed. Radio service is available.

Huangpu to Guangzhou

2.50 The main channel to Guangzhou continues with the river channel on the S side of the islands fronting Huangpu, trending SW, then NW, and finally N to the terminals at Guangzhou. Vessels having a maximum draft of 5m can berth in the harbor. Larger vessels are handled at Huangpu.

Several overhead power cables, some with unspecified vertical clearances, span the fairway. A power cable crossing the channel at the S end of the port restricts entering vessels to masthead heights of less than 26m.

Due to the nature of the channel, the need for extensive local knowledge, and the restrictions placed on foreign vessels in Chinese waters only general directions will be given.

From Huangpuxingang to **Junk Rock** (23°02'N., 113°24'E.), the fairway has general depths of 5.6 to 13.4m, but several shoal patches with depths of 5.2m and less obstruct the channel. Concrete piles and fishing stakes obstruct the N half of the channel at the confluence of two streams charted about 5 miles WNW of the Huangpu new port complex. A concrete pile obstructs the S side of the channel about 0.8 mile NE of the fishing stakes mentioned above.

Junk Rock, with a depth of 1.2m, lies 0.2 mile NE of a point with conspicuous cliffs on it, 44m high. About 1.2 miles N and close S of the point, overhead power cables span the channel.

From Junk Rock to **Yuangangsha Zui** (23°02'N., 113°21'E.) the channel runs SW, then W, and NW between Shen-ching Chou and Nan-T'ang Chou, passing N of Hai-hsin-kang, an islet which shows a light. Comus Rock, awash, lies about 0.1 mile E of the island.

Lijiao Shuido lies between the islands, is marked, and has a least depth of 5.9m.

Vessels bound for Guangzhou pass S of Hsi-yu Chou, 6 miles W of Xiajiao, then N past Macau Fort to the port. An overhead power cable, with a vertical clearance of 26m, spans the channel close by Macau Fort.

Guangzhou (Canton) (23°06'N., 113°14'E.)

World Port Index No. 57830

2.51 Guangzhou port area encompasses an area on the N bank of the Zhujiang with the main seaward approach coming from the S. The limits of the port are best seen on the chart.

Tides—Currents.—Spring tides rise 2.3m and neap tides rise 1.9m. The ebb current attains a rate of 3 to 4 knots abreast Macau Fort. A tide gauge is situated on a T-headed pier on the E bank.

Depths—Limitations.—Vessels having a maximum draft of 5m can be accommodated in the harbor, which has a total berthing length of 2,600m. Vessels of up to 6m draft can work cargo mid-stream. Vessels unable to enter must anchor out and discharge to lighters. A passenger service operates to Hong Kong. An overhead power cable, with a vertical clearance of 26m spans the channel close by Macau Fort. Bridges to the NE, N, and NW of the main berthing areas restrict vessels sailing beyond the port. Larger vessels are handled at Huangpu.

Aspect.—**Macau Fort** (23°04'N., 113°15'E.) is situated on a small island at the S end of the harbor area. Numerous wharves and T-headed piers line the river banks.

A large tract of alluvial land lies in the common delta of the Xijiang and the Zhujiang to the E of **Sanshui** (23°11'N., 112°50'E.) and S of Guangzhou. This tract of land is intersected by a web of creeks and waterways used for trade and communication.

The principal waterways connecting the two rivers intersect the Zhujiang between **Chin-Haing Men** (22°23'N., 113°37'E.) and the shoal area below Huangpuxingang. Since most of the passages are either extremely shallow or obstructed by underwater barriers and overhead cables, only shallow draft traffic, such as junks, travel them regularly. For the above reasons, further description of these waterways will not be given.

Pilotage.—The pilot boards in the quarantine anchorage.

Regulations.—Upon arrival vessels will be boarded by a berthing officer who will direct them to the proper berth.

Signals.—Storm signals, similar to those shown in Hong Kong, are shown at the yardarm of the customs house, 0.2 mile E of Honanchou Tsui and also from a mast atop the examination shed, 0.3 mile NNE.

Anchorage.—Anchorage is available in the port area, in depths of 5 to 6.5m, mud and sand. Local authorities and the pilot should be consulted before attempting to anchor in any of the areas mentioned above.

Directions.—Due to the nature of the channel, the need for local knowledge, and the restrictions placed on foreign vessels within Chinese waters, vessels are urged to contact local authorities before attempting any of the channels mentioned above.

Dahengqin Dao to Dajin

2.52 Dahengqin Dao (22°06'N., 113°30'E.) lies at the SW portion of the entrance to the Zhujiang Kou and at the SE end of Modao Men, which is the main entrance of the Xijiang. Several islands lie off the river deltas between Dahengqin Dao and Dajin about 30 miles WSW. To the N of the latter island is a bay which leads to Ya Men Wan and the T'an Chiang.

Aspect.—Dahengqin Dao is a large irregularly shaped island. Naobei Shan (Adams Peak), 460m high and located near the middle of the E part of the island, is its summit. Shihlan Chou, two islets lying close together, is located about 0.3 mile S of the S extremity of Dahengqin Dao. Hsing Chou, a small islet, lies about 1 mile NW of Shihlan Chou. Close approach to the above islands is prevented by dangerous rocks and mud flats.

Sanzao Dao (22°02'N., 113°21'E.) lies 4 miles W of Dahengqin Dao across the entrance to the Hsi Chiang. Though larger than the latter island, it is not as high, its highest mountain peak rising to only 270m. Sanzao Dao is populated and has a few small piers in the bays which indent its perimeter. **Titao Tsui** (Red Cliff Head) (22°05'N., 113°24'E.) is the NE extremity of this island.

A group of small islands and islets extends in an arc from Heng Zhou (Ross Island), off Titao Tsui, S and SW to **Shihwan** (The Stragglers) (22°00'N., 113°24'E.), off the SE side of Sanzao Dao. A narrow channel, bound on the E by mud flats,

leads between Titao Tsui and Heng Zhou, but it is blocked at its N end by a causeway.

Anchorage can be taken NW of Heng Zhou. The anchorage is well-sheltered, but the holding ground is only fair and the tidal currents are strong.

Caution.—Shoals, with depths of less than 5.5m, have been reported to extend farther SE from Sanzao Dao than charted.

2.53 Gaolan Dao (21°55'N., 113°15'E.) lies about 4 miles SW of the SW extremity of Dahengqin Dao. It is 420m high and has a prominent sand slide on its NE side. The island is indented by many small, shallow bays. Sunken rocks fringe the SE side of the island. Small vessels with local knowledge can anchor, in about 5m, mud, in the NW of the two small bays on the SW side of Gaolan Dao. The islets of Wen Zhou and Yuan Chou lie about 0.8 mile E of the island.

Hebao Dao is an irregularly-shaped island lying 3 miles SW of Gaolan Dao. Nan Wan, an exposed bay with depths of 5.5 to 10m in its middle part, indents the S coast of the island. A rock, 5m high, lies off the SW entrance to this bay. Hebao Dao is highest on its W side; anchorage may be taken, in a depth of 9m, about 1.5 miles W of the coast.

A channel, which leads to the approach to the T'an Chiang, passes between Hebao Dao and Gaolan Dao. Depths of 5.5 to 9.2m are found in the channel up to about 6 miles NW of the E extremity of Niu-chiao Shan. Small vessels can find protected anchorage in this channel.

Dajin (21°52'N., 113°02'E.) a rocky island with four peaks more than 305m high, is located about 5.5 miles W of Hebao Dao. Its 393m high peak, which is dark in color with some red streaks, stands on the island's E side. A rock, 4m high, lies close off the S extremity of the Dajin. This rock is the northernmost of a chain of rocks and islets that extends S for about 4 miles. The southernmost rocks are called San-pei-chiu.

Caution.—Vessels should pass well S of San-pei-chiu as the vicinity has not been closely examined.

Dajin is separated from the mainland to the NW by a channel with depths of less than 3.7m.

Tong Kwa (21°51'N., 112°54'E.), on the mainland, is located 5 miles W of Dajin. The description of the mainland W of Tong Kwa begins in paragraph 3.2.

Entrance to the Xijiang

2.54 The delta of the Xijiang is formed by many islands which are separated from the mainland by numerous shallow channels and waterways. The principal entrance, Modao Men, passes to the W of Dahengqin Dao and leads NNW into the river. Other entrances to the Xijiang are suitable only for small, local craft. Between the mouth of the Hsi Ching and San-shui Junction, about 75 miles NNW of Dahengqin Dao, the E side of the Xijiang is connected with the Zhujiang system by a large number of creeks. Although, these waterways will be mentioned as they join or leave the Xijiang, they will not be described, due to their restricted depths and lack of current information.

Modao Men is the E and principal channel and is entered from seaward between the islets off the SW of Dahengqin Dao on

the E, and a bank which partly dries and extends about 12 miles SE from Teng-lung Sha on the W.

Tides—Currents.—In the vicinity of the delta of the Hsi Chiang, the W current of the Northeast Monsoon occurs from October to May. In March, April, and May about one third of the currents set in an opposite direction. The E current of the Southwest Monsoon occurs from June to September. In June, July, and August this current attains its greatest rate and consistency.

Offshore of the delta of the Xijiang, the tidal current on the rising tide is governed principally by the prevailing wind. With strong E winds it sets WNW; with SW winds it sets N. The tidal current on the falling tide sets mostly in a SW direction.

The mean range of the tide at Gaolan Dao is about 1.2m and the diurnal range is about 1.7m.

Within the river the tidal currents, which are strong, usually follow the direction of the channels. These channels are generally shallow and intricate. However, the depths are greatly affected by seasonal change. In June and July, the river is at its highest, and in December and January it is at its lowest. A high river brings with it strong currents, making navigation difficult at times.

Caution.—Permission to navigate the river must be obtained from the proper authorities well in advance of the vessel's arrival. The river and the ports it services have been reportedly closed to foreign shipping.

2.55 From San-shui Junction, where the Pei Chiang joins the Xijiang, the Xijiang trends W past Wu-chou. Description of the river will terminate at Wu-chou, as only small craft proceed beyond to the upper reaches of the river.

The ports described with the Xijiang are Pei-chieh, Hsin-hui, San-shui, and Wu-chou.

Ta-ching Chiao (Morgan Point) (22°06'N., 113°28'E.) is the W extremity of Dahengqin Dao and lies 3.5 miles within the channel entrance on its E side. Vessels must avoid the rocks and islets between this point and Shih-lan Chou at the SE end of the entrance.

About 1.3 miles NW of Ta-ching Chiao on the E side of the channel is a drying rock marked by a beacon. A rock, awash, also marked by a beacon, lies on the mud flats about 1 mile W of the above mentioned drying rock.

Massie Point is the W extremity of Hsiao-heng-ch'in, a narrow island lying parallel to the N shore of Ta-heng-ch'in Tao. Mud flats fill the gap between these two islands. A bank that dries 0.2m at its N end, extends about 2.5 miles NW from Massie Point. Ta-kang (Mong Chau) lies on this bank in a position about 0.7 mile NW of Massie Point. A prominent white square tower stands on this islet. About 0.2 mile N of Ta-kang lies another small islet.

The island of **Hao Chou** (Pak Tank) (22°09'N., 113°24'E.) lies on the drying flat across the channel about 3 miles W of Ta-kang. The islands immediately NNW, W, and WSW of Hao Chou are joined by a causeway from the NE end of Ta-lin-Tao to Teng-lung Shan.

La-pa Shan lies about 1 mile N of Hsiao-heng-ch'in. A narrow boat channel separates the two islands and connects Modao Men with the Zhujiang Kou.

2.56 Yu-chi Shan (22°12'N., 113°27'E.) is the summit of an unnamed island, 210m high, lying close W of La-pa Shan and is separated from it by a creek. The N side of this island and La-pa Shan are separated from Ao-men Tao by another narrow channel. Ma On Shan, a steep hill, is the W extremity of this nameless island. A rock with a depth of less than 2m lies close W of this point.

A narrow bank, with its S end about 0.3 mile SW of the above rock, extends NW for 4.8 miles to Chu P'ai Sha. This bank forms the W limit of the channel and is backed by Teng-lung Sha. On the E side of the channel extending NW from Ma On Shan, several creeks lead into Ao-men Tao; a long narrow cultivated island parallels the aforementioned bank.

Sheong Ma Kok (22°16'N., 113°21'E.), located E of Chu P'ai Sha, is the SW extremity of a range of hills on Ao-men Tao. The main fairway leads between these two islands, then NW to Mo-Tao, a hilly island about 0.5 mile N of Chu P'ai Sha. Mo-Tao is separated from Ao-men Tao by a narrow channel. A fort stands on the island.

Lo-chou Men is a continuation of the main channel above Modao Men. Three islands which extend about 11 miles NNW from the N side of Teng-lung Sha form the W side of the channel. San Sha is the southernmost of these three islands. **Lo Chao** (22°19'N., 113°17'E.), the middle island, features Stripe Cliff on its SE side about 0.7 mile from the W bank of the river. Tree Point lies on the E side of the same island about 1.2 miles N of Stripe Cliff. Sunken rocks lie close off this point. Some white and red cliffs, fronted by rocks close offshore, stand a short distance inland on the NE side of Lo Chao.

Red cliffs are found on the SE side and on the N end of Chuk Chau, the third of the three islands. A rock with a depth of less than 1.8m lies close offshore about 1.3 miles SE of the N end of Chuk Chau. A shoal extends off the N and NE of the N red cliff for up to 0.5 mile.

Chuk Chau to Chau Lin Channel

2.57 Lo-chau Ch'i is entered from N close W of the N end of Chuk Chou. Moorhen Creek is entered from SE between the same point and the S end of an island about 0.5 mile N. The entrances to these creeks, which are used by small craft, are very narrow.

The E side of the river from Mo-tao to abeam the N end of Chuk Chau is also formed by islands, the northernmost being Kwongfuksha. The creeks that separate these islands from each other and from Ao-men Tao to the E, lead to the entrance of Nemesis Creek. This latter creek connects Lo-chou Men with the Zhujiang system, but is suitable for use by small craft only.

The main channel leads close W of an island which lies nearly in mid-channel about 0.5 mile NE of the N end of Chuk Chau. The W side of the channel, for a distance of about 9 miles NNW of this island, is formed by a number of low and cultivated islands. The E side of the channel is low and is intersected by a number of creeks. Some sunken rocks lie close off the NW end of Kwongfuksha, nearly 2 miles N of the mid-channel island.

An islet lies in mid-river about 0.8 mile N of the NW end of Kwongfuksha. The main channel leads between this islet and the E bank of the river. A shoal spit and two groins project from the N part of the islet. A rock with a depth of less than

1.8m, existence doubtful, lies close off the E bank of the river abreast the islet.

Kep Siang (22°29'N., 113°14'E.), a narrow islet, lies on the E side of the channel about 1.5 miles NNW of the above islet. A spit, with a depth of less than 1.8m, extends a short distance N from the N end of the islet. A rock with a depth of less than 2m lies abreast the N end of Kep Siang, close off the W bank of the main channel.

Shih-ch'i Ch'i (Shekpei Creek) enters the main channel abreast the SE end of Kep Siang. This creek connects the Xijiang with the Zhujiang system. Lung-Kang Ch'i (Lung Kong Creek) a tributary of the main river, enters the main channel off the NE side of Kep Siang. Holmes Creek leads S from a position about 4 miles NNW of Kep Siang.

The NE end of the island separating Holmes Creek from the main channel of the Xijiang is fronted by shoals to a distance of 0.3 mile. Groins extend from both banks of the river, just below the junction.

The main channel trends 4 miles N from its junction with Holmes Creek. Gruning Shoal, an extensive sand bank, is the only known danger in this part of the channel. It extends about 0.7 mile SE and 0.3 mile E from the SE end of **Chau Lin** (22°37'N., 113°09'E.).

The Xijiang is divided into three branches in the vicinity of Gruning Shoal. The W branch, which leads off the SW side of the shoal, leads to Pei-chieh and Hsin-hui. The NW branch, which leads off the NE side of this shoal, is the main branch of the Hsi Chiang and is known as Chau Lin Channel. The N branch, which is entered N of the SE side of this shoal, is known as Sandpiper Creek. It is used by small craft.

Wai-hai (Ngaihai), a village, stands on the S side of the W branch, abreast the SE extremity of Chau Lin. A tower stands on the river bank, close N of Wai-hai.

Wu-chun Hill, 56m high, is located on the E side of the main river about 1 mile E of the SE end of Chau Lin.

Chau Lin Channel leads NW about 4.5 miles along the NE side of Gruning Shoal, then, between Chau Lin on the SW and Futong Island on the NE. Near the N end of Chau Lin, Bamboo Island lies in mid-river with the main channel between its SW shore and Chau Lin. Hall Point, 0.6 mile WNW of Bamboo Island, is the N extremity of Chau Lin. An overhead cable crosses the river at Bamboo Island. A spit, with a depth of 1.2m, extends 0.3 mile N from Hall Point.

A narrow island, separated from the SE side of Chau Lin by a narrow creek, extends about 1.6 miles NW from a position about 0.5 mile NW of the SE extremity of Chau Lin. The main channel leads off the NE side of this island. A sunken stone barrier, nearly awash at LW and usually marked by eddies, extends 0.2 mile E from the NW end of the narrow island. A shoal, with a depth of 0.9m, extends a short distance from the SW side of the channel, close NW of the barrier. To the SW of Chau Lin on the W banks of a creek known as Chiang-men Ch'i, are situated Pei-Chieh and Hsin-hui. These towns can be approached through the channel leading W along the S side of Chau Lin or from the N by sailing S along the W side of Chau Lin to the Chiang-men Ch'i.

Vessels using the channel on the W side of Chau Lin from Chau Lin Channel should give Hall Point a wide berth. The depth in this channel is estimated to be about 3m and reported to be buoyed.

The E entrance, off the SW of Gruning Shoal is very narrow. Edgell Island, 46m high, lies in mid-channel about 1.7 miles within the E entrance. It can be passed on either side. A rock with a depth of 0.9m, lies on the S side of the fairway about 0.8 mile E of the island.

There is a shoal area and a spit extending from the S bank where the N entrance, E entrance, and Chiang-men Ch'i converge.

The tidal current on the falling tide attains a rate of 4 to 5 knots during the high river season, and from 1 to 2 knots during the low river season.

Pei-chieh (Pakkai) (22°35'N., 113°06'E.) (World Port Index No. 57780) stands on the W bank, close N of the E entrance of the Chiang-men Ch'i. It consists of a custom house, a business section, and a few homes. All vessels bound for or leaving Hsin-hui must stop at the customs house. There are four wharves at Pei-chieh where cargo is transhipped to junks and sampans for carriage to Hsin-hui, 1.8 miles SW, on the NW side of the Chiang-men Ch'i.

Chau Lin Channel to San-shui Reach

2.58 The main channel leads N about 3.5 miles from Hall Point to Chai Tau Shan. A couple of villages stand on the river banks in this portion of the channel and some rocky spits and shoals project up to 0.3 mile from shore. The NW end of Sandpiper Creek joins the Xijiang about 0.5 mile SE of Chi Tau Shan at the N end of Futong Island.

Chi Tau Shan (Plover Island) is a low, flat, narrow island lying in mid-river. A prominent house stands on a rocky mound, 12m high, on the N end of the island. The recommended channel is to the E of the island as rocks are reported to be in the W channel. A cable, with a reported clearance of 23m at LW, crosses the E channel. Vessels passing under it should keep well to the E bank.

The Xijiang widens somewhat as it trends NNW for 3 miles from Chi Tau Shan to Staunch Island. Heng-chiang, a village, stands near the W bank about 0.5 mile W of Chi Tau Shan. A temple stands on the same side of the river about 0.5 mile N of the village. A rocky point is located close N of the temple.

A rock, that dries 1.8m, lies close off the W bank about 0.5 mile S of the temple. A rock, that dries 2.4m, lies close off the same side of the river, about 0.2 mile N of the temple.

Short groins extend from the W side of the river in this area. The main channel leads along the W side of the river, off the groins.

Staunch Island is formed by a rocky patch that covers during periods of high river. A light is shown from a white hut erected on piles on the island. A rocky ledge extends 0.3 mile N from Staunch Island.

2.59 Lo Sa Tau Point (22°46'N., 113°05'E.), located about 0.5 mile E of Staunch Island, is a low projection. A drying shoal extends a short distance N and W from the point. A branch channel, entered between this point and First Cliffs, about 0.7 mile NE, trends in a SE direction for 2.5 miles to its intersection with three creeks. One of these leads S and rejoins the Xijiang and the others ultimately lead to the Zhujiang.

Fa Chiau, an island 36m high, lies on the E side of the main river in a position about 2.5 miles N of Staunch Island.

Navigable channels lead on either side of the island. A rock, with a depth of less than 1.8m, lies close W of the S extremity of Fa Chiau. A spit extends nearly 0.5 mile NW from the NW extremity of the island. The main channel leads SE of the island and the spit. A high overhead cable crosses the main river at a position about 0.3 mile S of the island.

Kan-chu-Ch'i, a waterway which connects the Xijiang system with the Zhujiang system, is entered just to the E of Fa Chiau.

Tam Kong Chau (22°49'N., 113°02'E.), a small islet, lies on the S side of the Xijiang about 1.5 miles WNW of Fa Chiau. Kaukong Sa Hau, the port area of Kaukong Hu, is situated on the N side of the river abreast the islet.

Sha-tzu (Hok Shan Islands) lie from 0.7 mile W to 3.2 miles WNW of Tam Kong Chau. They consist of two low, flat islands which are separated by a narrow, partly drying channel. The main channel leads along the N shore of these islands between them and an extensive shoal that extends out from the N bank of the river. Perkins Rock, with a depth of 1.8m, lies near the SE end of this shoal, about 0.2 mile off the NE side of the E island.

Ku Lao and Ho-ch'ing, two small villages, are situated on the SW and NE banks, respectively, of the river about 1.5 miles NW of the NW end of the W island. A rocky ledge, parts of which are above water, extends halfway across the river at Ku Lao. Its outer edge is usually marked by eddies.

Anchorage can be taken, in 13 to 16.5m, about 1 mile upstream from Ku Lao.

About 3.7 miles NNW of Ku Lao a prominent seven-story pagoda, 57m high, stands on a point on the W bank of the river. Lo An Chau (Rattler Island), low, narrow, and flat, lies near the E bank, abreast of this pagoda.

The island of T'ai-p'ing Shan, which is rather large, flat, and wooded, lies NW of Lo An Chau and divides the river into two channels. An extensive sand bank lies N and W from the N end of the island. The E channel is the main channel and has greater depths on its E side. The W channel is not recommended as it is shallow at each end.

Anchorage can be taken, in a depth of 4.9m, off the prominent pagoda at the entrance to the W channel of T'ai-p'ing Shan.

Ho Kok Island lies parallel and close to the E river bank from 1.2 to 3 miles N of the N end of T'ai-p'ing Shan. Red Hills, 178m high, is located a short distance inland from the W bank, abreast Ho Kok Island.

2.60 Rocky Point (23°00'N., 112°51'E.), located on the E bank about 1.8 miles NNW of the end of the above island, is rather steep-to. Fu Wan, a village, stands on a small point on the opposite side of the river, abreast Rocky Point. Some rocks lie close off the coast near the village.

Sik Lung Tsi, 18m high and very small, lies in the middle of the river in a position about 2 miles N of Rocky Point. The channel E of the island is clear. This reach of the river is lined with brick kilns.

Pai-ni Bank, which dries at low river lies close off the E bank in a position about 1.8 miles N of Sik Lung Tsi. The main channel leads W of this bank. A shoal bank, which extends up to 0.5 mile off the E side of the river, extends nearly 1.5 miles

NNW and then a little over 1 mile N from Pai-ni Bank. The river is very narrow in this vicinity.

A low point, on which stands a temple, is located on the W side of the river about 2.5 miles NNW of Sik Lung Tsi. This point is fringed with rocks, some of which dry, and which are usually marked by eddies.

Mau Hau, a village, stands on the E bank, about 2.5 miles N of the low point. The river narrows in the vicinity of the village and flows through rocky headlands. To the N of the village it widens out somewhat. At San-shui Junction, located about 1.7 miles N of the village, the Xijiang trends NW and then W. San-shui Reach, which connects the Xijiang with the Pei Chiang, leads NE from the junction. The E end of the reach is connected with the system by Fo-shan Chih-liu and Hsi-nan Ch'i.

Mandarin Shoal lies in mid-channel off the SW entrance to San-shui Junction. It varies as to size and position and when considered dangerous is usually marked by a sampan displaying a red flag.

The main channel of the Hsi Chiang leads NW off the SW sides of Mandarin Shoal and Chin-sha (Kwong Sai or Fort Island), then W. This latter island is narrow, low, flat, partly wooded, and extends about 1.8 miles NW from a position about 0.3 mile NNW of the shoal. A spit extends 0.3 mile from the NW end of the island and a rock, with a depth of 1.2m, is reported to lie off the SW side of Chin-sha.

San-shui Reach (23°10'N., 112°50'E.) is entered from the Xijiang through San-shui Junction. The W entrance is between Entrance Point and Mandarin Point about 0.1 mile N. The former point is the middle of three points on the SE shore of the entrance; the latter point is marked by a light.

A shoal bank, with depths of less than 1.8m, extends halfway across the junction from its NW side. The depths in San-shui Reach change from year to year and during low-river season, only small craft can navigate the channel.

Kang Ken (Tweed Point) is located on the SE side of the NE end of San-shui Junction, 0.7 mile NE of Mandarin Point. A light is shown from the shoal ground fringing Kang Ken. A tide gauge, marked from 1m below zero to 3.9m above zero, is situated near Kang Ken.

Frasers Hill, 61m high, rises 0.5 mile NE of Kang Ken. A rock, with a depth of less than 1.8m, lies close N of the hill. A drying bank extends up to 0.1 mile offshore for nearly 1 mile to the E, beginning about 0.1 mile E of Frasers Hill.

2.61 Lo Ah Chau (Rattler Island) (23°10'N., 112°50'E.) lies in the middle of the entrance of the Pei Chiang and forms the N side of the W entrance of San-shui Reach. Fish Point, the SW extremity of the island, is located about 0.3 mile NNE of Kang Ken. A light vessel, which displays a red flag by day, is moored off Fish Point. Chow Wei (Low Point), the SE extremity of the island, is located about 0.6 mile NE of Kang Ken. A beacon stands on Chow Wei.

A drying sand bank lies close off the SW side of Lo Ah Chau. A shoal bank, with depths of 0.6 to 1.8m, lies between the SE side of the island and the SE side of the reach in the vicinity of Frasers Hill.

A rock, 3.3m high and marked by a beacon, is located in mid-channel about 1 mile E of Chow Wei. A spit with a depth of 0.3m extends SSE to shore from close SE of this rock.

Sun Sha, a large island, lies in mid-channel. Its W end, which is fringed by a drying bank to a distance of 0.3 mile, lies about 0.5 mile E of the aforementioned rock. A wooded islet lies a short distance off the NE side of the island in a position about 0.2 mile NW of its E end. Lo Sha, a narrow island covered mostly by buildings, lies close E of Sun Sha. A narrow, drying bank separates the two islands. A chimney stands near the NW end of Lo Sha, and a tower stands near its SE end.

The channel, which passes S of the two islands, is reported to be the one used. Sand banks have been reported as extending from both sides of the W part of this channel.

A narrow spit, with a depth of 0.3m, extends 0.2 mile N from a position on the N side of Sun Sha, 0.5 mile W of the NW end of Lo Sha. A drying bank, the outer end of which lies close W of this spit, extends nearly halfway across the channel from the N side of the reach. A small drying patch lies in mid-channel, close E of the spit.

2.62 San-shui (23°11'N., 112°50'E.) is located on the E side of the mouth of the Pei Chiang, about 0.5 mile N of Hokau. San-shui is a small port, with Hokau, its port area, situated outside the embankment. Hokau is flooded about 6 months of the year. The greater part of the waterborne traffic of San-shui is carried through to Hsi-nan, about 2.5 miles E of Hokau.

A small jetty, with a pipeline, lies at the oil depot on the N bank, about 0.8 mile E of Hokau.

Floods can be expected once or twice a year when there are freshets concurrently in the Xijiang and Pei Chiang. At these times, usually June and July, the rivers become turbulent, sweeping past like a mill race. Violent squalls usually accompany the freshets. River levels under these conditions have exceeded 8m at the bar.

Signals.—A black ball is displayed at the custom house at Hokau when the depth on the bar is less than 2.4m.

Storm signals are displayed at the custom house at Hokau.

Day signal	Night signal	Meaning
One black ball	One red light	Bad weather is expected
Two black balls, disposed vertically	Two red lights	A typhoon or strong gale is expected

Anchorage.—The anchorage outside the bar off Kang Ken is used by vessels unable to cross the bar between Lo Ah Chau and Frasers Hill. This anchorage is small and can accommodate about three vessels.

The anchorage off the custom house at Hokau has good holding ground, but is exposed to sudden, heavy squalls from the SE in summer. During the winter months it is obstructed by shifting sand banks, which limit its use to vessels drawing less than 1.5m.

Caution.—Vessels without recent local knowledge should not attempt to enter San-shui Reach from the Xijiang as the charts are inadequate and the river is continually changing.

Great attention must be paid to the steering due to the strong swirls and eddies.

Numerous native craft and large rafts are often met within the entrance and in San-shui Reach. The rafts are kedged and their progress is slow, thus impeding navigation.

The large rafts, up to 122m long and 46m wide, which sometimes transit the Pei Chiang three or four at a time, are a danger to navigation. Large stacks of pine tree branches, which are floated down two abreast on boats which are lashed together, also are a hazard. Sometimes 20 or more of these rafts and stacks are in close proximity and occupy almost the entire width of the river.

The Pei Chiang leads N from the W of San-shui Junction and San-shui Reach. It is suitable only for shallow draft vessels.

Chin-sha to Ts'ang-Wu

2.63 From a position SW of the NW end of Chin-sha, the river leads W about 7 miles to the island of Moyan Chou. The channel favors the N bank of the river for most of this stretch.

Ch'ing-ch'i-hsu (Ching Ki Creek) joins the Hsi Chiang from the N about 0.5 mile NW of Chin-sha. A group of drying rocks lies close off the S bank of the Xijiang opposite the mouth of the Ch'ing-ch'i-hsu. Red Banks and Kestrel Bank, which extend over halfway into the river, stretch about 2.5 miles W from the drying rocks.

Anchorage can be taken close off the steep-to banks of the river near the village of Sha Po which lies 3 miles W of Kestrel Bank.

Moyan Chou (Kwangli Island), a rather large island, lies in mid-river, 2 to 4.5 miles W of Sha Po. The main channel leads over the N shore of the island. Sandbanks lie close off the NE side and NW end of the island and a shoal spit extends about 0.8mile WSW from its W end. Some rocky patches lie close off the N bank, N of the E end of Moyan Chou.

The Xijiang trends about 4 miles SW from the W end of Moyan Chou to the N entrance of Ling Yang Gorge. First Bar, which has a depth of 1.8m at low river, lies about 2 miles N of the entrance to the gorge. The river continues SW about 4.2 miles through this gorge, passing between mountain ranges rising to 858m at Mount Parkes, 3.5 miles due S of the N entrance. Ling Yang Gorge is 0.1 to 0.15 mile wide in its narrowest part, and is deep in the fairway. Overhead cables span the river at both ends of the gorge. Vessels should stay to the middle of the channel.

At the S entrance of the gorge, the Xijiang continues 4 miles SW, then turns W a distance of 6 miles. Sandbanks and rocks lie close off the banks for most of this latter SW portion of the channel. As the river turns W, it passes the walled city of **Kao-yao** (Shiuhing) (23°01'N., 112°28'E.), a military station. A sandbank, awash at LW, encumbers the S side of the river from abreast the city to 3 miles E. The Seven Stars, a marble range of hills, is located 2 miles inland, N of Kao-yao.

Anchorage can be taken off the S gates of Kao-yao about 1.5 miles E of a large pagoda.

Between Kao-yao and Narrow Island, the Xijiang winds through hilly country for a distance of 24 miles. The hills vary in height from 30 to 457m. They are mostly densely wooded, but many of them are cultivated. There are several villages along both shores of this portion of the river. Sandbanks and

sunken rocks project from the banks, primarily near the bends in the channels.

Spike Hill rises on the N bank about 2.5 miles W of Kao-yao. A temple can be seen on the S bank opposite Spike Hill. Overhead cables span the river at this location which should be passed near the N bank during high river season.

A deep, narrow, and steep-to gorge is entered 4 miles upriver from Spike Hill. A prominent tower stands on the N bank of the gorge near its N end where the channel turns from W to NW.

2.64 Lu-pu-hsu (Lukpo) (23°08'N., 112°28'E.) stands on the N river banks where the channel takes a sharp turn from W to S. A bank extends from the SE side of the river abreast the village. From here, the channel winds generally SW about 8 miles to Tree Head on the S shore 0.7 mile S of Narrow Island.

Narrow Island lies in mid-river and is covered with bamboo. Extensive sand banks connect the island with the N bank of the river. Sandbanks, which are steep-to on their S side, extend 1.3 miles WSW from Narrow Island. These banks are usually marked by stakes. A small, steep projection juts out from the E bank about 0.4 mile NE of the NE end of this island.

Three prominent red cliffs are located a short distance W of Tree Head. Some dangerous rocks, marked by eddies, are found nearly in mid-channel abreast the middle cliff.

Yueh-ch'eng (Yutshing) (23°04'N., 112°E.) a village, is situated on the NW side of a bend in the Xijiang, 3.5 miles W of Narrow Island. The Cock's Comb, a marble hill, stands near the N bank of the river, 4.7 miles W of the village.

From the Cock's Comb, the river trends W about 2.5 miles, then N 2 miles farther, before turning generally W again for about 14 miles to Steep Point on the S bank. The channel holds to mid-river for the most part. Some banks extend offshore in places along the passage, particularly where the channel turns from N to W above Cock's Comb and off Te-ch'ing (Takhing), about 3 miles E of Steep Point. A few drying rocks lie off the E shore opposite the former bank. These rocks are sometimes marked by buoys.

There are numerous villages and settlements on both banks of the river throughout this stretch. Several joss houses and pagodas can be seen on either shore along the way. Te-ch'ing, a walled city, is apparently the largest of the villages on this W heading. A nine-story pagoda stands on the N shore, slightly inland and 3 miles E of Te-ch'ing.

The Hsi Chiang turns SW for a short distance at Steep Point. Flat Rocks, which dry 0.3m, extend nearly halfway across the river from the NW bank, opposite the point. Strong eddies are found in their vicinity.

Yung Tong, a village on the N bank of the river, is situated 1 mile NW of Steep Point. Some rocks, that dry, lie close off the S bank, about 0.6 mile SW of the village. A buoy marks these rocks during winter. Shoals, composed of stones and shingle, fringe the N bank 0.7 mile to 1.8 miles W of Yung Tong.

Ta-li-Kou (Tai Lik Hau), a village, is situated on the S bank 2 miles WSW of Yung Tong. A shoal bank extends from the SW side of the river between the village and a point 2.5 miles NW. The SE side of this shoal extends into the middle of the river.

Rocky Spit is located on the NE side of the river, 1.5 miles NW of the village. A rock, marked by a buoy in winter, lies in

mid-river off the spit. The channel lies between the rock and the spit. Two rocks, the existence of which are doubtful, lie a short distance upriver from this rock. Strong eddies exist in the vicinity of these rocks.

Ha Lok, a village, is situated on the N bank about 1.5 miles NNW of Rocky Spit. An extensive shoal bank fringes the N bank of the river up to 4 miles WNW of the village.

A prominent temple stands on the S bank, 1 mile WSW of the village. A reef, that dries 0.6m, extends about 150m from the S bank, 1 mile W of the temple. Some rocks lie off the S bank between the temple and the reef.

2.65 Lo-p'ang (Lu Pong) (23°10'N., 111°37'E.), a village standing on the S bank, is situated about 2 miles W of the temple. Rocks, that dry 4.3m, lie in the middle of the river, N of Lo-p'ang. The channel leads between these rocks and the S bank of the river. Rocks, the existence of which are doubtful, lie on the edge of a shoal bank that extends from the NE shore, about 0.5 mile NW of the drying rocks.

A single mass of granite, in the form of a thumb, rises perpendicularly about 91m high, on a range of hills 430m high. The formation is prominent and lies a short distance inland from the N bank, NE of the drying rocks.

A rock lies close off the SW bank, 1.7 miles NW of Lo-p'ang. A shoal bank fringes the E side of the river 2.5 to 3.8 miles NW of Lo-p'ang. A reef, with some rocks N of it, extends W from the N end of the shoal bank almost to the opposite side of the river. The W extremity of this reef is marked by a buoy. Some rocks lie close off the W side of the river, abreast the reef. The channel leads between these rocks and the W end of the reef.

Tu-ch'eng (Dosing), a small town, stands on the W bank of the river, 4.2 miles NW of Lo-p'ang. An overhead cable crosses the river at a position 0.8 mile upriver from Tu-ch'eng. Vessels should keep close to the E bank of the river in passing under this cable.

The W side of the river, between Tu-ch'eng and a point 2.8 miles NE, is fringed by an extensive shoal. The E side of this shoal is marked by buoys.

Ku-hsun (Pa Chung), a village on the SE bank of the river, is situated 1 mile E of Tu-ch'eng. Some rocks lie off the SE bank, 0.5 mile NE of the village and some rocks, which dry 1.8m, lie off the E bank, 2 miles NE of Ku-hsun.

Ch'ang-kang Hsu (Chong Kong), a village, stands on the E bank 1 mile N of the latter mentioned drying rocks. A shoal bank extends from the NE side of the river both abreast, and for some distance N, of the buildings. A joss house, possibly blocked from view until nearly abeam, stands near a hill on the SW bank of the river 1 mile N of the drying rocks. A rock lies close offshore and SW of the joss house.

Caution.—Second Bar lies abreast of the joss house. A reported depth of 1.8m was found over this bar; the channel over it is subject to shifting.

Shoal banks extend 5 miles along the NE riverbank upriver from Second Bar. Robinson Rocks, marked by a buoy and lying nearly in mid-channel, lie on the W side of the channel in a position 1.2 miles NNW of the joss house. Janus Rock, marked by a buoy, lies in a similar position, 1 mile farther upriver. Some rocks lie close off the W bank, 3.5 miles NNW of the joss house. A sunken rock lies 0.2 mile NNW of these

rocks and over 0.1 mile from the W bank of the river. Another sunken rock lies 0.2 mile farther NNW.

Kok Heu, a village situated among the trees on the NE bank of the river, is located 3.2 miles N of the above joss house. Shoal banks, which dry 3.6m, extend halfway across the river abreast the village. The main channel leads between these shoal banks and the afore-mentioned rocks on the W side of the river.

2.66 Feng-ch'uan (Fungston) (23°24'N., 111°31'E.), a walled city, is situated on the E bank about 3.5 miles NNW of Kok Heu. A shoal bank extends into the middle of the river from the village. The Ho Chiang, a tributary of the Xijiang flows into the E side of the latter river in a position 2 miles N of Feng-ch'uan.

A shoal bank extends off the W side of the river for a distance of about 1 mile N and S, opposite the mouth of the Ho Chiang. A rocky ledge lies off the E bank a short distance N of the same river mouth. Rocks that dry 2.1m and that are marked by rips when submerged, lie in mid-river on the N side of the channel 2.5 miles N of the mouth of the Ho Chiang.

An islet, 6m high, lies on the S side of the fairway, 1.5 miles E of Wu-chou. There is a joss house on the islet. Rocks, some of which dry 2.7m, extend 0.3 mile W from the islet. A drying rock lies on the end of a drying shoal which extends 0.2 mile E from the islet. A small islet lies close E of this rock.

A reef that dries 3.3m extends a short distance from the S bank of the river, about 1.2 miles W of the 6m high islet.

Caution.—Some of the dangers in the Hsi Chiang between Tu-ch'eng and Wu-chou are marked by spar buoys, either on the danger itself or very near it, and by more conspicuous wooden triangular framework buoys moored near the spar buoys. The triangular buoys are sometimes swept away by tows, but the spar buoys usually remain in position. The triangular buoys are placed in position by the port authority at Wu-chou when the water level is about 2.1m at the city. These buoys are numbered from No. 1, off Sun Sin Kiu, to No. 14, in the Wu-chou Reach. Red buoys should be left to the starboard hand, and black buoys on the port hand, when proceeding up-river.

2.67 Wu-chou (Ts'ang-Wu) (23°29'N., 111°19'E.) stands primarily on the N bank of the Hsi Chiang at its junction with the Kuei Chiang to the W about 180 miles from the sea. It has several concrete and brick wharves equipped with light cranes, and several covered warehouses in the port.

Tides—Currents.—The rate of the current during high flood in the gorge is 5 to 8 knots, accompanied by heavy eddies. The average rate in winter is about 1.5 knots.

The Hsi Chiang has an irregular rise. In 1897, the lowest water was taken as a datum for the zero mark at Wu-chou. Since that time the river has fallen 0.8m below the datum and risen 21m above it. At the time of low river, a craft drawing over 2.1m runs the risk of grounding in several places in the river.

The period of low river appears to last from the start of December to the middle of March. Then the river rises rapidly, attaining its highest level in June, and falls again gradually from the end of September.

Depths—Limitations.—Vessels drawing up to 3.9m can proceed to Wu-chou at high river, and from 1.8 to 2.1m at low river.

Aspect.—The city stands on the SW side of a hill which is 336m high. The business center is in the SW part of the city. Some conspicuous barracks stand inland to the NE of the city and are backed by radio masts a short distance N. A tide gauge lies off the N shore 0.3 mile S of the barracks. The N bank of the Hsi Chiang at Wu-chou slopes and in summer when the river overflows its banks, the river is considerably wider opposite the city than it is in winter.

The hills on the S side of the river rise to a height of 259m. A prominent pagoda, which stands on a 150m hill on the S bank of the river, is situated 0.7 mile SSE of the barracks. There are some oil installations and a tide gauge on this side of the river.

The old British Consulate stands on the W bank of the Kuei Chiang, abreast of Wu-chou. A prominent building is situated 1 mile W of the consulate.

Anchorage.—The anchorage is close E of the city 0.3 mile SE of the barracks. It has been reported that in summer, when the Kuei Chiang is in flood, safe anchorage can be taken on the S side of the river, opposite the city.

Caution.—Overhead cables span the river to the E of the city near the anchorage. These cables are low and necessitate housing the topmasts. Vessels should keep to the N bank in passing under them during the high river season.

The Xijiang beyond Wu-chou is navigable only by small craft with shallow draft and will not be described.

T'an Chiang

2.68 T'an Chiang (22°26'N., 113°04'E.) is approached from the S between **Hebao Dao** (21°52'N., 113°10'E.) and Dajin, then, into a large bay indenting the mainland through which vessels pass to reach **Ya Men Wan**. **Ya Men Wan** (22°20'N., 113°04'E.), in turn, joins the T'an Chiang at its mouth.

Depths—Limitations.—The channels to and through the T'an Chiang are shallow and intricate. The rise of the river is very irregular and fluctuates with the seasons. The river is highest in summer and lowest in winter.

Aspect.—The W shore of the inner approach to the T'an Chiang is well-defined and has a number of small villages along it. It is fronted by mud flats on which lie some small islets. The E shore is formed by reclaimed land and mud banks and is not well-defined.

Ya Men Wan, entered 20 miles N of Dajin, is 13 miles long. The Hu-t'iao Men, a very narrow and shoal tributary leading to the Xijiang from the W, is entered just to the E of the S entrance to Ya Men. Its entrance is narrow and leads between shoals extending from both shores. The banks of the T'an Chiang beyond the N end of Ya Men Wan are low and flat. The land bordering the river is cultivated.

Caution.—Vessels are required to obtain the permission of the appropriate authorities before navigating the river, which has been reported to be closed to foreign shipping.

2.69 Damang, rounded and 263m high in its N part, and with a rocky peninsula extending 1.5 miles SW from its main part, lies with its S extremity 1.8 miles NNW of the NW

extremity of Hebao Dao. A group of rocks, 1m high, lie 0.5 mile W of the middle of the island. Mang-tzu, 60m high, lies at the outer extremity of a group of rocks that extends 0.5 mile SSW from the SW extremity of Damang. T'a Chou, a rocky islet, 85m high, lies about 0.8 mile NW of the N part of Damang. A rock, 6.4m high, lies 0.2 mile SE of T'achou.

Sanjiaosan Dao, a rocky islet, 138m high, lies 1.2 miles NE of Damang. A rock, 3m high, lies 0.3 mile W of Sanjiaosan Dao.

2.70 Nancy Dao (22°00'N., 113°13'E.), a narrow island, 253m high, lies with its SW extremity 1.5 miles NE of Mang-tzu. It is joined to the mainland to the N by reclaimed land.

In addition to the above mentioned islands, several small islets lie close off both the E and W shores of the bay. One of these islets, Chi's-pi, lies about halfway up and in the middle of the bay. The channel passes close E of this islet.

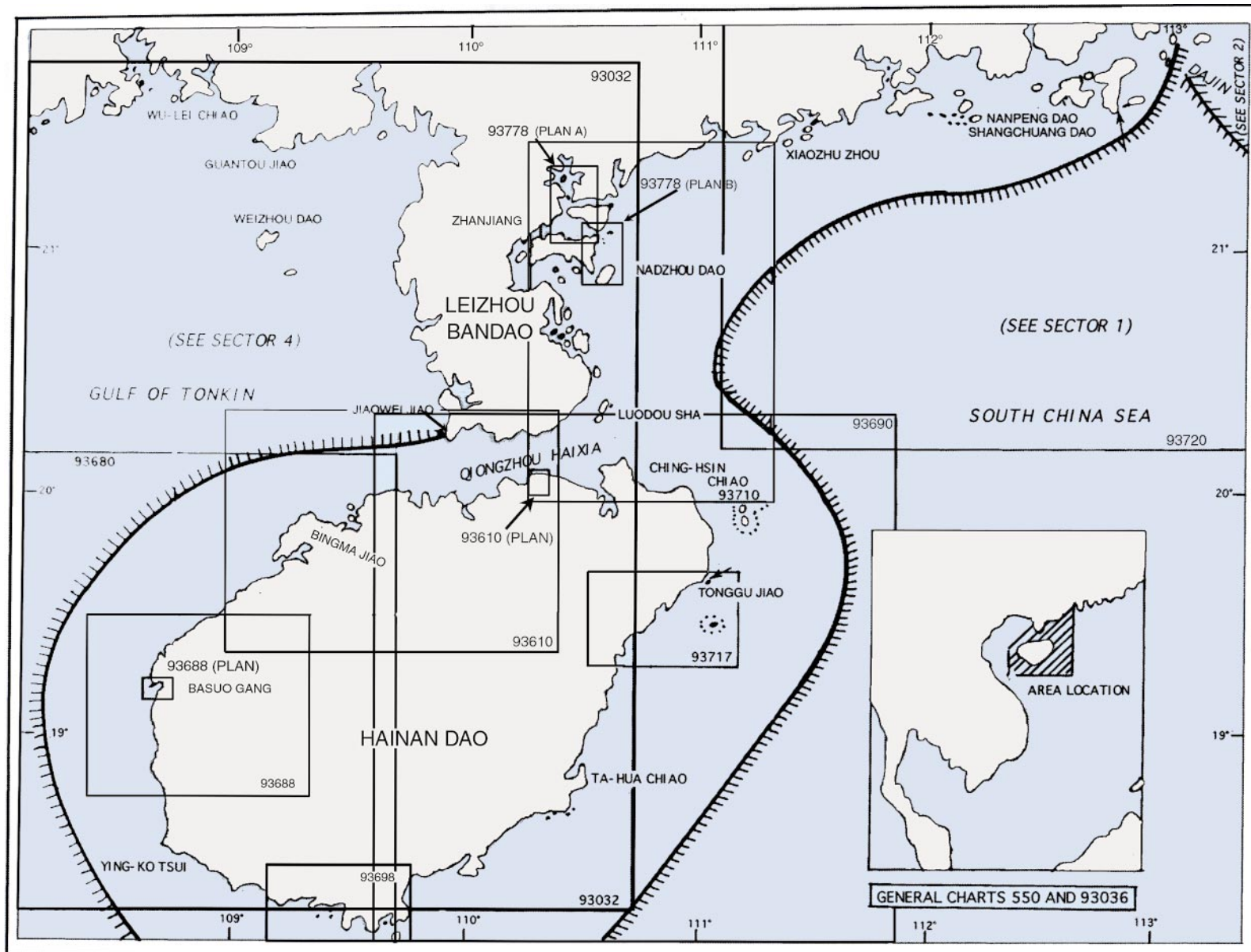
Depths—Limitations.—A narrow, intricate, and unmarked channel with a least depth of 2.1m at LW leads up the bay between the drying banks to the entrances of Ya Men Wan and Hu-t'iao Men. Pilots with local knowledge are a necessity.

Yai Men Channel is 13 miles long. Greater depths are found in this channel than in the approach channels.

Aspect.—A prominent white tower stands on the W side of the entrance of Ya Men Wan. A similar tower stands on the S end of the point separating the entrances of Yai Men and Hu-t'iao Men. A prominent, white building with a flagstaff stands close to the latter tower, but at a lower level. A ruined fort, with an overhead telegraph spanning the river in its vicinity, stands on the E side of the channel in a position about 1 mile NW of the tower.

Caution.—Vessels entering Ya Men Wan must depend on local knowledge. It may be necessary to lower the topmast at high river to clear the overhead cables.

The T'an Chiang is divided into two branches 3 miles NW of its entrance. The valley of the river is well-cultivated and there are several towns along its banks. The N branch of the river is wider and deeper than the preferred channel. Due to the need for local knowledge and for a pilot on board, no further description is given.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.
SECTOR 3 — CHART INFORMATION

SECTOR 3

COAST OF CHINA—DAJIN TO JIAOWEI JIAO, INCLUDING HAINAN DAO

Plan.—This sector describes the S coast of China from Dajin to Jiaowei Jiao, the sequence being from E to W, including the N shore of Hainan Dao bordering Qiongzhou Haixia. Following the description of the strait, Hainan Dao is described clockwise from Ching-hsin Chiao, its NE extremity, to Pingma-chiao, the island's NW extremity.

General Remarks

3.1 Winds—Weather.—The climate in this sector is governed by the monsoons. The Northeast Monsoon is much stronger and more persistent than its counterpart. It begins around September and brings rain with cool temperate weather.

This monsoon is rarely interrupted over the open sea and from between the N and E more than half the time. The direction of the wind is steadiest from December to February. In March and April winds from between S and E become increasingly frequent as opposed to the middle of the season when interruptions in the wind pattern last only for 1 or 2 days. May is the month of transition to the Southwest Monsoon.

The Southwest Monsoon is very irregular and often weak. Winds are from SE to SW, but not as strong or consistent as during the Northeast Monsoon. Hot weather begins in early summer and calms make the heat oppressive. Showers occur in the afternoon almost daily during this season. At the end of August, W winds are as common as E winds near Hainan Dao. These W winds bring rain and thick weather.

Near Hainan Dao and through Qiongzhou Haixia heavy squalls of short duration are common from June through August, although they may occur during any season of the year. These squalls are usually preceded by a blue haze over the land. The most dangerous type of squall is the arch squall, which is preceded by clouds rising from the horizon in the form of an arch. Heavy rain occurs when the arch is passing overhead. They can be expected inland off the river estuaries and in places where the hinterland is mountainous when strong offshore winds are occurring.

Typhoons may occur in any month, but they are more frequent from June through November. The typhoons occurring in August and September are considered more violent.

Fog occurs about two to three days per month from January to April between Hainan Dao and 112°E, however, to the E of this meridian the frequency increases.

Coastal fogs are fairly common from January through April, although not more so than at sea. During the Northeast Monsoon, particularly from January through March, visibility in Qiongzhou Haixia is poor. Misty or drizzly weather may reduce visibility to less than 2 miles with little or no warning.

Tides—Currents.—Tides in the South China Sea are mostly of a diurnal character. The principal changes follow the declination of the moon rather than its phases. Shortly after the moon crosses the equator, the diurnal tide vanishes and the semi-diurnal tides occur. As declination increases, the diurnal tide increases, and when the declination is near its maximum,

N or S, single day tides may occur. The springs of the semi-diurnal tide occur shortly after a full or new moon. The neaps of the semi-diurnal tide occur shortly after quadrature. The springs of the diurnal tide occur shortly after the moon reaches its maximum declination.

Currents of the South China Sea flow in accordance with the general pattern of the wind. The main currents are those caused by the monsoons. The SW current of the Northeast Monsoon is stronger and more constant than the NE current of the Southwest Monsoon. A considerable portion of the currents of both monsoons exceeds a rate of 1 knot.

Between 14° and 21°N, the SW or W current of the Northeast Monsoon occurs from October through February, with March and April being the months of transition.

The NE or E current occurs from May through August, September being the month of transition. In December and January, the current attains a maximum rate of 0.5 knot to 1.5 knots.

During the Northeast Monsoon, and also in August and September when E winds prevail, the current frequently sets W at a rate of 3 knots off **Tungtafan Shih** (21°28'N., 112°23'E.). It abates only to 1.5 knots when the tidal current, under ordinary circumstances, would be setting E.

Frequently during the Southwest Monsoon, if the wind shifts to the E, a W set is experienced. Off the SE and SW coasts of Hainan Dao, currents resulting from monsoons may be encountered. From October through March, the currents set NW at a rate of 0.7 to 1 knot. From June through August, the currents set SE at a rate of 0.5 to 0.8 knot.

Aspect.—For a distance of 115 miles WSW of T'ung-ku, the peninsula extending from the mainland 6 miles W of Ta-chin, to the mouth of the Shui-lung Chiang, the S coast of China is irregular and fronted by off-lying islands. Most of these islands and other dangers in this portion of the sector lie within the 20m curve. Along the coast, mud flats and banks are prevalent. The shore is backed by hills and mountains reaching heights of over 1,219m. There are no ports of commercial importance to foreign shipping in this part of the sector.

To the W of the above-mentioned river mouth, the coast trends SW for about 35 miles to the entrance of Kuang-chou Wan, within which is situated the port of Chan-chiang. This large bay, filled with islands and shoals, indents Leizhou Bandao. The S side of this peninsula, about 45 miles S of Kuang-chou Wan's main entrance, forms the N side of Qiongzhou Haixia.

Qiongzhou Haixia, the passage between the peninsula and the island of Hainan Dao is encumbered with numerous sandy shoals and banks in its E approaches, but a deep navigable channel leads between them.

The strait proper is about 50 miles long and 10 miles wide at its narrowest part. Specific regulations govern vessels transiting the strait.

Hainan Dao is 156 miles long NE-SW, and 100 miles wide at its widest part. Its coast is about 560 miles in length. Ch'i-chou

Ch'un Tao is the largest group of off-lying islets, lying as far as 18 miles from the NE end of the island.

The E and NW sides of Hainan Dao are reef-fringed in places. The SE and S coasts are bold, but banks and shoals have been reported along them in places as well as along the SW coast. Sand or sand and gravel beaches front most of the coast. These are interrupted by bold, rocky points and low, marshy land bordering lagoon and river entrances.

The S half of the island is mountainous and vegetation-covered, attaining elevations of over 1,829m in the Wu-chih Shan which at times are visible from Qiongzhou Haixia. Spurs from these ranges extend to the coast at the S two-thirds of the island where they form bold capes and headlands. Low-lying river valleys and constricted coastal plains lie between these ranges.

A flat to rolling plain, interrupted by steep isolated hills, extends over the N third of Hainan Dao. Much of this plain is under cultivation.

Only three harbors on the island are of commercial importance; the others provide only limited facilities to native junks. Of the main ports, Haikou is on the N coast, Tung-hai-t'an is on the W coast, and Sanya is on the S coast.

Caution.—Several wrecks lie off the coast described in this sector. Their type and location can best be seen on the charts of the area concerned.

Much of the area described in this sector has been imperfectly surveyed, especially between the offshore islands and the mainland and along the mainland shores in the many bights and bays. With the exception of the S side of Qiongzhou Haixia, much of the coast of Hainan Dao has not been thoroughly examined. Many shoals and reefs fringe the island, some of them extending seaward as far as 10 miles or more. The position of vessels may not be accurately determined by visual bearings in some instances.

Permission to enter Chinese waters should be obtained well in advance of any voyage here.

Certain portions of the coastline covered in this sector are reported to be dangerous due to mines.

Tong Kwa To Shui-Lung Chiang

3.2 Tong Kwa (21°51'N., 112°54'E.), at its S extremity, is a peninsula extending from the mainland to within about 1.5 miles of the NW side of Dajin. The passage between the two, Tong Kwa Hai, is shoal and used only by small craft. An islet, 93m high, lies in the passage off the S side of the peninsula and the S extremity of Tong Kwa is fringed by dangerous sunken rocks. The SE side of the above peninsula between its SW extremity and Chiao-tsui Shan, 10 miles NE, is high and rugged.

Several islands and islets lie offshore to the SW of Tong Kwa peninsula. The N shores of the islands of Hsia-ch'uan Shan and Shangchuang Dao form the S side of San-hsia Kou, a passage leading to a large bay to the W of Tong Kwa.

Shangchuang Dao (21°41'N., 112°48'E.) is a large mountainous, and irregularly shaped island which rises to a height of 485m in its N part. Its NE extremity lies 5.3 miles S of the SW extremity of Tong Kwa peninsula. Its W extremity lies 11 miles SW of Tong Kwa and its SW extremity, Shangchuan Jiao 14 miles SSW of its NE extremity.

Three large, open, unexamined bays indent the E coast of Shangchuang Dao. Some drying rocks lie off the NE extremity of the island and three islets, the highest of which is 52m high, are found about midway down the coast.

Off the SE coast lies the island of Weijia Dao which is rocky, marked by a light, and over 206m high. A deep channel, about 0.2 mile wide, separates the cliffs of the two islands.

Wuzhu Zhou (21°36'N., 112°53'E.), a barren island over 230m high, is separated from the SE end of Shangchuang Dao by a channel about 2.7 miles wide with a depth of 21.9m. An islet, 70m high, lies close off the NW side of Wuzhu Zhou.

The N coast of Shangchuang Dao is rugged and irregular with shallow bays and coves indenting its entire length. Huang-mao T'ou, a narrow peninsula, extends from shore about 5 miles W of the NE extremity of the island and forms the E side of a rather large bay which is divided by four offshore islets. On the E shore of this bay, in its N portion, stands a large monastery.

3.3 Pai Yen (21°41'N., 112°42'E.) is the point marking the W extremity of Shangchuang Dao. The W coast of the island, between the above point and Shangchuang Dao, is indented by three distinct bays. The northernmost, Ta Wan, indents the middle of the island to a distance of about 4 miles, nearly cutting Shangchuang Dao into two parts.

The middle bay on the W coast, Shati Wan, is entered between Shati Jiao and a point about 1.5 miles SE and indents the coast 1.5 miles. A naval activity consisting of a barracks and a jetty used by patrol craft is situated within the bay. Depths of 9.2m are found in the entrance, gradually decreasing to 5.5m about 0.3 mile from the head of Shati Wan.

Meitou Zhou, a rocky islet, 23m high, lies on the N side of the entrance to Shati Wan. The channel between this islet and Shangchuang Dao is foul.

A reef, marked by a lighted buoy, was reported (1957) to lie in the bay. The position of the reef is not known.

Anchorage.—Vessels can anchor, in a depth of 9.2m about 0.3 mile SE of Meitou Zhou or in a depth of 8.2m with the drying rocks at the head of the bay bearing 050° about 0.8 mile off. Large junks may be found anchored off Shati Hsu, the village at the head of the bay.

Tatien Wan is the southernmost bay on the W side of the island. A signal station is situated near Shangchuang Dao, SE of the S entrance to this bay. Rocks extend about 0.2 mile seaward to the S entrance to Tatien Wan.

The S coast of the island is rather rugged and steep-to.

3.4 Xiachuan Dao (Hsia-ch'uan Shan) (21°40'N., 112°36'E.), a large and irregularly shaped island, lies within the 10m curve to the W of Shangchuang Dao across a strait encumbered with islets. The island is about 11 miles long on its NE-SW axis and 7 miles wide on its E-W axis.

The W side of the island between the islet off its NE extremity and Pai-shih Chiao, its SW extremity, is indented by a number of bays and coves. Anchorage can be taken, in 9 to 11m, soft mud, about 1 mile W of the southernmost cove on this W shore, just N of Pai-shih Chiao. The E side of Hsia-ch'uan Shan, between the NE end of the island and its E extremity, is indented by a shallow bight about 2.5 miles across its mouth.

Nan-ao Wan is a small but well-protected bay on the S coast of the island. The bay is protected by a peninsula extending E from the SW extremity of Hsia-ch'uan Shan and by the island of Wang-fu Chou, which lies about 1.2 miles E of the E end of the peninsula across the mouth of Nan-ao Wan.

Wang-fu Chou (Wang-fu Zhou), 186m high, is separated from the S shore of the larger island by a channel about 0.5 mile wide which is encumbered by fishing stakes. Passage Islet lies close off the SW end of Wang-fu Chou with a reef joining the two. Rocks extend 100m W from Passage Islet and along the W shore of Wang-fu Chou.

Depths of 9.2m are found in the S entrance to the bay which leads to the W of the above mentioned off-lying rocks and to the E of the peninsula on the SW end of Hsia-ch'uan Shan. Depths of 7.3 to 8.2m are found in the middle of the bay NW of Wang-fu Chou.

Anchorage.—Vessels can anchor in Nan-ao Wan, in 8.2m, soft mud, about 0.5 mile off the W side of Wang-fu Chou. This anchorage offers protection from E winds, but is exposed to S winds and swells. Anchorage can be taken, in about 7.3m, mud, in the middle of the W part of the bay. This anchorage affords protection from S and SE winds.

Some sunken rocks lie off the E entrance point of Nan-ao Wan. Between this point and the E extremity of the island, 3.2 miles NE, there is a shallow bight.

3.5 San-hsia Kou (21°47'N., 112°52'E.), the passage between Shangchuang Dao and Hsia-ch'uan Shan and the mainland to the N, leads SW from SW of Tong Kwa peninsula to the island of Mang Chou, a distance of over 25 miles. Depths of 4.8 to 5.5m are found in this unmarked fairway.

The channel is entered from the E between the rocks off the Tong Kwa peninsula and those NE of the NE end of Shangchuang Dao. The S entrance leads to the W of the islands off the E coast of Hsia-ch'uan Shan on the W and the W coast of Shangchuang Dao on the E. Depths of 9.2m shoaling to 5.5m are found in this latter approach channel.

Tides—Currents.—The flood current sets N and the ebb S through the S approach channel. They are strongest at springs.

Anchorage.—Anchoring is possible in this passage, which has a soft bottom.

Vessels can anchor, in 9 to 11m, soft bottom, in the S part of the S approach to San-hsia Kou. Anchorage can also be taken, in 4.3m, soft mud, between the SE coast of Hsia-ch'uan Shan and **P'ing Chou** (21°36'N., 112°39'E.).

The W and SW approaches to San-hsia Kou which lead N of Mang Zhou across the mouth of Pei-hai Wan and SW of Mang Zhou along the NW coast of Hsia-ch'uan Shan, respectively, have not been adequately surveyed.

Mang Zhou (21°40'N., 112°27'E.), an irregularly-shaped, grass-covered island, 304m high, lies close within the 5m curve about 4 miles SSE of the W entrance point of Pei-hai Wan. A village, visible from SE, stands near the summit of the island and a rock, 9m high, lies about 0.8 mile S of Mang Zhou. Shoal ground, on which there are some rocks, extends about 1.5 miles NE and E from the NE side of the island.

The coast between the SW extremity and the Tong Kwa peninsula and T'an Wan, 29 miles WSW, is mountainous, rugged, and irregular. The many bays formed by the indentations of the coast have not been closely examined. Kuang-hai

Wan, at the head of a bay 11 miles N of Shangchuang Dao, is a supply center for fishing craft. A fishing harbor with a shipyard for repair and construction of fishing craft is established.

The mouth of **T'an Wan** (21°44'N., 112°08'E.) is 13 miles across. Mo-yang Chiang, a river with a rather large delta, flows into the bay in its NW part. The main entrance to the river lies between two forts about 0.5 mile apart. Local knowledge is required to enter this bay as it is shallow, rock-strewn, and relatively unexamined.

Mud flats extend a considerable distance off this entire portion of the coast.

Off-lying Islands

3.6 Dongdagan Shi (Tung-fan Shih) (21°27'N., 112°22'E.), a barren white rock, 61m high, and appearing as a junk with one sail, lies farthest offshore of the islands in this portion of the sector. It has a steep summit and is prominent. Tung-hsiao-fan Shih, a high rock, lies 0.5 mile N of Dongdagan Shi and a rock awash lies between the two islets.

Explosives grounds, with reported depths of 24m and 25m, lie approximately 1.5 miles W and 1.2 miles SSE of Dongdagan Shi.

Nanpeng Dao (Nan-P'eng) over 244m high near its W end, is located 12 miles WNW of Dongdagan Shi. Huangchengshan, a rounded islet, lies 3.8 miles W of Nanpeng Shi. Breakers have been reported on the shoal S of the island and in the area of two above-water rocks lying 1.8 miles SW of Huangchengshan.

Enhuo (Erh-huo), a rocky islet, 148m high, lies 4 miles NNW of Nanpeng Dao. Sunken rocks lie close off its W and SE ends and a rocky islet lies between it and Li-t'ou-t'ieh, about 1 mile E.

Dahuo (Ta-huo) (21°39'N., 112°07'E.), 129m high, lies in about the middle of the mouth of T'an Wan. It appears as a saddle when viewed from the SW. A rock awash lies about 1 mile SW of this island.

3.7 Hailingshan Dao (Hai-ling-shan Tao) (21°38'N., 111°54'E.) is a rather large, mountainous island whose N side forms the SW side of T'an Wan as well as the SE side of Yang-pien Hai. The waters N of the island have not been closely examined. Near the center, is the island's summit, Sugar Loaf, which is over 400m high.

The SW extremity of the island is a low, sandy point with a drying sand bank extending SW from it for about 0.5 mile. Two islets with numerous sunken rocks around them lie on this bank. The S coast of the island extends about 13 miles ENE and is slightly indented. Reefs, shoals, and drying flats extend off this coast from about 2.5 miles E of the SW end up to the E extremity, Hailingshan Dao, which is marked by a 223m high hill and a red patch of sand visible from SE.

Hailingshan Gang (Hai-ling-shan Chiang) (21°45'N., 111°39'E.) is a bay of moderate depth, encumbered by shoals, lying between the W side of Hailingshan Dao, and the mainland to the W.

Winds—Weather.—Southwest winds predominate in summer, when rainstorms are frequent. Northeast winds predominate in winter, when fog is prevalent. Northeast winds are usually experienced during the approach of a typhoon.

Tides—Currents.—The tide sets NE on the rising tide at a rate of 1.3 knots and SW on the falling tide at a rate of 2.5 knots.

Pilotage.—Pilots board 1 mile SW of Mawei Zhou.

Anchorage.—The anchorage is sheltered from NE, E, and SE winds, but during NW and N winds, considerable swell is experienced. Vessels wishing to use this anchorage should obtain permission from the proper authorities well in advance. Local knowledge is essential for this anchorage.

A quarantine anchorage and a designated anchorage have been established 1 mile SW and 2.5 miles WSW respectively, from Mawei Zhou.

3.8 Shuangshan Dao (Shuang Shan) (21°33'N., 111°41'E.) is comprised of two islets, 64m high, that lie in the SW of a bay indenting the coast to the W of Hailingshan Dao. A rocky spit, extending E from the mainland, encloses and extends beyond these islets. The Rugged Mountains, which attain a height of nearly 914m, lie inland in this vicinity.

The coast, from Shungyu Zui (Shuang-yu Tsui), a low, sandy point about 3.2 miles SW of Shuangshan Dao, to the mouth of Shui-lung Chiang, 31 miles W, is very irregular and fringed by offshore reefs and islets. Most of this coastline has not been closely examined and mariners should remain well offshore. Continuing W and WSW to the Huang-p'o Chiang, a distance of about 30 miles, the coast is low and relatively regular, but incompletely surveyed. Vessels should give this coast a wide berth.

A pinnacle-shaped feature on Shungyu Zui, 38m high, is reported to be prominent. A reef, with some rocky islets on it, extends 1.3 miles SW from this point. The entrance to the narrow inlet N of this reef is foul.

Qing Zhou (Ch'ing Chou) (21°29'N., 111°28'E.), 126m high and covered with bushes and grass, is located 2 miles S of a rocky peninsula which marks the E entrance of a bay. Depths of 7.3 to 11m are found in the unobstructed sections of the outer part of this bay, but the inner part is mostly shallow.

3.9 Xiaozhu Zhou (Ta-chu Chou) (21°26'N., 111°22'E.), 87m high, lies 0.5 mile NNE of Dazhu Zhou and foul ground extends 1.8 miles farther NNE. Reefs and rocks are found N, NW, S, and SW of Qing Zhou and N and NE of Xiaozhu Zhou.

Anchorage, in 7.3 to 11m, fine sand, can be taken about 0.5 mile or more W of the latter island. The anchorage is exposed to the Southwest Monsoon, but offers some protection from the Northeast Monsoon.

The coast immediately N of the above anchorage trends N to SW and terminates at its SW end in a triangular-shaped peninsula called Lien-t'ou. The NE end of the peninsula is joined to the mainland by a sandy isthmus. The S side of Lien-t'ou is hilly and has a rounded appearance from the E. Sie Ho Point, the S extremity of the peninsula, is located about 2.5 miles SSE of its N extremity.

Caution.—An SBM lies about 5.5 miles SE of Xiaozhu Zhou. A submarine oil pipeline extends 8 miles NW from the SBM to the coast. Navigation is prohibited within 1 mile of the SBM and the pipeline.

Sie Ho Reef lies about 0.5 mile off the SE side of Lien-t'ou and extends 1 to 2 miles ESE from Sie Ho Point. An above-water rock lies near its center. Po-p'i Shih, a large white rock,

lies about 0.5 mile SW of the above point. A drying rock lies close W of Po-p'i Shih and a sunken rock lies about 0.5 mile off the W side of Lien-t'ou, 1 mile NW of Sie Ho Point.

Hsiao-fang-chi Tao, a very small islet, 32m high, lies 1.5 miles W of Po-p'i Shih with a sunken rock in the area between the two as well as other sunken rocks lying nearly 0.5 mile off the NW extremity of the former islet.

3.10 Dafangji Dao (Ta-fang-chi Tao) (21°23'N., 111°11'E.) rises to a height of 122m about 2 miles SW of Hsiao-fang-chi Tao. A shoal spit with a depth of 4.5m extends 1.5 miles N from the islet.

Anchorage.—Anchorage can be taken with some protection from monsoons, in a depth of 11m, just N of an imaginary line joining Dafangji Dao and Hsiao-fang-chi Tao. Heavy swells roll into the anchorage during the strength of the monsoons.

Caution.—Dangerous wrecks lie about 2 miles S and 6 miles SSW of Dafangji Dao.

A shallow bank extends up to 4 miles off the mainland coast to the N of the above anchorage. The E end of the bank dries. Niu-mu Shih (Black Rocks) and Hua-wen Shih (Marble Rock) lie to the W of the S end of the drying bank with the former lying 4.8 miles NW and the latter 2.3 miles N, respectively, of Hsiao-fang-chi Tao. These rocks are above-water and prominent.

3.11 Tien-pai Chiang is a small harbor located N of Lien-t'ou. It is entered through a channel leading between the above-mentioned dangers and the W side of the peninsula. The harbor is used only by junks and other small craft.

Shui-lung Chiang, another small coastal harbor used by junks and small craft, lies with its narrow entrance about 8 miles W of the entrance to Tien-pai Chiang. The coast between the two entrances is rather hilly, but has not been completely examined. Chim Shan, a white hummock, 21m high, is located midway along this coast.

Shuidong (21°29'N., 111°05'E.) is a new port opened in 1993. Vessels approach from the S using an entry and departure lane that is 5.5 miles wide and 12 miles long. Currents run parallel to the coast, in either a SW or NE direction.

A channel, 91m wide with a depth of 9.4m and marked by buoys and ranges, leads to the piers. The government general cargo berth is 189m long. There is also a private general cargo berth, 244m long. Both berths have a depth of 11m alongside. A private oil wharf has depths of 7.5 to 11.9m alongside.

Vessels with a maximum draft of 7.5m can be accommodated. Vessel transits are allowed during daylight hours only.

Pilots board in the pilot anchorage area.

Caution.—Two 4.5m shoals lie close off the pier area.

Shoal ground, as defined by the 3m curve, extends up to 4 miles off this coast. The E end of this shoal ground dries. The 20m curve is charted 6.5 miles offshore.

3.12 A narrow peninsula with its E end forming part of the W side of the entrance channel to Shui-lung Chiang, extends about 5 miles WSW to An Kang Shan. This bold cliff, 168m high, is fronted by dangerous rocks extending 4 miles farther WSW and about 1 mile offshore. Two prominent hills, 9 and 18m high, stand on the peninsula between its NE end and An Kang Shan.

Between this hill and the mouth of the Huang-p'ò Chiang, about 24 miles WSW, the coast is low and has some red cliffs. A 1.8m rocky patch lies 2.5 miles offshore in a position about 11.5 miles WSW of An Kang Shan. The 20m curve is charted up to 16 miles offshore of this coast.

Huang-p'ò Chiang has not been thoroughly examined. Breakers have been reported as extending 3 miles seaward of the river mouth. Ngchunyun, a small river port, lies about 5 miles within the river entrance. Light-draft vessels with local knowledge can ascend the river as far as the port. A white fort (21°14'N., 110°38'E.) stands on an island on the SW side of Huang-p'ò Chiang, and a peak, 183m high, lies 12.5 miles NNW of the fort.

The coast from the mouth of this river for about 10 miles SSW to the entrance of Zhanjiang Gang is low and sandy.

Leizhou Bandao is a large peninsula extending S from the S coast of China between the parallels of 20°13'N and 21°25'N. Its surface is undulating and deeply indented. Barren sand dunes and scattered fishing villages are found along its coasts.

The E coast of the peninsula between Huang-p'ò Chiang and Caia-pei Chiao, 46 miles S, is indented by a wide bight to a distance of about 25 miles. The coasts of the bight are flat and muddy and are intersected by a number of small rivers. The islands of Lin-hai Tao and Tung-hai Tao fill the N half of this bight. The main entrance to Kuang-chou Wan, which is also the entrance to the port of Chan-chiang, leads between these two islands. The country backing Zhanjiang Gang is undulating and volcanic in origin.

The S portion of the bight is filled with shallow banks with narrow channels between them. Much of this portion of the bight is imperfectly surveyed. Rocks and reefs probably exist within 10 miles of the SE coast of the peninsula.

The S coast of Leizhou Bandao is described with Qiongzhou Haixia in paragraph 3.27.

3.13 Naozhou Dao (Nao Chao) (20°54'N., 110°35'E.) is a rocky island with a barren summit, 85m high, marked by a stone lighthouse which is prominent from all directions except S. Sometimes this light is obscured by clouds. The island appears as a flattened cone from seaward and is reportedly a good radar target. Tung-pei Chiao, the NE point of the island, and Chung Chiao, about 2.8 miles SSW, provide good radar fixes. Sandhills, 12 to 15m high, stand on the N side of Naozhou Dao.

A conical tower, painted in black and white bands, stands on the N coast of the island about 0.3 mile E of Pei-ch'ing T'ou, the N extremity of the island.

The coasts of Naozhou Dao are irregular and are fringed with drying banks which extend 0.2 to 0.8 mile offshore. Foul ground consisting of sunken and drying reefs connected by sand and mud shoals, extends 1 to 6 miles seaward from the SE coast of the island. P'ang Chiao (Grand Plateau), 2.2 miles SSE of Tung-nan Chiao, which is the SE extremity of Naozhou Dao, dries 3.6m and is the highest reef within the foul area.

Naozhou Roadstead, lying to the SE of Kuang-chou Wan, is formed by the N side of Naozhou Dao, the E side of Tung-hai Tao, and the SE side of Lin-hai Tao. The main channel through the roadstead allows vessels with a draft of about 11m to ride the tide into Kuang-chou Wan. Vessels with a draft of less than 8m can enter and leave regardless of the tide.

Kuang-chou Wan is reportedly accessible via a channel passing S and W of Naozhou Dao, but this approach is not authorized by Chinese authorities.

Longshui Ling (Wei-t'sui Ling) (21°02'N., 110°31'E.), located 9 miles NW of the summit of Naozhou Dao and 1 mile inland of the E coast of Tung-hai Tao, is 109m high and very prominent. Its dark summit is fronted by light sand. Sand hills lie between it and the coast.

3.14 Hung Shan (21°04'N., 110°32'E.), 32m high, stands 2.5 miles N of Longshui Ling and 1 mile within the S entrance point of Kuang-chou Wan. The latter is low, sandy, and rounded. The N side of the entrance is marked by several wooded hills which are prolonged toward the N by high sand dunes.

Ch'ing Ling (21°06'N., 110°33'E.), which is wooded only on its S and W sides, is the most conspicuous of these hills. It is 0.7 mile inland and shows a light, close to the W of which is a prominent white house.

Caution.—During the Northeast Monsoon, the seas break over the shoal ground that extends SE from the SE end of Lin-hai Tao and E from the NE end of Tung-hai Tao.

The coastal area S of Naozhou Dao, for a distance of about 22 miles to the N limit of the mined area in the E entrance to Qiongzhou Haixia, is unsurveyed, and is probably dangerous due to reefs and shoals.

Dangerous wrecks lie 11 miles S and SSE and 2 miles SSW of Naozhou Dao.

Zhanjiang Gang

3.15 Zhanjiang Gang (Kuang-Chou Wan), a rather large bay, is 6.5 miles long in an ESE-WNW direction. It is 5.5 miles wide within its entrance. The navigable portion is reduced to a comparatively narrow channel which in some places is only 0.2 mile wide between the shoals with which it is encumbered. The entrance channel of the bay is about 1 mile wide between the narrow drying banks which fringe the coast on either side.

The channel bottom for its entire length is of mud and sand. The shores of the bay are low, sandy, and fronted nearly everywhere by banks of soft, drying mud. There are, however, some red cliffs and some clumps of trees which shelter villages along the shores of the bay.

Maxie He Chiang enters Kuang-chou Wan in its N part abreast the island of Ta-ch'ing Tao.

Pilotage.—See the port description for Zhanjiang.

Regulations.—Vessels wishing to navigate within Chinese waters should obtain the permission of the proper authorities well in advance.

3.16 Islands.—**Dongtoushan Dao** (Tung-T'ou Shan) (21°06'N., 110°24'E.), a rather large island, lies in the SW part of the bay. There is a prominent white, cone-shaped beacon on the SE end of the island. A narrow and foul channel separates the S side of Dongtoushan Dao from Yuan Chiao, a point on the N end of Donghai Dao. The N and E sides of the island are fronted by banks of rock and mud.

Teching Dao (Ta-ch'ing Tao) (21°09'N., 110°25'E.) is about the same size as Tung-t'ou Shan, but is more regular in shape and lies 3.2 miles N. It lies on the E side of the main channel

close E of the tanker piers. The island is cultivated and supports some villages. Hsi Chiao is the W extremity of Teching Dao. A drying bank extends 1.2 miles SE of the island.

The tidal currents in the entrance of Zhanjiang Gang sometimes attain a rate of over 4 knots. They flow in the general direction of the channel. However, seaward of the entrance, particular care should be given to the set of lateral currents during the Northeast Monsoon. These crosscurrents have been reported to reach velocities of 8 knots.

Within the bay the tidal currents follow the general direction of the main channel, except near the N end of Dongtoushan Dao where the flood continues to set W into the channel off the NW side of this island and the ebb sets in an opposite direction.

To the N of Dongtoushan Dao the tidal currents return to the main channel directions. Velocities range from 1.2 to 2.5 knots on the flood and reach 0.5 knot on the ebb.

3.17 Entrance channel.—From seaward, the entrance channel has a least reported depth of 9.2m, but the range line passes close aboard shoal patches, an obstruction, and across a 7.5m shoal patch charted 5.8 miles N of the range lights on Naozhou Dao. The fairway passes N of Naozhou Dao, between Nansan Dao and Donghai Dao, and through the estuary to the port of Zhanjiang.

Several secondary channels exist in Zhanjiang Gang, but should only be attempted by vessels with local knowledge.

Kuang-chou Wan

3.18 North side.—This shore, lying NW of Lin Shan, is low and swampy. Chintzu Chiao, located 4 miles NW of Lin Shan, is formed by red cliffs. Banks formed of sand, mud, and rocks, some of which dry as much as 3.7m, extend from the shore S to the fairway. These banks are charted.

3.19 South side.—This side of the bay begins with a low, sandy point at the NE part of Donghai Dao. The shore to the SW, for a distance of 2.5 miles, consists of broken cliffs up to 20m high. There are patches of rock along the shore. The coast is then low and sandy as far as Yuan Chiao, where it again rises to a low cliff.

The shoal ground and drying banks that front the N coast of Donghai Dao force the main channel to a nearly NW-SE direction. Fishing stakes may be found on these banks.

A rocky shoal forms the SW side of the fairway of the main channel about 1 mile to the N of Dongtoushan Dao. In this vicinity, the channel is about 0.3 mile wide.

3.20 West side.—The W side of the bay from Shitou Jiao extends SW. A sand bank, which dries and has several scattered drying rocks on it, extends offshore forming the NW side of a side channel and the W side of the main channel. Fisher's Rock, which dries 4m, lies 2 miles SSW of Shitou Jiao.

Shitou Jiao (21°09'N., 110°23'E.) can be identified by the oil tanks at the foot of the main tanker jetty extending from it.

Caution.—Vessels should have little trouble as long as they stay in the main channel and adhere to the guidance of the pilot when moving off the range lines or out of the buoyed passages. Most turns and dangers near the fairway are marked by buoys and can be cleared by staying on the ranges.

Fishing stakes are found bordering the main channel in various locations along its routes.

Zhanjiang (21°12'N., 110°24'E.)

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3.21 The port of Zhanjiang (Chan-Chiang) is situated at the NE part of the Leizhou Peninsula of Guangdong Province, on the W bank of Maxie He Chiang (Wu-li-shan Chiang).

The port is protected against typhoons, but during the Northeast Monsoon, conditions caused by strong onshore winds can be difficult. The inability of a pilot to berth a vessel during this period can cause considerable delays. However, this deep water port handles much of the trade of southern China and it also serves as a base for offshore oil drilling and deep sea fishing industry.



Zhanjiang

Winds—Weather.—The port has a subtropical climate with long hot summers and short winters.

Winds follow the patterns of the Northeast Monsoon and Southwest Monsoon. In summer, winds from E and SE prevail while in winter they are NW through N to NE. Rainfall is heavy from May to September.

Typhoons strike the port most frequently between July and November and bring winds reaching force 8 to 12 on the Beaufort Scale. Although the harbor provides shelter during these storms, cargo operations are often interrupted.

Fog occurs frequently between dawn and mid-morning during winter and spring. The fog is infrequently dense however, and does not affect aviation or cargo operations to any great extent. There is little fog in summer and autumn.

Tides—Currents.—The tides within the port are semi-diurnal, but irregular. They rise 3.8m at springs and 2.9m at neaps.

Off Zhanjiang, the tidal current on the rise flows roughly NW following the channel at a rate of 1.2 to 2.5 knots. It begins 2.5 hours after LW at Naozhou Dao. When falling, the direction is SE beginning 1 hour 12 minutes after HW at Naozhou Dao. The velocity on the fall is between 0.5 and 1.5 knots.

Depths—Limitations.—Vessels of up to 70,000 dwt can be accommodated at the port. The port is divided into three working areas totalling 2,767m of wharfage. The majority of the berths, 23 of the 29, are deepwater berths for vessels exceeding 10,000 tons. There are an additional 18 anchorage berths, in depths of 13 to 34m.

Nine berths in Area No. 1 have alongside depths of 10.9m and can accommodate vessels of up to 10,000 tons. Two berths in Area No. 2 can accommodate vessels of up to 35,000 tons.

There is a petroleum jetty with a 100,000 ton capacity and an alongside depth of 11.9m; four vessels of 25,000 to 50,000 tons can be berthed at the pier. There are two container berths able to accommodate vessels of up to 15,000 dwt.

The controlling depth of the approach channel is 11m at HW and 9.5m at LW. The maximum permitted drafts are:

1. Bulk carriers—10.4m.
2. General cargo vessels—9.2m.
3. Tankers—11.7m.

It has been reported (1987) that cargo vessels having a draft of 11 to 11.5m can be accepted.

The general cargo area is situated 1 mile N of the oil jetty. There are 14 berths here and a ro-ro camber for local ferries.

A bulk terminal capable of handling coal, ore, grain, or phosphate vessels of up to 35,000 dwt, is situated 1 mile N of the oil pier. It is approached by a narrow channel.

Aspect.—When entering the port proper, the oil tanks and the piers of the petroleum complex are conspicuous on the W bank of the Maxie He Chiang. Two breakwaters, parallel to each other and to the tanker jetty, extend E from shore close N of the N tanker berth which extends N from the main jetty.

Shoal ground and drying banks extend into the river from both shores. Some drying and above-water rocks stand on these banks. Vessels are, therefore, advised to stay to mid-channel unless directed otherwise by the pilot.

Alouette Bank (21°11'N., 110°24'E.) a rocky shoal that dries less than 0.3m at its S end, lies on the NW side of the fairway, 1 mile SSW of Tung-ying Chiao. A 1.5m patch lying at the end of a foul bank, lies 1.5 mile SW of Alouette Bank.

Zhanjiang Gang Light Vessel(20°56.0'N., 110°40.3'E.) marks the S limit to ZhangJiang Harbor.

Pilotage.—Pilotage is compulsory, and should be ordered through the Harbormaster, Zhanjiang, at least 24 hours in advance of the vessel's arrival. Vessels should indicate which pilot anchorage they intend to use when ordering the pilot.

The pilot will board inbound vessels at the First or Second Pilot Anchorage depending on draft and familiarity with the port. The First Pilot Anchorage is used by vessels lacking local knowledge and/or entering with drafts in excess of 9.1m. Vessels drawing less than 9.1m and in possession of local knowledge may board the pilot at the Second Pilot Anchorage, which is also the quarantine anchorage. Both anchorages are best seen on the appropriate chart.

Regulations.—Port officials will board with the pilot.

Signals.—A signal and lookout station with a signal mast is situated close inshore about halfway between the root of the Shih-t'ou petroleum jetty and the S end of the main cargo wharf. Strong wind and storm signals are shown in the accompanying table.

Anchorage.—The outermost anchorage, First Pilot Anchorage, is situated at the intersection of Longshuiling Hangdao and Doulongoun Beighangdao leading tracks. The holding ground is good in soft mud, but the anchorage is exposed to the Northeast Monsoon. Alternatively, most vessels embark pilots at Second Pilot Anchorage, which also has good holding ground; this anchorage lies off the N side of the fairway, at the intersection of Entrance Channel and Nansandao Xihangdao. A yellow lighted buoy marks the shoal limit NE of the anchorage. Vessels with a maximum draft of 10.3m can use Second Pilot Anchorage.

There are 19 anchor berths, in depths of 13 to 34m, designated by the harbormaster, most of them with good holding ground, sand and mud. However, mariners should note the 1.6m shoal within the Oil Tanker Anchorage lying 1 mile E of the bulk terminal.

Zhanjiang—Strong Wind and Storm Signals		
Day signal	Night signal	Meaning
Winds not associated with a typhoon		
Cylinder, disposed vertically	Two green lights, disposed vertically	Winds over force 6-7 within 6 hours
Diamond, disposed vertically	One red light over one green light	Winds over force 8 within 24 hours
Winds associated with a typhoon		
T-shape	Three white lights, disposed vertically	Tropical storm within 48 hours
Ball	One white light over one green light over one white light	Winds force 6-7 within 24 hours
Cone, point up	One white lights over two green lights	Winds over force 8 within 12 hours

Zhanjiang—Strong Wind and Storm Signals		
Day signal	Night signal	Meaning
Two cones, points together	Three green lights, disposed vertically	Storm force winds not exceeding force 12 within 12 hours
Cross	One red light over one green light over one red light	Typhoon

Anchor berths No. 17, No. 18, and No. 19 lie on the N side of Entrance Channel off the SW extremity of Nansan Dao. There are several anchorages for tankers, situated 1 mile S of **Shai Wei** (21°09.5'N., 110°25.0'E.), and 1.5 miles NNE of the same point.

Anchorage is prohibited in the cable area NE of the city.

There are a number of mooring buoys for use by vessels of 10,000 tons during typhoons.

Directions.—Approach Naozhou Dao from the E, keeping **Doulong Cun** (20°56'N., 110°38'E.) leading lighted beacons in line bearing 270° and passing N of Lighted Buoy No. 1 Lighted Buoy (Fairway), alter course to head for Longshui Ling leading lighted beacons in line 303°45'. If the leading beacons are unrecognizable, then steer for Longshui Ling summit bearing 299°; however, a W set towards Naozhou Dao is usually encountered on this leg. The dark summit fronted by light sand is unmistakable, and sometimes appears to rise from the clouds. A vessel choosing First Pilot Anchorage should use the N section of the anchorage area during the Northeast Monsoon, and the W section when anchoring with a flood tide.

A vessel proceeding to cross the bar continues on the above course and from First Pilot Anchorage area brings Doulong Cun lighted beacons in line bearing 167° astern when steering on 347°. This course should lead a vessel through the bar, between lighted buoys until about 4 miles from Nasan Dao front range light, when course should be altered to 325° in alignment with Nansan Dao leading lighted beacons.

A regular mid-channel dredging operation is conducted to maintain a least depth of 9m in Doulongcun Beihangdao channel bar (in the vicinity between Lighted Buoy No. 2 and Lighted Buoy No. 3). An obstruction lies about 0.2 mile NNW of Lighted Buoy No. 2 with a 6.5m depth above it; another shoal, with a depth of 7.3m, lies on the W limit of the channel and 4.7 miles SSE of Nasan Dao front range light.

When Hou Ling bears 259°, or at night when Longshui Ling front range light changes from red to white, alter course to 284°30' and proceed through the entrance channel.

There are three anchorage berths, lying midway between the 10m contour S of Nansan Dao and mid-channel. The Second Pilot Anchorage lies 0.5 mile W of the westernmost anchoring berth. Fishing stakes are usually encountered on both sides of this channel; a dangerous wreck lies about 0.2 mile ESE of Lighted Buoy No. 10

Caution.—In 1993, lesser depths than charted were reported in the entrance channel and adjacent waters. Mariners should also note the dangerous wrecks, best seen on the chart, within this part of the approach.

Some of the range lights within the port may be obscured by trees. Vessels may experience considerable scend in the shallowest part of the channel. Fishing piles encumber both sides of the fairway.

Mariners should exercise caution due to numerous charted obstructions and dangers between Zhangjiang Gang and Hailingshan Gang, some lying up to 70 miles offshore.

3.22 Maxie He Chiang, above Zhanjiang, maintains its width and deep-draft navigability as far N as the island of Diaoshun Dao, a distance of about 6 miles. To the N of this island, the river is traversed by smaller vessels with local knowledge and junks as far as the village of **Shih-men** (21°24'N., 110°22'E.).

West bank.—Between Zhanjiang and **Ping-lo T'ou** (21°14'N., 110°24'E.), 2 miles NNE, the shore is indented about 0.5 mile by a mangrove-fringed bight. The bight, which is encumbered with fishing stakes, is filled with drying mud flats.

Bonheur Tower, which is prominent, stands near the shore 1 mile NNW of the N piers at Zhanjiang. Between the tower and Ping-lo T'ou, there are two prominent hills, 12m high, standing close together. Ping-lo T'ou is the E extremity of a range of hills. Nearly the entire W shore is fronted by mud flats that dry.

A chimney stands on the coast near the NW end of Pese Cliffs which begin about 2.5 miles NW of Ping-lo T'ou and extend NW. A black and white banded square tower, 7m high, stands 0.5 mile NW of the chimney. Another chimney stands close SE of the tower.

Due N of Pese Cliffs lies the island of Diaoshun Dao. An extensive flat lies between the W side of the island and the mainland to the W. A causeway extends to the SW end of the island from the vicinity of the above mentioned black and white tower. Another causeway joins the N end of the island with the mainland to the N.

A rocky shoal, with depths of 1.2m to 1.8m at its outer end, extends about 1 mile SSE from the S end of Diaoshun Dao.

A steelworks has been built on Diaoshun Dao. There is a 2,000m long quay on the SE end of the island, at which there are five berths with alongside depths of 9.1m. A bulk loading berth lies at the NE end of the quay.

Anchorage can be taken in the river in a position about 1.3 miles SE of the SE end of the island.

3.23 Between **Tung-ying Chiao** (21°12'N., 110°25'E.), which is rather steep-to, and a point 2 miles NE, the E side of the Maxie He Chiang consists of low and level cliffs. Inland there is cultivation, and several villages lie hidden by trees. A naval installation extends N from the point. A drying bank fringes the shore N of Tung-ying Chiao and fishing stakes are sometimes found on the banks.

Between the point located 2 miles NNE of Tung-ying Chiao and Point Tumulus, about 1.5 miles NNW, there is a bight, most of which dries. A hill, 9m high, stands on Point Tumulus.

A sand bank lies about 1.5 miles NNW of this point, about 0.3 mile offshore. A drying rock lies about 0.3 mile SW of the S end of the sand bank.

Between Point Tumulus and Chenal de Potao about 2.2 miles N, the E side of the river is bordered by mangroves. Mud flats, which dry, extend up to 0.3 mile offshore and generally fringe the coast N to Shih-men.

Leizhou Bandao

3.24 Hsi-nan Hang-men is a partially unsurveyed and unmarked channel which leads S of Nao Chao and Tung-hai Tao and NE of Leizhou Bandao. The channel is entered from the SE between the foul ground off the SE of Nao Chao, which is nearly always visible during daylight hours, and the banks off to the E of the peninsula. The entrance is 3 miles wide.

Caution.—Hsi-nan Hang-men and the branch channels leading from it are used only under favorable conditions by vessels with local knowledge, most of which are also light draft. Although the channels are described here in general, due to their unsurveyed nature and Chinese regulations governing territorial waters, their use is not recommended.

3.25 Chi-moa Sha (20°51'N., 110°31'E.) is an extensive bank which nearly dries and forms the S side of Hsi-nan Hang-men. Near the SE end of this bank, a branch channel, Tung-pei Hang-men, leads to the NE between Naozhou Dao and the reefs and foul ground to the SE. The entrance, between two 1.8m patches and the channel, lies SE of Naozhou Dao Roadstead in the approaches to Kuang-chou Wan. This channel should be attempted only at LW when the dangers are most visible.

Nao-chou-hsi-pei Hang-men, a channel connecting the inner part of Hsi-nan Hang-men with the approach to Kuang-chou Wan, leads along the W and NW sides of Naozhou Dao. It is entered from S between Hsi-nan T'an and Ma-ti T'an where there is a least depth of 5.3m over a width of 0.5 mile in the fairway. The channel narrows to about 0.25 mile within the entrance for a good part of its length as it leads between the banks of Kan-hsin T'an and Hsi-pei T'an.

Swatchway Channel, with a least depth of 2.8m in the fairway, lies between Kan-hsin T'an and the shoal ground fringing the SE side of Tung-hai Tao.

Mandarin Bay is entered at the NW head of Hsi-nan Hang-men. This bay fills the bight on the S of Tung-hai Tao and on the E of Leizhou Bandao. The shores of the bay dry nearly all around. However, a narrow channel does lead from its W part, N along the W coast of Tung-hai Tao and into Kuang-chou Wan. A river enters the SW corner of the bay, but access to it is shoal.

Tides—Currents.—The tidal currents are divided by Naozhou Dao. One current passes N of the island and the other S. In Nao-chou-hsi-pei Hang-men the tidal currents attain a rate of 2.5 knots at springs, changing about 1 hour after high and low water. The set is to the S on the rising tide and to the N on the falling tide. The flood current setting NW through Hsin-nan Hang-men meets the flood current setting S through Nao-chou-hsi-pei Hang-men in the channel abreast of Tan-shui; they separate at the same spot.

To the SW of Chi-mao Sha, the coast of Leizhou Bandao (Lei-chou Pan-tao) between **Pei-kou-keng Chiao** (20°51'N., 110°20'E.) and Malu about 18 miles SSE, is low, irregular, and indented by shallow creeks. The coast has not been thoroughly examined and shoal banks extend as far as 18 miles offshore.

3.26 Malu (20°35'N., 110°28'E.), a small port, stands on the S side of Wai-lo-pou Chiang. Between this port and Chia-pei Chiao, 8 miles SSE, the coast consists of sand hills.

Off the entrance of Ma-lu, the tidal currents set strongly across the channel on both sides. The maximum rate of the current is reported as 2.5 knots.

Chia-pei Chiao (Nui-pi Chiao) (Gopai Point) (20°29'N., 110°32'E.), the NE entrance point of Qiongzhou Haixia, forms the E extremity of Leizhou Bandao. The point is low and is backed by sand hills rising to heights of 21 to 24m. A mound, 48m high, lies 3 miles SSW of Chia-pei Chiao.

Hei Chiao (Black Rocks) (20°30'N., 110°32'E.) which dry 1.2m, are located about 1.5 miles NNE of Chia-pei Chiao. A shoal that dries in places lies 3 miles E of the same point.

Caution.—The N limit of a mined area lies at the E end of Qiongzhou Haixia and extends E about 32 miles from Hei-chiao; the area then extends along the inner route close off Leizhou Bandao to the S of Hei-chiao and could be dangerous.

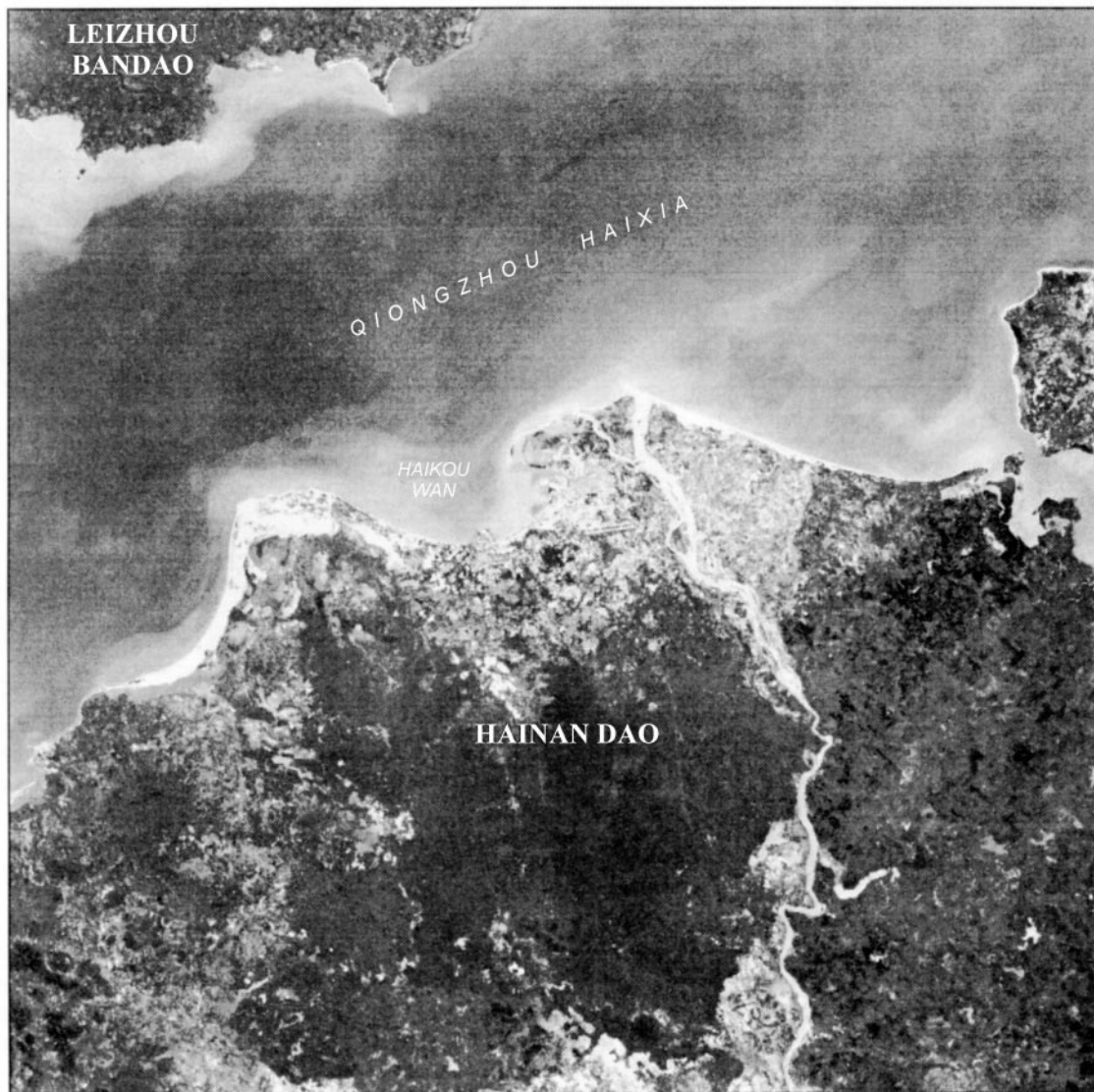
Qiongzhou Haixia

3.27 The S side of Leizhou Bandao forms the N side of Qiongzhou Haixia and the N coast of Hainan Dao (Hai-nan Tao) forms the S side of the strait. The waterway has a least width of about 10 miles between the peninsula and the island and is about 47 miles long. The E limit of the strait is defined as a line drawn from **Mulan Tou Light** (20°09'42"N., 110°41'06"E.) in a 320° direction to Leizhou Bandao in the vicinity of Shanzhu Ling. The W limit is a line drawn between **Lingao Jiao** (Lin-kao Chiao) **Light** (20°00'42"N., 109°42'36"E.) and **Jiaowei Jiao** (Chiao-Wei Chiao) **Light** (20°13'20"N., 109°55'12"E.), from which a racon is transmitted.

Depths—Limitations.—Rocks and shoals lie in the approaches to the E and W entrances of the strait, with the E entrance being far more encumbered with dangers than the W. The offshore approaches to the S coast of the peninsula and to the N coast of the island within the strait are mostly clear. The inshore approaches, however, are obstructed in many places. Fringing reefs are prevalent in some of the bays indenting the peninsula and along many parts of the N coast of Hainan Dao.

Both coasts bordering Qiongzhou Haixia share a similar aspect. They are indented by many bays separated by capes and points of varying configuration. The heads of these bays are mostly shoal and some are bordered by mud and sand flats. Some have detached dangers and others have lagoons extending inland from them.

The coast is fronted predominantly by sandy beaches although, there are short stretches of cliffs with scattered rocky points. In most places the coast is backed by low sand dunes and sand hills covered with scrub growth. Scattered palms and other trees grow near the coast while a wide coastal plain extends inland. This low rolling plain is broken in places by isolated hills rising between 91m and 244m.



Qiongzhou Haixia

The streams which discharge into the sea are navigable only by small, native craft.

Haikou is the only commercial port of importance within the strait. It lies on the N coast of Hainan Dao about midway through the strait.

Regulations.—The Chinese government issued the regulations on 8 June 1964 which govern the passage of nonmilitary, foreign registered vessels through Qiongzhou Haixia.

Based on the “Declaration of the Government of the People’s Republic of China Concerning Territorial Waters,” Qiongzhou Haixia is considered inland waters. Passage is prohibited to foreign military vessels. If passage is necessary for nonmilitary vessels of foreign registry, application for authorization to transit the strait should be made in accordance with these regulations.

For the purpose of facilitating control over Qiongzhou Haixia, the “Qiongzhou Haixia Administration of the People’s

Republic of China” (hereafter called the Qiongzhou Haixia Administration) is established.

The Administrative Area of Qiongzhou Haixia (hereafter called the “Administrative Area”) is tentatively designated as the waters W of a line between Mulan Tou Light and Shanzhu Ling, 19 miles NNW (hereafter called the “E limit”), and E of a line between Jiaowei Jiao Light and Lingao Jiao Light, 17.5 miles SW (hereafter called the “W limit”).

If it is necessary for nonmilitary vessels to transit the strait, they should execute the following procedures:

Forty-eight hours prior to entering the Administrative Area or prior to sailing from the port of departure, the vessel shall communicate by cable the following to the Qiongzhou Haixia Administration:

1. Vessel’s name.
2. Nationality.
3. Gross tonnage.

4. Speed.
5. Color of hull.
6. Description of funnel.
7. Date and time due to sail from current port of call or date and time of sailing from last port and port of destination, and request for authorization to pass through the strait.

Upon receipt of authorization to pass through the strait, and 24 hours prior to entering the Administrative Area or within 2 hours of sailing the port of departure, the vessel shall report to the Qiongzhou Haixia Administration the exact time of entry into the Administrative Area.

The above telegraphic communication requesting authorization to pass through the strait shall be sent to PENAVIDEO HAIKOU through Haikou (XSR), for the Qiongzhou Haixia Authority. Authorization or refusal to grant transit will be received via this agent.

The Qiongzhou Haixia Administration may, on short notice, withdraw permission for a vessel to transit the strait if it deems necessary.

Passage through the Administrative Area is restricted to daylight hours only. That is, the vessel shall enter the Administrative Area after sunrise and complete its passage out of the Administrative Area before sunset. The Qiongzhou Haixia Administration approves the specific time of entry and exit from the strait on the basis of the rate of speed of the vessel requesting authorization to pass through the strait.

Vessels authorized to transit the strait shall do so in mid-channel unless given special permission by the Qiongzhou Haixia Administration to deviate from the prescribed route.

When passing through the Administrative Area, vessels shall remain N of a line extending from a point on the E limit, 4 miles from Mulan Tou Light, to a point on the W limit, 4 miles from Linago Jiao Light, and S of a line from a point on the E limit, 6 miles from Mulan Tou Light, to a point 4 miles distant and bearing 180° from **Paiwei Jiao Light** (20°15'N., 110°17'E.), then to a point on the W limit, 14 miles from Lingao Jiao Light.

When passing through Qiongzhou Haixia the vessel should adhere strictly to the reported time schedule and remain within the stipulated navigational area. Upon entry into the Administrative Area or while proceeding through the strait, if signals originating from the bank or from a naval vessel are sighted, the transiting vessel shall reply immediately and comply with the request conveyed by the signals. Consequences for failure to comply with the regulation shall rest solely with the transiting vessel.

When passing through Qiongzhou Haixia the vessel may not operate its radar, take photographs, conduct surveys or engage in acts contrary to the laws of the People's Republic of China. If in the course of navigation, conditions such as dense fog or a storm are encountered which severely restrict visibility and necessitate the use of radar, the vessel involved shall submit a report to the Qiongzhou Haixia Administration stating the reasons for wishing to operate its radar and the vessel's present position and speed. Not until approval is given may the vessel operate its radar. If at that time conditions are critical and the ship's navigational safety is endangered, it may submit a report of the circumstances and operate its radar immediately and afterward send a detailed report to the Qiongzhou Haixia Administration for its records showing the time that the radar

was used and describing the circumstances and events concerning its operation.

A non-military vessel which violates these regulations shall be treated as follows:

1. Prior to its entry into the Administrative Area, the vessel may be ordered to desist from entering the Administrative Area, reverse its course, and sail around Hainan Dao, or wait until it has satisfactorily completed formalities to pass through the strait and receive approval before resuming its passage.

2. If the vessel has already entered the Administrative Area, it may be ordered to heave-to, be escorted to the port of Haikou for an inspection to be conducted, and be penalized in accordance with the findings of the inspection. After the inspection or delay, depending on circumstances, the vessel may be allowed to transit the Administrative Area, or may be ordered to leave the Administrative Area, in which case it will be escorted out of the strait under guard.

It should be clearly understood that the publication of the above regulations is solely for information relative to the navigational safety of shipping, and in no way constitutes a legal recognition by the United States of the international validity of any rule, regulation, or proclamation so published.

Additional cautionary notes and regulations concerning navigation in the vicinity of China's coastline are found in paragraph 1.1, paragraph 1.2, and paragraph 2.1, as well as in Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia.

In June of 2002, the Qiongzhou Haixia VTS commenced operations. Vessels maintain a continuous watch on VHF channels 8 and 16, and use VHF channel 25 for business communications. Reports must be made to Qiongzhou Haixia VTC on VHF channel 8 when crossing the following reporting lines:

1. East Approaches—connecting the following points:
 - a. 20°25.7'N, 110°31.0'E.
 - b. 20°25.7'N, 111°04.3'E.
 - c. 20°01.0'N, 111°04.3'E.
 - d. 20°01.0'N, 110°55.7'E.
2. West Approaches—connecting the following points:
 - a. 20°00.6'N, 109°42.7'E.
 - b. 20°13.5'N, 109°55.2'E.
3. Haikou—connecting the following points:
 - a. 20°06.8'N, 110°02.8'E.
 - b. 20°06.8'N, 110°20.0'E.
4. Hainan Gang—connecting the following points:
 - a. 20°12.1'N, 110°05.4'E.
 - b. 20°14.8'N, 110°16.9'E.

Caution.—Although, the hydrography in the E entrance and approach to Qiongzhou Haixia seems to offer many usable channels between the various shoals and banks, the entire area is reported to be mined. However, a channel has been swept for use on a risk-acceptable basis and presents the best route through the shoals. The channel is buoyed and begins at Buoy No. 1 (21°15'30"N., 111°05'00"E.) and leads through Chung Shui-Tao passage.

A smaller minefield is reported to obstruct the W approaches to the strait. For details of the limits of both mined areas and the buoyed channel through the E area, see Pub. 120, Sailing

Directions (Planning Guide) Pacific Ocean and Southeast Asia..

Tide rips exist throughout the strait, particularly abreast Mulan Tou. Some of these rips have the appearance of shoals and are discolored by vegetable matter. When the currents set W in the vicinity of Mulan Tou there is a strong set toward the reef extending from this point. Currents in this vicinity attain rates of 3 to 5 knots.

Qiongzhou Haixia—East Entrance

3.28 The sea usually breaks on the shoal parts of the dangerous banks at the E approach to the strait during the Northeast Monsoon and when there is a swell from E. These banks extend as far as 20 miles NE from a line joining the E entrance points of the strait. Although there are deep channels between the banks, vessels should proceed with extreme caution as tidal currents are uncertain and most of the shoal heads are unmarked.

Zhong Shuidao leads between **Pei-fang Tui** (20°19'N., 110°54'E.), an extensive shoal oriented ENE-WSW with a least depth of 0.2m on its W end, and **Nau-Fang Tui** (20°12'N., 110°52'E.), another extensive shoal bank with a dangerous wreck on its NE extremity. The channel then leads S of **Hsi-fang Tui** (20°17'N., 110°40'E.), which has several dangerous sunken rocks on its SE edge, to the designated navigable area of the strait as previously described in the regulations in paragraph 3.27. This middle channel is the only channel open to foreign shipping. The channel is swept through the mined area and is marked by a safe water buoy at its entrance. The rest of the channel is marked by lighted buoys. This channel is the widest and deepest channel in the E approach to Qiongzhou Haixia. Although the dangers are not all marked, the channel is considered the best channel in the approach to the strait from the E and its use is mandatory.

Caution.—The positions and characteristics of the channel buoys may be other than charted. The least charted depth in the channel is 15.8m; however, in 1961 it was reported that the depths are less than charted.

Pei shui-tao, with a least depth of 10.4m at the E part of its fairway, leads between Pei-hsi Tui on its NW side and Hsi-fang Tui and Pei-fang Tui on its S and SE sides. Several isolated shoals and detached patches with depths of 8.2 to 9.4m, lie throughout the channel, and are best seen on the appropriate chart.

The use of this channel is not recommended because the dangers are not marked, the currents are strong, the channel is not straight and the use of a channel other than Zhong Shuidao is a contravention of local regulations for foreign shipping. Additionally, Pei Shui-tao traverses a reported mine danger area.

Pei-hsi Tui, with a least depth of 2m, lies with its center approximately 13 miles NNE of Mulan Tou. An extensive shoal area, which has not been thoroughly examined, lies N of this bank and extends about 12.5 miles ENE from the NE end of **Lo-t'o Sha** (20°22'N., 110°35'E.).

In general, the 20m curve lies less than 2 miles from the salient points of the N and S shores of the strait, except where bays indent the coast.

Qiongzhou Haixia—West Entrance

3.29 Several sandy banks lie in the W approach to the strait, some with shoal heads. Pei Sha is a large shoal, about 1.3 miles wide with a least depth of 5.4m, that extends about 11 miles E from a position 20 miles NE of **Bingma Jiao** (Ping-ma Chiao) (19°55'N., 109°18'E.).

In approaching the strait from the W or departing to the W, the best channel leads S of Pei Sha. Vessels should give the NW coast of the island a berth of about 5 miles to ensure avoiding the coastal bank W of **Lingao Jiao** (Lin-kao Chiao) (20°01'N., 109°43'E.) Two dangerous wreck lies 9 miles and 15 miles WNW of Lingao Jiao. Care should also be taken to avoid the wrecks lying NW of Bingma Jiao. Additionally, anchoring in the vicinity of the reported minefield in this area would not be prudent.

A shoal, with a least depth of 5.4m lies 5 miles N of the E end of Pei Sha in a position lying between 16 and 20 miles W of Jiaowei Jiao. A bank with several shoal heads extends NW from a position about 7.5 miles W of the same point. The NW shoal head lies 25 miles NW of the point and has a depth of 7m. The SE shoal head with a least depth of 8.5m, reported (1962), lies about 7 miles W of Jiaowei Jiao.

For information concerning the Gulf of Tonkin N and W of the entrance to Qiongzhou Haixia, see Sector 4. For information on the South China Sea E of the strait, see Sector 1.

Qiongzhou Haixia—North Shore

3.30 The S coast of Leizhou Bandao forms the N shore of Qiongzhou Haixia. It extends from **Chia-pei Chiao** (20°29'N., 110°31'E.) SW about 20 miles to Paiwei Jiao, then W about 21 miles to Jiaowei Jiao.

Between Chia-pei Chiao and **Paiwei Jiao** (P'ai-wei Chiao) (20°14'N., 110°17'E.), the coast is backed mostly by sand hills between 21m and 24m high. San-kao-lung rises to 49m about 3 miles SSW of Chia-pei Chiao and along the SW part of this portion of the coast, red cliffs mark the shore.

Between Chia-pei Chiao and **Shangouhou** (Peterson Point) (20°26'N., 110°31'E.), which is reportedly marked by a light, a fringing offshore reef extends as far as 1.8 miles offshore. About 3 miles off this shore are reefs which continue E and SE for at least 15 miles. It is on this reef, to the SE of the point, on which lies Luodou Sha.

This cay is 2.3 miles long and 2m high. Small cays lie close off the N and S ends of the main islet. Depths shoal abruptly in the approach to these cays.

The channel between Luodou Sha and the mainland is about 1 mile wide but it is fringed on both sides by reefs. It is used by small, local craft as an inner route to and from Chan-chiang, but it is not recommended for vessels without local knowledge as the area is imperfectly surveyed and governed by local regulations. The passage becomes narrow and dangerous in its N portions.

The coast SW from Shangouhou to **Hongkan Point** (20°19'N., 110°24'E.) is mostly unexamined. Hongkan Wan is a slight indentation just SW of the latter point. Foul ground extends about 1.3 miles offshore from the NE entrance point. Small vessels with local knowledge and permission can anchor

in 13m, mud, with the light on the NE entrance point bearing 068° distant 1.5 miles.

Paiwei Jiao (P'ai-wei Chiao) is a fringed, sandy reef with a conical point about 24m high. To the SW of the point the coast is reef fringed and indented by Hai-an Chiang which recedes about 2 miles. Depths in the bay shoal sharply within the 20m curve which fronts the bay less than 1 mile offshore abreast the entrance points.

The head of the bay is backed by red cliffs between 15 and 18m high. Anchorage for small vessels can be taken, in 9.2, mud, with the light bearing 338°, distant 1.8 miles.

3.31 Hsiao-tao Chiao (Islet Point) (20°14'N., 110°07'E.) is the E entrance point of Jiaowei Wan (Chiao-wei Wan) (Kami Bay). The mouth of the bay stretches from this point for about 12 miles W to Jiaowei Jiao.

The bay indents the coast about 4 miles, and is shoal and reef-fringed from about 0.5 to 1.8 miles offshore. The land backing the E side of the bay rises gradually to the N of Hsiao-Tao Chiao. A pagoda stands on the E slope of a hill 5.5 miles NNE of the point.

Several small islets lie on the reef fringing the E entrance point.

The W side of the bay is backed by sand hills. These hills are brush-covered, but become bare towards the SW part. There are red cliffs at the central part of the head of the bay.

Jiaowei Jiao (Chiao-Wei Chiao) (20°13'N., 109°55'E.) marks both the W entrance to Jiaowei Wan and the NW entrance to Qiongzhou Haixia. It is the SW end of a 12m reef-fringed islet on which stands a light. It was reported (1965) that the high trees on the island make the lighthouse extremely difficult to distinguish. A rock, with a depth less than 1.8m, lies about 1 mile SSW of the point. Depths of less than 11m extend 2 miles SW from the point and there are rips in this area.

Small vessels can take anchorage, with some shelter from the NW, in a depth of 9.1m, mud, with Jiaowei Jiao Light bearing 277°, distant 1.5 miles; and from NE winds, in 16.5m, mud, with the point bearing 128°, distant 1.5 miles.

The coast N of Jiaowei Jiao is described in paragraph 4.3.

Hainan Dao—North Coast

3.32 The N coast of Hainan Dao forms the S side of Qiongzhou Haixia. The coast is very irregular, being indented by several bays. The Nan-tu Chiang delta bisects the coast.

The port of Haikou is situated at the mouth of this river. The E portions of this coast are generally sandy and low, but toward the W part cliffs intersperse the dunes. The rivers that intersect the coast are navigable only by very small craft.

Baohu Jiao (Ching-hsin Chiao) (20°01'N., 110°56'E.), marked by a racon and light, is a low sandy point rising to a height of 63m about 1.5 miles inland to the S of its extremity; a radiobeacon is situated 0.5 mile NW of the light. Baohu Shan, a black, double-peaked hill, 194m high, rises 4.5 miles SW of the point. The hills W of the point are red and those S of the point are covered with black patches. A prominent conical tomb stands on the point. A reef extends about 1 mile offshore from Baohu Jiao.

Between Baohu Jiao and Mulan Tou, 16.5 miles NW, the coast recedes about 3 miles SW and is backed by sandy hills.

Shan-tou Chiao, with a reef, parts of which dry, extending about 1.3 miles NE from it, divides this large bight about midway along its length. A reef fringes the coast as far as 2 miles offshore, W from Baohu Jiao to a position about 2.5 miles SE of Shan-tou Chiao. Depths of less than 5.5m extend 2 miles N of the same point.

From a position about 3.8 miles N of Shan-tou Chou, a shoal extends NW for about 3 miles to **Magpie Rock** (20°08'N., 110°42'E.). Close NE of this rock is Riversdale Patch, with a depth of 4.5m. The patch lies on the NE end of a spit about 1.7 miles SE of Mulan Tou. There are numerous rocks and shoal heads fringing the coast in this vicinity to as far as 1 mile offshore.

3.33 Mulan Tou (20°10'N., 110°41'E.) is the N headland of the coast. A light marks the point. It is reef-fringed to a distance of 0.8 mile offshore in places. A 59m hill rises 1 mile S of this point and a 49m hill, with a conspicuous white sand cliff on its E side, rises 0.8 mile farther SE.

The tidal currents on the flood set strongly toward the reef extending N from Mulan Tou. To the W of the point they set SW into Puqian Chiang and must be allowed for. It is advisable at times to pass E and N of Nan-hsi-hsiao-tui, then W into the strait due to the set of these currents.

Regulations.—As Nan Shuidao leads into Qiongzhou Haixia from other than the required approach, its use is restricted to local vessels unless prior permission is obtained from the Chinese authorities. Extreme caution should be taken when rounding Mulan Tou, because of the numerous dangers and strong tidal currents off the point.

Caution.—In addition to the previously-mentioned reefs, rocks, and shoals, several wrecks and obstructions lie off the coast of Hainan Dao between Baohu Jiao and Mulan Tou. Their locations can best be seen on the charts.

Hainan Tou Tui, with shoals and patches which dry at low water, extends about 10 miles ESE and then irregularly about 6 miles NE from a position about 1.5 miles NE of Mulan Tou. A detached 5m shoal head is reported close off the NW end of Hainan Tou Tui, with depths of 13.2m around. The shoal heads at the NE part of this bank encumber the channel between this bank and Nanfang Qiantan.

Nan Shuidao leads between Hainan Tou and the dangers which fringe the coast SE of Mulan Tou. Although this channel is marked by buoys, it is very narrow at its NW end and the charted positions of the buoys should not be relied upon. There is a least charted depth of 12.6m in the fairway. This channel has the advantage of leading close to the coast with navigational aids. It is considered dangerous at night or in restricted visibility and with strong tidal currents.

The channel is closed to foreign merchant ships.

3.34 Puqian Jiao (20°06'N., 110°34'E.) lies 7.8 miles SW of Mulan Tou, across the mouth of Hainan Wan, a slight indentation in the coast. The shores of this bay are backed by scrub-covered sand hills between 15m and 21m high.

Anchorage can be taken, in 13m, mud, about 1 mile SW of Hai-nan Yuan-yai which is a prominent, flat bluff 56m high that stands about 1 mile SW of Mulan Tao. Rocks, wrecks, and reefs make close approach to the shores of Hainan Wan dangerous without local knowledge.

Puqian Shan (Chi-hsing-ling), a hill with several summits, the highest 140m and on which stands a conspicuous pagoda, rises 1.5 miles E of Puqian Jiao.

Puqian Wan, a bight indenting the coast about 4 miles, stretches between Puqian Jiao and Pai-sha Chiao, 13 miles E, at the center of the delta of the Nan-tu Chiang. Depths within the bay are mostly less than 9m and they shoal toward its head. Fishing stakes are charted off the entrance to the bight.

A 10.1m patch, and several wrecks, along with numerous fishing stakes lie off the E entrance to the bight.

The shores are low except on the E side. The entrance to a large, shallow lagoon, used by small craft with local knowledge, lies at the SE end of the bay.

Pai-sha Tui, a dangerous shoal ridge with shoal heads having depths of as little as 0.4m, extends about 11.5 miles ENE from **Pai-sha Chiao** (20°05'N., 110°18'E.), close within the 20m curve.

Anchorage.—Exposed anchorage can be taken, in a depth of 11m, mud and sand, good holding ground, about 1.5 miles W of Puqian Jiao. Small vessels can anchor, in a depth of 8.2m, mud, in the W part of the bay in the lee of Pai-sha Tui with the pagoda SE of Pai-sha Chiao bearing 226° and the pagoda on the hill E of Puqian Jiao bearing 088°. The latter anchorage should be approached from the E.

Fishing stakes may be encountered as far as 2 miles N of Pai-sha Chiao and a detached 8.2m patch lies about 0.8 mile N of the same point at the W entrance to Haikou Wan.

3.35 The mouth of Haikou Wan is formed on the E by the Nan-tu Chiang delta and on the W by Chengmai Jiao, about 10 miles W. The 10m curve generally fronts the bay between these points. From here the depths shoal rapidly toward the head of the bay. The port of Haikou lies in the S part of Haikou Wan.

Several small, shallow river mouths discharge through the delta of Nan-tu Chiang, on the E side of the bay.

A cliffy ridge, 12 to 15m high, on which several conspicuous buildings are situated, rises close inland at the S side of the bay. Sand dunes, 21 to 24m high, back the SW side of Haikou Wan up to its W entrance. Xiaomao Shan, a conspicuous hill, 25m high, is located 1.5 miles E of Chengmai Jiao and Ma-an Ling (The Hummocks), with two crater like peaks, the higher of which is 230m, rises about 8 miles S of the above hill.

Ta-lu T'an, with depths of less than 0.8m, extends NW from within the bay to a position about 1.5 miles NE of the W entrance point. Several partially exposed wrecks lie in the central part of the bay.

Haikou (20°02'N., 110°17'E.)

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3.36 Haikou is an artificial harbor situated in the S, central part of Haikou Wan. It is protected by two strengthened breakwaters and is used as a typhoon refuge. The outer harbor anchorage handles most of the foreign commerce.

Winds—Weather.—The winds affecting the port are a result of the monsoons. During the summer, they have little effect on port operations unless they result from a typhoon. In winter, the Northeast Monsoon can develop heavy seas in the anchorage area rendering cargo operations untenable. Fog

occurs in winter and spring, but is usually of short duration. Violent squalls occur occasionally.

Tides—Currents.—The tropic range is 1.8m and the diurnal range is 1.3m. Tidal currents set SW into the bay for about 16 hours on the flood and NE for about 8 hours on the ebb at rates of 1.2 to 3 knots. These rates and directions are subject to change during the strength of the monsoon due to the consistency of the wind.

Depths—Limitations.—Haikou is entered through a buoyed channel with a depth of 6m in it. It was reported that the channel has a tendency to silt. Range lights lead through the channel to the harbor area.

A wharf on the E side of the harbor, having three berths can accommodate vessels of up to 5,000 dwt and up to 6m in draft. On the S side of the harbor, two piers exist with lesser depths. The majority of the cargo operations involving larger vessels, especially those of foreign registry, takes place at anchor with the use of lighters. Vessels of 25,000 dwt are handled at the anchorage.

Passenger services to Hong Kong and Guangzhou are in operation as well as a passenger and ro-ro service to Zhanjiang.

The W entrance to the harbor is much deeper than the entrance, which is used only by small craft.

Aspect.—The port of Haikou is situated on the S shore of Haikou Wan near the city of Xiuying. The city of Haikou lies 3.5 miles ENE of the port area within the delta of the Nan-tu Chiang. This city can be reached only by small, local craft.

A conspicuous white fort stands on each of the entrance points to Haikou Wan, with the shores to the E, W, and NW being mainly wooded. Several towers stand on the SE side of the bay, and a conspicuous, 47m high pagoda stands 2 miles SE of the town.

Pilotage.—Pilotage is compulsory. Pilots are met in the pilot quarantine anchorage. Pilotage is available day and night. ETA should be sent 24 hours in advance to PENAVICO (Haikou).

There is a coast radio station and a port radio station.

Regulations.—Since vessels proceeding to or from Haikou must use Qiongzhou Haixia they should comply with the regulations governing the use of the strait.

Signals.—A signal station, from which storm signals are shown is situated in the port area SW of the main wharf.

The following flags of the International Code of Signals are used:

Haikou Port Signals	
Flag	Meaning
C	Customs Officer requested
O	Stevedores requested
Q	Quarantine

Anchorage.—The Pilot and Quarantine Anchorage lies 4 miles N of the harbor area, and has depths of 15.2 to 16.4m, mud and sand. Several anchorage berths, having depths of 3.7 to 9.2m, are available, and are best seen on the chart. Northeast winds send a heavy sea into the anchorages.

Directions.—Due to the restrictions placed on foreign vessels in Chinese waters, and the compulsory nature of pilotage for this port, no directions are given. Vessels are urged to

contact local authorities for the latest information on depths in the channels and anchorages of the port.

Caution.—Depths in the approach channel, the harbor basin, and the anchorages are liable to shoal. Several prohibited anchorages lie in the vicinity of the port, and are best seen on the appropriate chart.

Hainan Dao—North Coast (continued)

3.37 Chengmai Jiao (20°04'N., 110°09'E.) is a low, sandy point which forms the E point of Chengmai Wan, a shoal bay indenting the coast about 4 miles. The NE part of the bay is encumbered with fish stakes to a distance of 1.5 miles offshore. Depths in the SW part of the bay shoal rapidly.

The SE shore of the bay is low and sandy from Chengmai Jiao to the pagoda 7 miles SW. The pagoda stands on the NE end of some low cliffs which extend W about 3 miles to the mouth of a shallow lagoon. Tong Sui Mun, a hill, 172m high, rises to its summit 3.5 miles ESE of the lagoon entrance. Sand dunes, 6 to 9m high, back the SW side of the bay as far as Yubao Jiao.

Caution.—An area containing unexploded ordnance is charted 2 miles NE of Yubao Jiao.

3.38 Between **Yubao Jiao** (19°59'N., 109°53'E.) and Leigong Dao, an eroded, 15m high islet lying 3.2 miles W, the coast is quite steep-to. It is faced with red cliffs, 15 to 18m high. A layer of black lava lies close under the top of the cliffs and appears as a HW mark.

Anchorage for small vessels can be taken in Maniao Chiang, in 7.3m, blue clay, about 0.8 mile SSW of the small islet which lies close NW of the E entrance point. The shores of this bay are low and reef-fringed with drying flats at its head.

The bay indenting the coast between Hung-t'ao Tsui and Lingao Jiao is suitable only for small craft.

A fort stands on a spit at the SE side of the bay near a shallow inlet.

Lingao Jiao (Lin-kao Chiao) (20°01'N., 109°43'E.), which is marked by a light and a signal station, is the SW limit of the Qiongzhou Haixia Administrative Area. The point is low and sandy and the coast, for about 11 miles WSW to T'iao-lou, is low, reef-fringed, and sandy. This portion of the island should be given a wide berth. Kao-shan Ling, 210m high, is a prominent hill rising 6 miles E of T'iao-Lou.

3.39 Bingma Jiao (Ping-ma Chiao) (19°55'N., 109°18'E.) is located 12 miles WSW of T'iao-Lou across the mouth of Houshui Wan. The point is low on its N side and cliffy on its E side. Reefs fringe the coast on either side of the point, but the 20m curve lies less than 1 mile off the point. A light is shown from a white tower on Bingma Jiao; a signal station and racon are situated at the light.

The shore of Houshui Wan is irregular and low, but several hills behind it make good landmarks. **Sun-lin Ling** (19°48'06"N., 108°25'00"E.) is a wooded, conical hill rising to 198m about 9.5 miles SE of Bingma Jiao and another hill, 212m high, rises 8.5 miles farther ESE.

The bay is reef-fringed with drying flats at its head. Linchang Dao, a large drying reef which is steep-to on its N

side, lies in the center of the mouth of the bay. A low, sandy cay, 4m high, lies on the S side of the reef toward its E end.

Anchorage, sheltered in all seasons, for small vessels, with permission, can be taken, in a depth of 7.3m, sand, about 1.5 miles SW of the cay.

Caution.—Care should be taken to avoid the detached drying reef lying S of the cay when approaching this anchorage from the E.

Hainan Dao—East Coast

3.40 Qizhou Leidao (Ch'i-chou Ch'un Tao) (T'a-ya Ch'un-tao) (19°56'N., 111°13'E.) is comprised of two small groups of offshore islands that lie 17 miles ESE of Baohu Jiao. The islands are high, almost inaccessible, and barren and extend in a NE-SW direction for about 8 miles.

Bei Shi (Pei-t'a-ya Tao) (Pei Shih) (19°59'N., 111°16'E.), the outermost and largest of the NE group of four islets, is 191m high. Two small islets, of which the southwesternmost is conical, lie close together about 0.7 mile SW of the large island. P'ing-shih, 114m high, lies 0.3 mile farther SW. It is the southwesternmost island of the group and the space between these latter three islets is encumbered with sunken rocks. A light is shown from Bei Shi; a racon is situated at the light.

The N islet of the SW group, Ch'ih-shih-tzu, is very small, but 52m high. It lies about 5 miles SW of Bei Shi. Nan-shih, the largest of this group and with a sunken rock and a small islet close off its N end, has three peaks, the highest 151m high.

Nan-t'a-ya Tao (Shuang-fan) (19°53'N., 111°12'E.), 99m high, with a sunken rock close off its N end, lies 1.2 miles SSE of Nan-shih and has two summits.

The coast trends regularly about 24 miles S from Baohu Jiao to Tonggu Zui, a hilly headland. It is fairly low between these two points with several streams discharging into the sea. The coast is backed by sandy ridges, 30 to 60m high, and fronted by a sand and pebble beach.

A rocky shoal area, with depths of less than 5.8m, was reported (1941) within a radius of 2 miles from a position about 7 miles SE of Baohu Jiao.

3.41 Tonggu Zui (Tung-ku Chiao) (Tung-ku Tsui) (19°38'N., 111°02'E.) is a reef-fringed point. It forms the SE extremity of a hilly promontory which rises to a height of 347m about 2 miles NNW. Between Tonggu Zui and the entrance of Ch'ing-lan Chiang, 14 miles SW, the coast is low and reef-fringed. The light to the W of Tonggu Zui is encumbered by above-water and drying rocks.

Lorne Rock, which covers, is a dangerous pinnacle lying about 11 miles S of Tonggu Zui.

Ch'ing-lan Chiang, lying 11 miles W of Lorne Rock, is a sheltered inlet receding 3 miles NW which leads to a large shallow lagoon. Rocks and sandbars that fringe the entrance uncover at LW and limit the use of the light for shelter to small vessels. These craft anchor off the entrance of the inlet, in a depth of 12.8m, sand and coral, about 2 miles S of the E entrance point. A narrow buoyed channel, about 0.1 mile wide, leads over the bar and into the harbor. The village of Ch'ing-lan is situated on the W bank, 1.5 miles from the W entrance

point. In 1989, it was reported that there are two berths built at Ch'ing-lan for vessels up to 5,000 dwt.

Between Ch'ing-lan Chiang and Ta-hua Chiao, 46 miles SSW, the coast is low and flat with scattered hills rising inland. A small cove, the entrance points of which are reef-fringed, is located about 11 miles SW of Ch'ing-lan Chiang. It affords anchorage for small vessels with local knowledge, in 11 to 14.6m, sand and mud.

The Wan-ch'uan Ho discharges into Po-au Chiang, a large very shoal lagoon, the entrance of which lies 15 miles SSW of the above cove. A prominent white pagoda stands close S of the entrance. A conspicuous hill, 332m high, rises 11 miles W of the entrance. Several above-water and drying rocks lie close off the lagoon entrance and make it nearly inaccessible. The tallest rock is 7.9m high.

Rocks, some of which uncover, fringe the coast up to 1.5 miles offshore for a distance of about 15 miles S of the lagoon entrance. Scattered hills rise closer to the coast in this vicinity.

Caution.—When piloting between Tung-ku Chiao and Po-au Chiao, vessels should be maintained in depths greater than 27m.

The entrance to another large, but very shallow lagoon, lies 17 miles farther S from the entrance to Po-au Chiang. Two black rocks, the outer rock being 6.1m high, mark the lagoon entrance.

3.42 Baian Dao (Kuan-Ts'ai Ling) (18°49'N., 110°34'E.) is 87m high, with a conspicuous pillar rock on its E end, and lies 2 miles NE of Dahua Jiao. A rock, 12m high, lies at the outer edge of a ledge which extends about 0.8 mile NNW from the islet of Baian Dao. A light is shown from the S extremity of the islet.

Dahua Jiao (Ta-hua Chiao) (18°47'N., 110°33'E.), close off which there is a sunken rock, rises to a height of 124m at its N and highest summit. A signal station stands on the point.

Between Dahua Jiao and Jinmu Jiao, 68 miles SW, the coast is rugged and mostly steep-to. Several fairly deep bays and coves indent the coast between bold headlands and steep points. These are backed by high land with mountains rising in the interior.

The coast between Dahua Jiao and Ma-liu T'ou, a cliffy point located 11 miles SW, is filled by an irregular bight that recedes 2.5 miles NW. Several hilly points which rise to over 91m project slightly seaward. They form coves affording shelter for small craft. Between these points the coast is low and sandy.

Round Islet (18°46'N., 110°30'E.), 71m high, with a rock awash at LW close off its SE side, lies 3 miles SW of Dahua Jiao.

Dazhou Doa (Ta-chou Tao) (18°40'N., 110°29'E.), 4 miles E of Ma-liu T'ou, consists of two high ridges connected by a sandy isthmus which partly covers. The S end rises to 290m. A shoal with depths of less than 7.3m extends 1.3 miles W from the N part of the island.

Anchorage can be taken by vessels with permission, in a depth of 13m, mud and sand, off the W side of the island, S of the shoal area or, in 20 to 22m, E of the isthmus on the E side of the island.

Ma-liu T'ou (Malow T'ou) (18°40'N., 110°25'E.) rises to a height of 141m near its outer end. It forms the S end of a hilly ridge that extends 2 miles N from the point. Several prominent peaks rise to the W and inland from the point. The highest peaks have been reported to be visible at a distance of 90 miles.

A large, fairly regular bight indents the coast to the NW for a distance of 5 miles and extends between Ma-liu T'ou and Lingshi Jiao which lies 27 miles to the SW. Several islets lie offshore within this bight.

Chou-tzu Tao, 155m high, lies 3 miles SW of Ma-liu Tao with Chia-ching Tao, 79m high, about 4.2 miles farther W. Anchorage, sheltered from NE, can be taken, in depths of 11 to 16.5m, sand, about midway between the former island and the point. A shallow lagoon entrance breaks the shoreline between the two islets.

3.43 Fen-chieh Chou (18°35'N., 110°12'E.), 107m high, lies 6.5 miles SW of Chia-ching Tao and 1 mile offshore. This islet has two hummocks. Shunang-fan Shih, 9.5 miles SSW of Fen-chieh Chou is 46m high and about 4 miles offshore. It is the largest of a group of rocks and resembles a junk from the distance.

Lingshi Jiao (Ling-shui Chiao) (18°23'N., 110°03'E.) is the SE extremity of a headland that is cliffy on its S side. It rises to a height exceeding 259m in a range of hummocks that extend 5 miles W from the point. A white tower stands near Lingshi Jiao. The S end of the headland has a 148m high sugar loaf point. A rocky shoal extends nearly 2 miles SW from a reef-fringed point about 2 miles WNW of this latter point.

Anchorage, sheltered from the NE, can be taken, in depths of 18 to 22m, mud with the fort at the lagoon entrance NNW of Lingshi Jiao bearing 034°, distant about 3 miles.

Between Lingshi Jiao and **Ya-lung Chiao** (Lang-yeh Chiao) (18°12'N., 109°42'E.), which is the S point of an irregular peninsula projecting SE from Hainan Dao, the coast recedes irregularly about 8 miles to the NW and forms Ling-shui Wan. The N and W shores of this bay are low and sandy, with the exception of the section lying 13 miles W of Lingshi Jiao, where a reef-fringed point with some sunken and above-water rocks interrupts the shore. The narrow coastal plain is backed by hills and mountains to the N and W.

Wu-ch'i Chou (Niu-ch'i Chou) (18°19'N., 109°45'E.), 82m high, lies in the SW part of the bay about 3.5 miles NE of the entrance to a shallow lagoon. The island is cliffy on its S side and reef-fringed on its N side. A rocky shoal, with a least depth of less than 1.8m, lies 1 mile E of Wu-ch'i Chou.

Anchorage, sheltered from the SW, can be taken, in 29m, sand, about 2 miles S of Wu-ch'i Chou.

The peninsula forming the SW side of Ling-shui Wan is indented by several coves around its entire perimeter. It is cliffy, mostly steep-to, and rises to a height of 359m toward its center. The W spit of the peninsula, which has Ya-lung Chiao as its S extremity, forms the E side of Lang-yeh Wan. Pai-hu Chiao, a black, rocky point located 5.5 miles SSW, forms the W entrance point of the bay. The head of the bay is fronted by a sandy beach and backed by hills.

3.44 Lang-yeh Wan contains several islands and islets. **Dongmao Zhou** (18°11'N., 109°41'E.), 111m high, is the outermost island of the bay. A 14m high rock and an 11m high

rock lie close E and N, respectively of the island. Hsi Chou, 105m high, lies 1 mile W of Dongmao Zhou and is marked on its SE end by a light.

Yeh-Chu Tao, an island, 95m high, stands within the bay about 2.5 miles NW of Dongmao Zhou. Two small islets, Tung-p'a and Hsi-p'ai lie to the W of Yeh-chu Tao. Anchorage can be taken, in 12.8 to 14.6m, mud and sand, about 0.8 mile NE of the E end of Yeh-chu Tao. However, the NE wind blows strongly between the hills of the peninsula to the E and during S and SE winds, considerable swell may build up in the bay.

Between Pai-hu Chiao and **Jinmu Jiao** (Chin-mu Chiao) (18°10'N., 109°33'E.), 2.8 miles WSW, the coast is bold and steep-to. This headland marks, at Jinmu Jiao, both the S point of Hainan Dao and for descriptive purposes, the dividing line between the E and W coasts of the island. The peninsula rises to 380m to the NE of the signal station above Jinmu Jiao. A light is shown from the S extremity of this point and the coast to the W is steep-to and bold; a racon is situated at the light.

Hainan Dao—West Coast

3.45 From Jinmu Jiao, the W coast of Hainan Dao trends WNW a distance of 55 miles, then N about 52 miles, and then NE a distance of 49 miles to Bingma Jiao.

Mountains stand fairly close to the S part of this coast forming several fairly bold and prominent points. Along the NW part of the coast, the coastal plain widens. Here, the hills are more isolated and many of the points are low.

Chien-feng Ling, 1,290m high, a conspicuous peak, stands about 16 miles NE of Ying-ko Tsui and 3.8 miles SE of **Tu Ling** (18°45'N., 108°50'E.), which is 1,293m high. The former peak appears as a precipitous crater from SE and NE, but from W appears as a single pinnacle.

Farther inland the mountains of the interior rise to elevations exceeding 1,829m.

Tides—Currents.—The flood current sets WNW at a rate of 2 knots abreast Yai-chou Wan and the ebb sets E at a rate of 1.8 knots.

Abreast Ying-ko Tsui, the flood current sets NW at a rate of 2.3 knots and the ebb current sets SE at a rate of 1.8 knots.

Caution.—When navigating along the W coast of the island, it is recommended that vessels stay in depths greater than 46m in order to stay seaward of the dangers lying off this coast.

3.46 Yu-lin Chiang (18°11'N., 109°31'E.) (World Port Index No. 57765) is a large bay indenting the coast between Jinmu Jiao and Luhuitou Jiao. Yu-lin Chiao, supporting a signal station, is the S end of a small peninsula that divides the N part of the bay. The bay is free of dangers beyond 0.3 mile offshore with the exception of a 3.6m patch which lies 2 miles E and a 7m shoal lying 1.8 miles ENE of **Luhuitou-Ling** (18°10'N., 109°34'E.). To the E and N of this peninsula is the naval port of Yu-lin. The port area is nearly landlocked, but is reported to be able to accommodate vessels with a draft of up to 9.7m; however, it has also been reported that the port is closed to foreign commercial vessels.

Caution.—The approaches to the port of Yu-lin are reportedly dangerous due to mines near Jinmu Jiao, Yu-lin Chiao, Ta-lang Chiao and in Yu-lin Chiang.

Luhuitou Jiao (Lu-hui-t'ou Chiao) (18°11'N., 109°28'E.) is the S extremity of a narrow peninsula that rises to a height of 277m. Between this point and Nan-shan Chiao, 18 miles WNW, the coast recedes 5 miles N forming San-ya Chiang and then tends quite regularly W. The coast is backed by hills and intersected by narrow valleys. Several islands lie across the mouth of San-ya Chiang.

Dongmao Zhou, 79m high, reef-fringed and cliffy on its SE side, lies 4 miles NW of Luhuitou Jiao. Shoals with depths of less than 7.8m exist within 0.5 mile of the island. A reef, with two rocky heads 8.7 and 11m high, lies 1.2 miles SW of the island.

Ximao Zhou (Hsi-mei Chou), 124m high, wooded, reef-fringed and cliffy on its S end, lies about 2.2 miles WNW of Dongmao Zhou. A 38m high islet lies close off the SW end of the island; Pan-hu Shih, a rock which dries 1.1m, lies about 1 mile SW of the islet. A light is shown from the S end of Ximao Zhou.

Caution.—It is recommended that vessels not pass between Dongmao Zhou and Ximao Zhou, nor between Ximao Zhou and Chiao Ling due to a dangerous wreck in the fairway, 2 miles NW of Ximao Zhou.

3.47 Sanya (18°14'N., 109°30'E.) lies on the E side of Sanya Chiang, and is entered between Hsiao Chou, 24m high, located at the W end of a drying reef extending from the shore, 1.5 miles NE of Sanya Chiao, and the SW end of Bai Pai, 0.6 mile NNW. The port is primarily a salt export terminal.

Tides—Currents.—The mean range of the tide is 1.8m.

Depths—Limitations.—An L-shaped pier, divided into three sections, provides 728m of berthing space for general cargo vessels. Berth No. 3 is 92m long and has an alongside depth of 4.5m. Berth No. 4 and Berth No. 5 have a combined length of 250m and an alongside depth of 4.2m. Berth No. 6 and Berth No. 7, 260m long, have an alongside depth of 7.5m. Vessels of 10,000 dwt are loaded and unloaded at the anchorage.

Sanya Lifesaving Station, an L-shaped pier, extends 100m into the channel from an area of reclaimed land on the side of the entrance channel.

The entrance channel, marked by lighted buoys, leads ENE towards the harbor area from a position 0.3 mile N of Xia Zhou. The depth of the channel is 7m at LW and 9.2m at HW. The maximum allowable draft in the channel is 7m.

Aspect.—Range lights are established for the entrance channel. The lights in line bearing 071°30' lead in a least charted depth of 7.1m (on the Chinese chart), towards the pier.

Nan-shan Chiao, located about 8 miles W of the last mentioned group of rocks, rises to a height of 490m about 1 mile N of the point. Its summit is flat and bold with a slight saddle in it. A prominent pagoda stands on a hill about 3.5 miles E of the summit.

A rock that dries about 1.8m lies 4.2 miles SW of the point.

Pilotage.—Pilotage is compulsory and is available 24 hours daily. The pilot will board at the Pilot Anchorage (18°11'N., 109°26'E.). The anchorage, established in depths of 20 to 28m, mud, good holding ground, is intended for vessels of up to 10,000 dwt. Vessels awaiting pilotage or quarantine clearance should anchor within 0.5 mile of the pilot boarding place.

Anchorage.—There are three anchorages available, including the Pilotage and Quarantine Anchorage. The Haven Anchorage (18°14'N., 109°26'E.) has depths of 5 to 16m, mud, good holding ground, and accepts vessels of up to 50,000 dwt. The Lightening Anchorage (18°14'N., 109°27'E.) has depths of 8 to 16m, mud, good holding ground, and accepts vessels of up to 50,000 dwt.

Anchorage during the Northeast Monsoon may be obtained outside the port, in a depth of 9m, or inside the entrance, in a depth of 4m, good holding ground.

Vessels should anchor as directed by the pilot in one of the designated anchorages situated in the area NE of Dongmao Zhou and Ximao Zhou. Vessels over 50,000 dwt may choose an anchorage in greater depths.

Vessels should not proceed closer to shore from the anchorage without local knowledge due to the existence of reefs, shoals, and islets to the E and SE.

Directions.—It is recommended that vessels entering Sanya Chiang use the route passing through the following positions (bearings and distances from Ximao Zhou peak (18°14'N., 109°22'E.)):

- a. 225°, 9.0 miles.
- b. 284°, 5.1 miles.
- c. 352°, 1.8 miles.
- d. 044°, 1.3 miles.
- e. 083°, 5.5 miles.

Caution.—Several rocks lie N of the recommended track about 3.2 miles NW of Ximao Zhou.

A lighted production platform stands 48 miles SSW of Nan-shan Chiao; a submerged gas pipeline extends from the platform to the point.

3.48 Yai-chou Wan indents the coast for about 12 miles W of Nan-shan Chiao as far as Fu-jung Ch'i (Fu-jung-ch'i). In the NE part of the bay, a stream discharges into the sea where the coast is low. Fu-jung Ch'i is marked by two, 35m high hummocks.

The islands of **Tung-lo Tao** (18°19'N., 108°59'E.) and Hsi-ku Tao, 2 miles WSW of it, lie to the S Fu-jung Ch'i. A 5.5m shoal lies about 2 miles S of Hsi-ku Tao and a drying rock lies 2 miles S of Hsi-ku Tao.

Between Fu-jung Ch'i and **Ying-ko Tsui** (18°30'N., 108°41'E.), the SW extremity of Hainan Dao, the coast is backed by a low cultivated plain. Ying-ko Tsui is marked by a light; a racon is situated at the light structure. Sandy hillocks, 6.1 to 12.2m high, border the W part of the coast in places. An isolated hill, 119m high, rises 5 miles NE of Ying-ko Tsui. A stream discharges into the sea through the marshes about midway along the shore at the head of the bay. Seaward to the S and SW of the river mouth are several shoal heads having depths of as little as 2.7m.

Eddies are frequently encountered in the vicinity of the banks off the SW coast of Hainan Dao.

3.49 **Yu-lin Chiao** (Yu-lin Chou) (19°06'N., 108°36'E.), a 45m high point, stands 36 miles N of Ying-ko Tsui. The intervening coast is indented by two large bights and the shore is mostly low, flat, and sandy. About 12 miles N of Ying-ko

Tsui, a spur from the mountains in the interior extends to the coast terminating in a 195m hill.

Several dangerous shoal areas and banks lie a considerable distance off this portion of the coast. Most of these are elongated and lie parallel to the coast. They are relatively steep-to on their seaward sides.

Outer Bank (18°37'N., 108°23'E.), the outermost danger, has a 3.6m shoal head which breaks near its center. Shoal depths extend ESE from this bank to a position lying 3 miles SW of Ying-ko Tsui and N, then NE to about 11 miles SW of Yu-lin Chiao.

Caution.—Due to the shoals and other dangers off the W and SW coast of Hainan Dao, vessels should keep to depths of 46m or greater, and at least 25 miles offshore. With the strong tidal currents and soft nature of the bottom off this coast, the shoal heads may constantly shift position.

3.50 **Beili Wan** (Pei-li Chiang) (19°10'N., 108°35'E.) is a shoal bay indenting the coast between Yulin Chiao and a low sandy spit about 7 miles N. The N part of the bay has drying flats. Shoals with depths of less than 5.5m extend over 5 miles WSW from the N entrance point. Except in the SW part of the bay, the depths are less than 5.5m. Reefs fringe the SE shore of the bay. The port of Basuo Gang is located in Beili Wan and the Pei-li Ho discharges into the bay about 4 miles NE of the harbor. The city of Beili stands 0.5 mile up this river.

Basuo Gang (19°06'N., 108°37'E.)

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3.51 Basuo Gang is located 0.8 mile E of Yu-lin Chiao, the westernmost point on Hainan Dao. The harbor is protected by two long breakwaters of large concrete blocks; the N breakwater submerges partially at HW. However, the harbor is exposed to typhoons. The major activities at the port are export of iron ore and fishing. A red light is shown from the N breakwater head, and a green light from the S breakwater head.

Winds—Weather.—The Northeast Monsoon is at strength at Basuo Gang from November through February. Winds blow out of the NE at force 4 to 7 and sometimes force 8 for several days at a time. During these periods of strong wind, a heavy sea can build up in the open roadstead and cause ships to pitch and roll at the berths within the breakwaters. The Southwest Monsoon season is from April to September.

Fog is not a major problem at Basuo Gang, but heavy rain can be expected at times between June and September.

Storm warnings are given by the signal station on Yu-lin Chiao and should be particularly heeded by vessels at the ore berths during the typhoon season.

Tides—Currents.—Tides at Basuo Gang are usually diurnal. Tidal heights reach a maximum of 3.6m at MHHW, and 0.4m at MLLW. At flood tide, the current flow is NE attaining a rate of 0.8 knots and at ebb tide, it is SW at about 1.3 knots. Offshore currents are governed by the prevailing monsoon and generally parallel the coast.

Depths—Limitations.—The maximum draft for vessels entering the harbor is 9m, although depths of 7.8m are charted

on the range line. The approach channel is 120m wide and has a depth of 9m at HW.

North Wharf, comprising Berth No. 1 and Berth No. 2, has a length of 450m and an alongside depth of 9m. The wharf is designed to accommodate ore vessels of up to 20,000 dwt.

South Wharf, comprising Berth No. 3 and Berth No. 4, has a length of 670m and an alongside depth of 9m for general cargo vessels. The wharf is designed to accommodate one vessel of 20,000 dwt and one of 5,000 dwt.

Berth Nos 5 and Berth No. 6 have a combined length of 400m and an alongside depth of 10m. General cargo and LPG vessels of up to 20,000 dwt can be accommodated.

Vessels up to 180m long and 43,000 dwt can be accommodated.

Aspect.—The pyramidal hill on Yu-lin Chiao is very distinctive. A 145m high hill, located 6.5 miles NE of the point, has been reported to be a useful landmark. A light is shown from Yu-lin Chiao.

The entrance channel and breakwaters are marked by range lights and beacons. The axis of the main channel is 089°-269° and is nearly 1 mile long. The breakwaters are visible completely at LW and the ore-loading machinery which extends the length of the ore wharf is distinctive.

Pilotage.—Pilotage, available during daylight only, is compulsory for all foreign vessels entering and leaving the harbor.

Regulations.—Masters are requested to radio the following information to Basuo Gang 72 hours, 48 hours, and 24 hours before arrival or immediately on departure from their last port of call:

1. ETA and route taken.
2. Cargo to load.
3. Ship's overall length, breadth, draft, and tons per inch immersion.
4. Type and quantity of dangerous cargo on board.

A subsequent message 16 hours before arrival should give an amended ETA.

Anchorage.—The Pilot and Quarantine Anchorage is situated 1.8 miles NW of the N breakwater, in depths of 8 to 11m, mud and sand. The anchorage may prove to be untenable in a strong wind, as it is exposed, and the holding ground is reported to be marginal.

Directions.—Vessels should make Yulin Jiao, and from a position with the lighthouse bearing between 100° and 110°, distant 10 miles, should steer for the quarantine anchorage. The channel entrance is marked on the S side by a lighted buoy moored 0.6 mile NW of Yu-lin Chiao.

Caution.—Numerous fishing stakes and fixed nets exist in the approaches to Basuo Gang.

A dangerous wreck lies 3 miles W of Yu-lin Chiao Light.

3.52 Between **Ssu-keng-sha Chiao** (19°13'N., 108°37'E.), the N entrance of Beili Wan and Ta-chiao T'ou, a bold, rocky point 10 miles NNE, the coast is low. The Ch'ang Chiang

discharges through a wide delta with several mouths about midway between these two points. Depths are very shoal near the delta. Farther N, a sunken rock lies 2.8 miles SW of Ta-chiao T'ou.

Anchorage.—Lying 16 miles NE of Ta-chiao T'ou is a shallow lagoon entrance used by fishermen. The entrance can be identified by a conspicuous fort which stands near it. Exposed anchorage, in 13m, can be taken off this entrance with the fort bearing 114°, distant about 3 miles.

Caution.—Vessels should give this portion of the coast a wide berth due to the obstruction area lying offshore between the river mouth and Ta-chiao T'ou.

3.53 **Yang-p'u Wan** (19°42'N., 109°06'E.) recedes 5 miles E between **Guanyin Jiao** (19°35'N., 109°00'E.) and Shenjian Chiao, 15 miles NE. The head of the bay is shoal and it is reef-fringed on the SE and NE sides.

Lin-ch'ang Shih (Ta-ch'an) (19°41'N., 109°06'E.), is a reef which has a low, sand cay and an islet on it, and together with a reef extending W from the low, sandy peninsula projecting WSW into the bay from its NE part, obstructs the entrance to Yang-p'u Chiang.

Depths—Limitations.—The port has 26 deep water berths for the handling of steel products, general and bulk cargo, and containers.

Yang-p'u Chiang has a coal terminal for vessels of 20,000 dwt, a container berth for a 20,000 dwt vessel, and a berth for vessels of 3,000 dwt. Vessels should contact local authorities for more information.

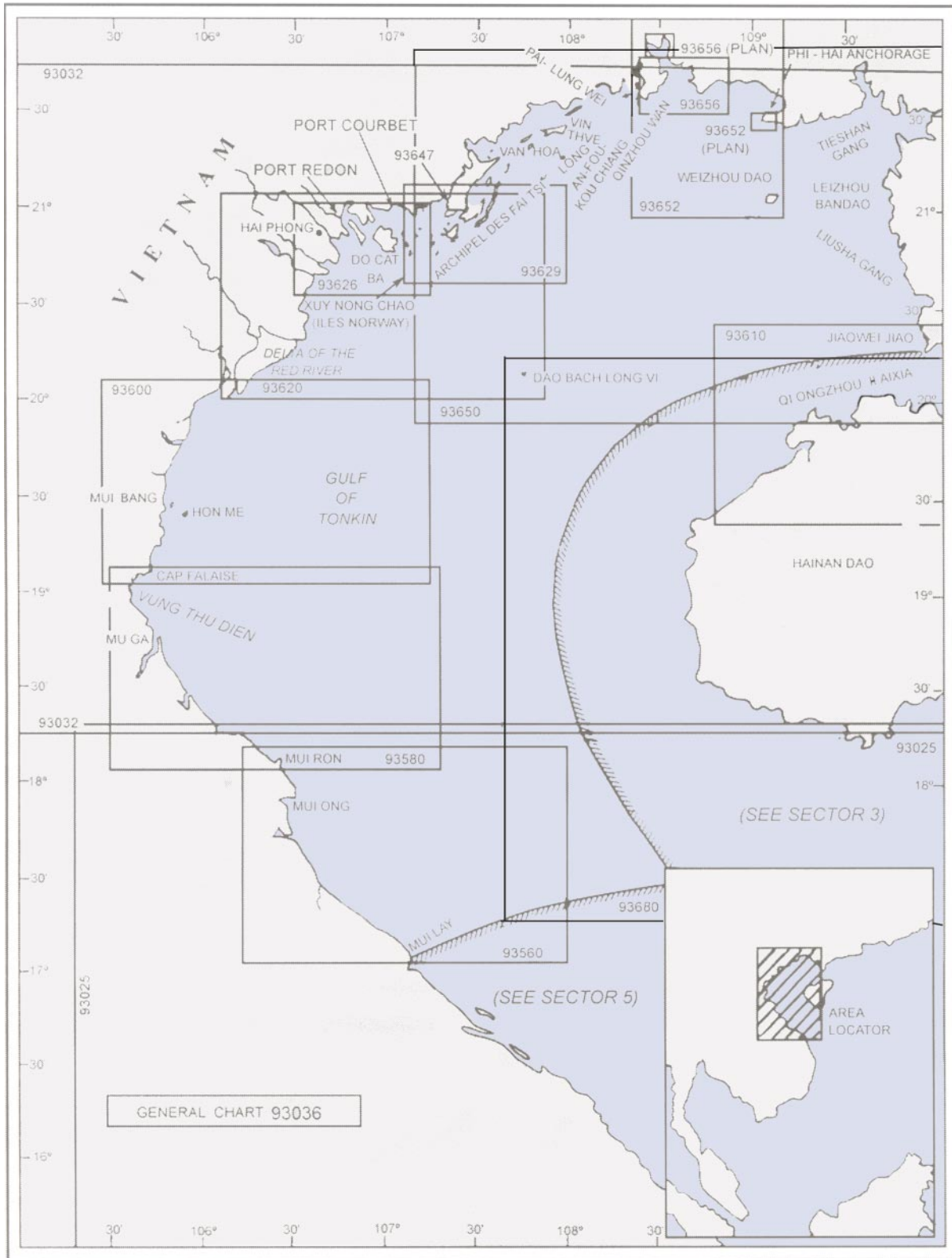
The maximum permissible draft in the harbor is 11m at LW, or 13m at HW. The maximum allowable vessel length is 200m.

Anchorage.—Vessels anchor about 0.8 mile offshore, in a depth of 15m, sand.

Small vessels with local knowledge can proceed to a sheltered anchorage, in 7.3 to 9.1m, close within the entrance of a large lagoon, which has its entrance at the head of the bay. A narrow buoyed channel, with a least known depth of 4.2m across the bar, leads clear of the reefs and sandbanks to the lagoon entrance.

3.54 **Shen-chien Chiao** (19°47'N., 109°09'E.) is a cliffy, reef-fringed point with a conspicuous pillar rock, 18m high, lying close WSW. A conspicuous pagoda stands on the N side of the point. The remainder of the coast, NE to **Bingma Jiao** (19°55'N., 109°18'E.), a distance of about 11 miles, is reef-fringed to a distance of 0.8 mile offshore in places. Bingma Jiao is marked by a light; a signal station and racon are situated at the light structure. Ping-ma Shan, an important landmark in the approach to the W entrance of Ch'iung-chou Hai-Hsia from SW, rises to a height of 211m about 3.5 miles SSW of Bingma Jiao.

Caution.—Two wrecks lie approximately 10.5 miles WNW of Bingma Jiao, and are best seen on the chart.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR 4 — CHART INFORMATION

SECTOR 4

COAST OF VIETNAM—THE GULF OF TONKIN

Plan.—This sector describes the Gulf of Tonkin and includes the port of Hai Phong, the shipping port for Hanoi, the capital of Vietnam. The arrangement of the sector is N from **Jiaowei Jiao** (20°13'N., 109°55'E.) and along the coast of Leizhou Bandao, then W to the Chinese border. The SW and NW shores of the Gulf of Tonkin, from **Mui Lay** (17°05'N., 107°07'E.) to the Chinese border, including the Archipel des Fai Tsi Long, are then described.

General Remarks

4.1 The Gulf of Tonkin is bordered S and W by the coast of Vietnam, and E by Hainan Dao and Leizhou Bandao, which are Chinese territory. The entrance to the gulf is more than 120 miles wide between the SW extremity of Hainan Dao and the mainland SW. Numerous islets and shoals lie at the head of the gulf, and several small islands lie near the W shore. In the NW part of the gulf is the extensive delta plain of the Red River, with its many waterways. This region is densely populated.

General depths in the gulf are comparatively shallow, with depths of 101m being found in the middle of the entrance; the depths decrease toward the shores, and average less than 55m in the N part of the gulf. The bottom is generally soft and suitable for anchorage. Large patches of muddy water, resembling banks, are seen at times, but invariably are found to have deep water when examined.

The NE part of the gulf is quite shallow, with depths of 18m and less being found 25 miles from the land.

For the most part, sunken dangers are within or near the 20m curve, with the exceptions of the banks and shoals fringing the W and N shores of Hai-Nan Tao.

Pilotage.—Pilotage is compulsory for all foreign vessels when entering, leaving, shifting, mooring or unmooring within the limits of a Vietnamese port. Request for pilotage services is required 24 hours prior to departure from a port or for any movement within a port.

Vessels must send their ETA message at least 48 hours before arrival at any Vietnamese port, followed by intervals of 12 hours, 7 hours, and 2 hours. Vessel messages are tendered through their local agents to the office of the port authorities. The port authorities should be immediately informed of any unforeseen delay occurring during the above stipulated period.

Anchorage.—A vessel awaiting a pilot on arrival shall anchor in the designated waiting area until further notice. Vessels carrying explosives or flammable cargo shall anchor in the area as designated.

Regulations.—In the approaches to Vietnamese ports, vessels must follow the tracts recommended by the port authorities. From the time of such an approach, the Vietnamese flag must be kept hoisted at all times until departure from a port or a pilot station.

Port entry is controlled by the port authorities, pending berth availability, weather, etc.

Requests for port entry are made by vessels to the port authorities on VHF channel 16 or by radiotelephone, or by means of visual International Code of Signals.

A vessel shall not enter a harbor until the signal granting entry is shown from the signal station, or from the pilot boat.

When refused entry, the vessel should immediately reduce speed, alter course to stay clear of the fairway, stemming the tide if possible, or anchor in the area recommended to avoid obstructing traffic flow.

Inbound vessels should give way to outbound vessels, as vessels leaving port maintain priority over inbound vessels.

Caution.—Vessels wishing to enter the ports or approach the coasts described in this chapter should do so only with the prior permission of the respective authorities, well before the vessel's arrival. Vessels not having the approval of the proper authorities should give the coast a wide berth.

Fishing stakes are frequently encountered at distances of 25 to 30 miles offshore. They consist of several long bamboo poles, anchored by large stones, and marked by a flag; a sampan is usually attached to them, and vessels should not pass between the sampan and the bamboo.

Very large fleets of fishing junks may be met off the coast of China. The large trading junks have five masts, with two small sails aft. Chinese junks do not carry the regulation lights.

Steel pipes and well heads are reported in the following approximate positions:

- a. 20°35'N, 108°33'E.
- b. 20°46'N, 108°38'E.
- c. 20°45'N, 109°02'E.
- d. 20°17'N, 109°17'E.
- e. 20°46'N, 108°59'E.
- f. 20°46'N, 109°00'E.

Dao Bach Long Vi

4.2 Dao Bach Long Vi (20°08'N., 107°44'E.) lies 42 miles SE of Xuy Nong Chao (Iles Norway) and serves as a good mark for vessels approaching Hai Phong. The summit of the island is a plateau, 58m high, the slopes of which are precipitous in places, and in others, covered with trees. It is fringed by reefs, and a rocky bank with depths of less than 10m up to 1.3 miles NE, 0.8 mile W, 1.3 miles SW, and 2 miles S of the island. The island should be given a berth of at least 2 miles. Dao Bach Long Vi can be seen on radar at a distance of 18 miles.

Shoals of fish are plentiful in the vicinity and have been mistaken for breakers.

Pilotage.—Pilotage is compulsory. Vessels calling at any port in the Gulf of Tonkin, or at Hai Phong, must continue to **Hon Dau** (20°40'N., 106°49'E.), where pilots are available.

Anchorage.—Small vessels may find anchorage during the Northeast Monsoon, in a depth of 6.4m, off the S side of the island.

Caution.—A depth of 10.9m lies 26 miles WNW of Dao Bach Long Vi.

A pinnacle depth of 29m has been reported in approximate position 18°49'N, 106°35'E.

A dangerous wreck lies about 27 miles NW of the island.

The Gulf of Tonkin—Northeast Side

4.3 Jiaowei Jiao (Chiao-Wei Chiao) (Denglou Jiao) (20°13'N., 109°55'E.), the SW extremity of a sandy islet, 12m high, lies on the N side of the W approach to Chiung-chou Hainan (Hainan Strait). Jiaowei Jiao was described in paragraph 3.31.

Dongchang Wan lies between Jiaowei Jiao and Shuiwei Jiao, a low point, 11 miles NNW. The shores of the bay are level and cultivated, with sandy beaches in places, and groups of trees. There are numerous fishing stakes about 5 miles NW of Jiaowei Jiao. A rock, with a depth of less than 1.8m, lies about 1 mile S of Jiaowei Jiao.

Liusha Wan, entered N of Shuiwei Jiao, is unsurveyed, but is reported navigable by large vessels for a distance of 2 or 3 miles, and by small craft for several miles further. The river enters the Gulf of Tonkin through a wide lagoon, and is reported to provide good shelter during typhoons.

The coast in this vicinity is low and wooded, rising gradually to a summit, 186m high, about 11 miles NNE of Shuiwei Jiao. Approaching from W this summit is the first land to be seen.

The coast between Shuiwei Jiao and Guantou Jiao, 77 miles NW, has not been surveyed. Numerous banks exist offshore and there are many fishing stakes. Several bays indent the W side of Leizhou Bandao.

An extensive bay lies in the NE part of this section of coast. The large estuaries of **Tieh-shan Chiang** (21°35'N., 109°35'E.) and Ying-lo Chiang discharge into the N and E sides, respectively, of the bay. The bay and estuaries are encumbered with numerous shallow banks and fishing stakes.

Guantou Jiao (Kuan-tou Chiao) (21°27'N., 109°02'E.) is the W extremity of a low peninsula. A ridge of hills rises close behind the point and attains an elevation of 114m at its summit, about 0.5 mile NE of the point. The ridge of hills appears as an island from a distance. Nautilus Hill, 111m high, is the summit of Guantou Jiao.

A light is shown from a conspicuous white tower situated on Guantou Ling. A conspicuous white fort stands on a hill about 0.9 mile NE of the light.

There is an L-shaped oil pier close NE of Guantou Jiao; an L-shaped jetty lies 0.2 mile farther NE.

4.4 Off-lying islands.—Weizhou Dao (Wei-chou Tao) (21°03'N., 109°07'E.) lies 23 miles S of Guantou Jiao. From the sea, the island is seen rising abruptly on its W and S sides and sloping gradually on its SE side. A light is shown from a stone tower situated on its SW side.

Wan-t'ou Ling (21°02'N., 109°07'E.), the summit of the island, 70m high, rises near the SE extremity of the island.

A reef extends 1 mile from the N side of the island and 0.3 mile from the SW and E sides of the island. At night the island should not be approached within depths of less than 20m.

Discolored patches of small area, with the appearance of shoal water, are very common between Weizhou Dao and

Guantou Jiao; they are only detached mud whirls or weed patches.

Nam Wan (Nan Wan), the small bay on the S side of the island, affords anchorage, in 7.3 to 9.2m, in its outer part. It is sheltered from all winds except those between SSE and ESE; apart from the chance of a typhoon, S winds are seldom very strong. A bank, with a depth of 4.5m at its outer end, extends 0.8 mile SE from the W entrance point of the bay; a sunken rock, with a depth less than 1.8m, lies 0.4 mile SE of the same point. Depths of less than 5.5m extend 0.5 mile offshore between the E entrance point of the bay and a point located 0.8 mile WNW. A rocky islet, 29m high, lies 0.8 mile W of the E entrance point.

4.5 Xieyang Dao (Hsieh-yang Tao) (20°54'N., 109°13'E.) lies 9 miles SE of Weizhou Dao Light. The steep cliffs on its W side rise up to a height of 140m where a 15m high triangular light structure stands.

Weizhou Marine Terminal is a floating process, storage, and off-loading vessel, Nan Hai Xi Wang, permanently moored to an SPM in position 20°49'54"N, 108°36'48"E. A production platform situated 1 mile SSE of the SPM is connected to it by pipeline. Vessels of up to 100,000 dwt with a maximum length of 270m may be accommodated at the terminal. The terminal requires a minimum dwt of 30,000 and length of 100m. Draft requirements are given in the accompanying table.

Vessel size	Draft	
	Forward	Aft
Up to 32,000 dwt	4.9m	7.3m
32,000 to 45,000 dwt	5.5m	7.9m
45,000 to 60,000 dwt	5.8m	8.2m
60,000 dwt and over	6.7m	8.5m

Vessels must be in accordance with MARPOL (The International Convention for the Prevention of Pollution from Ships) regulations.

Restricted areas encircle both the platform, with a radius of 1 mile, and the SPM, with a radius of 2 miles.

Beihai Gang (Pei-hai Anchorage) (21°29'N., 109°04'E.)

World Port Index No. 57750

4.6 Beihai Gang, situated NE of Guantou Jiao, affords anchorage for vessels of moderate draft. The anchorage is protected by sand banks on its N side and is open SW. Working car-go is often difficult during the Northeast Monsoon. The major cargoes are fertilizers, grain, steel products, coal, ore, and timber.

Tides—Currents.—The tidal rise at Beihai is 4.7m at MHHW.

The tidal currents set through the anchorage area at velocities of 0.5 to 2.5 knots, proportional to the range of tide. The NE flood begins 1 hour after LW; the SW ebb begins 1 hour after HW.

Depths—Limitations.—Beihei Channel extends from the pilot and quarantine anchorage to the lightening anchorage. The channel has depths of 6 to 10m, a width of 0.2 to 1 mile, and can be transited by vessels of up to 38,000 dwt at HW. Vessels of up to 180m in length, 35m beam, and 10m draft can be accommodated.

The channel to Shibuling harbor is marked by lighted buoys and extends from the central part of Beihei Channel. The channel is 90m in width and has a depth of 6.3m. There are two deepwater berths capable of accommodating general cargo vessels of up to 30,000 dwt at Shibuling, with a combined berthing length of 340m and an alongside depth of 9.5m.

The Waisha harbor channel extends from the end of Beihei channel to Waisha harbor. The channel is 60 to 80m wide and has depths of 2.5 to 3.8m. Waisha inner harbor has a 463m long quay wall with alongside depths of 2 to 4m.

Aspect.—The coast for a distance of 1.2 miles NE of Guantou Jiao consists of cliffs about 21m high.

Ti-chiao, a fishing village, lies 2.7 miles NE of Guantou Jiao. The town of Pei-hai lies 2 miles farther E; a conspicuous custom house is situated in the E end of the town.

Pilotage.—Pilotage, available during daylight only, is compulsory for foreign vessels entering, leaving, and moving within the port. Requests for pilotage are sent 24 hours in advance. Vessels are boarded at the pilotage and quarantine anchorage centered 4 miles S of the light on Guantou Jiao. Vessels should send their ETA with draft and cargo description 72 hours, 48 hours, and 24 hours in advance of the arrival at the anchorage, and amended as necessary.

Regulations.—Local harbor regulations are in force as follows:

1. Before adjusting ballast, lowering lifeboats, inspecting the main engine, testing/using radio, or painting the outer hull, vessels should apply to the harbormaster in writing.
2. When taking bunkers or welding, in addition to first obtaining permission from the harbormaster, the work must also be done under the harbormaster's supervision.
3. There must be crew available at the top of the gangway to adjust the gangway as required. A safety net must be securely rigged under the gangway.
4. The master must arrange for a duty officer to be available to solve any potential problems during the vessel's loading and discharging and said officer should liaise closely with shore personnel.
5. While at anchor, a duty officer must maintain a VHF watch on the nominated channel.

All vessels must use a Chinese State agent. A separate, locally appointed agent is responsible for all dealings with the state agent.

Signals.—Storm signals are displayed from a flagstaff situated 1 mile SE of Ti-chiao. Radio services are available on VHF channels 16 and 14.

Anchorage.—The pilot and quarantine anchorage, centered 4 miles S of the light on Guantou Jiao, has a radius of 800m, and depths of 8 to 10m, sand and mud.

Three lightening anchorages are situated off the port, in depths of 5 to 9m, mud and sand. The Northeast Monsoon makes cargo operations at these anchorages difficult.

Directions.—From a position located 5 miles W of Weizhou Dao, proceed as safe navigation permits to the pilot and quar-

antine anchorage, then be guided by the buoys to the cargo anchorage.

Caution.—An area prohibited to fishing and anchorage extends NW from Guantou Jiao. Fishing stakes are reported to lie in the SE portion of the pilot and quarantine anchorage, as well as several other positions in the approaches to the port that are best seen on the appropriate chart.

Danshuisha Qiantan, the bank between Guantou Jiao and **Dijiao** (21°29'24"N., 109°04'24"E.), extends 0.2 to 0.8 mile offshore and has depths of 2 to 3m. The NW and N stretch of the bank is marked by lighted buoys to a distance of 1 mile NE of **Wai Sha** (21°29'N., 109°05'E.).

4.7 Between Guantou Jiao and **Wu-lei Chiao** (20°36'N., 108°44'E.), 20 miles WNW, a large shallow bay, with depths of less than 1.8m, indents the coast. Several rivers discharge into the bay. Tai-mei Tun (Tai-mao Chou), an islet, lies 0.7 mile S of Wu-lei Chiao. A hill, 111m high, rises 1.5 miles N of Wu-lei Chiao.

A 1.8m patch and a 5.5m patch were reported to lie 7.2 and 8.5 miles S, respectively, of Tai-mei Tun, but their existence is doubtful.

Qinzhou (Ch'in Chou Wan) lies between Tai-me Tun and **Hu-tieh Ling** (21°33'N., 108°26'E.), 17 miles WSW. Hu-tieh Ling, an islet, 36m high, lies close to the coast, connected by a sand bank. The bay is encumbered with shoals, many of which dry. Depths in the bay are mostly less than 5.5m. A narrow channel, obstructed by a bar lying 6.5 miles E of Hu-tieh Ling, leads N into the bay. Only vessels with local knowledge should attempt to enter the bay.

An-pu-k'ou Kang (An-fou-k'ou Chiang), a shallow bay encumbered with drying banks, is entered between a point, 3 miles W of Hu-tieh Ling, and Pai-lung Wei, 10 miles farther WSW. A bank, with depths of less than 1.8m, extends 3.5 miles SW of the E entrance point of the bay. An islet, 7.9m high, and a rock that dries 0.9m, lie 1.5 miles WSW and SSW, respectively, of the E entrance point.

Fangcheng Gang (21°45'N., 108°21'E.)

World Port Index No. 57745

4.8 Fangcheng Gang, a deep water port at the mouth of the Fangcheng River, is open to foreign shipping, and primarily handles cement, ore, timber, grain, fertilizer, and general cargo. The port borders the provinces of Yunnan, Guizho, and Sichuan to the NW, and Beibu Gulf to the N.

Winds—Weather.—The prevailing winds are NE and SW. Fog is most frequent in the morning or at night in the early spring and late winter.

Tides—Currents.—The average tidal range is 3 to 4m.

The current attains a velocity of 1.7 knots at flood tide and 3.1 knots at ebb tide.

Depths—Limitations.—The approach channel leading to the port is 7.5 miles long, with a minimum width of 80m, and depth of 7.5m at LW. Maximum permissible draft is 9.5m. It is marked by lighted buoys and lighted range beacons.

Vessels of up to 69,550 dwt, with a maximum length of 225m and beam of 32m, can be accommodated.

The port has eight berths. Berth Nos. 1 and 2 are general cargo berths which can accommodate vessels of up to 10,000 dwt, each having a length of 180m and an alongside depth of 8.5m.

Berth No. 3 through Berth No. 35 are heavy cargo, grain, and cement berths, which can accommodate vessels of up to 15,000 dwt, each having a length of 180m and an alongside depth of 9m.

Berth No. 6, with a length of 180m and an alongside depth of 10m, is a bulk cargo berth, which can accommodate vessels of up to 25,000 dwt.

Berth No. 7, with a length of 210m and an alongside depth of 10.5m, is a coal and ore berth, which can accommodate vessels of up to 25,000 dwt.

Berth No. 8, with a length of 220m and an alongside depth of 10.5m, is a bulk cargo berth which can accommodate vessels of up to 30,000 dwt.

The cement factory has a berth with a length of 165m and an alongside depth of 7.5m, which can accommodate vessels of up to 10,000 dwt.

The swinging basin near the berths has a 360m diameter.

Aspect.—A light is shown from the E side of the entrance to the bay of An-pu-k'ou. The approach from seaward to the quarantine anchorage is clear of dangers. The hilly coastline provides a good radar return.

Pilotage.—Pilotage is compulsory. Pilots board vessels from a tug, 1 mile S of the quarantine lighted buoy.

Fangcheng Radio monitors VHF channels 9 and 16 around the clock.

Anchorage.—A quarantine anchorage is established between the parallels of 21°21'30"N and 21°28'00"N, and the meridians of 108°20'00"E and 108°26'00"E.

The pilot anchorage is a circular area with a radius of 0.5 mile centered at the quarantine lighted buoy (21°27'54"N., 118°21'12"E.).

Anchorage Area No. 1, consisting of berths for large vessels waiting to enter the harbor, are situated NW and NE of the pilot anchorage. There are ten berths, designated B1 through B10, in this area, each with a 450m radius, in depths exceeding 10m, sandy mud and clay. Anchorage for vessels carrying dangerous cargo may be taken in designated areas B9 and B10.

Anchorage Area No. 2, intended for vessels engaged in lightening, awaiting berth, or taking shelter from inclement weather, has four anchorages, designated C1 through C4. Each anchorage has a radius of 300m in depths of 6 to 13m, sandy mud and clay.

Additional berths for large vessels waiting to enter the harbor are situated 2 miles W of Paotai Jiao on a continuation of the initial leg of the approach channel.

Directions.—The channel entrance to Fangcheng is marked by a pair of lighted can buoys in position 21°30'N, 108°21'E, which is 3 miles N of the pilot boarding place. The channel then extends N for a distance of 2.5 miles to the first pair of leading lighted beacons. After crossing over the unmarked bar and passing E of two red can lighted buoys, vessels should align the lighted beacons and steer into the range bearing 303°15'.

The next pair of lighted beacons align on a bearing of 326°45' and lead a short distance through the turn into Niutou Hangdao. Leading lights bearing 350° ahead, and an additional set to be kept bearing 170° astern, lead a distance of 2 miles

through this reach. When the next pair of lighted beacons is aligned bearing 339°15', steer on this range for a distance of 0.8 mile until a lighted can buoy is on the starboard beam, then head NNE for the berths.

4.9 Bailong Wei (Cap Pak Loung) (21°30'N., 108°13'E.), 88m high, is the SW extremity of a hilly peninsula projecting from the mainland.

Bailong Wan is entered close W of Bailong Wei. Nearly all the N and NW portions of the bay are occupied by drying sand banks, on which lay the islands of Man-wei tao and Wu-t'ou. Outside the entrance to the bay there is a bar with depths of 7m. From a position lying 0.8 mile W of Bailong Wei, for a distance of 2 miles NNE, there are depths of 7 to 11m in the fairway, and anchorage with good holding ground. The bay should not be entered without local knowledge.

The Gulf of Tonkin—West Side—Mui Lay to Archipel des Fai Tsi Long

4.10 Mui Lay (Cap Lay) (17°05'N., 107°07'E.) is rocky and covered with vegetation. The cape is 21 to 30m high, and a small group of rocks extends a short distance from it. On the S side of the cape are some yellowish-brown cliffs, at the N end of which is a small bay. On the N side of the cape there are red and yellow cliffs.

Hon Co (Hon Gio) (Ile du Tigre), 70m high, lies 13 miles ENE of Mui Lay, from which it is separated by a deep and clear channel. A conspicuous tower is situated on the summit of the island. The N and S ends of the island slope steeply towards the sea.

Rocks fringe the N and W sides of the island, and detached rocks lie close to its E and S extremities. The bottom around the island is rocky and uneven. A depth of 14m lies 2 miles N of the island.

Aspect.—Abreast Hon Co, in fine weather, the inland range of mountains from **Dong Ngai** (16°21'N., 107°14'E.), 1,774m high, to the peaks in the vicinity of Rau Nhat Le can be seen. The most prominent mountains are: Dong Voi Mep (Dent du Tigre), 1,739m high, rising 30 miles SW of Mui Lay; Dong Chan, 1,254m, about 10 miles farther N; Nui Da Mao, 734m high, standing 9 miles SW of Rau Nhat Le; and Co Roong (Grand Sommet), 1,623m high, located 15 miles WSW of Nui Da Mao.

Mui Lay to Mui Ron

4.11 The coast between Mui Lay and Rau Nhat Le, 37 miles NW, is low and sandy, with villages and a few palm trees in places.

Rau Nhat Le (Ron Nhat Le) (17°29'N., 106°38'E.) is fronted by a bank with depths of less than 1.8m extending more than 0.5 mile offshore. The charted depths of about 3m in the entrance to the river are subject to change. Entry should not be attempted without local knowledge.

The town of Dong Hoi stands on the W bank of the river. A church, with a tower, surmounted by a dome, rising above the sand hills, stands on the W bank about 0.8 mile within the entrance and is prominent from seaward.

A rock, which dries 1.8m, lies nearly 1 mile offshore, 2 miles N of Rau Nhat Le.

Anchorage.—There is good anchorage off Rau Nhat Le, outside the bar, during the Southwest Monsoon. Within the entrance, small vessels may anchor off the church and tower, in a depth of 4m.

4.12 The coast between Rau Nhat Le and Pointe Da Nhai, 12 miles NW, is sandy, backed by sand hills, and has low cliffs in places. The first of these cliffs lies 2.3 miles NW of Rau Nhat Le. Another cliff, 2 miles farther NW, is red in color, stands at the entrance to a small river, and rises to a wooded summit on which stands a pagoda.

Cua Lyhoa lies 11 miles NW of Rau Nhat Le. A rocky point lies 1 mile SE of the river entrance. A fishing village is situated on the N side of the entrance. A dredged channel to Cua Lyhoa, suitable for small craft, has a depth of 1.5m at HW.

Pointe Da Nhai (17°40'N., 106°30'E.) consists of two rocky spurs, close together and bordered by sand. A small white pagoda stands at the foot of the N spur. The mountains approach the coast here and form a promontory, 74m high, rendering the point prominent. Ru Hon Bong, 233m high, rises 2 miles WSW of the point.

Cua Giang, 3 miles NNW of Pointe Da Nhai, is fronted by a steep-to bar. It was reported that vessels with a draft of less than 1.8m could cross the bar at half-tide. The bar is subject to frequent change and should not be attempted without local knowledge. Song Giang is reported to be deep as far as the mountains inland, where timber is floated down to the mouth.

Between Cua Giang and Cua Ron, 10 miles N, the coast is low and sandy. A rocky bank extends about 2.3 miles E of Cua Ron. Hon No, a coral reef, which dries 0.9m, lies near the outer end of the bank. The bank extends N and connects with the reefs extending W of Hon Nam, which is 61m high.

4.13 Mui Ong (17°56'N., 106°31'E.) rises to an elevation of 154m about 1 mile inland, and can be recognized by a pagoda and large red patches on it. Ba Coc, 1,006m high and Hoanh Son, 1,022m high, are two prominent wooded summits, about 4 and 11 miles, respectively, WNW of the cape. A shoal with a depth of 0.6 mile lies 0.4 mile S of Mui Ong.

Hon Co and Hon La lie close to, and about 0.7 mile ESE, respectively, of Mui Ong. Hon La is the higher of the two.

Hon Gio, 109m high, is a rugged and steep-to islet, lying 9 miles E of Mui Ong.

A bank, with a depth of 18m, was reported to lie 29 miles ESE of Mui Ong. The bank was unsuccessfully searched for, and its position and existence are doubtful.

Vung Chua, a bay lying SW of Hon La and Hon Co, is the only place on this section of coast offering protection during the Northeast Monsoon. The bay affords good holding ground, but is exposed to the swell. Small vessels can anchor, in 5.5 to 9.2m, in the shelter of the above islets. Larger vessels anchor farther offshore, keeping Hon Gio open S of the S extremity of Hon La.

Mui Doc rises to an elevation of 264m about 0.7 mile W of Mui Ong. Good anchorage, during the Southwest Monsoon, can be found N of Mui Ong, or off Mui Doc.

The coast is rocky between Mui Doc and Mui Dao, a low point lying 2.5 miles NNW, and another low point, located 0.5

mile farther NNW. The coast is then low and sandy for a distance of 7 miles NNW.

4.14 Mui Ron (18°07'N., 106°26'E.) is a rocky steep-to headland rising to an elevation of 230m. Nui Can Son, 368m high, is conspicuous about 3.5 miles SW of Mui Ron. Mui Ron Ma is the NE point of the cape.

Hon Son Duong, 145m high and wooded, lies 1.5 miles SE of Mui Ron. From the E it has the appearance of three pointed summits, with a perpendicular cliff towards its N end, and sloping highlands towards the SW end. A reef, with a depth of 1.8m, and steep-to on its N and S side, extends about 0.3 mile WSW from the W extremity of Hon Son Duong. A reef, with a rock which dries about 3m at its outer end, extends 0.4 mile SE from the SE extremity of the islet.

Hon Con Chim, 25m high and rocky, with two pointed peaks, lies 1.5 miles ENE of Hon Son Duong.

Anchorage.—Good anchorage can be taken, in a depth of 11m, mud, about 0.5 mile S of Hon Son Duong, which is steep-to, with its W extremity bearing 325°, and with Hon Con Chim bearing 055°. The anchorage is sheltered by the islet and the reefs extending from its extremities, but during the Northeast Monsoon the swell is considerable.

Mui Ron to Ben Thuy

4.15 The coast between Mui Ron and Mui Ga, 60 miles NW, consists of sandy beaches, backed by sandy plains. Inland, the mountains, which approach the coast at Mui Ong, curve W, then NW, following to some extent the curve of the coast.

Rao Co (18°10'N., 105°25'E.), 2,286m high and the most prominent peak, lies 58 miles W of Mui Ron and 35 miles inland. From N, this peak presents a remarkable double summit, but is often hidden by clouds. There are prominent isolated peaks on the plains near the coast.

Vung Han, the bay W of Mui Ron, affords shelter from E and S winds, but is open to winds from NE to W, and is therefore available only during the Southwest Monsoon. The head of the bay is low and sandy, and can be approached according to draft.

Cua Khau, the narrow outlet of a large lagoon, lies close W of Vung Han and is obstructed by a bar that dries. Nui Ban Do, two prominent peaks, 441m high, lie 5 miles NW of Cua Khau.

Cua Nhuong (18°16'N., 106°08'E.) has a narrow entrance, obstructed by a shallow bar. Hon Buc, a group of gray rocks, 4 to 5m high, and many rocks, some of which dry, lies 1 mile N of the entrance. Hon En, a precipitous rectangular-shaped islet, 41m high, lies 3.5 miles NE of the E entrance point of Cua Nhuong. Hon Man, a ridge of rocks, 7m high, lies 0.3 mile E of Hon En; the sea has been observed to break a short distance SE of these rocks.

Cliffs extending 1.8 miles E of Cua Nhuong are high and precipitous. Ru Cua, 458m high, lies 1.7 miles ESE of the E entrance point of Cua Nhuong.

4.16 Ru Cum, 108m high, with a pagoda on its E slope, lies close to the coast, 2 miles WNW of Cua Nhuong.

The coast between Ru Cum and Nui Nam Giai, 13 miles NW, is low, sandy, and bare of vegetation. Nui Nam Giai,

375m high, is the summit of a ridge terminating 1.8 miles N in Mui Sot, a high, cliffy headland, 57m high, which is connected to the coast by a narrow low sandy isthmus. A rock, 2.4m high, lies about 137m N of Mui Lo, the N extremity of Mui Sot. Cua Sot, entered W of Mui Lo, has an entrance with a least depth of 1.8m over the bar; within the bar the depths increase, but the channel narrows.

Between Cua Sot and Cua Hai, 20 miles NW, the coast is sandy. Bong Son, 213m high, lies 3 miles W of Mui Lo, nearly 1 mile inland. Nui Ong, consisting of four peaks, the highest of which is 700m high, lies 6.5 miles NW of Bong Son, and 2.5 miles inland; it is the highest range in the vicinity.

Between Cua Hoi and the mouth of Song Cua Lo, about 5 miles NW, the coast is low and sandy. Mui Rong, the N entrance point of Song Cua Lo, is cliffy and a hill, 102m high, rises 0.3 mile W of it; drying rocks extend up to 0.8 mile E of the point. Roche Cua Lo, high, black and prominent, lies 1 mile S of Mui Rong, about 0.1 mile off a small projection on the coast.

Mui Ga (18°51'N., 105°43'E.), comprised of cliffs, lies 0.8 mile N of Mui Rong. Ru Than Vu, 441m high, standing 7 miles W of Mui Ga, is the summit of a range of mountains.

4.17 Off-lying islets and dangers.—Hon Mat (18°48'N., 105°58'E.), 218m high, lies 13.5 miles ESE of Mui Ga. Roche des Pecheurs, with a depth of 1.5m, lies about 1.5 miles NW of the NW end of the islet. A rock awash lies close off its SE extremity.

Hon Truan, 43m high, lying 1.2 miles E of the S extremity of Hon Mat, is the easternmost of the islets off this part of the coast. A rock, above water, with a rock drying 0.9m close E, lies about 300m NW of Hon Truan.

Rocher Nom, 13m high, and fringed by rocks on its SW and SE side, lies in the E approach to Cua Hoi, 7 miles WSW of Hon Mat. Rocher Lap, 4m high, lies 1 mile NW of Rocher Nom. Rocky patches, with depths of 3.7m, lie about 0.5 mile SSE and 0.2 mile W of Rocher Lap.

Hon Nieu (18°48'N., 105°46'E.), 4 miles SE of Mui Ga, lies in the N approach to Cua Hoi. It is comprised of two hills, separated by a low neck; the E and higher hill is 123m high. A rock, with a depth of less than 2m, existence doubtful, is charted 1.2 miles NNE of Hon Nieu.

Plateau du Large, a group of rocks, one of which is about 0.6m high, lies 3 miles E of Mui Ga. It is generally visible or can be distinguished by the sea breaking over it. Rocher St. Ann, which dries 0.3m, lies 1.2 miles WSW of Plateau du Large.

Anchorage.—Small vessels can obtain shelter, during the Northeast Monsoon, on the SW side of Hon Mat, in a depth of 20m. There is good anchorage, sheltered from NE winds, for vessels with local knowledge, on the SW side of Hon Nieu, in a depth of 8m. This anchorage is useful to vessels unable to enter Cua Hoi.

Ben Thuy (Nghe Tinh) (18°39'N., 105°42'E.)

World Port Index No. 57660

4.18 Cua Hoi is the mouth of Song Ca. Vessels able to cross the bar can ascend to Ben Thuy, about 10 miles from the

entrance. Ben Thuy is the port for Vinh, the capital of the province of Nge An.

Tides—Currents.—The tidal rise at MHHW at Hon Nieu is 2.7m.

With large tides the flood current lasts about 6 hours, and the ebb for 18 hours. With small tides there is no flood. During periods of high river, the currents can be very strong. Slack water at Ben Thuy occurs about 1 hour 45 minutes after that at Cua Hoi, or about 1 hour after high and low water.

Depths—Limitations.—A bank, with depths of less than 2m, extends from both entrance points of Cua Hoi, which are low and sandy. The bar is composed of hard sand and subject to frequent change. No vessel should attempt to cross the bar without a pilot.

Vessels drawing up to 4.5m can reach Ben Thuy. Vessels of deeper draft anchor NW of Hon Nieu and discharge their cargo into lighters.

Ben Thuy Pier (18°39'00"N., 105°42'00"E.) can accommodate vessels with a maximum draft of 4m.

Cua Lo Pier (18°49'30"N., 105°42'00"E.) can accommodate vessels up to 100m long with a draft of 5m.

Xuam Hai Pier (18°40'48"N., 105°42'00"E.) can accommodate vessels with a maximum draft of 4.5m.

Aspect.—A lighted beacon is shown from the N entrance point of Cua Hoi.

The channel over the bar is buoyed.

Pilotage.—Vessels requiring a pilot should give 24 hours notice. The pilot will then meet the vessel outside the bar or off Hon Nieu. Messages should be sent through Da Nang or Hai Phong coast radio stations.

Anchorage.—Anchorage can be obtained off Ben Thuy, in a depth of 8m. A vessel drawing 3m can anchor 100m from the outer ends of the piers.

There are several mooring buoys established off the port area.

Vung Thu Dien (Vung Phu Dien) (Baie du Brandon) is entered between Mui Ga and Mui Falaise, located 15 miles N. The bay affords inadequate shelter as it is open NE; during the Southwest Monsoon, the winds are SE. Le Pate, an isolated peak, 149m high, lies 12.5 miles NW of Mui Ga, and 5 miles inland.

Ben Thuy to the Delta of the Red River

4.19 Mui Falaise (19°06'N., 106°44'E.) rises to an elevation of 189m about 0.5 mile inland. The cape has a broad, light-colored stripe on its N face. Lach Quen, about 1.5 miles W of Mui Falaise, has an entrance restricted by banks. Nui Ky, 117m high, lies 0.2 mile W of the W entrance of Lach Quen.

The coast between Mui Falaise and Cap Bouton, 7 miles N, is low and sandy. A group of rocks, some of which are sunken, lie 2.5 to 3.5 miles N of Mui Falaise, and close offshore; two of these rocks are prominent and the highest is about 79m high.

Cap Bouton (19°13'N., 105°45'E.), 139m high and wooded, is the E entrance point of Cua Can, a shallow estuary. Two rocks, the S of which dries 1.5m, lie close together, 1 mile ENE of the cape, and about 0.3 mile offshore.

Shoals, the existence of which is doubtful, with depths of 5.8m and 7m, are charted 7 miles ESE and 4 miles SE, respectively, of Cap Bouton.

Mui Ta Lus (Cap Ta Lus), 4 miles NNE of Cap Bouton, is joined to the mainland by a narrow neck of sand. About 0.7 mile N of Mui Ta Lus is the S extremity of Hu Truong, a steep cliff the summit of which, nearly 1 mile N, is 171m high.

Dao Bien Son, 2 miles NNE of Mui Ta Lus, is an island, 162m high at its N end, and joined to the mainland by a drying bank. There is a conspicuous vertical rock, almost detached at the SE extremity of the island. Foul ground, drying 1.5m at its outer end, extends about 0.3 mile S from the island. A rock, with a depth of 4m, lies 2 miles N of Dao Bien Son.

Abreast Dao Bien Son, the coast is bordered by a range of hills, which attain an altitude of 431m in Nui Xuoc, about 4 miles inland.

Off-lying Islets and Dangers

4.20 Hon Me (19°22'N., 105°56'E.), the largest and north-easternmost of a group of precipitous islets, which shows a light, lies 5.2 miles ENE of the N end of Dao Bien Son. The islets are uninhabited and only frequented by fishermen in summer. Hon Me has several wooded peaks, the highest rising to a height of 251m. Hon Vat, 127m high, lies close SSE of Hon Me, with an islet and rocks between. Hon Vong, 58m high, lies 0.3 mile W of the W extremity of Hon Me.

Anchorage can be taken off the SW side of Hon Me, between Hon Vat and Hon Vong, in depths of 7.3 to 8.2m, with local knowledge.

Hon Dot, 115m high and conical, lies 1.5 miles SW of Hon Me. Hon Tio, 28m high, lies close off the SE end of Hon Dot.

Hon Men, 36m high, is the highest of a group of rocks, 0.7 mile SW of Hon Dot. Hon Sap and Hon Neu are groups of rocks, the highest reaching heights of 16m and 50m high, respectively, 0.8 mile and 1.5 miles SE, respectively, of Hon Men. A 9.5m patch lies 2 miles S of Hon Sap.

Hon Bong, 65m high, is the NW of a group of islets lying 2.3 miles WSW of Hon Me. A ledge of rocks, some of which dry, extends 0.4 mile WSW from Hon Bong. A bank, with depths of less than 9m, extends 1.3 miles S of Hon Bong.

Mui Bang (Cap Bang) (19°26'N., 105°49'E.), 92m high, lies 7.5 miles WSW of Hon Me, and has a summit, in the shape of a finger, dominating the sand hills.

A range of mountains lies within this section of coast. Nui Tu Vi, 560m high and cone-shaped, lies at the S end of the range, 6 miles W of Mui Bang. Nui Cac, 507m high, rises 4 miles N of Nui Tu Vi, and stands at the N end of the range. Nui Bom, 307m high, lies 4 miles NE of Nui Cac and 2 miles from the coast.

North of Nui Cac is the plain of Thanh Hoa, through which flow Song Yen and Song Ma. The plain is also watered by numerous canals and is wooded. It is cultivated near the coast and studded with villages. Nui Dau Lon, 304m high, lies on this plain, 13 miles NW of Nui Tu Vi.

Lach Yapp, the mouth of Song Yen, lies 9 miles N of Mui Bang. Within the mouth of Lach Yapp a bank of mud nearly obstructs the river.

4.21 Mui Chao (Cap Chao) (19°43'N., 105°54'E.) is 78m high, and can be recognized by a pagoda on its N slope that is visible from sea.

Lach Chao (Song Lach Chao), 4 miles NNE of Mui Chao, is the mouth of Song Ma. There is a depth of 3.7m between the entrance points in the fairway, although drying banks extend from both points. The bar close off the banks has a depth of about 1.2m, but is subject to change.

Lach Truong Giang is entered about 6.5 miles N of Lach Chao. Nui Truong, 201m high, steep and isolated, lies 1 mile SW of the S entrance point. Hon Bo, 26m high, lies near the extremity of a drying bank that extends 0.3 mile ENE from the S entrance point; two drying rocks lie close E of the islet.

Lach Truong Giang is accessible at HW to vessels drawing 3.4m, but the depths are subject to change. No vessel should enter without local knowledge.

Hon Ne (19°55'N., 106°01'E.), 79m high, lies 3 miles NE of Hon Bo.

Delta of the Red River

4.22 Located 7 miles N of Hon Ne is the SE extremity of a range of serrated mountains that extend NW for a considerable distance. Northeast of this range is an extensive plain watered by the Red River, the Song Thai Binh, and their tributaries. The mouths of the different branches of these rivers form a vast delta extending from the above-mentioned range of mountains to **Lach Huyen** (20°46'N., 106°55'E.), the NE mouth of Song Thai Binh, 70 miles NE.

Shallow banks of mud front this section of coast, which is flat with trees here and there which appear to rise out of the sea. Vessels approaching the coast should continuously employ sound signals, and should not attempt the river mouths without a pilot. During restricted visibility, the proximity of the coastal bank is noticed by the reddish color of the water and the breakers.

The branches of the Red River and Song Thai Binh are connected by creeks and canals, and a considerable trade is carried on within the interior.

4.23 Hanoi (21°02'N., 105°50'E.) (World Port Index No. 57670) can be reached by shallow draft vessels. Vessels drawing 2.7m can reach Hanoi by Song Day and the Red River, except when the river is low.

Tides—Currents.—Tidal currents in the approaches to the Red River normally set N on the flood and S on the ebb. Strong currents have been noted near Cua Lach Giang and Cua Ba Lat.

The Red River is at its lowest from December to May. Around May, the melting of the snows causes the river to rise rapidly, frequently washing away the banks. The annual rise at Hanoi is 4.9 to 6.1m. The current in the lower reaches of the river is often 2 or 3 knots. In the upper reaches, above Hanoi, 4 to 5 knots is common in the high-river season. In the narrows during freshets, 7 or 8 knots may be reached.

Depths—Limitations.—The wharves provide 850m of berthing space with alongside depths of up to 6m.

Smaller vessels can proceed about 200 miles above Hanoi when the river stages permit.

Hai Phong, 13 miles inland, is situated on the S bank of the Cua Cam, a mouth of Song Thai Binh.

Cua Day to Presqu'île de Do Son

4.24 Cua Day (Cua Dai) (19°58'N., 106°06'E.), the mouth of Song Day, lies 8 miles NE of Hon Ne, and is fronted by drying banks extending 4 miles S of the entrance. The narrow channel between the banks is subject to frequent change.

Cua Lach Giang, 6 miles ENE of Cua Day, and Cua Ba Lat, 26 miles farther NE, are impracticable for ocean-going vessels. They are fronted by drying mud banks for a considerable distance, and muddy waters, having the appearance of banks of mud, extend a considerable distance offshore. Vessels passing should give these mouths a wide berth due to the strong cross-currents in the vicinity, and the scarcity of landmarks.

A light is shown 5.5 miles NE of the entrance to Cua Ba Lat.

Cua Tra Ly, 11.5 miles N of Cua Ba Lat, appears easy of access, but the depths within decrease rapidly.

Cua Thai Binh (20°36'N., 106°38'E.) and Cua Van Uc, 5 miles NE, are among the shallower mouths of Song Thai Binh. The bars that obstruct their entrances have depths of less than 1.5m. Three buoys are moored 6 miles SE of the river entrance. A stranded wreck lies 1.2 miles to seaward of the middle buoy.

Presqu'île de Do Son is a hilly peninsula with Petit Mirador, 70m high, at its SE extremity. The peninsula attains an elevation of 129m at Grand Mirador, located 2.5 miles NW of Petit Mirador.

Approaches to Hai Phong

4.25 Hai Phong is approached between Presqu'île de Don Son and Xuy Nong Chao (Iles Norway), 18 miles E. Dao Cat Ba (Ile Cac Ba), 7 miles NNW of Xuy Nong Chao, lies on the N side of the approach.

Two channels lead to Hai Phong. Cua Cam, a mouth of Song Thai Binh, NE of Presqu'île de Do Son, and Cua Nam Trieu, 3 miles NE, and separated from Cua Cam by Ile de Dinh Vu. Deep draft vessels use Cua Nam Trieu, which is entered by a dredged channel across the bar. Cua Nam Trieu is connected to Song Cua Cam by Dinh Vu (Canal Maritime), which has been cut through Ile de Dinh Vu. Hai Phong lies on the S bank of Song Cua Cam, 4 miles above Dinh Vu.

Hon Dau (20°40'N., 106°49'E.), which shows a light from which a radio beacon transmits, lies 0.5 mile SE of Presqu'île de Do Son.

Xuy Nong Chao (Iles Norway) consists of two groups of high and inaccessible islands and rocks, separated by a channel about 1.5 miles wide. Rocher Est, 75m high and the largest island of the E group, is a natural landmark for vessels calling at ports in the NW part of the Gulf of Tonkin. Several islets and rocks extend 0.3 mile ENE of Rocher Est and La Tour, a pointed rock surrounded by depths of 4.7m, lying 0.3 mile N of the island.

4.26 Grande Norway (20°37'N., 107°10'E.), 83m high, is the largest of the W group. A light, from which a radio beacon transmits, is shown from the SE part of the island. A small group of islets lies 0.5 mile SE of Grande Norway; Le Menhir, a rock, lies 0.1 mile SE of the group.

Ile Ouest, 64m high and lying 1.5 miles WSW of Grande Norway, is the W island of Xuy Nong Chao.

Caution.—A depth of 11m lies 21.8 miles distant bearing 162° from the S extremity of Grande Norway.

Numerous junks may be encountered in the approach to Hai Phong and in the vicinity of Xuy Nong Chao. Most of these vessels display no navigational lights at night.

Ta Lao Pai (Rocher de Large), 17m high, lies 3.5 miles NW of Ile Ouest, and shows a light. Basse du Passage, with a depth of 8.5m, lies 1.7 miles WNW of Ta Lao Pai.

Dao Cat Ba (Ile Cac Ba), a large irregularly-shaped island, has a range of mountains rising to a summit over 340m high near the W part of the island. A peninsula at the S end of the island has a summit 144m high, with a prominent fort on it, 0.8 mile NE of the S extremity of Dao Cat Ba.

4.27 La Quille (20°41'N., 107°03'E.), a 41m high rock, lies 1.3 miles S of Dao Cat Ba. Les Orelles, an islet, and Ile H, 98m high, lie 0.1 mile N and 0.8 mile NNW, respectively, of La Quille.

Rocher Trident, with a depth of 1.8m, lies 1 mile W of La Quille; a stranded wreck lies on the N side of the shoal. A wreck, with a depth of 1.5m, lies 0.8 mile W of Rocher Trident.

In the approaches to Hai Phong the tides are subject to a large diurnal inequality. Only one high and one low tide occurs in 24 hours. The lowest tides occur about 3 days after the moon has crossed the Equator. At this period the ordinarily diurnal tides are observed. High water occurs at Hai Phong about 1 hour after HW at Presqu'île de Do Son. Highest tide occurs about 5 hours after the moon's upper transit when the moon has a N declination, and about 5 hours after lower transit when the moon has a S declination. The tides are higher during the Northeast Monsoon than during the Southwest Monsoon.

The tidal rise at Cua Nam Trieu is 3.1m and 2.7m at Xuy Nong Chao at MHHW.

Tidal currents off the entrance to Cua Nam Trieu generally set NE and follow the channels on the flood. As the tide rises, the flow becomes less restricted to the channels and sets across them in a northerly direction, at the same time attaining its maximum rate. At HW locally, the flow turns counterclockwise and decreases. The flow sets SSW on the ebb tide, attaining a velocity of nearly 0.8 knot with small tides and 1 knot with large tides. The flow becomes very weak 2 hours before LW, and reverses at LW. The flow is stronger on the flood tide than on the ebb tide, and in the dredged parts of the channel over the shallows.

Hai Phong (20°52'N., 106°41'E.)

World Port Index No. 57680

4.28 Hai Phong, the shipping port for Hanoi, has the appearance of a European town. The city and wharves lie on the S bank of the Cua Cam. Moorings are laid in the river to provide berths for deeper draft vessels, and cargo is worked by lighters.

Hai Phong port limits cover the Vinh Ha Long (paragraph 4.35) and Hon Gai (Hon Gay) (paragraph 4.36) areas.

Winds—Weather.—The climate of Hai Phong is primarily tropical. However, during the months of January, February, and March the weather is cold and damp.

Squalls are a probability at any time of the year, those of particular violence being the “arch squall” that occurs in this area. This type is preceded by clouds rising in the form of an arch, attended by heavy rains and high winds.

Tides—Currents.—In Song Cua Cam the current may attain a velocity of 2.5 knots. In Cua Nam Trieu, the flow reverses 2 hours 30 minutes after HW and 1 hour 30 minutes after LW at Cua Cam. With large tides, the velocity of the ebb current exceeds 3 knots.

At Hai Phong during the low-river season (October to February), the ebb current begins 2 hours after HW at Hon Dau and the flood current begins 2 hours 30 minutes after LW at Hon Dau; the maximum velocities are 1.5 knots and 1 knot, respectively. With large tides, the ebb current begins 3 hours 30 minutes after HW at Hon Dau and the flood current begins 6 hours 30 minutes after LW at Hon Dau; the maximum velocities are 2 to 4 knots and 2 to 3 knots, respectively.

At Hai Phong during the high-river season, which occurs in summer, the flood current is reduced and the ebb current is increased in both speed and duration; there is no flood current at all if the tidal range is less than 0.3m. The ebb current has been observed to reach 4 to 5 knots after heavy rain and vessels frequently drag anchor.

The flood current becomes established slowly; for the first 0.5 hour the velocity does not exceed 0.5 knot and this is followed by a slack water period of 1 hour to 1 hour 30 minutes before the current is properly established. The ebb current starts rapidly, beginning in the middle of the river; it attains a velocity of 1 knot within 1 hour of commencement.

Depths—Limitations.—Dinh Vu (Canal Maritime) has a least depth of 7.9m. The depths decrease to 4.6m in Cua Cam on the range line, about 0.5 mile farther WNW.

The maximum size vessel permitted to cross the bar and enter the dredged channel in Cua Nam Trieu is 200m in length, 26m breadth, and 7m draft. Vessels of lesser size may have an allowable draft of 7.6m to berth alongside. Vessels of lesser draft may also lighter in Nihtiep (20°51.3'N., 106°46.0'E.) and Bachdang (20°52.4'N., 106°45.4'E.) anchorages. Vessels exceeding this draft are lightered in Ha Long Bay (Vinh Ha Long) anchorage.

There are 11 berths with depths of 8m alongside for general, bulk, and container cargo, and passenger vessels. Additionally, the longest berth is located in the Doanxa berthing area, which has two berths for ro-ro and container vessels, and has a total length of 300m.

The tanker berth in the Thuongly area can accommodate vessels of up to 5.8m draft.

The Cua Cam berthing area harbors three berths for general cargo vessels. The Thuysan area has an additional two berths for fishing vessels and general cargo vessels. Chauve provides a berthing area for two general cargo vessels.

If maximum draft exceeds port limitations, vessels anchor in Baie d'Halong and discharge into lighters.

The harbor has a total of 15 marine moorings which are capable of accommodating vessels of the 15,000 dwt class, with maximum drafts of 7.6m. Mooring berths in the river have depths of 5.7 to 7.8m.

Large vessels usually swing upstream, beyond the wharf area, and then dock with their bows downstream.

It was reported in 1990 that it was not uncommon for vessels with a draft of 5.3m or more to touch bottom. In 1993 it was reported that because of the absence of dredging in the approach channel, the controlling draft at the port was 3.1m, increasing to 5.6m at high tide.

Vessels bound for Hai Phong should seek up to date advice regarding draft limitations prior to arrival.

Pilotage.—Pilotage for merchant vessels is compulsory. Pilots are stationed at Hon Dau and board 2.5 miles E of Hon Dau Light (20°40.0'N., 106°48.7'E.).

Vessels should radio their expected time of arrival at the pilot station at least 48 hours in advance. The notice should also include the last port of call and their estimated draft at arrival. Vessels are generally taken upriver by day only. Pilots may be contacted on VHF channels 9 and 16.

The pilot boat has a red hull. Pilots embark in the vicinity of Lighted Buoy No. 0.

Regulations.—A customs officer and police officer usually board vessels at Lighted Buoy No. 0 and accompany the vessel to Hai Phong.

During poor visibility vessels should maintain constant radio watch, and should notify the port authorities of the time of departure from Lighted Buoy No. 0 and their speed. Vessels with a draft of less than 3m must navigate outside the channel, NE of the line of starboard hand lighted buoys.

Passage at night is possible, but daylight hours are preferred.

When two vessels are approaching Dinh Vu from opposite directions, the one from Cua Nam Trieu must wait, and anchor if necessary, until the vessel from Cua Cam has passed through.

Signals.—When dredges are at work, vessels must sound their whistles repeatedly. A dredge must not be passed until it displays the signal “Not under command” at half mast, indicating that the channel is clear, and one of the two following signals:

Day	Night	Meaning
A cone, point up	Two green lights, vertically disposed	The dredge must be passed on the starboard side
A cone, point down	Two red lights, vertically disposed	The dredge must be passed on the port side

Vessels passing a dredge must do so as slowly as possible, and must stop if necessary.

A signal station is available in Hai Phong, from which storm signals are displayed.

Anchorage.—There are four anchorage areas, as follows:

Anchorage	Maximum draft
Ninhtiep	7.0m
Bachdang	6.0m
Halong	10.0m

Anchorage	Maximum draft
Hongay	9.4m

Vessels awaiting the tide should anchor as near **Hon Dau** (20°40'N., 106°49'E.) as their draft will permit. If there is a heavy swell, vessels with a draft of 5.8m can anchor in the entrance of **Baie d'Apowan** (20°43'N., 107°02'E.) in a depth of 7m. See also Vinh Ha Long for deep-draft anchorage, which will be described later in paragraph 4.35.

Vessels anchoring in the vicinity and outer anchorages should beware of intruders. See also the cautionary remarks on piracy in paragraph 2.1.

Directions.—Vessels bound for Hai Phong should steer for Xuy Nong Chao (Iles Norway). Approaching these islands in thick weather or at night, caution should be exercised in depths of less than 29m. The bottom E of the islands consists of gray mud. The radio should be manned continuously in thick weather.

A vessel approaching from S in thick weather should steer for Hon Dau. Approaching Hon Dau on a bearing of 343° the bottom consists of muddy sand, while to the W of this line the bottom is almost all mud, often mixed with shells. East of this line the bottom is white or gray sand, with black speckles.

In poor visibility, if a vessel considers itself too far W, it should anchor as soon as it is in depths of 15m. On ascertaining such is the case, it should steer E into a depth of 20m, and then N, into a depth of 11m, when it will have a better chance of sighting Hon Dau.

If the pilot boat is not sighted or it is too late to proceed to Hai Phong, excellent anchorage can be obtained, in 12m, mud, good holding ground, with Hon Dau bearing W, and with Lighted Buoy No. 0 bearing N.

Due to the changing nature of the entrance channel and the compulsory pilotage for the port, no further directions are given.

Caution.—Depths in the seaward approach channel are subject to change, and the buoyage is altered accordingly. The buoyage in the approach channel is reported to be unreliable or missing. In 1990, heavy silting in the Cua Nam Trieu was reported.

Song Bach Dang

4.29 Above the E entrance of Dinh Vu, the Cua Nam Trieu becomes the Song Bach Dang (20°51'N., 106°46'E.), and then the Song Da Bach. **Port Redon** (20°59'N., 106°46'E.) lies on the NE bank of Song Da Bach, about 8.5 miles above Dinh Vu; it is the terminus of a railway to mines and has a small jetty at which vessels can not berth.

Bancs de Ha Nam extend about 0.8 mile from the W bank of Song Da Bach, about midway between Dinh Vu and Port Redon. A narrow channel on its E side is marked by buoys. In 1990, it was reported that the dangerous rock on Bancs de Ha Nam was removed by explosives.

Pilotage.—Pilotage in the river is compulsory.

Anchorage.—There is anchorage above Bancs de Ha Nam, abreast the W entrance of Song Chanh, in a depth of about

10m. This anchorage serves **Quang Yen** (20°56'N., 106°48'E.) and its zinc factory.

Port Redon Anchorage, about 3 miles farther N, has depths of 7 to 11m. Vessels load coal and other ores by lighters.

Lach Huyen (20°48'N., 106°55'E.), the NE mouth of Song Thai Binh, has a tower on its W entrance point. The bar lies 3 to 4.5 miles SE of the entrance. Vessels, with local knowledge, and a draft of 4.9m can cross the bar at HWS and proceed upriver in deep water to the E entrance of Song Chanh. There are depths of not less than 4.9m in Song Chanh to within 2.5 miles of Quang Yen. Anchorage can be taken by vessels with a draft of 4.9m in Song Chanh, 4 miles SE of Quang Yen.

Archipel des Fai Tsi Long

4.30 The NW shore of the Gulf of Tonkin, for a distance of 40 miles NE of **Dao Cat Ba** (20°48'N., 107°02'E.), is bordered by numerous, high, rocky islands and islets of limestone formation, known as the **Archipel des Fai Tsi Long** (20°50'N., 107°25'E.). These islands present varied forms with very distinct summits, some of which attain elevations of over 305m.

Xuy Nong Chao (Iles Norway) makes a good landfall in the approach from S. The fort on the S end of Dao Cat Ba, and **Dao Lai Tao** (20°43'N., 107°28'E.) 23 miles E, an island with a conical summit, are easily identified.

The archipelago consists mainly of steep rocks and islets of marble, 46 to 91m high, some of which have been worn away at the waterline and overhang the sea. From a distance, these islands appear as a compact mass, but on nearer approach the channels between them can be distinguished. Steep mountains run parallel to and back the coast NW of the archipelago.

Caution.—Vessels should not pass close to the limestone rocks as large pieces occasionally break off. Small islets should be given a wide berth to avoid the shoals in their vicinity.

4.31 Channels.—Archipel des Fai Tsi Long provides anchorages for large vessels. The principal channels leading to these anchorages are:

1. Entree Profonde, leading from Baie de Lan Ha, through Rade du Crapaud, then through Chenal du Volta, or Passe de l'Arche, to Vinh Ha Long.
2. Entree Profonde, then through Passe Crochet into Passe Henriette and Vinh Ha Long to Port Courbet.
3. Passe Henriette, the best approach to Vinh Ha Long. Chenal du Ducouedic and Chenal del'Hamelin lead from Passe Henriette to Baie de Fai Tsi Long.
4. Passe de l'Aspic, leading into Baie de Fai Tsi Long, and through Chenal de la Saone and Chenal de Cam Pha to Cam Pha Port.
5. Passe de la Perouse, then through Passe du Casque into Chenal de la Saone. This is the most direct route to Cam Pha Port.

The above channels lead to sheltered anchorages where the working of cargo is generally uninterrupted and where vessels can go alongside one another. The holding ground is good and tidal currents attain a velocity of only 1 knot at spring tides. These anchorages offer fair shelter during typhoons as they are practically landlocked, and the islets are high enough to diminish much of the wind.

Pak Ha Mun (20°58'N., 107°34'E.) on the E side of the archipelago, has depths of 11 to 13m, and affords secure anchorage in a depth of 15m.

Winds—Weather.—From December to March fogs are frequent and persistent. Among the islands the heat in summer is greater than in the delta area SW or offshore. Temperatures reach 38°C in summer, and drop to 7° to 10°C in winter.

Pilotage.—Pilotage is compulsory to ports in the archipelago. Pilots for Hon Gai and Cam Pha Port are embarked in the vicinity of Lighted Buoy No. 0. Vessels must arrive at the pilot boarding area before 1500 on weekdays and before 1200 on Sundays or festivals in order to enter these ports on the day of arrival. Once embarked the pilot will signal the time of arrival at the port concerned, after which the use of radio is forbidden.

A pilot boarding place is also in the vicinity of L'Orange.

Approaches to Vinh Ha Long and Hon Gai

4.32 Baie de Lan Ha (20°45'N., 107°07'E.) is entered between the islets fronting the SE side of Dao Cat Ba and the SW extremity of **Ile de la Paix** (20°45'N., 107°07'E.). The E side of the bay, which is high and steep, is formed by Ile de la Paix, with several islets off its NW side, and Ile de l'Union, close N.

Ilots M (20°42'N., 107°05'E.), a group of three islets, lies 2.8 miles N of Hon Ta Lao Pai. Roche du Pecheur, with a least depth of 8.2m, lies 0.5 mile SE of Ilots M. Ilot Cornu, 37m high, lies 1.5 miles NE of Ilots M. Rocher Soulipai, which dries 3m, lies 0.8 mile S of Ilot Cornu; a rock, with a depth of 0.9m, lies 0.2 mile farther S.

Anchorage according to draft can be taken in several sheltered inlets formed by the islets on the W side of the bay.

Entree Profonde (20°47'N., 107°07'E.) is entered between the S extremity of Ile de l'Union and Pointe O, 1.3 miles WNW. Ile du Milieu, 62m high, lies on the W side of the channel, about 0.3 mile SE of Pointe O. From S, the entrance to Entree Profonde is not visible until past Ile du Milieu.

On the E side of the channel, Ilot de la Recherche, 36m high, with a rock close off its SW side, lies 0.3 mile NW of the S end of Ile de l'Union.

La Selle, 220m high, the summit of Ile de l'Union, is conspicuous and stands 0.8 mile N of the S end of the island. Above-water rocks extend about 0.2 mile offshore abreast La Selle; a rock with a depth of 1.8m, lies close W of the rocks. Ilot Rouille, 58m high, lies 0.1 mile farther N.

A chain of islets and rocks extend up to 0.3 mile off the N part of the W side of Ile de l'Union. Vessels should pass W of these dangers.

Anchorage.—Port Bayard, on the W side of Entree Profonde, affords excellent shelter to small vessels with local knowledge in typhoon conditions. It has depths of 5.5 to 7.3m, but the entrance between the rocks on either side is about 73m wide.

Entree Profonde leads into Rade du Crapaud at its N end between the NW end of Ile de l'Union and Le Cobra, about 0.5 mile NW.

Rade du Crapaud (20°49'N., 107°07'E.) affords the most accessible shelter from typhoons for large vessels when in the vicinity of Xuy Nong Chao. Le Crapaud, 13m high, lies on the

SW side of the roadstead, 0.1 mile ENE of the N end of Le Cobra.

Anchorage can be taken, in 13m, mud, with Le Crapaud bearing 150°, distant about 0.7 mile.

Chenal du Volta, on the NW side of the roadstead, leads to Vinh Ha Long. A vessel can proceed into Passe Henriette via Passe Crochet on the E side of the roadstead.

4.33 Passe Henriette (20°48'N., 107°09'E.) is the best approach channel to Vinh Ha Long and Hon Gai, and the only one that should be used by deep-draft vessels. It has a least depth in the fairway of 12.8m, and is entered between **L'Orange** (20°44'N., 107°11'E.), a 42m high islet, and Ile Henriette, a 60m high islet, lying 1 mile W. L'Orange has a white mark on its SE point, which was reported to be visible, although indistinctly, for a distance of about 5 miles. Le Bloc (Bloc), a 94m high islet, lies about 0.2 mile N of Ile Henriette.

La Mauvaise, a shoal with a depth of 3m, lies 0.7 mile SSE of Ile Henriette; a rock, with a depth of 0.9m, lies 0.2 mile S of the same islet.

Le Canot, a 23m high islet lying 1.5 miles N of Ile Henriette, is the outermost of several islets lying E of Ile de la Paix. A 4.6m shoal, with a wreck on its S side, extends 0.1 mile SE of Le Canot.

Le Youyou, a rock, 0.9m high, lies about 0.3 mile N of Le Canot, and close W of the recommended track. A rock, with a depth of 2.1m, lies 0.2 mile NW of Le Youyou.

Le Nez, 69m high, lies 0.5 mile NE of La Scie, the northeasternmost of the islands fringing Ile de l'Union. A reef, with a depth of 3.7m, extends 100m E of Le Nez, and close W of the recommended track.

An 11m patch lies 0.1 mile SSE of L'Orange. L'Epieu, a 46m high islet, lies 0.8 mile ENE of L'Orange.

Le Fantome, a 47m high islet, lies 0.8 mile N of L'Orange. La Jonque, a 63m high islet, lies 0.3 mile N of Le Fantome. A rock, with a depth of 0.6m, lies 0.4 mile W of La Jonque.

Le Bouquet, 34m high, lies 1 mile NNW of La Jonque. Le Musoir, 123m high, lies 0.5 mile N of Le Bouquet. Ile du Cirque, 131m high, lies 0.7 mile E of Le Musoir. A 4.6m shoal lies 0.5 mile NNW of Le Musoir.

L'Echelle (20°49'N., 107°09'E.), 127m high, and Le Dragon, on which there is a prominent casemate, are the southernmost and northernmost of a group of islets lying 0.5 mile NE of Le Nez. A bank, with depths of less than 9m, extends 0.3 mile SSE from L'Echelle.

4.34 Head of Pass.—Ile Salacco (20°50'N., 107°08'E.) lies on the W side of the channel, 0.7 mile WNW of Le Dragon. Le Moine, 0.5 mile N of Ile Salacco, has a rock, 2m high, close off its E extremity. The island of Le Goeland lies close NW of Le Moine; a wreck lies off the NE side of the island.

Anchorage.—In 1988, the lightering anchorage was reported to lie 0.5 mile E of Ile Salacco and the quarantine anchorage situated 0.5 mile WSW of L'Index.

Le Puceron, a 12m high islet, lies on the E side of Passe Henriette, about 0.5 mile ENE of Le Moine. La Roche Percee, a 126m high island, lies 0.3 mile farther N.

L'Index (20°52'N., 107°07'E.), a 156m high islet, has a prominent notch about halfway up its steep W side, and a white

mark on its E side. A light is shown from the islet. A bank with depths of less than 9m extends 0.4 mile S of the islet.

La Tribune, 59m high, lies 0.3 mile SE of L'Index and is the southernmost of a group of small islets on the E side of the entrance to Chenal de l'Hamelin.

La Banane, 102m high, lies 1 mile NNW of L'Index.

Vinh Ha Long

4.35 Vinh Ha Long (20°55'N., 107°05'E.) is an extensive bay lying between the islands bordering the N and NE coasts of Dao Cat Ba and the mainland N. The major part of the bay is occupied by a bank with depths of less than 4.5m. Large vessels can anchor in a narrow band in the SE part of the bay off the inner entrances of the channels leading into the bay.

Ile de l'Hospital lies about 1.8 miles WSW of L'Index; two islets, the N of which is 45m high, lie close N of the W extremity of Ile de l'Hospital. La Noix, a small islet, marked by a light, lies 0.5 mile E of Ile de l'Hospital.

Anchorage.—The most frequented anchorage is in depths of 11 to 15m, mud, between **Ile de la Surprise** (20°51'N., 107°06'E.) and L'Index.

Anchorage can be taken, in depths of 9 to 15m, abreast Ile de l'Hospital. The anchorage has excellent holding ground, and vessels intending a long stay should weigh their anchors occasionally to prevent them from being buried.

Hon Gai (20°57'N., 107°04'E.)

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4.36 Hon Gai (Hon Gay), a coaling port, lies in the N part of Vinh Ha Long, and is accessible by a dredged channel through the bay. Chenal de l'Hamelin is an alternate route to Hon Gai. The port lies at the SE extremity of Cua Luc, the entrance to Port Courbet. The latter is a large bay, encumbered with drying banks.

Tides—Currents.—The tidal rise at Hon Gai is 3.6m at MHHW.

The N flood current in Cua Luc begins 4 hours after LW during small tides, and 2 hours after LW during large tides. The S ebb current begins 1 hour after HW. The ebb current is the stronger, attaining a velocity of 3 knots after heavy rains. The flood current has a maximum velocity of about 0.8 knot at half-tide.

Outside the entrance the tidal current is stronger on the E side than on the W side; during the ebb there is an eddy which sets N along the wharf at Hon Gai.

In the anchorage the ebb begins about 1 hour after HW, with both small and large tides.

Depths—Limitations.—A buoyed channel, dredged to a depth of 6.8m, leads NNW across Vinh Ha Long from a position about 0.6 mile NNW of La Noix. Vessels drawing 10m can reach Hon Gai at HW.

There is a coal berth, 200m long with an alongside depth of 8.5m. Cai Lan berth is 160m long and has an alongside depth of 9m.

Tankers of up to 20,000 dwt can be accommodated at a buoy berth, in a depth of 15m, about 0.5 mile N of Cua Luc narrows.

A submarine cable and an overhead electrical cable, with a safe clearance of 33m, cross the entrance of Cua Luc.

Aspect.—The axis of the channel, 160°-340°, is marked by two directional lights; one is shown on La Noix, and the other is shown on the W side of Cua Luc.

Pilotage.—Pilotage is compulsory. The pilot station is situated in position 20°44'12"N, 107°10'30"E. See pilotage instructions for Hai Phong (paragraph 4.28) and Archipel des Fai Tsi Long (paragraph 4.30).

Anchorage.—There are designated anchorages for LASH vessels, tankers, dangerous cargo, and lightering.

Anchorage can be taken in the deep water S of the entrance to Cua Luc, provided they do not obstruct the approach to the wharves at Hon Gai.

Anchorage can also be taken, in depths of 15 to 17m, in the S part of Port Courbet, N of Cua Luc, where there are two mooring buoys.

4.37 Chenal de l'Hamelin, an alternative channel leading to Port Courbet, has a least depth of 3.7m in the fairway, and passes between a number of islands in the NW part of Vinh Ha Long. In the NW part of the channel there is a bar, through which there is a dredged channel with a depth of 4.9m, soft mud. Lighted and unlighted buoys mark the S side of the dredged channel.

The channel leads close E of L'Index, then leads N and NE, passing NE of La Clochette, an islet, marked by a light, lying 1.3 miles NE of L'Index. Then it passes close W of La Toque, a 24m high islet, about 0.3 miles farther N. From close W of La Toque the channel leads about 0.7 mile NW, passing close NE of La Porte-Fanal, an islet marked by a light. The channel then extends WNW, passing S of Ile du Repos, which shows a light, then passes through the dredged channel leading to the deep water S of Cua Luc. Vessels in the dredged channel should keep about 50m N of the buoys.

The shallowest part of the channel is midway between La Porte-Fanal and La Lionne, a 65m high islet lying 0.5 mile N, where there is a depth of 3.7m.

Baie de Fai Tsi Long

4.38 Baie de Fai Tsi Long (20°55'N., 107°53'E.), the largest bay in the archipelago, is exposed to NE winds. Depths within the bay are mostly shoal except in its SE part. The bay is not as commercially important as Vinh Ha Long, and is more of a thoroughfare to the channels within the islands.

The bay is entered from SW by Chenal du Ducouedic, which branches off from Passe Henriette. Chenal du Chateau Renaud, which branches off Chenal de l'Hamelin, close N of **La Clochette** (20°53'N., 107°08'E.), enters the W end of the bay, runs along its NW side and joins Chenal de la Saione E of L'Aigle.

Baie de Fai Tsi Long is entered from the S by Passe de l'Aspic, or by Passe de la Prouse, which connects with **Passe du Casque** (20°52'N., 107°18'E.). Passe de la Mouche, available for ships with local knowledge, is entered E of Ile de Deux Passes, which lies 1 mile NE of **Ile de l'Entree** (20°50'N., 107°19'E.). Tidal currents in Passe de la Mouche are very strong.

Chenal de la Saone parallels the S and SE sides of the bay. It connects with Chenal de Bourayne, from which Chenal de Cam Pha leads to Cam Pha Port.

Chenal du Ducouedic

4.39 Chenal du Ducouedic is the deepest channel from Passe Henriette to Baie de Fai Tsi Long. It branches off Passe Henriette, E of Ile de l'Union, and passes E of **L'Echelle** (20°49'N., 107°09'E.) in a N direction. It then passes W of Le Sac, which lies close NW of Le Grand Sommet, 113m high. Le Sampan, a rock which dries 3.4m, lies about 0.3 mile N of Le Sac.

From abreast Le Sac, the channel leads NNE, passing W of Ile Commune, 1.3 miles NNE of Le Sac. It then passes W of Ilot A and Ile de l'Entree, which lie nearly 1 mile and 1.8 miles, respectively, NNE of the W extremity of Ile Commune. The channel then turns ENE and enters Chenal de la Saone.

Chenal du Chateau Renaud

4.40 Chenal du Chateau Renaud branches off Chenal de l'Hamelin NW of **La Clochette** (20°53'N., 107°08'E.), and trends NE between Le Nid and Le Pierrot, a 113m high islet, lying 0.3 mile N, where the channel enters Baie de Fai Tsi Long. Le Nid, an islet with a needle-shaped rock at its N extremity, lies 0.2 mile W of **Ile des Singes** (20°53'N., 107°10'E.). A rock, with a depth of 3.7m, lies nearly 0.3 mile NNE of the N extremity of Ile des Singes.

Le Castel, a 169m high islet, lies on the SE side of the channel, about 0.3 mile NE of Ile des Singes. **Le Lapin** (20°54'N., 107°10'E.), 30m high, and **Le Kepi**, 40m high, are two islets lying 0.5 mile and 1.7 miles ENE, respectively, of Le Castel.

On the NW side of the channel, **Le Marron**, a 16m high rock, lies 0.6 mile N of Le Lapin. **La Voile**, a steep, 24m high rock, lies nearly 1.8 miles farther ENE.

Chenal du Chateau Renaud leads across the NW side of Baie de Fai Tsi Long, and passes between **Le Dome** (20°57'00"N., 107°14'30"E.), a 102m high islet, lying 4 miles NE of Le Kepi, and **Le Carosse**, a 34m high islet, about 0.3 mile E.

Le Spectre (20°57'N., 107°15'E.), an island, lies 0.2 mile E of Le Carosse. A bank, with a depth of 4m, extends 0.1 mile N of the E end of Le Spectre. **Roche du Chenal**, which dries 0.9m and is marked to its N by a buoy, lies 0.2 mile N of Le Spectre. The channel passes between the bank and Roche du Chenal.

After clearing Roche du Chenal, the channel extends ENE to a position about 0.2 mile S of the E end of **La Momie**, an island lying 0.8 mile NW of **L'Aigle** (20°58'N., 106°59'E.). **Le Chien**, an islet, lies on the NW side of the channel, about 0.3 mile SW of La Momie. The channel then extends in an ESE direction, passing close NE of L'Aigle, and joins Chenal du Bourayne. L'Aigle, seen from the W, dominates all other islands and rocks.

Islands and Dangers in the Approach to Baie de Fai Tsi Long

4.41 Dao Lai Tao (20°43'N., 107°28'E.), 170m high, is the southernmost of the islands which lie on the NE side of the S

approach to Baie de Fai Tsi Long. The island lies 15 miles ENE of Roche Est, and is steep-to on its S side, outside its fringing reef. **Roche du Chinois**, with a depth of 4.2m, lies 1 mile SW of the island, and a dangerous rock (PA) lies 1.3 miles further SW.

Nui Thuong Mai (Siong Lai Tac), 132m high, lies 1 mile NNE of Dao Lao Tao. **Cap Quan Lan**, the S extremity of Dao Cai Ban (Ile de Quan Lan) lies 2.5 miles N of Dao Lai Tao.

Off-lying dangers.—**Tche Li Pai**, an 8m high rock, surrounded by a reef, lies 6 miles WSW of Dao Lai Tao. At LW several pointed rocks are visible, which occasionally resemble the masts of junks. Depths of less than 3.7m extend up to 0.6 mile N and S of the island.

Recif des Salpes, which dries 3.4m, lies 1.2 miles N of Tche Li Pai. A reef, which dries 0.3m, and a rocky shoal, with a depth of 2.1m, lie 0.5 mile NNE and 1 mile NNW, respectively, of Recif des Salpes.

Nui Nut (Ti Mao Tao), 116m high, lies 3.5 miles WNW of Dao Lai Tao. A bank, with depths of less than 5.5m, extends 1.7 miles W of Nui Nut. **Baou Tao**, 94m high, lies on this bank, 0.5 mile W of the island.

Ile du Sud (20°47'N., 107°20'E.), with **Le Fourmilier**, a 55m high islet, close N, lies 3.2 miles NW of Baou Tao, and is the S of a group of islets and rocks off the SW extremity of Ile Danh Do La.

A bank, with depths of less than 9m, extends 5 miles SW from Ile Danh Do La, and NW as far as the E side of Passe de L'Aspic and across the entrances of Passe de la Mouche and Passe de la Pouse.

Passe de l'Aspic

4.42 Passe de l'Aspic lies E of Passe Henriette, and has a least depth of 8.2m on the recommended track in the pass.

Approaching from SW, a vessel should pass E of **Hu Lang** (20°44'N., 107°12'E.), a 52m high islet, and **L'Epieu**, lying 0.2 mile SW, at a distance of at least 1 mile. L'Epieu, a 46m high islet, is the southeasternmost islet of the group lying on the E side of Passe Henriette.

The entrance to Passe de l'Aspic lies NNE of Hu Lang with that islet bearing 210°, astern, showing about midway between Sam Pui Tsao and the NW island of the group lying 1 mile W of Grande Norway.

La Mere (20°48'N., 107°15'E.), a 45m high islet, with **L'Enfant**, a 19m high rock lying close SE, lies on the SE side of the entrance to Passe de l'Aspic. A rock, which dries 1.8m, lies almost 100m NW of La Mere. **L'Arche**, an islet, lies 0.7 mile NW of La Mere.

From abreast L'Arche, **L'Escargot** (20°53'N., 107°15'E.), a 66m high islet lying 4.5 miles NNE, will be seen between the islets bordering Passe de l'Aspic on either side, bearing about 011°.

Le Roquet, an islet, lies on the E side of the pass, 0.7 mile NNE of L'Arche. **Ile de l'Aspic**, on the W side of the pass, lies 0.5 mile NW of Le Roquet.

L'Escalier, an islet, about 0.7 mile NNE of Ile de l'Aspic, lies on the W side of the channel. A rocky ledge, with a depth of 1.8m at its extremity, extends 0.1 mile S from L'Escalier.

Ile du Souffleur lies nearly 0.5 mile E of L'Escalier, on the E side of the pass. A rocky ledge connects Ile du Souffleur to the

W extremity of Ile de l'Arlene, 0.7 mile N. A rock, with a depth of less than 1.8m, lies close off the W extremity of Ile de l'Arlene. La Tranche, a rock, lies about 0.4 mile WNW, on the W side of the pass.

Ile du Pont lies 0.8 mile N of Ile de l'Arlene, with several islets between, on the E side of the pass. A bank, with a depth of 0.9m, and a spit, with a depth of 3.7m, extend a short distance from the SW side, and N end, respectively, of Ile du Pont.

On the W side of the pass, La Potiche, a rock, close off the E end of an islet, lies 0.1 mile W of Ile du Pont. An islet lies close NE of La Potiche.

After passing Ile du Pont, Passe de l'Aspic leads about 0.5 mile NE, then NNE, passing between some islets. It then enters Baie de Fai Tsi Long between L'Escargot and Le Nigre, a rock, 0.7 mile E, and joins Chenal de la Saone, 1 mile farther NNE. Shoals over which there are depths of 5.8 to 7m, lie E of L'Escargot and 0.4 mile SW of Le Nigre, but there is a narrow channel between them in which the depths are greater.

Tidal currents are strong abreast Ile du Pont.

Passe de la Perouse (Lach Dong Trang)

4.43 Passe de la Perouse, E of Passe de l'Aspic, is oriented on a 029°-209° axis and approached from SW between **Tche Li Pai** (20°41'N., 107°21'E.) and L'Epieu, about 9 miles WNW. The best course of approach is with **Sam Pui Tsao** (20°39'N., 107°09'E.) bearing 221° astern.

Le Turco (20°48'N., 107°16'E.), a rock, lies on the NW side of the approach to Passe de la Perouse.

Le Cancrelat (20°50'N., 107°18'E.), an islet marked by a light, lies 1.5 miles NE of Le Turco, on the SE side of Passe de la Perouse. There is a least depth of 8.5m on the recommended track at the S end, but the depths increase as Passe du Casque is approached.

Approaching the pass from S, La Mere, L'Enfant, and Le Cancrelat are easy to identify. The channel leads about 0.3 mile NW of Le Cancrelat and passes between it and several islets on the NW side of the pass.

A 6m patch lies close off the E extremity of **La Meduse** (20°51'N., 107°17'E.), the largest of the islands lying NW of the recommended track, and an above-water rock lies close W of the patch. Two islets lie about 0.2 mile further N.

L'Encrier, a rock, marked by a beacon, lies 1.5 miles NNE of Le Cancrelat, and between them is a group of islets and shoals which lie within 0.1 mile of the SE side of the recommended track.

Tidal currents at the junction of Passe de la Perouse and Passe du Casque attain a velocity of 1.5 knots, with a tidal range of about 3m.

Passe du Casque

4.44 Passe du Casque leads NW from a position located 0.3 mile NW of **L'Encrier** (20°51'N., 107°19'E.). It then passes between Le Marsouin, 0.7 mile NW of L'Encrier, and a group of islets which lie on an extensive shoal on the NE side of the channel.

The channel continues NW, passing close E of Le Casque, a 261m high island lying 1.2 miles NW of Le Marsouin. The NE

extremity of Le Casque is marked by a beacon backed by a white-washed mark facing N.

From a position 0.2 mile NW of L'Encrier, the SW extremity of **Hon Hang Toi** (Ile Double) (20°49'N., 107°20'E.) bearing about 146° astern, and just open SW of Ile Verte, leads through the NW portion of the pass. Ile Verte lies 0.3 mile SE of L'Encrier.

Passe du Casque, which should only be used by vessels with local knowledge, can be used at any state of the tide.

Passe de la Mouche

4.45 Passe de la Mouche, E of Passe de la Perouse, should only be used by vessels with local knowledge. **Le Chien** (20°50'N., 107°20'E.), with another smaller islet close NW, lies 1 mile N of Hon Hang Toi, on the E side of Passe de la Mouche. Ile Haute lies 0.4 mile farther NNW. A rock, with a depth of 0.3m, lies 0.4 mile W of Le Chien.

Ile de l'Entree lies nearly 0.8 mile W of the above rock. The E extremity of Ile de Deux Passes, located nearly 1 mile NE of Ile de l'Entree, bearing 015°, in range with La Mouche, a low rock lying 0.2 mile farther NNE, leads W of this rock, and through the entrance of the pass.

Passe de la Mouche is entered from S between Ile des Deux Passes and the islet lying 0.3 mile ESE.

From a position about 0.3 mile S of Ile des Deux Passes, a vessel may leave Passe de la Mouche steering in a NW direction to join Passe du Casque, with Le Casque bearing 313°. The channel then leads N and NNW, passing E of the SE extremity of Nui Thua Cong, and E of Ile Kieu, farther N. The SE extremities of both islands are fringed by reefs.

Ile Dao Trao (20°52'N., 107°22'E.), on the W side of the pass, has a peninsula projecting from its NW end. Nui Say Tau, 110m high, lies on the N end of the peninsula. A patch having a depth of 5.8m lies nearly in mid-channel, 0.5 mile NW of the NW extremity of Ile Dao Trao.

Northward of the N end of Ile Kieu, Passe de la Mouche turns NW and enters Chenal de la Saone.

Chenal de la Saone

4.46 Chenal de la Saone, a continuation E of Chenal du Ducouedic, crosses the banks in the S part of Baie de Fai Tsi Long, in a least depth of about 4.5m. From 1 mile SE of **Ile du Milieu** (20°55'N., 107°16'E.), Chenal de la Saone turns NE through the E part of Baie de Fai Tsi Long.

Ile du Chenal (20°56'N., 107°17'E.), 1.5 miles NE of Ile du Milieu, lies on the NW side of Chenal de la Saone. La Poire and La Pomme lie close together about 0.5 mile farther NE.

Les Aiglons is a group of islands lying off the S side of L'Aigle. A beacon lies on the SE extremity of the E island of Les Aiglons.

On the SE side of the channel, Ilot Plat lies 0.3 mile WSW of the NW end of Nui Thua Cong.

Ile Rousse lies 0.8 mile E of La Pomme. A bank, with a depth of 1.5m at its outer end, extends 0.5 mile SW of the W end of Ile Rousse. Chenal de la Saone passes between La Pomme and the bank.

Chenal du Bourayne, the continuation NE of Chenal de la Saone, is entered between **Le Vautour** (20°58'N., 107°19'E.)

an islet lying 0.7 mile NE of L'Aigle, and La Regate, 1 mile SE. The channel has a least fairway depth of 9.1m to the entrance of Chenal de Cam Pha, 2 miles NE.

L'Abeille, an islet with a 4.3m shoal patch close NE, lies on the SE side of this channel, nearly 1 mile NE of La Regate. La Ruche, a rock, with a depth of 1.5m, and with an islet close SW, lies 0.7 mile farther NE. A light is shown from the NW side of L'Abeille.

Cam Pha (21°02'N., 107°22'E.)

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4.47 Cam Pha consists mainly of a coaling wharf, built for the export of coal from the mines in the vicinity.

Tides—Currents.—The tidal rise at Cam Pha Port is 4.3m at MHHW.

The tidal currents are strong. The ebb tidal current sets in a SW direction in the S part of Chenal de Cam Pha. Abreast the wharf, the tidal current sets N and S; the ebb current attains a velocity of 3 knots.

Depths—Limitations.—The approach channel is dredged to a depth of 6.7m.

The wharf at Cam Pha Port, 320m long, can berth two vessels alongside, in a depth of 9m. Vessels of up to 50,000 dwt, with a length of 265m and a draft of 11m, can be accommodated.

Aspect.—Chenal de Cam Pha, which is buoyed and marked by ranges, is entered close SE of **Les Ours** (20°59'N., 107°21'E.), the SE of a group of islets which lies on the coastal bank extending over 1 mile offshore. The E side of the channel is bordered by a shoal bank, which extends about 1 mile SW from Le Bouton, an above-water rock, 1 mile ENE of Les Ours.

Ile de l'Angle, 0.7 mile NNE of Les Ours, lies on the outer edge of a bank, which partly dries, on the W side of the channel. A beacon marks the edge of the bank E of Ile de l'Angle.

Ile Jaune lies 0.5 mile N of the wharf at Cam Pha. Ile Verte lies 0.3 mile NE of the S extremity of Ile Jaune. A spit, which dries, extends 0.5 mile S of Ile Verte; a rock, 0.9m high, lies on this spit, 0.2 mile S of Ile Verte.

A rock, with a depth of 3.7m, lies 0.3 mile N of the S extremity of the wharf at Cam Pha Port and about 100m offshore.

Aspect.—Chenal de Cam Pha is marked by buoys, and range lights which are shown only occasionally.

Pilotage.—Pilotage is compulsory. The vessel's ETA should be sent on departure from last port of call and 72 hours, 36 hours, 24 hours, 12 hours, 6 hours, and 4 hours prior to arrival.

The pilot will board at Buoy No. 0, at the entrance to Cua Nam Trieu. In 1984, it was reported that pilots may board 0.5 mile WSW of L'Orange. On leaving, pilots disembark at **Le Cancrelat** (20°50'N., 107°18'E.). See Hai Phong (paragraph 4.28) and Archipel des Fai Tsi Long (paragraph 4.30).

Regulations.—Pratique can not be granted by radio, but must be applied for through the boarding party delegated by the port authority to review all related shipboard documentation and manifests.

Anchorage.—There is good anchorage, in 5.8 to 10.1m, in the N part of Chenal de Cam Pha, but there is very little swinging room.

Directions.—The most frequent route to Cam Pha Port is via Passe de la Perouse and Passe du Casque, then through Passe de la Saone to Chenal du Bourayne and Chenal de Cam Pha to the wharf.

Inner Channels in the North Part of Archipel des Fai Tse Long

4.48 Between the islands in the N part of Archipel des Fai Tsi Long there are several channels, some of which are linked by subsidiary channels. During the Northeast Monsoon these channels offer considerable advantages for shallow-draft and low-powered vessels with local knowledge. There are few aids to navigation and most of the dangers are unmarked. Most of the channels have depths of not less than 4.3m in the fairway, except at the N end of Chenal du Duchaffaut, where there is a bar with a depth of 3m. This bar can be avoided by proceeding to the open sea through Passe des Bruyeres, close N of Ile aux Bruyeres, and then Tsieng Mun.

Chenal du Roc aux Aigles

4.49 Chenal du Roc aux Aigles is entered from W between **Van Duoi** (20°55'N., 107°20'E.) and Ile Rousse, close N. Shoals, with depths of less than 5m, extend nearly 0.5 mile W from the W end of these islands.

Ilot Boise, 38m high, lies 0.8 mile E of Van Duoi. A rock, which dries 0.6m, lies close to the SE side of the channel, on the N end of the foul ground extending almost 1 mile NE of Ilot Boise.

La Brioché, a 91m high islet, lies 1.5 miles ENE of Ilot Boise. Le Coin, 0.3 mile N of La Brioché, is the southeasternmost of a group of islets on the NW side of the channel. Depths of less than 5m extend 1 mile WSW of Le Coin.

The channel then leads NE between **Le Roc aux Aigles** (20°57'N., 107°26'E.), a steep hill, 195m high, on the NW side of Ile Longue, and Le Lapin, a 38m high rock lying 0.3 mile W. The channel continues NE passing between La Hache, 173m high, and La Plate, another islet, 109m high, which lies close NW of the N end of Ile Longue.

L'Enclume (20°59'N., 107°26'E.), a 136m high islet, lies 0.8 mile NE of La Hache, with several other islets between it.

Farther N the channel joins Chenal du Lynx.

Chenal du Lynx

4.50 Chenal du Lynx extends NNE from the NE entrance of Chenal du Roc aux Aigles, and between **L'Isole** (21°00'N., 107°27'E.), a 48m high islet lying 0.8 mile NNE of L'Enclume, and Le Gamin, a 19m high rock, lying 0.6 mile ENE of L'Isole. **La Souris** (21°00'N., 107°28'E.), a prominent rock, 30m high, lies nearly 0.5 mile E of Le Gamin. Le Gland, a 4m high rock which is difficult to distinguish, lies on the W side of the channel, 0.4 mile N of L'Isole.

The least depth in the fairway of Chenal du Lynx is 5.8m and lies 0.3 mile SE of L'Isole.

From a position 0.3 mile E of L'Isole, the channel continues NNE a distance of 3.5 miles to pass close E of **Ile du Coude** (21°03'N., 107°28'E.). On this stretch the channel passes close E of a group of islands that lie together on the W side of the

channel, 1 mile N of Le Gamin. The channel continues 5.5 miles NE past Ile du Coude along the E side of the shallow bank separating it from Chenal du Duchaffaut.

4.51 Le Grande Ile (21°04'N., 107°30'E.), 212m high on its W end, and Le Diademe, an 89m high islet, lie 0.3 mile, and 1.7 miles, respectively, NE of Ile de la Saone.

Le Chat, a 58m high islet, lies 0.4 mile NNE of the W extremity of Le Grande Ile. A bank with depths of less than 5.5m, extends about 0.3 mile SW of Le Chat.

From a point lying 0.3 mile SW of Le Chat, round the islet at a distance of about 100m from its E side, and from a position about 0.3 mile NE of the islet, continue in a NE direction with the SE extremity of Le Chat bearing 226° astern, in range with the SE extremity of Ile du Coude.

On the NW side of this part of the channel, Basse du Diademe, with a depth of 5.2m, lies 0.3 mile NW of Le Diademe. Basse du Lynx, lying 0.2 mile farther W, is marked by a beacon. Le Lion, a 96m high islet, lies about 0.2 mile farther W.

Le Pate, an 84m high islet, and Le Donjon, 88m high, lie 1.3 miles and 2 miles, respectively, NE of Le Lion, and lie on the bank separating Chenal du Lynx from Chenal du Duchaffaut.

After passing between Basse du Diademe and Le Diademe, the channel takes a more N course and passes between Le Donjon and Le Castel, a 109m high islet lying 0.8 mile E. The channel then joins Chenal du Duchaffaut.

Chenal du Kersaint

4.52 Chenal du Kersaint, with a least depth of 7.3m in the fairway, branches off Chenal de la Saone, 0.3 mile NW of the NW end of Ile Rousse, and leads E between that island and **L'Amande** (20°57'N., 107°20'E.), which lies 0.2 mile N of the W part of Ile Rousse. A rock, with a depth of 3.7m and marked by a buoy, lies 0.1 mile S of L'Amande.

La Limace, an island, lies on the N side of the channel, nearly 1 mile ENE of L'Amande. Le Doigt, an above-water rock, lies 0.4 mile E of the N end of La Limace. Le Capitole, an islet, lies 0.8 mile farther ENE, on the N side of the channel. Shoals, which partly dry, lie on the S side of the channel, about 0.5 mile S and SSW of La Limace.

Abreast the shoals S of La Limace the channel leads NE, with the summit of **Le Colosse** (Colosse) (21°01'N., 107°27'E.), bearing about 051°, until reaching a point 1.2 miles SW of that island, when it takes a more N course and joins Chenal du Duchaffaut.

Le Dome (21°00'N., 107°26'E.), a 123m high island, lies on the SE side of the channel. A rocky shoal, which dries 3.4m, lies 0.4 mile N of Le Dome, and is marked by a beacon. Chenal du Kersaint connects with Chenal du Duchaffaut about 0.2 mile W of the shoal.

Chenal du Duchaffaut

4.53 Chenal du Duchaffaut, the continuation of Chenal du Kersaint, leads in a NNE direction for a distance of 6 miles between the islands and rocks off the SE side of Dao Cai Bau (Ile de Ke-Bao), and then for 10 miles along the SE side of that

island, about 0.5 mile offshore, as far as the S entrance of **Cua Mo** (21°13'N., 107°37'E.), where it accesses the sea. Off Cua Mo there is a bar, over which there is a depth of 4.6m, which is the shallowest part of the channel.

The channel leads between **Le Colosse** (21°01'N., 107°27'E.) and Le Maillet, another island, 63m high, 0.5 mile W of the S extremity of Le Colosse. The channel then continues NNE, passing E of Ile aux Trois Sommets, lying 2.2 miles NNE of Le Maillet. From abreast Ile aux Trois Sommets the channel trends more N to a position 0.2 mile E of Le Marron, a 20m high islet, lying 1 mile farther NNE.

Le Doigt, an islet, 63m high, lying 0.7 mile NNE of Le Marron, is the SE of a group of islets NW of the channel.

From abreast Le Marron, the channel leads NE and passes between L'Isole, a 45m high islet, and a 2.4m high rock lying 0.1 mile ESE. The fairway in this stretch leads across patches with depths of 5.5m. L'Isole lies 0.5 mile NW of **Ile du Marquis** (21°05'N., 107°30'E.). Basse de l'Isole, with a depth of 2.7m, lies 0.3 mile E of L'Isole. Lying 0.2 mile N of Basse de l'Isole, are depths of less than 5.2m in the fairway of the channel.

From a position lying 0.3 mile NE of L'Isole, the channel continues NE for about 3 miles to abreast **Le Donjon** (21°07'N., 107°32'E.). Chenal du Duchaffaut joins Chenal du Lynx about 1 mile NNE of Le Donjon.

From abreast Le Donjon, the channel continues 8 miles NE to abreast the NE extremity of Dao Cai Bau, the S entrance point of Cua Mo. A shoal, with a depth of 4.2m, lies 0.3 mile offshore, about 1.5 miles SW of the NE extremity of Dao Cai Bau. The SE extremity of **Ile de la Plage** (21°14'N., 107°38'E.) bearing 035°, and in range with the partly wooded summit of **Ile du Grand Singe** (21°17'N., 107°41'E.), leads close SE of the above shoal.

A marked shoal with a least depth of 4.6m extends from the NE extremity of Dao Cai Bau, SE to Hon Chin, obstructing the fairway. Vessels may bypass this shoal and proceed to the open sea via Passe des Bruyeres and Tsieng Mun. Passe des Bruyeres leads close around the N end of **Ile aux Bruyeres** (21°09'N., 107°35'E.), with a fairway depth of 4.5m.

Off-lying Islands and Dangers in the East Approach to Archipel des Fai Tsi Long

4.54 Iles Kao Tao, a group of islands located 7 to 14 miles offshore, lies 20 miles NE of **Dao Lai Tao** (20°43'N., 107°28'E.). The islands are nearly bare of trees, the larger ones being cultivated, and form a contrast with the islands near Cap Quan Lan, which are densely wooded. The islands are fairly steep-to on the SE side, and lie close within the 20m curve. The channels between the islands are encumbered with numerous dangers, and vessels without local knowledge should not navigate between the islands.

Dao Ching Lan Xan (Ile Tching Lan Xan) (21°01'N., 107°50'E.), the SE island of the group, has a range of hills extending the length of the island, and attains an elevation of 210m near its middle.

Dao Cu Xa (Ile Cu Xu), an island with a conical summit, 166m high, near its N end, lies 1 mile W of Chao Chay Toc, the SW extremity of Dao Ching Lan Xan.

Anchorage for vessels with local knowledge, having a draft of 4.5m, can be taken between Dao Ching Lan Xan and Dao Cu Xa.

A rock, which dries 0.9m, lies 2 miles NNW of the S extremity of Dao Cu Xa; a detached 5.5m patch lies 1.5 miles W of the rock.

Rocher Ulipai, 0.9m high, lies 2.8 miles NW of the N extremity of Dao Cu Xa. A rock, which dries 2.4m, and another rock, which dries 1.8m, lie 0.3 mile N and 0.2 mile S, respectively, off Rocher Ulipai.

Roche du Pou, with a depth of 4.6m, lies 1.2 miles NW of Rocher Ulipai.

Vang Chao lies 4 miles NW of Xan Chao, an island lying off the NW end of Dao Ching Lan Xan. **Txat Xing Chao** (21°08'N., 107°48'E.), 1.5 miles NW of Vang Chao, is the largest of a group of islets off the NW side of Iles Kao Tao. A reef on which lies several islets, extends nearly 0.5 mile NNE of Txat Xing Chao.

Ma Chao (21°09'N., 107°51'E.), 106m high, lies 3 miles NE of Txat Xing Chao, and is the N island of Iles Kao Tao. A reef, on which there are some islets, extends about 0.5 mile from the NE end of Ma Chao.

Dangers between Iles Kao Tao and Tsieng Mun.—Banc Intermediaire, which has a least depth of 3m, lies about midway between Rocher Ulipai and Ile Ba Mun. Roche Nam, with a depth of 3.7m, lies at the NE end of this bank, nearly 4 miles ESE of Pointe de Tsieng Mun, the SE entrance point of Tsieng Mun. Roche du Nhatrang, with a depth of 2.7m, lies 2 miles SE of the same point.

Islands and Channels on the East Side of Archipel des Fai Tsi Long

4.55 Dao Cai Ban (Ile De Quan Lan) is hilly, rising to an elevation of 195m about 2 miles NNE of **Cap Quan Lan** (20°59'N., 107°29'E.). Sommet de l'Entree, 96m high, lies at the N extremity of the island.

Pak Ha Mun (20°58'N., 107°34'E.), a body of water from which Chenal de la Surprise is accessible, is identified by Sommet de l'Entree and La Bosse, a 220m high hill, about 1 mile NE at the S end of Ile Ba Mun. Sommet Pak Ha Mun, 401m high, in the N part of Ile de la Table, and the flat summit of the same island, 436m high, can also be identified rising 2.5 miles NNW and WSW, respectively, of Sommet de l'Entree.

Le Fer a Cheval, a group of black jagged rocks, lie about 1 mile NW of the entrance. Pointe Cormoran lies 0.5 mile farther N.

Within the entrance of Pak Ha Mun the land is high on both sides; the E side is densely wooded and on the W side the slopes of the hills are clearer. The middle of Pak Ha Mun is encumbered by a narrow sand bank, with depths of less than 3.7m, which extends 1.8 miles S from La Tortue, a 27m high island, lying 0.8 mile NNE of Pointe Cormoran.

The NE end of Chenal du Jaguar lies between Sommet de l'Entree and Le Fer a Cheval. In this vicinity, Ile de la Table and Dao Cai Ban are connected by a sandbank which has depths of less than 1.8m. Chenal de Jaguar is available only for shallow-draft vessels with local knowledge.

Anchorage.—Vessels can anchor, in depths of 10 to 12m, between Le Fer a Cheval and the sand bank lying 0.4 mile E. A

more sheltered anchorage lies E of the sand bank, abreast Anse du Pirate, in depths of 6 to 7m. The bottom is mud, good holding ground, but the tidal currents are strong and the sea is rough during the Northeast Monsoon.

Vessels entering from seaward should steer for Sommet Pak Ha Mun bearing 313°.

Chenal de la Surprise

4.56 Chenal de la Surprise is entered between Pointe Cormorant and Pointe Ducouedic, 0.7 mile ENE. From the entrance of Pak Ha Mun, the channel leads N, passing E of the sandbank extending 1.7 miles S of La Tortue, and E of the bank, with depths of less than 5.5m, which extends off the E side of Ile de la Table from La Tortue to **La Gourde** (21°02'N., 107°34'E.). An islet, 20m high, lies on the bank about 0.3 mile NNE of La Tortue. A rocky shoal, which dries 2.7m, lies on the bank, about 0.7 mile SSW of La Gourde.

The channel passes 0.3 mile E of La Gourde, then passes close E of La Tour, a 135m high island, lying 1.5 miles farther NNE.

There is a least depth of 5.8m in the fairway of the N part of Chenal de la Surprise, and the depths are not less than 4.9m for about 100m on either side.

After passing E of La Tour, the channel is navigated by keeping the SE extremity of that island bearing 204° astern, and in range with La Gourde. Then, from abreast **Ile Noire** (21°05'N., 107°35'E.), the channel leads in a more E direction, with the S extremity of Ile Noire bearing 217° astern.

Ile du Doigt, 99m high, lies on the NW side of the channel, with several islets close NE, one of which is 122m high. The NE of these islets lies 1 mile W of the N extremity of Ile Ba Mun. Rocher Tsieng Mun, 48m high, lies 0.3 mile NNE of the latter islet.

Les Freres, two islets close together, lie on the SE side of the channel. The N islet is 51m high, and lies 0.7 mile WSW of the N extremity of Ile Ba Mun.

Chenal de la Surprise enters Tsieng Mun between Rocher Tsieng Mun and Pointe de Tsieng, the N extremity of Ile Ba Mun, from a position 0.2 mile E of Ile du Doigt, with the S extremity of Ile du Doigt bearing 236° astern.

Chenal de la Carabine

4.57 Chenal de la Carabine is entered from Chenal de la Surprise between **La Gourde** (21°02'N., 107°34'E.), the outermost islet off the NE end of Ile de la Table, and Le Cone, an islet, 56m high, lying 0.5 mile N. The channel trends W and SW, and connects with Chenal du Lynx and Chenal du Roc aux Aigles. The least depth in the fairway is about 6.7m.

La Quille, a 22m high rock, lies close off the NE end of Ile de la Table, about 0.3 mile NW of La Gourde. Ile Plate lies on the N side of the channel, 0.2 mile NW of La Quille. The islet of Le Chateau Fort lies 0.1 mile farther NW.

A shoal, with a least depth of 2.7m, lies 0.3 mile W of the S extremity of Le Chateau Fort. La Touffe, a 13m high island, with a white rock on its S end, lies in mid-channel, about 0.5 mile farther W. A bank, with a depth of 4.6m, and a bank with a depth of 3m, extend 0.1 mile W and E, respectively, of La Touffe. A shoal, with a least depth of 0.9m, lies about 0.2 mile

S of La Touffe. The main channel lies S of La Touffe, but vessels with local knowledge may pass about 150m N of it. The white rock on the S end of La Touffe bearing 274° leads from Chenal de la Surprise to La Touffe.

The channel trends SW and divides into two branches after passing La Touffe. The branches pass on either side of a bank, on which there are three islets. Chenal du Sud, leading SW between the islands and the NW side of Ile de la Table, is only available at LW for vessels with local knowledge, drawing less than 4.6m. Le Schako, 43m high and the northeasternmost islet, lies 1.2 miles SW of La Touffe. La Chimere, a 95m high islet, lies 0.3 mile SW of Le Schako, and Le Meutriere, a small islet, 74m high, lies 1 mile farther SW. A rock, awash, lies 0.2 mile SW of Le Meutriere.

Chenal de la Carabine leads SW between the above dangers and a chain of islands, lying on a shallow bank extending SW from **Ile Madeline** (21°06'N., 107°34'E.), and forming the NW side of the channel. Ile de Amers, Le Lieve, and La Fourmi lie on the above bank closest to the fairway. Ile de Amers lies 0.5 mile W of La Touffe. Le Lieve, a 24m high islet, lies 0.3 mile NW of La Meutriere. La Fourmi, a 5.5m high rock, lies close off the edge of the bank, 1 mile SW of La Meutriere.

The channel passes between La Meutriere and La Lieve and then SE of La Fourmi. It then passes N of La Souris and then on either side of Le Gamin, about 0.5 mile farther W. The latter two rocks are described with Chenal du Lynx (paragraph 4.50). Chenal de la Carabine joins Chenal du Lynx W of Le Gamin.

Tsieng Mun

4.58 Tsieng Mun (21°08'N., 107°38'E.) is entered between Pointe de Tsieng Mun, the N extremity of Ile Ba Mun, and Ile Boise, about 0.8 mile NE. This pass leads to Passe des Bruyeres and the N end of the channels running through the E part of Archipel des Fai Tsi Long. A spit, with a depth of 2.7m, extends 0.1 mile NE of Pointe de Tsieng Mun.

Anchorage.—Anchorage can be taken, in 14 to 18m, good holding ground, close within the entrance of Tsieng Mun. Shallow draft vessels can find better shelter in Chenal de la Surprise, close SE of Ile du Doigt, which lies 1 mile SW of Pointe de Tsieng Mun.

Iles Kao Tao and the dangers W of them have been previously described in paragraph 4.54.

Passe de Bruyeres

4.59 Passe de Bruyeres is a narrow shoal channel, with a least depth of 4.6m. It leads WNW from a position 0.5 mile NNW of Pointe de Tsieng Mun, passing N of Rocher Tsieng Mun, lying 1 mile WNW of the point. The channel then passes 0.1 mile NE of the reef extending from the NE end of Ile aux Bruyeres, and SW of an extensive bank which lies S of Hon Chin. The channel is less than 0.2 mile wide here, and there are depths of less than 0.9m on the S and SW sides of the latter bank. The channel then leads into Chenal du Duchaffaut.

Directions.—From Tsieng Mun, pass N of Rocher Tsieng Mun, then bring the N end of the latter rock to bear 132° astern, and in range with a white pyramidal structure on the NW end of Ile Ba Mun. Steer on this range for about 1 mile. Then bring a white mark on the N extremity of the northeasternmost islet

of the Ile du Doigt group in range 148°, astern, with a pyramidal structure on the S islet of Les Freres. This course leads N of Ile aux Bruyeres into Chenal du Duchaffaut.

Dao Cai Bau to the Chinese Border

4.60 The coast between the NE extremity of **Dao Cai Bau** (Ile de Ke-Bao) (21°31'N., 107°37'E.) and the Chinese border, about 16 miles NE is backed by hills, covered with trees and dense jungle, extending to the coast, which is bordered by mangroves. A range of mountains lies between 8 and 18 miles inland, rising to an elevation of 1,507m, about 21 miles N of the NE end of Dao Cai Bau, but they are only visible from seaward in clear weather.

A chain of long and narrow islands, with hills about 100 to 150m high, and usually very wooded, lie a short distance off and parallel with the coast. Vinh Thuc (Ile du Kersaint), the E island of the chain, has a conspicuous peak, 159m high, at its SW extremity. Xinh Moui Tiai (Gai Tien Xa) (Ile du Chateau Renaud) is separated from the SW end of Vinh Thuc, by Passe Fu Tai Mun (Fu Tai Mun), a narrow pass.

Off-lying Islands and Dangers

4.61 Dao Lo Chuc San (Ile Lo Chuc San) (21°14'N., 107°58'E.), 186m high, is the highest of a group of islands and rocks, fringed by foul ground, and lies 6 miles NE of Iles Kao Tao. Several 10m patches lie between Iles Kao Tao and the group.

Tai Shan Tao, 141m high, the SE island of the group, is located 3 miles SE of Dao Lo Chuc San. Rocher Occidental, 5m high, lies 0.5 mile W of the W extremity of Tai Shan Tao. A 10.1m patch lies 2.5 miles S of the island.

Im Shan, a 59m high island, lies 0.4 mile NNW of Tai Shan Tao. A reef, which dries 3.4m, lies 0.3 mile E of the S extremity of the island, and a group of rocks, 4.9m high, lies 0.2 mile farther E, with a 4.9m patch close NE.

Anchorage.—Anchorage, affording good shelter during the Northeast Monsoon, can be taken, in a depth of 10m, mud and sand, 0.5 mile SE of the W extremity of Dao Lo Chuc San, about 0.2 mile offshore.

Sam Hai Pai, a reef with two heads, which dries 0.3m, lies 5.5 miles ENE of the N extremity of Dao Lo Chuc San.

Pak Son Kong Pai, a dangerous rock, 0.3m high, with a reef, which dries 1.2m close W, lies 10 miles NE of Sam Hai Pai, and 7 miles S of Pei Lung Wei. A rocky shoal, with a depth of 1.8m, lies 1 mile E of Pak Son Kong Pai, and a rocky shoal, with a depth of 6.1m, lies 1 mile W of the same rock.

Approaches to Van Hoa and Rade de Tien Yen

4.62 Van Hoa is approached via **Kuai Chin Mun** (21°15'N., 107°42'E.), N of Ile des Singes (Ile aux Singes), then through Cua Mo. It can also be approached via Tsieng Mun, Passe de Bruyeres and the channels through Archipel des Fai Tsi Long.

The seaward approaches to Kuai Chin Mun are encumbered with numerous shoals with depths of less than 5.5m. Le Grand Banc, with a least depth of 3.4m, lies with its W edge about 0.5 mile W of Ile aux Sangliers. **Le Petit Banc** (21°12'N.,

107°45'E.), with two heads, with depths of 2.1m and about 0.7 mile apart, lies 4 miles ESE of Ile aux Singes. Le Banc du Milieu, a sandbank, with a least depth of 1.2m, lies 4.5 miles E of Ile aux Singes. Banc de la Clocheterie, with a least depth of 3m, lies 2.5 miles SSE of the E end of **Iles Tsin San** (21°17'N., 107°47'E.).

The fairway depths in Kuai Chin Mun are over 5.5m, with the exception of a 4.5m patch lying 1.7 miles W of the N extremity of Ile aux Singes. Kuai Chin Mun should only be used by shallow draft vessels having local knowledge.

Cua Mo is entered between the NE extremity of Dao Cau Bau and Ile Verte, 0.5 mile NNE. The channel passes NW of **Ile des Pirates** (21°13'N., 107°35'E.), which lies close W of the NE extremity of Dao Cai Bau. Iles des Pirates should be passed 0.1 mile off to avoid the extensive sandbank, with depths of less than 5.5m, lying 0.3 mile NW of that island.

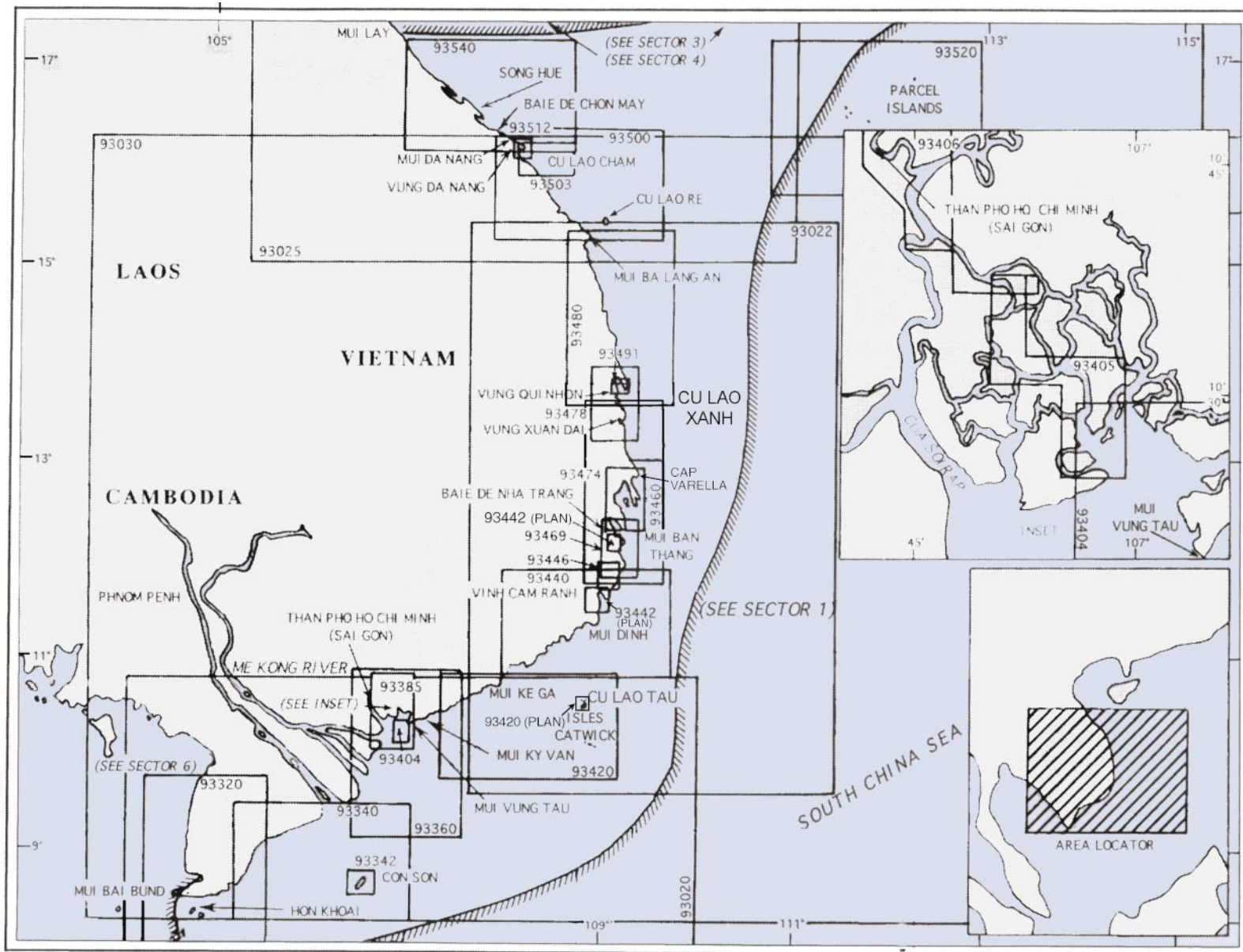
Van Hoa and Rade de Tien Yen

4.63 Van Hoa (Port Wallut) (21°12'N., 107°34'E.) (World Port Index No. 57720), a coaling station, reported in disrepair, is situated on Dai Cai Bau, S of the SW extremity of Iles des Pirates. There is a stone coaling wharf, 60m long, with a depth of 4.9m alongside.

Pilotage.—Pilotage is not compulsory, but can be obtained at Hon Dan with advance arrangement. (See Hai Phong, paragraph 4.28).

Anchorage.—Anchorage can be taken, in 7.3 to 12m, good holding ground, 0.5 to 1 mile W of the SW extremity of Ile des Pirates.

Rade de Tien Yen provides anchorage about 3 miles NW of Ile des Pirates, but vessels without local knowledge should not proceed above Van Hoa.



Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.
SECTOR 5 — CHART INFORMATION

SECTOR 5

VIETNAM—CENTRAL AND SOUTH COASTS

Plan.—This sector describes the central and S coasts of Vietnam, and includes the port of Sai Gon (Sai Gon). The off-lying islands and banks off the SE coast of Vietnam are first described; these include Dao Phu Qui, Iles Chadwick, Royal Bishop Banks and Con Son. The central and S coasts of Vietnam are then described. The arrangement of the latter part is SE, S, then SW from **Mui Lay** (17°05'N., 107°07'E.), the W entrance point of the Gulf of Tonkin to Mui Bai Bung, the SW extremity of Vietnam.

General Remarks

5.1 The coast from Mui Lay to Mui Da Nang is generally low with sand dunes, 20 to 30m high, with the exception of the mountains near Mui Chon May Dong.

The coast of central Vietnam to **Mui Vung Tau** (10°19'N., 107°05'E.) is for the most part mountainous, and consists of a succession of jagged cliffs and wind-swept sand hills. There are many bays and secure anchorages S along the coast to **Mui Dinh** (11°22'N., 109°01'E.).

The coast from Mui Vung Tau to Mui Bai Bung is low and at times inundated by the sea, and in most parts the tops of the trees are only just visible at a distance of up to 12 miles. This coast is fringed by banks of sand, with depths of 1.8 to 5.5m, which extend offshore up to 15 miles off the delta of the Mekong.

Caution.—Mariners are cautioned that unknown dangers may exist in the approaches to the mouths of the Mekong between the meridians of **Mui Bai Bung** (8°36'N., 104°43'E.) and **Cu Lao Thu** (Dao Phu Qui) (10°33'N., 108°56'E.) and also that less depths than charted may exist.

Vessels navigating within 25 miles of the coastline should exercise extreme caution when N of the Con Son Islands, as numerous dangerous wrecks and obstructions lie in these waters.

Off-lying Islands and Banks

5.2 Cu Lao Thu (Dao Phu Qui) (10°32'N., 108°57'E.), an island with two hills near its N end, lies 40 miles off the coast of Vietnam. The NE hill, 91m high, is conical and several masses of rock near its summit give it a jagged appearance. The SW hill, 108m high, has a round top. The island has been reported to be a good radar target at 18 miles.

Ilot du Sud, 47m high, lies near the center of a reef extending 1.5 miles SSE of the island. Some rocks, one of which is 22m high, lie on the outer edge of the coastal reef which extends 0.5 mile NE of the island.

Anchorage.—During the Northeast Monsoon, there is fair anchorage, in depths of 24 to 29m, sand and shells, off the sandy shore forming the W and SW sides of the island. The best position is in depths of 18 to 26m, just S of the SW extremity of the island, about 0.5 mile off the coastal reef.

Anchorage can be taken during the Southwest Monsoon off the NE end of the island, in depths of 26 to 28m, but the bottom is rocky, the holding ground is poor, and it cannot be recommended as an anchorage. There is a better anchorage, however, with the 22m rock bearing 170° distant about 1 mile.

Caution.—A mined danger area lies close S of Ilot du Sud. The area is about 6 miles N to S and 5 miles E to W.

5.3 Rocher Eleve, 20m high, lies 5 miles NW of Cu Lao Thu. Soundings of 11 to 13m lie within 1 mile E and W of the rock. A depth of 12.8m lies on a bank midway between Cu Lao Thu and Rocher Eleve.

Banc Hollandais consists of coral and has a least depth of 2m about 15 miles WNW of Cu Lao Thu. There are depths of 4.6 to 9m on its SE side, which is very steep-to.

Depths in the channel between Banc Hollandais and Rocher Eleve are very irregular, varying from 12 to 50m. A bank, with a depth of 11m, coral, and a bank with 15.8m, lie 4 miles N and 6 miles NNW, respectively, of the shallowest part of Banc Hollandais.

Vessels should give Banc Hollandais a wide berth as soundings are so irregular in its vicinity that it cannot be approached with safety.

Banc Rivier, 10 miles WNW of Banc Hollandais, together with the banks NE and SW, will be described with the mainland beginning in paragraph 5.41.

Banc de la Marne, 21 miles WSW of Cu Lao Thu, has a least depth of 15.8m. It has not been thoroughly examined. A depth of 13.7m, existence doubtful, and a depth of 16.5m (reported 1964), lie 8 miles ESE of Banc de la Marne.

Iles Catwick

5.4 Iles Catwick (10°00'N., 108°59'E.), S of Cu Lao Thu, lie in a region of irregular depths in which volcanic activity has been noted. Great caution is necessary when navigating in the vicinity. Iles Catwick consists of three islands.

Poulo Sepate (Poulo Sapate) (9°58'N., 109°05'E.), 111m high and barren, is the E and highest of Iles Catwick. Viewed from some directions, the island resembles a shoe and from others it appears as a square column, while from E it appears as a pyramid.

The island is steep-to, except for a rock awash, close E of its S extremity. Anchorage can be taken, in 29m, E of the island, but the holding ground is not good. Poulo Sepate has been reported to be a good radar target at a distance of 19 miles.

Rocher Julia (Julia Shoal), with a depth of 5.8m, coral, lies 3.5 miles SE of Poulo Sepate. A depth of 28m lies 5 miles SSE of Poulo Sepate, in an area in which submarine volcanoes have been reported. A 20m depth was reported (1978) 33 miles SSE of Poulo Sepate.

Petite Catwick, a pyramidal rock, 17m high and steep-to, lies 2 miles NW of Poulo Sepate. Unsheltered anchorage can be taken, in a depth of 20m, about 0.2 mile NE of the rock.

Grande Catwick (10°03'N., 108°54'E.), a round, barren rock, 60m high, lies 9.5 miles WNW of Petite Catwick. The island is steep-to, except for a reef extending about 0.2 mile SE. Anchorage can be taken, in a depth of 40m, about 0.2 mile N of the island. Grande Catwick has been reported to be a good radar target at 20 miles.

La Paix, a rock which dries 1.8m, lies midway between Grande Catwick and Petite Catwick. The rock is small and steep-to; the sea always breaks on it except in calm weather.

Rocher Yusun, 17 miles N of Petite Chadwick, is a coral patch with a depth of 6m. In fine weather it is not easily seen, but in the strength of the monsoon the sea has been observed to break on it.

Currents in the vicinity of Iles Catwick are at times very strong. They are quite irregular close in around the islands.

An unlit mooring-type buoy was reported (1989) in a position about 39 miles WSW of Grande Catwick.

Royal Bishop Banks

5.5 Royal Bishop Banks, composed of coral, has a least depth of 7.9m. The following depths lie at distances and bearings from the least depth:

1. Depths of 12.8m and 16.1m lie 13.5 and 20.5 miles, respectively, ENE.
2. A depth of 13.7m lies 7.5 miles ESE.
3. Depths of 16.8m lie 14 and 22 miles S.
4. A depth of 9.2m lies 7 miles SW.
5. A depth of 10.4m lies 11.5 miles WSW.

Numerous platforms have been established in the Royal Bishop Banks.

Banc Wallace (9°29'N., 107°38'E.), with a least depth of 8.5m, lies 31 miles WSW of the least depth of Royal Bishop Banks.

Banc Callou (Callou Bank), with a least depth of 9.2m, lies 11 miles SSW of Banc Wallace.

A shoal, with a depth of 12.8m (reported 1959), lies 19 miles SE of Bank Callou and a dangerous wreck lies 22 miles ENE of the bank.

Banc de l'Astrolabe consists of three detached coral reefs. The E reef (10°06'N., 107°58'E.), with a least depth of 6.7m, lies 25 miles NNW of the least depth of Bishop Banks. The W reef has a least depth of 4.6m and lies 11 miles W of the E reef. The middle reef, with a least depth of 6.7m, lies about midway between the E and W reefs. Banks, with least depths of 8.5m and 8.2m, lie 8 and 10 miles, respectively, N of the middle reef. A depth of 7.3m was reported (1972) to lie 24 miles NE of the middle reef.

A 12.8m patch lies 8 miles ESE of the E reef.

Con Son Islands (8°42'N., 106°37'E.)

World Port Index No. 57550

5.6 This group consists of about 12 islands and islets, lying 45 miles from the coast of Vietnam. They are located near the track of vessels proceeding between Singapore and Sai Gon (Sai Gon). The islands are of sufficient height as to be conspicuous in clear weather from a considerable distance.

They serve as a useful mark in making a landfall on the mainland coast from S. Con Son has been reported to be a poor radar target at a distance of 29 miles, and a good radar target at 20 miles.

Con Son, the principal and largest island of the group, is mountainous. The summit of the island, 549m high and flat, lies in the S part of the island. A rocky peninsula, terminating in Mui Con Chim (Mui Ta Be), divides the E coast into two bays, Vinh Con Son and Vinh Dong Bac. The village of Con Son, at the head of Vinh Con Son, contains a penitentiary.

Most of the islets off Con Son are high and wooded.

Rocher Blanc (Hon Trung) (8°46'N., 106°43'E.), 57m high, lies 3 miles ENE of the NE end of Con Son.

Hon Cau, 221m high, lies 4.5 miles E of Mui Con Chim. Hon Bai Canh, 2 miles WSW of Hon Cau, lies in the approach to Vinh Con Son, and consists of two hills joined by a narrow isthmus. A light is shown from the islet.

A 13.7m depth was reported (1968) about 32 miles E of the NE end of Con Son.

Hon Chac Lon and Hon Tai Lon lie 0.3 mile SE, and 1 mile ESE, respectively, of the SE extremity of Con Son. Hon Tho (Hon Nghe) lies near the extremity of a reef extending about 0.2 mile E of Hon Tre Nho.

Hon Ba lies close off the SW side of Con Son, to which it is joined by a drying bank. La Dent, 330m high, the summit of Hon Ba, lies near the E end of the islet.

Hon Tre Lon, 141m high, with an islet close off its E extremity, lies 2.5 miles N of Hon Ba, off the W side of Con Son; Hon Tre Nho lies 2.5 miles farther NE. Hon Nghe lies near the extremity of a reef extending 0.2 mile E of Hon Tre Nho.

Vinh Con Son

5.7 Vinh Con Son (Vung Con Son), the S of the two bays on the SE side of Con Son, is entered between Mui Con Chim and Mui Ca Map (Bai Nhut), the SE extremity of Con Son. The bay is open SE, and is recommended only during the Southwest Monsoon.

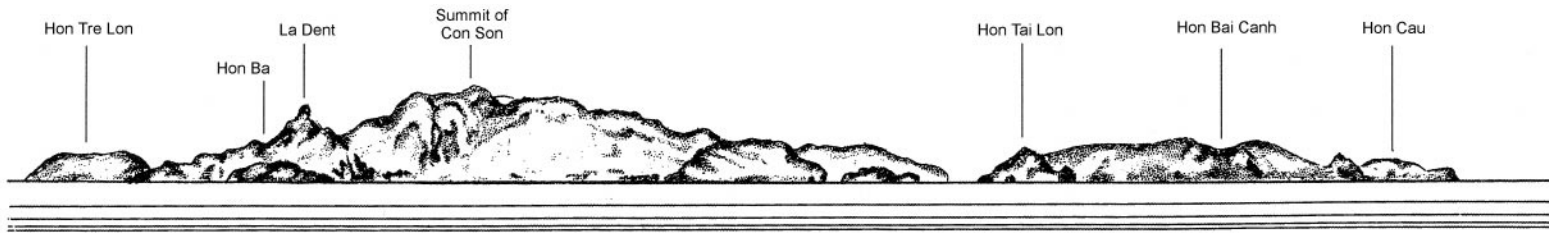
The N part of Vinh Con Son, inside the line joining the entrance points is encumbered with an extensive shore flat and many detached shoal patches, some of which dry. Banc du Convict, which dries 0.6m, lies near the outer edge of this area, 1.8 miles SW of Mui Con Chim.

Banc des Tortues fronts the bay and extends from the W side of Hon Bai Canh to the N end of Hon Tai. It has general depths of 5.5 to 11m, with shoal patches of less than 5.5m.

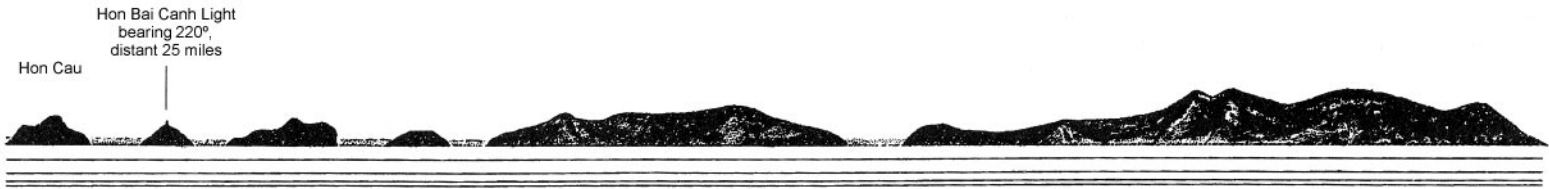
Rocher du Courier, with a depth of 5.8m, lies 1 mile WSW of the W extremity of Hon Bai Cahn, with a 9.2m patch about 1 mile farther SW; they lie in the deep passage between Banc des Tortues and the shallow patches of Vinh Con Son.

Entrances.—There are three entrances into Vinh Con Son. The NE entrance, wide and deep, lies between Mui Con Chim and Hon Bai Canh. Care must be taken to avoid Rocher du Courier.

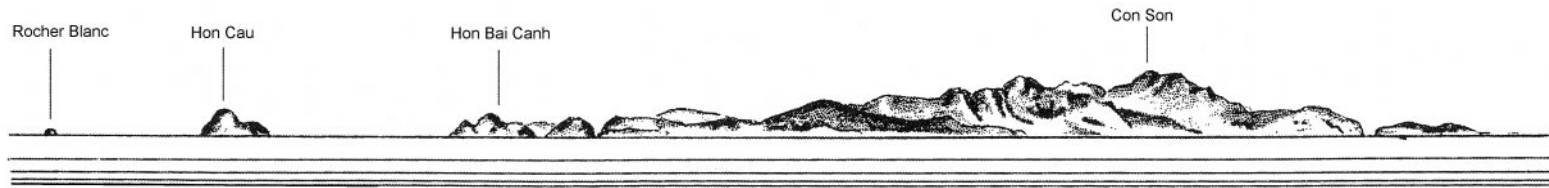
The SE entrance is entered by passing 0.1 mile NE of Hon Tho, midway between the islet and the shoal with depths of 4.9 to 5.2m, which lies near the SW end of Banc des Tortues. There are least depths of 9.2m in the fairway of this channel.



Con Son Islands from SW



Con Son Islands from NE



Con Son Islands from N, distant 8 miles

The SW entrance lies between Mui Ca Map and Hon Chat. The channel is narrow and deep, but the depths decrease somewhat rapidly N of the entrance.

Aspect.—Lights, in range bearing 339°, situated at the head of the bay near the town of Con Son, lead to Pierre Blanche Anchorage. The light structures are conspicuous by day.

A radio tower exhibiting aircraft warning lights stands at the head of the bay.

A light shown from a large white rock is situated 1.2 miles S of the range lights.

Anchorage.—Deep-draft vessels, which must enter by the NE entrance, can find a good berth, in 11 to 12.8m, with the summit of Hon Tai bearing 182°, and Hon Bong Lan bearing 095°. The latter is a small islet lying 0.3 mile S of the SW end of Hon Bai Canh.

Vessels of moderate or light draft should anchor W of the above position, in depths of 8.5 to 9.4m, to avoid the sea during the strength of the Southwest Monsoon. The squalls are strong there, but the holding ground is good, consisting of gray mud.

Anchorage can be taken in Pierre Blanche Anchorage, in depths of 6.4 to 7.3m, with the pier at Con Son bearing 010°, distant 0.8 mile. The entrance range leads clear of Rocher du Milicien, which dries.

Vinh Dong Bac (Ving Dong Bac), immediately NE of Vinh Con Son, offers convenient anchorage during the Southwest Monsoon. The bay is free from dangers, but the depths decrease rapidly within the 10m curve. Vessels should therefore anchor, in a minimum depth of 13m, mud. A dredged and buoyed channel leads to the river entrance.

5.8 Ben Dam (Baie du Sud Ouest) (8°40'N., 106°32'E.) is formed between the SW side of Con Son and Hon Ba, close SW. The bay is well-sheltered by the surrounding hills, except from NW, but the wind is seldom strong from that quarter. Anchorage can be taken, in 11 to 13m, good holding ground, gravel and mud. The head of the bay narrows and dries.

Off-lying islets.—**Hon Trung Lon** (8°36'N., 106°09'E.), the NE of two islets, is 47m high and round, with the upper half covered with vegetation. It lies 24 miles W of the Con Son Islands.

Hon Trung Nho, lying 3.5 miles SW of Hon Trung Lon, is 12.8m high, with patches of vegetation. It appears white from E, and the sea breaks heavily on its E side during high winds.

The above islets have been reported to be good radar targets at 17 miles.

A sounding of 8.2m was reported (1965) to lie 13.7 miles SSE of Hon Trung Lon.

Mui Lay to Vung Da Nang

5.9 Mui Lay (17°05'N., 107°07'E.), with Hon Co and the mountains inland, has been described in paragraph 4.10.

The coast between Mui Lay and Mui Chon May Tay, 65 miles SE, is low and sandy, with intermittent sandhills. It offers no anchorage during the Northeast Monsoon, but anchorage is possible anywhere off the coast during the Southwest Monsoon, in suitable depths. There are no known sunken dangers. The high mountains inland are often hidden by mist, particularly during the Northeast Monsoon.

Cua Tung, 4.5 miles S of Mui Lay, is the outlet of Song Ben Hai, and is often marked by breakers. The river is only accessible to boats with drafts up to 1.8m.

Cua Viet, 12 miles SSE of Mui Lay, is often marked by breakers and has a bar, with a depth of 1.5m, lying 0.8 mile E of the entrance and subject to change.

The coast between Cua Viet and Cua Thuan An, 32 miles SE is a sandy plain with fishing villages near the shore.

A depth of 14m lies 21 miles ESE of the entrance to Cua Thuan An.

Cua Thuan An (16°34'N., 107°38'E.) is the entrance to Song Huong, which provides access to the city of Hue (16°29'N., 107°35'E.). During the Northeast Monsoon, the sea breaks on the bar and it may become impassable. A barrier, with a number of openings through it, stretches across the inner end of Cua Thuan An. During the Southwest Monsoon, the river can probably be entered by vessels with a draft of 3m, but can only be navigated by vessels of 1m draft to Hue, which lies 7 miles upstream. The last of the flood is the best time to enter.

The river is encumbered with sand banks and fishing stakes, and vessels should not enter without local knowledge. The river is at its lowest level in February, and at its highest in November. The tidal currents are strong on the bar and in the river. A light is shown from the W side of the entrance.

There is no regular pilotage service, but the services of a pilot may possibly be obtained.

Anchorage can be taken, in 11 to 18m off the bar during periods of favorable winds.

Banc de Thuan An, with depths of 12.8 to 16.5m, lies E of Cua Thuan An, almost parallel to the coast and 4 to 7 miles offshore.

Cua Tu Hien, located 22 miles SE of Cua Thuan An, leads into Dam Cua Hai, which is connected by inland waterways with Song Huong. The coast between the above entrances consists of sandy beach backed by sandhills, on the summits of which are villages surrounded by trees and cultivated fields. This part of the coast is distinctive and unlikely to be mistaken for that section N of Cua Than An, where the villages are on the sides of the hills, not on the summits.

Mui Chon May Tay, 2 miles ESE of Cua Tu Hien, projects only a short distance from the coast. Nui Vinh Phong, 482m high, and Dong Nhut, 592m high, lie 1 mile and 2.5 miles SSW, respectively, of Mui Chon May Tay.

Baie Chon May (Vung Chon May), entered between Mui Chon May Tay and Mui Chon May Dong, provides anchorage, in 13m, good holding ground, leeward of Mui Chon May Dong. However, the bay is barely tenable when the Northeast Monsoon is fairly established.

Mui Chon May Dong (16°21'N., 108°02'E.) is the N extremity of a steep and wooded peninsula, joined to the coast by a sandy isthmus. The peninsula rises to Nui Tron, 282m high, 1.7 miles from the cape.

The coast is low from the peninsula of Mui Chon May Dong to the outlet of Dam Lap An, 6 miles SE, which is marked by a pagoda. The coast is rocky for a distance of 6 miles to the peninsula at the NW entrance point of Vung Da Nang.

Hon Son Cha (16°13'N., 108°12'E.), a 230m high island, is cliffy and separated from the NW entrance point of Vung Da Nang by a passage about 0.3 mile wide, with a depth of 24m in the fairway.

Vung Da Nang (16°09'N., 108°12'E.)

World Port Index No. 57650

5.10 Vung Da Nang (Da Nang) (16°09'N., 108°12'E.) is entered between the N extremity of Ban Dao Tien Sa and another high peninsula, lying 4 miles NW. The entrance to the bay is easily recognized by Hon Son Cha, previously described above in paragraph 5.9, and Ban Dao Tien Sa, which lie off the NW entrance point of the bay. There are a number of dangerous wrecks in Vung Da Nang.

Ban Dao Tien Sa, a mountainous peninsula of irregular outline, rises to an elevation of 696m near its center, and is joined to the mainland by a low isthmus. **Mui Da Nang** (16°07'N., 108°21'E.) forms the E extremity of Ban Dao Tien Sa, and a small peninsula, 62m high, with Hai Quan (Ilot de l'Observatoire) at its S end, forms the W extremity. Rocher Canton, which dries 0.6m, lies 0.4 mile N of the N extremity of Ban Dao Tien Sa, is generally visible and is marked close N by a buoy. An obstruction with a least depth of 9.6m lies 1.3 miles WSW of Rocher Canton.

The port of **Da Nang** (16°04'N., 108°14'E.) lies in the SW part of Vung Da Nang, on the W bank of Song Han, close within the river mouth. The channel to the river is protected on its W side by a detached breakwater nearly 1 mile long. A breakwater extends NW from the E side of the entrance to the river.

Da Nang is a principal port of central Vietnam. The terminal handles bulk cargo, being the port for the coal mines of Nang Son, 35 miles upriver, as well as general cargo, containerized cargo, cars, and petroleum products.

Winds—Weather.—During the Northeast Monsoon season, from November to March when fresh breezes prevail, the climate is temperate. Squalls from the N appear in February, warning of which is given by the clouds amassing on the mountains N. Exposure to the sun should be avoided during the remaining 7 months of the year. The heat is very trying in April and May due to the frequent calms. At this time vessels should anchor well out in the bay away from the high land of the peninsula in order to have the benefit of any light airs, avoiding the stifling inshore anchorages. In June the heat is tempered somewhat by land and sea breezes.

Tides—Currents.—The tidal rise at Da Nang is 1.2m at MHHW and 1.1m at MLHW.

During large tides the currents in the bay are negligible, and only just reach a velocity of 0.5 knot in the river. There is no flood current at Da Nang during nominal tides.

Depths—Limitations.—There are depths of 18 to 22m in the entrance of Vung Da Nang, decreasing gradually toward the SW shore. The entrance channel is dredged to a controlling depth of 13m.

The two piers NW of Hai Quan (Ilot de l'Observatoire) comprise the sea port of Tien Sa. There are four berths able to accommodate vessels of up to 182m in length with alongside depths of 9.5m.

A jetty, 91m long, projects SE from the S end of Hai Quan. Vessels up to 190m in length, 26m beam, and drawing up to 11m can berth at this jetty.

The channel from Ile de l'Observatoire to the entrance of Song Han has charted depths of 4.5m.

The main quay at the river port of Song Han is 530m long and has alongside depths of 4 to 6m. Song Han 7 is 134m long with an alongside depth of 6m. Song Han 8 is 90m long and has an alongside depth of 6m. Song Han 9 is 70m long and has an alongside depth of 6m. Quay No. 234 is 220m long and has an alongside depth of 6m.

My Khe (16°04'15"N., 108°15'20"E.), an offshore tanker berth in depths of 12m, lies 2 miles off the S shore of Vung Da Nang and can accommodate vessels of 35,000 dwt.

Lien Chien (16°08'15"N., 108°08'10"E.), a tanker mooring berth designated for vessels of up to 5,000 dwt, lies in depths of 7.6m in the N part of Vung Kim Lien, on the W side of Vung Da Nang.

Submarine pipelines connect the oil berths mentioned above to the shore and are best seen on the chart.

Aspect.—A light is shown from the E side of Ban Dao Tien Sa, 1.8 miles NW of Mui Da Nang.

A conspicuous radar tower stands on the 621m peak on the W side of Ban Dao Tien Sa.

A light is shown on the W extremity of Ban Dao Tien Sa, about 0.5 mile NW of Hai Quan.

Pointe Isabelle (16°10'N., 108°09'E.), the SE end of a small peninsula, 130m high, on the W side of the bay, is reported to be a good radar target.

A green tank is conspicuous 1.8 miles ESE of Hai Quan.

Lighted buoys mark the channel over the bar leading to the anchorage E of Hai Quan, and to the entrance of Song Han.

The detached breakwater on the W side of the channel leading to the river entrance is marked by lights at its N and S ends.

Pilotage.—Pilotage is compulsory. Pilots will board in the designated quarantine anchorage (16°10'N., 108°11'E.). Requests for pilotage should be sent 48 hours and 24 hours in advance. Berthing is usually restricted to daylight hours.

Signals.—The Harbor Entrance Control Post (HECP) is situated near the W extremity of Ban Dao Tien Sa, which may be contacted on 2716 kHz. A signal station is situated near the light structure NW of Mui Da Nang.

Anchorage.—Large vessels anchor in the 45 designated anchorages established in Vung Da Nang, in depths of 10 to 16m.

Small vessels can anchor E of Hai Quan, sheltered from the force of the Northeast Monsoon.

Vung Da Nang offers no sheltered anchorage during the Northeast Monsoon or during a typhoon; in the latter case the best anchorage is in the shelter of **Cu Lao Cham** (15°57'N., 108°31'E.).

Emergency and Explosive Anchorages are situated in the W part of the bay.

Directions.—Vung Da Nang is easy of access between the N side of Ban Dao Tien Sa and Hon Son Cha, 4 miles NW. Vessels should pass N and W of Rocher Canton.

To enter Song Han, after passing Hai Quan, a vessel should keep the range lights, situated NE of Hai Quan, in line astern, and proceed through the dredged channel.

Caution is necessary to avoid the numerous fishing vessels which generally show no lights.

Vung Da Nang to Vung Qui Nhon

5.11 Baie du Lutin (Bai Num) (16°06'N., 108°18'E.), on the S side of Ban Dao Tien Sa, provides sheltered anchorage, in 11 to 12m, mud, to vessels with local knowledge.

Baie du Rocher Noir lies farther W. Rocher Noir, above water, lies on a shoal outside the entrance of the bay.

Southwest of Rocher Noir there is a stretch of coast known locally as China Beach. An offshore pipeline berth, 1 mile S of Rocher Noir, can accommodate tankers up to 183m long, with drafts of 13m.

The coast between Ban Dao Tien Sa and Song Cua Dai, 15 miles SW, is low and backed by lagoons. A hill, 106m high, rising 10 miles NW of Song Cua Dai, is the only landmark on this stretch.

Song Cua Dai (15°53'N., 108°24'E.) is entered between **Pointe Cua Dai** (Mui Cua Dai) and Mui An Luong, 1 mile E. A narrow sandbank extends in a curve 1 mile E of Pointe Cua Dai. Southward of the bank, Song Cua Dai is fronted by a bar, about 1 mile wide. The channel through the bar has a depth of about 1.5m, but is subject to frequent change.

Anchorage can be taken, in depths of 14 to 18m, outside the bar, but the holding ground is poor. The masts of junks anchored inside the bar are visible from seaward.

Off-lying Islands

5.12 Cu Lao Cham (15°57'N., 108°31'E.) is the largest of a group of islands extending up to 10 miles ENE of the mouth of Song Cua Dai. It is 517m high, and can be seen for a great distance in clear weather.

Anchorage.—The bay on the SW side of Cu Lao Cham provides good shelter during the Northeast Monsoon, in depths of 7.3 to 8.2m, sand and mud, good holding ground. Good shelter can also be found in deeper water SW of the island.

Hon Tai, 212m high, lies 0.7 mile S of Cu Lao Cham. Rocher d'Entrecasteaux, with a least depth of 4.3m, lies 0.8 mile WSW of Hon Tai.

Hon Giai and Hon Mo lie 1 mile and 2 miles, respectively, SSW of the W end of Cu Lao Cham.

Hon La, 166m high, lies 2 miles W of Cu Lao Cham. Hon Co and Hon Cu lie 1 mile and 1.5 miles, respectively, farther W.

Caution.—Cu Lao Cham, Hon Tai, and Hon Giai lie in an area restricted to traffic.

The depths between the Cu Lao Cham group are irregular, with shoal patches. Several areas of potential danger, many of which are charted, lie up to 60 miles offshore from and between ESE and NNE of Cu Lao Cham.

A 9.7m patch was reported (1960) about 50 miles ENE of Cu Lao Cham. A depth of less than 9.2m and a depth of 12.8m were reported (1964) about 6 and 7.5 miles, respectively, SW of the above patch. Vessels should give the area a wide berth.

5.13 The coast between Song Cua Dai and **Mui An Hoa** (15°31'N., 108°41'E.), 44m high, located 28 miles SE, continues at a low elevation. Hon Ong, a steep-to islet, 140m high, lies 18 miles N of Mui An Hoa. In the interior are several mountain ranges. Hon Nui Tau, 953m high, lies 31 miles NW of Mui An Hoa.

A ledge of rocks, with a depth of 1.8m and another ledge with depths of less than 0.3m, lie 1 mile NW and 0.5 mile W, respectively, of Mui An Hoa. The sea sometimes breaks on these ledges.

5.14 Vung An Hoa lies between Mui An Hoa and a peninsula lying 1.2 miles SSE. The bay is encumbered by rocks and islets in its N part. Truong (Trung) Giang discharges into the S end of the bay.

A radio tower, marked by red obstruction lights, and a water tank stand near the S entrance point of the bay. A conspicuous dome and water tank stand about 1 mile S of the S entrance point.

A channel, dredged to 6.1m in 1970 and marked by lighted buoys, leads through the S part of Vung An Hoa, and to a ramp near the E entrance of Truong Giang.

An offshore pipeline berth, 3.5 miles SE of Vung An Hoa, can accommodate vessels up to 183m in length and up to 10.3m in draft.

Vung Dung Quat is entered between Mui An Hoa and **Mui Dat Vian Ka** (Mui Vian Ka) (15°25'N., 108°48'E.). Foul ground extends about 0.3 mile NNW of the latter point. Song Tra Bong enters the bay 2.5 miles SW of Mui Dat Vian Ka. Several islets and rocks lie off the mouth of the river. Inland of the coastline the country is mountainous. Nui Chua, 1,362m high, lies 14 miles SW of Mui An Hoa.

Anchorage.—During the Southwest Monsoon, good anchorage can be taken in the SE part of Vung Dung Quat. Large vessels should anchor, in a depth of 15m, SW of Mui Dat Vian Ka. Small vessels can anchor, in depths of 5.5 to 7.3m, nearer the shore.

5.15 Mui Nam Tram (15°21'N., 108°52'E.), rising to an elevation of 141m, lies 1.5 miles E of Mui Dat Vian Ka, from which it is separated by a bay. Between Mui Nam Tram and Pointe de Go Nhan, 6 miles SSE, lie two open bays separated by Mui Phuoc Thien (Pointe de Phuoc Thien), a 31m high headland. A rock, awash, lies 0.5 mile SE of Pointe de Go Nhan.

A sandy bay lies between Pointe de Go Nhan and Mui Ba Lang An, 6 miles SE. Anchorage can be taken, in depths of 10 to 12m, in the S part of the bay, NW of Mui Ba Lang An.

Mui Ba Lang An (Mui Batangan) (15°14'N., 108°57'E.), 36m high, is fringed on its N side by a reef and rocks, some of which are above water, extending more than 0.5 mile offshore. Hon Bong Lan (Rocher Plat), 6m high, lies 3.5 miles SSE of the cape, and 1.8 miles offshore. Two detached rocks, with depths of 7.6 and 2.7m, lie 1 mile and 1.3 miles, respectively, NNW of Hon Bong Lan. Mui Ba Lang An should be given a wide berth.

Off-lying Islands and Dangers

5.16 Cu Lao Re (15°23'N., 109°07'E.), an island lying 12 miles NE of Mui Ba Lang An, is formed of several craters and peaks. These appear isolated when viewed from a distance of 25 miles, except on a N bearing, when the island has a level aspect. The E and highest peak is 169m high. A light is shown from the NE extremity of the island.

Cu Lao Re is fringed by coral reef which extends 0.7 mile WNW from its W extremity and 1 mile SE from its E end.



Cu Lao Re from SE

Anchorage.—The holding ground off the island is rocky and poor, but temporary anchorage can be taken S of the summit. The best anchorage during the Southwest Monsoon is N of the W peak, where the sea is generally calmed.

Cu Lao Bo Bai, a rocky islet, lies 2.5 miles NNW of Cu Lao Re. It is fringed by coral reef, and lies on a bank, with depths of less than 9m, extending 0.5 mile offshore.

Banc du Volta, with a least depth of 4.3m, lies 6 miles NW of Cu Lao Re. The sea breaks frequently on the bank; during the Southwest Monsoon, it is frequented by fishermen.

In 1965, a depth of 11m was reported to lie 31 miles NE of Cu Lao Re, with another shoal, with a depth of 18.3m, lying 5 miles farther N. In the same year a shoal with a depth of 18.3m was reported to lie 23 miles ESE of the same island.

5.17 The coast between Mui Ba Lang An and Cap Sa Hoi, 35 miles SSE, is backed by sandhills. A prominent sand hill, 163m high, lies close inland from Cap Mia, which lies 10.5 miles NNW of Cap Sa Hoi. Inland of the coastline the country is mountainous. Nui Da Vach, the highest in the area, rises to an elevation of 1,136m, about 21 miles SW of Mui Ba Lang An.

Song Tra Khuc discharges 6 miles SSW of Mui Ba Lang An. The village of Quang Ngai is situated 5 miles within the river mouth.

Rocher Noir, a 4.5m high black rock, lies 3 miles S of Song Tra Khuk, near the edge of a bank that extends 0.8 mile offshore.

Cap Sa Hoi (14°40'N., 109°05'E.), 92m high, is the S end of a peninsula enclosing a lagoon. There is a customhouse on the cape and a village lies on the mainland W.

The coast between Cap Sa Hoi and Pointe de Kim Bong, 5 miles S, consists of beaches, separated by rocky points. The coast is then sandy to Pointe An Yo, 8.5 miles farther S. Nui Kho, with a red summit, 223m high, lies 4 miles NW of Pointe An Yo and 2 miles inland.

Pointe An Yo is the N of two rocky spurs that extend from a chain of mountains. The summit of the mountains rises 5 miles SSW of the point. A rock, with a depth of 2.1m, lies 0.5 mile E of Pointe An Yo.

Ile Tortue (14°22'N., 109°12'E.), a 10m high black islet, lies 6.5 miles SE of Pointe An Yo and 3.5 miles offshore. A reef extends a short distance from its E side.

Ile Nuoc, 45m high with two peaks, lies 6.5 miles S of Ile Tortue. It is the largest and NE of a group of black, rocky islets, and lies on a bank extending 1 mile from the mainland. Rocher Plat, which dries 2.1m, lies on this bank about 1 mile S of Ile

Nuoc. A white house, formerly a lighthouse, lies on the mainland W of the islet.

5.18 Nuoc Ngot (14°08'N., 109°13'E.) is a steep promontory, 168m high, with several red granite peaks made conspicuous by the patches of sand on their slopes. This promontory is the S end of a peninsula that forms the E side of Dam Nuoc Ngot.

Nui Ba, 874m high, with an isolated rock on it, lies 7 miles SW of Nuoc Ngot. Hon Heo, 664m high with a flat summit and an isolated rock on it, lies 5 miles ESE of Nui Ba.

Hon Trau, a barren, granite islet, 37m high, lies 4 miles E of Nuoc Ngot. Two rocks, above water, lie 0.2 mile E of the islet. A rock, on which the sea breaks, lies between the rocks and the islet.

Thanh Hi (14°01'N., 109°15'E.), 188m high, lies 2.5 miles E of Hon Heo. Tan Ly, a 218m high prominent hill, lies on the coast 1.5 miles farther S, separating two small bays. A rocky point lies 2 miles S of Tan Ly. An open sandy bay, backed by sand hills, extends 5 miles SSE to Ban Dao Phuoc Mai, a 94m high promontory, near its N end.

Nghiem Kinh Chieu (13°53'N., 109°19'E.), a rock-fringed islet with another islet close N, lies 0.3 mile E of the above promontory. The E side of Ban Dao Phuoc Mai is steep and high to Mui Yen at its SE extremity. A prominent gap between two hills lies 3.5 miles N of Mui Yen. **Nui Den** (13°51'N., 109°17'E.), 361m high, the summit of the peninsula, lies 2.3 miles N of the gap.

Cu Lao Hon Kho, a 52m high islet connected to the coast by a reef, lies 0.8 mile NE of Mui Yen.

Off-lying Islands—Approach to Vung Qui Nhon

5.19 Cu Lao Coni (Nui Ong Can), a small group of islets, the highest of which is 34m high, lies 3.5 miles E of the N extremity of Ban Dao Phuoc Mai. A 7.3m rocky patch lies 0.4 mile W of Cu Lao Coni.

Nui Ong Co, a steep pyramidal rock, 54m high, lies 1.7 miles W of Cu Lao Coni.

Cu Lao Xanh (Cu Lao Poulo Gambir) (13°37'N., 109°21'E.), with two summits, the tops of which are bare, lies nearly 8 miles SSE of Mui Yen. The NW hill is 123m high, and a light is shown from the E hill. Banc de Paques, composed of coral and with a least depth of 7.6m, lies 2 miles W of the S extremity of Cu Lao Xanh.

Les Mamelles are two sharp-peaked rocks, one of which is 38m high, lying 0.7 mile SSE of Cu Lao Xanh. Another rock lies close S of Les Mamelles, and there is a depth of 5.2m about 0.1 mile S of this rock.

Vung Qui Nhon (13°46'N., 109°14'E.)

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5.20 Vung Qui Nhon, on the W side of Ban Dao Phouc Mai, is a mostly shallow bay, with the exception of the dredged channels in its S part. The bay is entered between Pointe Sud, the SW extremity of Ban Dao Phouc Mai, and Pointe de Gia, about 0.3 mile N. The town of Qui Nhon occupies the spit forming the SW shore of Vung Qui Nhon which terminates in

Pointe de Gia. Numerous streams discharge into the W side of the bay. Les Sept Ilots lie nearly in the middle of the bay, 1.8 miles NNW of Pointe de Gia.

The port handles cement, fertilizer, timber and wood products, and agricultural cargo.

Tides—Currents.—The tidal rise at Qui Nhon is 1.9m at MHHW.

Tidal currents near Culao Hon Kho set W on a rising tide, attaining a velocity of 1.5 knots. During the rainy season the current setting out of Vung Qui Nhon is strong. The current at the entrance attains a velocity of 2 knots with large tides, and 1.5 knots with small tides; this velocity is attained 6 hours after high and low water locally. The current changes direction 2 hours after high and low water.

Depths—Limitations.—The 20m curve in the approach to Qui Nhon runs roughly between Mui Yen and close E of **Hon Dat** (13°41'N., 109°16'E.).

Hon Kho, with a depth of 7m, is an isolated danger in the approach, lying 2.5 miles SSE of Mui Yen.

A buoyed channel, established between the 10m curves, leads between Pointe Sud and Pointe de Gia.

There are two berths with a total length of 350m and a depth of 7.5m alongside. There is also a floating petroleum dock for tankers having a draft of up to 8m.

Vessels of up to 16,000 dwt, having a maximum length of 180m and a maximum draft of 7.5m, can be accommodated.

A rock, with a depth of 3.9m and marked by a buoy, lies 0.1 mile W of Pointe Sud.

Aspect.—Ban Dao Phuoc Mai and Cu Lao Xanh have been previously described in paragraph 5.17 and paragraph 5.19, respectively.

Nui Mui Yen, 151m high, lies 0.6 mile NNW of Mui Yen, the SE extremity of Ban Dao Phuoc Mai. Nui Dau Goc Let (Phuong Mai), 318m high, the highest peak on this part of the peninsula, lies 1.5 miles farther NW. Hon Dat, 68m high and covered with brushwood, lies 4.5 miles SSW of Nui Mui Yen, and 1 mile off the mainland.

A tower, showing red obstruction lights and white lights at its base, stands 3.5 miles WSW of Pointe Sud.

Beacons, in range bearing 352°, lead from the Zero Buoy to the bay.

Pilotage.—Pilotage, which is compulsory, should be arranged for well in advance. The pilot boards during daylight hours at Zero Buoy (13°44'19"N., 109°15'16"E.). During inclement weather, the harbormaster designates an anchorage position via VHF where the pilot may board with safety.

Signals.—The Harbor Entrance Control Post (HECP) on Pointe Sud can be contacted on 2716 kHz or by flashing light.

Anchorage.—Anchorages in the Qui Nhon area are assigned by the Harbor Entrance Control Post. Large vessels anchor S of Ban Dao Phuoc Mai in suitable depths. Sheltered anchorage can be found in Vung Qui Nhon, in depths of 5.5 to 9m, N of Pointe de Gia.

Vung Qui Nhon to Vung Xuan Dai

5.21 Mui Ke Ga (13°34'N., 109°18'E.), 4 miles SW of Cu Lao Xanh, is the E extremity of a rocky peninsula. A few above-water rocks lie close off the NW side of the peninsula.

Nui Yen Beo, 336m high with a conical summit, lies 3.5 miles W of Mui Ke Ga.

Baie De Cu Mong, entered 2.5 miles SSW of Mui Ke Ga, is quite shallow. There are depths of 11m in the entrance which shoal rapidly. The shores of the bay are densely populated and bordered by coconut trees. Anchorage, well-sheltered, can be taken by small vessels in the SW part of the bay in a depth of 5m, mud.

Mui Vung Trich, 3.8 miles S of Mui Ke Ga, is the S extremity of a peninsula, 114m high, joined to the mainland by a narrow isthmus of sand. Anchorage during the Southwest Monsoon can be taken, in depths of 5 to 9m, in the bay SW of Mui Vung Trich.

Mui Ong Dien, 6 miles SSE of Mui Ke Ga, rises to an elevation of 158m and is the NE end of a hilly peninsula forming the E side of Vung Chao.

Mui Luoi Cay (13°24'N., 109°18'E.), a perpendicular cliff, 4 miles SSW of Mui Ong Dien, is the S extremity of the peninsula. Three peaks rise on the S side of the peninsula; the E and highest peak is 358m high, and nearly 2 miles N of Mui Luoi Cay.

Vung Xuan Dai and Vung Chao

5.22 Vung Xuan Dai (13°23'N., 109°17'E.), entered between Mui Luoi Cay and Mui Ganh Den, 2.5 miles S, provides access to Vung Chao (Baie de Vung Chao), one of the most sheltered bays on the coast of Vietnam. The entrance of Vung Xuan Dai can be recognized by the peaks on the peninsula N of Mui Luoi Cay, the high cliffs of Mui Ong Den and those close N of Mui Vung Trich. Vung Chao is entered between **Mui Mu U** (13°26'N., 109°15'E.) and Dong Tranh, lying 1.2 mile E.

Rocher de l'Ilissus, with a depth of 1.8m, lies in the approach to Vung Xuan Dai, 1.2 miles SE of Mui Ganh Den, which is 77m high and cultivated.

Tides—Currents.—The tidal rise at Vung Xuan Dai is 1.7m at MHHW.

The tidal currents in the entrance to Vung Xuan Dai attain a velocity of 1.5 knots, setting W on the flood.

Depths—Limitations.—Vung Xuan Dai has general depths of 11 to 17m. Vung Chao has general depths of 5.5m to 8.2m. Depths of less than 5.5m extend 1 mile from the W shore of the bay and the NE part of the bay is fringed by a drying reef extending up to 0.5 mile offshore.

Hon Yen (13°23'N., 109°17'E.), 48m high, and formed of jagged red rocks, lies in the entrance of Vung Xuan Dai. A bank, with above-water rocks, extends about 0.2 mile ENE and WSW of the islet. Rocher de l'Octant, with a depth of 1.5m, lies 0.5 mile WSW of Hon Yen.

Cu Lao Ong Xa, gray in color and rock-fringed, lies 2.3 miles WNW of Hon Yen. Rocher du Volga, with a depth of 4m, lies 0.5 mile NNE of Cu Lao Ong Xa.

Rocher Bouee, 1m high, lies 0.4 mile W of **Mui Ganh Tuong** (13°24'N., 109°16'E.), in the approach to Vung Chao.

Hon Lo Dam Ca, a coral patch which dries 1.2m, lies nearly in the middle of Vung Chao, 1.5 miles NNW of Dong Tranh.

Anchorage.—Anchorage during the Southwest Monsoon can be taken, in a depth of 11m, with the mouth of Song Binh Ba in the S part of Vung Xuan Dai, bearing 165°, and with Hon

Yen bearing 070°. Rocher de l'Octant is to be avoided when approaching this anchorage.

Anchorage can also be taken in Rade de Vung Lam (Ao Xom Luoi), about 0.5 mile N of Cu Lao Ong Xa, in 9m, mud. When approaching this anchorage, Rocher du Volga should be avoided.

During the Northeast Monsoon, anchorage can be taken, in a depth of 10m, NNW of Rocher Bouee, but the sea is usually rough during this monsoon and if the draft permits it is better to enter Vung Chao.

In Vung Chao anchorage can be taken, in a depth of 7m, between Hon Lo Dam Ca and Mui Co, a point located 2 miles E. Anchorage can also be taken, in depths of 5.5 to 5.9m, in the W part of Vung Chao, off Song Cau, with the town bearing between 280° and 300°. The bottom in the latter two anchorages is hard mud, good holding ground.

Vung Xuan Dai to Cap Varella

5.23 Mui Lang (13°20'N., 109°18'E.), a black rocky bluff, lies 1.7 miles S of Mui Ganh Den.

Cu Lao Ma Nha (Lao Ma Nha), a wooded island, 104m high, lies 3.5 miles SE of Mui Lang. It is uninhabited, but frequented by fishermen. During the summer the narrow channel between the island and the coast is blocked by fishing nets.

Le Trapeze (13°15'N., 109°19'E.), a black, prominent point, is located 1.5 miles SW of Cu Lao Ma Nha. A steep-to reef, on which lies an above-water rock, extends 0.3 mile E of the point. Le Bonnet, a black islet, lies 1.8 miles farther SSW.

Iles Bai Ma Lieng lie on a rocky bank extending 2 miles SE from a rocky promontory. **Lao Dua** (13°10'N., 109°20'E.), 14m high, lies near the outer end of the bank. Hon Chua (Lao Chua), 37m high, lies about midway between Lao Dua and the point. A 7m patch lies 0.5 mile SE of Lao Dua.

Anchorage during the Southwest Monsoon can be taken SW of Hon Chua. Iles Bai Ma Lieng provide some shelter during the Northeast Monsoon, but anchorage is not recommended during the season.

A sandy beach extends from the vicinity of Iles Bai Ma Lieng to Cap Varella.

The mouth of Song Da Rang (Song Ba), accessible only to junks, lies 5 miles S of Iles Bai Ma Lieng. Nui Chap Chai, 391m high, and Nui Hon Chuong, 572m high, are prominent standing 4.5 and 11 miles, respectively, NW of the mouth.

Hon Co, 18m high, lying 9.5 miles SE of the mouth of Song Da Rang and 1.5 miles offshore, is the SE of a group of rocks, some of which are awash.

Cap Varella, the E extremity of Vietnam, consists of steep cliffs rising to four rocky peaks. Three of the peaks lie on the peninsula forming the E side of Vung Ro. Mui Nay is the NE point of the cape. **Mui Ke Ga** (Mui Dieu) (12°54'N., 109°28'E.) lies NE of the NE rocky peak. Mui Ba, 2.3 miles S of Mui Ke Ga, is the SW extremity of the cape.

Nui Da Bia, 706m high, the summit of Cap Varella, is located 3.5 miles W of Mui Ke Ga and has a rock resembling a pagoda. The summit is visible for 50 miles in clear weather, but is often hidden by clouds. A light and a signal station stand on the peak.

Anchorage.—During the Southwest Monsoon, anchorage can be taken off the bight NW of Mui Nay, in a depth of 18m, with Nui Da Bia bearing 233°.

Vung Ro (12°51'N., 109°25'E.), a small bay, is entered W of Mui La, the SW extremity of Cap Varella. It is backed by high land and its E side formed by Cap Varella. It is one of the safest anchorages on the coast of central Vietnam. The depths in the entrance are 18.3m, which gradually decrease towards the village at the head of the bay. Hon Nua, a 143m high island, with perpendicular cliffs on its E side, lies in the approach to Vung Ro, 1.7 miles SW of Mui La.

An offshore pipeline berth, with a least depth of 12.8m, lies in the NW part of the harbor. A pier, 180m long and linked to the shore by a causeway, has depths of 7.9 to 11.5m alongside.

Anchorage can be taken as convenient in Vung Ro. During the Southwest Monsoon or in good weather anchorage can be taken W of Hon Nua.

Presqu'île de Hon Gom

5.24 Presqu'île de Hon Gom, with **Mui Ganh** (12°34'N., 109°26'E.) at its S extremity, is joined to the mainland, 15 miles NNW of Mui Ganh, by a low and narrow isthmus about 5 miles long. The islands in Ben Goi can be seen over the isthmus. Hon Nhon, 436m high, 8 miles NNW of Mui Ganh, is the summit of a mountainous projection extending 4 miles SW from the W side of the peninsula.

The S side of Ban Dao Hon Gom is mountainous. Khai Luong, 291m high, and Le Doigt, 309m high, lie 0.8 mile N, and 3.5 miles NNW, respectively, of Mui Ganh.

Chu Mu (La Mere and L'Enfant), 2,051m high, prominent and surmounted by two rocks that appear like fingers of unequal size, is located 31 miles WNW of Mui Ganh. Nui Hon Chao, 1,625m high, lies 10.5 miles ENE of Chu Mu. The mountain peaks are frequently obscured by clouds, especially during the Northeast Monsoon.

Hon Lon, a large island, lies close off the SW side of Ban Dao Hon Gom. On the E side of the peninsula, Hon Trau Nam, a group of eight rocks, 6m high, lies 1.5 miles E of Mui Ganh. Hon Kho Tran, an islet, lies 2 miles farther NNE and 0.5 mile offshore.

Mui Doi, 5.5 miles NNE of Mui Ganh, is the SE extremity of a hilly peninsula. Hon Doi, with sunken rocks lying close to its W and S side, lies close NE of Mui Doi.

Baie de Van Fong and Ben Goi

5.25 The approach to Baie de Van Fong and Ben Goi lies between Mui Ganh, the S extremity of Presqu'île de Hon Gom, and **Mui Ban Thang** (12°24'N., 109°21'E.), 11 miles SSW. The latter point is the E extremity of a mountainous and wooded peninsula. Hon Heo, 813m high, rising 4 miles W of Mui Ban Thang, is the summit of this peninsula.

Lach Cua Be, entered between Mui Ghan and Mui Co, 1 mile W, is the deep clear channel by which vessels reach Cua Van (Port Dayot). Vung Van Fong, which leads into Ben Goi, is entered between the SE extremity of Hon Lon and **Mui Mong** (12°30'N., 109°19'E.), the E extremity of Hon My Giang, 6 miles WSW. Hon Do, 136m high, lies 2 miles ESE of Mui Mong. Hon Hoa, 26m high, lies 1 mile E of Hon Do on a small

shoal patch, and is the outermost islet in the approach to Vung Van Fong. Vung Cai Ban is formed between the latter islands and Mui Ban Thang.

Lach Cua Be is entered W of Mui Ganh. Rocher du Lion, with a depth of 2.7m, lies 0.3 mile S of Mui Ganh. The passage has depths of 28m, and narrows to a width of 0.25 mile NE of Hon Lon, where it enters Cua Van. Vung Thu, a small bay, lies midway along the NE shore of Lach Cua Be.

Cua Van (Port Dayot) is a small land-locked bay on the W side of Ban Dao Hon Gom. It has two prominent islands within it.

Lach Co, with depths of 20m, is the continuation W of Lach Cua Be from Cua Van into Ben Goi.

Anchorage.—Cua Van provides anchorage in any of its bights, in depths of about 18m. The NW bight, where the bottom is mud, is most frequented. In the Northeast Monsoon, there is better anchorage in Vung Thu, in depths of 12m, about 0.2 mile offshore.

5.26 Vung Van Fong has depths of 12 to 28m, mud bottom. Hon Lon, wooded and mountainous, forms the NE side of the bay which is free of dangers. The island rises to a flat summit, 567m high, near its NW end. A small bay indents the SW side of Hon Lon. Hon Den lies 0.7 mile WSW of the NW entrance point of the bay; a patch, with a depth of 2.4m, lies 0.2 mile W of the islet.

Anchorage during the Northeast Monsoon can be taken leeward of Hon Lon, but it is open SE.

Ben Goi is entered between the NW end of Hon Lon and **Pointe Hon Khoi** (12°35'N., 109°15'E.). The latter point is the NE extremity of Presqu'île de Hon Khoi, with a high summit rising 1.5 miles SSW of the point.

Hon Mai, 42m high, is the outermost of several islets off the NW end of Hon Lon, and lies 0.8 mile NW of the point. A detached drying patch lies 0.2 mile S of the islet.

Banc du Milieu, which dries, lies 0.5 mile W of Hon Mai. Da Bia, described with Cap Varella in paragraph 5.23, in range 022°45' with Hon Mao, the NE of the chain of islets on the NW side of Ben Goi, leads into the bay between Hon Mai and Banc du Milieu.

Plateau du La Perouse, a group of detached shoals with several rocky heads and some with depths of less than 0.6m, lie nearly in the middle of the S end of Ben Goi. Rocky patches having depths of 3m and 0.3m, lie 1.6 and 2 miles, respectively, WNW of Hon Mai, on the NE side of the group.

A chain of islets fringed by drying coral reef lies parallel to the NW side of Ben Goi. Hon Vung, 20m high, the SW of the chain of islets, lies 3 miles NW of Hon Mai. A patch, which dries 1.5m, and another patch, which dries 0.6m, lie about 0.3 mile WSW and NE, respectively, of Hon Vung.

Cua Gia (Kua Gia), a channel separating the islets from the coast, has a least width of 0.7 mile between the reefs on either side, with depths of not less than 5.5m in the fairway.

Hon Mao (12°44'N., 109°20'E.), 16m high, is the NE islet of the group. Hon Trau, a reef which dries 0.6m, lies 1 mile NE of Hon Mai.

Pilotage.—Pilotage is compulsory. Vessels approaching the bay should contact Hon Khoi pilots on VHF channel 16 at least 2 hours prior to arrival. The pilot boards just outside the entrance to the bay in position 12°30'N, 109°23'E.

Regulations.—Vessels should forward their ETA 48 hours, 24 hours, 12 hours, and 6 hours prior to arrival. The message sent 48 hours prior should include the following information:

1. Vessel's name, port of registry, and flag.
2. Dwt/nrt/grt.
3. Number of crew members.
4. Anti-pollution Insurance Coverage (TOVALOP or equivalent).
5. Arrival/departure drafts.
6. Parallel body length (arrival and departure).
7. Freeboard (arrival and departure).
8. Manifold compatibility with 8 or 10 inch hose.
9. Cargo description.
10. Total cargo on board.
11. Total cargo transfer.
12. Nationality of senior officers.
13. Validity of trading certificates.

Anchorage.—Vessels can anchor as convenient, in depths of 12.8 to 16.5m, in Ben Goi, with Da Bia in range 023° with the summit of Hon Mao, or closer to Ban Dao Hon Gom.

Vung Hon Khoi is entered between the N extremity of Ban Dao Hon Khoi and a point lying 4 miles NW. There are depths of 5.8m between the entrance points, but S of this line the depths decrease rapidly. Anchorage can be taken in the bay, in depths of 4m, good holding ground, by small vessels with local knowledge or, in depths of 7m, farther out.

Directions.—Ben Goi can be entered through Lach Cua Be and Lach Co, or through Vung Van Fong. If entering from the latter, a vessel should pass between Hon Mai and Banc du Milieu, keeping on the charted range line.

Vung Cay Ban, NW of Mui Ban Thang, is sheltered by the islets on its N side. Banc de Deo Ngan, with depths of 7m in its outer part, extends 2.8 miles N of Mui Ban Thang.

Baie de Nha Trang—Approaches

5.27 Several islands, the largest of which is **Hon Tre** (12°12'N., 109°17'E.), and **Grand Banc** (12°17'N., 109°18'E.), an extensive shoal, lie in the approach to Baie de Nha Trang.

Hon Tre is formed of three mountain ranges, connected by low isthmuses. The summit of the E range is 414m high and lies nearly 1.5 miles WNW of Mui Rach Trang, the E extremity of Hon Tre. The summit of the central range, 482m high, lies 2 miles farther W. The island is densely wooded and there are steep cliffs in places. A light is shown from Mui Rach Trang.

5.28 Eastern approach.—The E approach lies between Mui Rach Trang and Mui Ban Thang, 12 miles N.

Hon Dung (12°16'N., 109°22'E.), 218m high and prominent, with a framework tower on its summit, is located 4.5 miles NNE of Mui Rach Trang. The islet is steep-to and bordered at its base by a narrow ridge of shingle. Hon Cau, 116m high and bare with high rocks off its S end, lies 0.6 mile NE of Hon Dung and resembles a ruined castle from the offing.

Hon Cha La, 192m high and rocky, lies 2.5 miles SE of Mui Ban Thang, in the NE part of the approach. The island is bare except for some scrub on its summit, where there is a large boulder. Hon Bac, 18m high, is located 4 miles SSW of Mui

Ban Thang, the E extremity of a mountainous and wooded peninsula. **Hon Heo** (12°24'N., 109°17'E.), the summit of this peninsula, is located near the center of its SE end, 4 miles W of Mui Ban Thang.

Baie de Binhcang lies on the NE side of the approach to Baie de Nha Trang. It is entered between Mui Da Chong and Mui Khe Ga, located 4 miles SW. Hon Cu Lao and Hon Thi lie 3.5 miles NNW and 4.5 miles N, respectively, of Mui Khe Ga. The depths in Baie de Binhcang gradually decrease as the islands are approached. A shallow, marshy inlet lies NW of the islands.

Anchorage.—Baie de Binhcang affords good anchorage during both monsoons, in depths of less than 18m.

5.29 Grand Banc lies near the middle of the E approach to Baie de Nha Trang; the depths on the bank are very irregular. Rocher du Nord-Ouest, with a depth of 0.3m, is the shallowest coral head, lying 2.5 miles E of Mui Khe Ga. Rocher Bourayne, with a depth of 1.8m, coral, lies 0.8 mile SE of Rocher du Nord-Ouest.

Mui Khe Ga (12°18'N., 109°15'E.), the N entrance point of Baie de Nha Trang, rises steeply from the sea to several high peaks. Due Ba, 578m high, consists of three summits, rising 5.5 miles WNW of the point. Hon Mat (Ile Tortue), 49m high and resembling a tortoise, lies nearly 1 mile S of Mui Khe Ga.

5.30 South approach.—The S approach to Baie de Nha Trang lies between **Mui Dong Ba** (12°08'N., 109°14'E.) and Mui Rach Trang, 7.5 miles ENE. Mui Dong Ba is the E extremity of a mountain range, and rises steeply from the sea. Nui Chu Hin, a 643m high peak, lies 1.5 miles W of the point, and Nui Cau Hin, 978m high, lies 3.5 miles farther WNW.

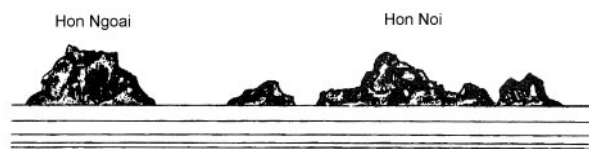
Hon Tam, 2 miles NW of Mui Dong Ba, lies in the middle of the S approach, and is fringed by a narrow, steep-to reef.

Mui Chut (12°13'N., 109°13'E.) is the S entrance point of Baie de Nha Trang. Hon Mieu, 100m high, lies about midway between Mui Chut and Hon Tam.

Hon Mung, 184m high, is located on the E side of the S approach, 2 miles SW of Mui Rach Trang. North of Hon Mung there is an indentation in the S side of Hon Tre.

Hon Mot, 92m high, is located 1.2 miles WNW of Hon Mung. Rocher du Lion, with a depth of 4m, lies 0.3 mile W of Hon Mot.

5.31 Off-lying islets and dangers in the South Approach.—Iles des Pecheurs is a group of islets with **Hon Ngoai** (12°00'N., 109°20'E.), 112m high, the S and highest, located 11.5 miles S of Mui Rach Trang. A white cairn stands on the summit of Hon Ngoai, and Rocher Vulcan, with a depth of 1.5m, lies about 0.5 mile N of the islet.



Iles des Pecheurs bearing 255°, distant 15 miles

Hon Noi, 2 miles N of Hon Ngoai, is the largest of the group, and its summit, 99m high, has a white cairn on it. Smaller islets lie close N and S of Hon Noi.

Banc de Castlereagh, Banc de Thuy Trieu, and Banc du Tondu extend NW from Iles des Pecheurs.

Banc de Thuy Trieu has a depth of 5.5m lying 4.5 miles WNW of Hon Noi. Vessels without local knowledge should not pass between Iles des Pecheurs and the coast.

Baie de Nha Trang (Nha Trang) (12°15'N., 109°14'E.)

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5.32 Baie de Nha Trang lies between Mui Chut and Mui Khe Ga, 6 miles NNE. In the bay, the shore from Mui Chut to the entrance of Song Cai, 3 miles N, is fronted by a sandy beach, backed by sand hills. The NW shore of the bay, between Song Cai and Mui Khe Ga, is fringed by coral reef. Hon Cut Chim, 7m high, is located 1 mile E of the N entrance point of Song Cai. Depths of 0.3m and less extend 0.1 mile S and W of Hon Cut Chim.

Tides—Currents.—The tidal rise at Nha Trang is 1.8m at MHHW.

In Baie de Nha Trang the flow is weak and is governed by nontidal current.

Depths—Limitations.—An offshore pipeline berth, close N of Mui Chut, can accommodate tankers up to 10.7m in draft and 20,000 dwt.

There is a quay, 172m in length, with a depth of 8.5m alongside.

A pier, 58m long, for barges and small vessels, has depths of 3 to 6.1m alongside and is situated 0.5 mile NW of Mui Chut.

Cargo vessels are lightened at the anchorages.

Aspect.—The islands in the approach to Baie de Nha Trang are good radar targets. A red and white checkered water tank stands 1.5 miles NW of Mui Chut.

A statue of Buddha is prominent above a temple on the summit of a hill, 2 miles farther NNW; the statue is flood-lit and marked by a red obstruction light.

Rocher Noir, 1.5m high, lies 0.3 mile offshore, near the NW end of Hon Tre.

Pilotage.—Pilotage is compulsory. For vessels from the S, the pilot boards 1 mile SSW of Hon Mot. For vessels from the E, the pilot boards 2 miles NNE of Mui Chut. Pilots board during daylight hours only.

Signals.—The Harbor Entrance Control Post (HECP), close S of Mui Chut, will assign anchorage berths and may be contacted by radio or flashing light.

Anchorage.—Anchorage during the Southwest Monsoon can be taken almost anywhere in Baie de Nha Trang, S of the town, over a bottom of sand and mud.

Vessels carrying dangerous cargo anchor NW of Hon Mot, in a depth of 20m. Other vessels anchor within 0.5 mile of the quay, in a depth of 15m.

There is anchorage, frequented by junks, W of Hon Mieu. During the Southwest Monsoon, this anchorage is sheltered from the swell that frequently comes from SE. During the Northeast Monsoon, the anchorage is sheltered from the heavy swell by the NW end of Hon Tre.

During the Southwest Monsoon, vessels with local knowledge can find secure anchorage in Bai Tru or Bai Tre on the N side of Hon Tre.

During the Northeast Monsoon (October to March) anchorage in Baie de Nha Trang may become untenable due to the heavy swell that enters the bay. At such times, shelter can be found SE of Hon Tre or in the bay on its S side.

Directions.—Vessels approaching from the E can pass N or S of Hon Dung. The entrance channel S of Hon Dung is 1 mile wide and passes S of Grand Banc and Hon Mat.

Approaching from the S, a vessel should pass E of Iles des Pecheurs and proceed between Hon Mot and Hon Tam or between the latter islet and Hon Mieu. Care must be taken to avoid Rocher du Lion off the W side of Hon Mot.

Caution.—Submarine cables are laid across Baie de Nha Trang, generally in an E direction from the shore 2 miles NW of Mui Chut.

Caution is necessary at night due to the presence of fishing boats which often show no lights.

Baie de Nha Trang to Vinh Cam Ranh

5.33 Plage de Thuy-Trieu, a low, sandy beach, backed by sandhills, extends 9 miles SSE from a point located 2 miles SSW of **Mui Dong Ba** (12°09'N., 109°14'E.). A bare and rocky hill, 142m high, lies at the SE end of the beach.

Mui Lo Gio, 2 miles farther SW, is rocky and bare; a rocky ledge, with a depth of 4.6m at its extremity, extends 0.2 mile ENE from the point. A rock, 4m high, lies nearly 1 mile NNW of the point; a 4.2m shoal lies 0.1 mile NE of the rock.

The N entrance point of Baie de Ba Dai is located 1.5 miles SSW of Mui Lo Gio. Two islets lie on a bank extending 0.8 mile E of the N entrance point. Hon Nhan is the inner islet. The outer islet is 16m high, and Mui Cam Linh (Pointe de Cam Ranh) is located 3.5 miles farther S.

Approach to Vinh Cam Ranh

5.34 The approach to Vinh Cam Ranh lies between **Mui Cam Linh** (Pointe de Cam Ranh) (11°53'N., 109°17'E.) and Mui Da Vaich, 9.5 miles SSW. Vinh Cam Ranh is one of the finest harbors on the coast of central Vietnam. A secure anchorage is available for all types of vessels at the approaches and within the bay.

Mui Cam Linh (Pointe de Cam Ranh) is the E extremity of the mountainous end of a peninsula. The summit of this peninsula is Nui Ao Ho (Ao Ho), 465m high, located 2.3 miles WNW of Mui Cam Linh. Hon Deo, 14m high, is the outermost islet lying off a point located 1.2 miles SSW of Mui Cam Linh.

Dao Tagne (11°50'N., 109°15'E.) lies with Mui Bai Nom, its S extremity, lying 4 miles SW of Mui Cam Linh. The island is divided into two parts by low land with palms on it. The summit, 206m high, with a conspicuous white square building on it, is located on the SW side of the island. Hon Co Ngoai (Hon Kho Ngoai), 15m high, lies 0.3 mile off the SE extremity of the island.

5.35 Mui Da Vaich (Mui Da Vach) rises steeply to an elevation of 330m about 0.7 mile W of the point and forms the E extremity of a range of mountains, which attains an elevation

of 950m in Nui Ong, 4.8 miles WNW of Mui Da Vaich. On Nui Ong there is an isolated rock, or knob, resembling that on Cap Varella. Nui Chua, cone-shaped, is located 1 mile E of Nui Ong. Mui Da Vaich slopes evenly from its summit and is wooded to the steep cliffs fronting the sea. Rocher Varella, 5m high, is conspicuous close S of the point. There is deep water close off the point.

Hon Chut, 117m high, bare and rocky, lies 2.7 miles NNW of Mui Da Vaich and is connected to the mainland by a submerged ridge with depths of 3.7m in the fairway. An islet and above-water rocks lie close SSE of Hon Chut. A light is shown from the NE end of Hon Chut.

Hon Salacco (Hon Trung), 25m high, lies 0.3 mile NW of Hon Chut. Basse Salacco, with a depth of 5.2m, lies 0.3 mile NE of Hon Salacco.

Mui Ca Tien (Pointe de Ba Tien), lying 1.7 miles NW of Hon Chut, is the E extremity of a peninsula joined to the mainland by a narrow neck of land.

Hon Trung (Hon Mui) (11°49'N., 109°12'E.), 22m high, is composed of dark, rock with its summit covered with brushwood, and lies 0.5 mile NE of Mui Ca Tien.

Grande Passe, the access channel to Vinh Cam Ranh, is entered between Hon Trung and Dao Tagne, 1.5 miles NE. The passage has depths of 20 to 25m in the fairway.

Mui Sopt (Mui Sop), 3.5 miles N of Hon Trung, is the N extremity of a range of hills that separates the outer roadstead from Vinh Cam Ranh. Rocher Doigt, a hill, 140m high, is conspicuous nearly 0.5 mile S of Mui Sopt.

Hon Lo Ong Gia, a group of rocks, one of which is 8m high, lies 1 mile S of Mui Sopt. There are other dangers near.

Le Goulet, the passage leading into Vinh Cam Ranh, lies between Mui Sopt and Mui Hon Lan (Mui Hon Luong), 0.8 mile ENE. Mui Hon Lan is fairly steep-to, while Mui Sopt is foul to a distance of 0.1 mile, and Le Goulet has depths in the fairway of 22m. A radio tower, marked by red obstruction lights, stands 1.2 miles NNE of Mui Hon Lan.

Baie de Binh Ba, on the E side of the outer roadstead, is entered between Mui Nam, the NW extremity of Dao Tagne, and Mui Hon Lan. Baie de Binh Ba has general depths of about 14 to 22m.

Vinh Cam Ranh (11°53'N., 109°10'E.)

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5.36 Vinh Cam Ranh, on the coast of central Vietnam, is easy to access and surrounded by mountains. The harbor opens N and SW within Le Goulet. The village of Cam Lam (Cam Ranh) lies on the W side of the bay, 3.5 miles WNW of Mui Hon Lan.

Pointe Bai Sau lies on the E side of the bay, 1.8 miles N of Mui Hon Lan. A sandbank, with depths of less than 1m and steep-to on its W side, extends 0.8 mile W of the point.

Mui Con Ke projects from the NW shore of the bay, 2 miles NNW of Pointe Bai Sau. Lagune de Thuy-Trieu, a shallow lagoon, extends N of Mui Con Ke and is separated from the sea by Plage de Thuy-Trieu, a narrow neck of land.

Tides—Currents.—The tidal rise at Vinh Cam Ranh is 1.7m at MHHW. In Vinh Cam Ranh, at springs, the current inside the bay and at the entrance is less than 1 knot.

Depths—Limitations.—There are depths of 9.2 to 18.3m for a distance of 2 miles within the entrance. In the SW part of the bay, depths of less than 5.5m extend 1.5 miles from the shore. The NW shore, opposite Le Goulet, is bordered by drying reef extending up to 0.5 mile offshore in places.

Rocher Da Nau, with a depth of 1.5m, lies 1 mile E of Cam Lam. Banc de Da Bac, nearly awash and marked by a tower, lies 1 mile S of Cam Lam.

A concrete tanker pier, 160m in length, with a depth of 12.8m alongside, lies 0.5 mile S of Pointe Bai Sau. The pier is connected to the shore by a causeway, and a mooring dolphin is situated close seaward of the pier. A pier close S can accommodate deep-draft vessels.

A channel dredged to 9.2m and marked by lights leads to charted LST ramps and a basin situated 1 mile N of Pointe Bai Sau.

The T-head pier, at the outer end of the causeway S of Cam Lam, has a 90m long face capable of berthing vessels up to 107m in length with a draft of 4.9m.

Pilotage.—Pilotage is compulsory and should be arranged well in advance. The pilot will board in position 11°48'30"N, 109°12'30"E during daylight hours.

Signals.—The Harbor Entrance Control Post (HECP), situated on top of a conspicuous white building on Mui Hon Lan, may be contacted by radio or flashing light. Anchorage berths are assigned by the post.

Storm signals are shown from Cam Lam, 0.9 mile NNE of the head of the pier.

Anchorage.—Vessels can anchor according to draft in Vinh Cam Ranh or the approaches as directed by HECP.

Vin Cam Ranh to Baie de Phan Rang

5.37 Ilot Da Tai (Hon Long Doi) (11°43'N., 109°14'E.), 46m high, lies close offshore, 1 mile SW of Mui Da Vaich.

Baie de Vung Gang, entered 1 mile farther W, is difficult to distinguish due to the high mountains near it. La Sentinelle, a small island, lies close off the W shore of the bay, 0.5 mile N of the S entrance point of the bay. A rock, above water, lies close E of the latter entrance point. Three rocks above water lie close N of La Sentinelle. The bay is divided into two basins N of the latter rocks. A fishing village stands at the head of the bay, and a number of fishing craft are found here in season.

Anchorage can be taken, in a depth of 14.6m, in the outer basin, which provides good protection and is easy to access. Heavy squalls occur at times, but the holding ground is good.

The coast between the S entrance point of Baie de Vung Gang and Hon Chong, 8.5 miles SSW, slopes steeply inland from the mountains and is fringed by reef. Bai Lua, 27m high, lies midway along this stretch and close offshore.

Hon Chong, 27m high, is the outer of a group of islets extending 0.5 mile off the coast. Hon Do, a low peninsula, lies 1.3 miles SW.

5.38 Vung Phan Rang (Thon Ninh Chu) (Baie de Phan Rang) (11°35'N., 109°02'E.) (World Port Index No. 57600) is entered between Hon Do and the mouth of Song Kinh Dinh, 6 miles WSW. The river is not navigable. Two mountains are located at the head of the bay; Nui Quit, 356m high, rises 5

miles WNW of Hon Do, and Nui Ca Du, 319m high, rises 3.2 miles farther WNW.

Depths—Limitations.—Plateau de Corail, with a least depth of 0.3m, extends 0.7 mile to 1.5 miles SW of Hon Do. Banc du Chateaurenault, with a least depth of 2.4m, lies 3.2 miles WSW of Hon Do; a 5.5m patch lies 1 mile NE of the bank. Banc du Haiphong, with a depth of 0.3m, lies 3.2 miles WNW of Hon Do and 0.5 mile offshore.

There are depths of 7.5 to 14.6m in the entrance to the bay, W of Banc du Chateaurenault. The general depths in the bay are 7.5 to 9.2m.

Aspect.—A prominent church of Phan Rang stands 2 miles WNW of the mouth of Song Kinh Dinh. A drying coral reef extends 0.8 mile E from a point lying 0.7 mile N of the above river mouth. The town of Ninh Chu lies 2.5 miles farther N.

Anchorage.—During the Northeast Monsoon, the best anchorage is in a depth of 7m in the NE part of the bay.

Vung Phan Rang to Mui Vung Tau

5.39 The coast from Song Kinh Dinh to **Mui Dinh** (11°22'N., 109°01'E.), 10.5 miles S, is backed by high land. Nui Cha Bang, 437m high, is located 8 miles NW of Mui Dinh at the N end of a range of mountains extending S. Nui Maviék, 354m high, is located 3.5 miles E of Nui Cha Bang and 1.2 miles from the coast.

Mui Dinh (Cap Padaran) is high, steep, and convex to seaward. Nui De Ca, 614m high, is located 4 miles W of the cape. The land near Mui Dinh appears isolated when viewed from the N or SW.

Aspect.—A light is shown from the high part of the cape. Vessels can communicate with the signal station on Mui Dinh by means of the International Code of Signals.

Banc Nouvelle, with a depth of 6.1m, lies 2 miles N of Mui Dinh and 1 mile offshore.

Anchorage.—During the Southwest Monsoon, large vessels can anchor, in a depth of 14.6m, off a small bay close N of Mui Dinh, with the NE extremity of the cape bearing 157°. Bancs du Lutin, with depths of 1.4 to 3.3m, lie close NNW of the anchorage.

5.40 High land extends along the coast from Mui Dinh to Mui Sung Trau, 7 miles WSW.

Baie de Padaran is entered between Mui Sung Trau and Pointe Lagan, 15 miles SW. The SW part of the bay is encumbered by a bank with depths of less than 9m. Hon Lao, 40m high, lies 8 miles ENE of Pointe Lagan, on the E edge of the above bank. A bank, with a depth of 4.3m at its outer end, extends 1 mile W of the island.

Banc Ernest Simons, with a depth of 8.8m, lies 2 miles E of Hon Lao.

Banc de Breda, with a least depth of 1.5m, coral, lies nearly midway between Hon Lao and Mui Sung Trau.

Ca Na, a village situated 2.5 miles NW of Mui Sung Trau, lies on the E side of the entrance to a lake. The village lies at the S end of a gap between the mountains which is only prominent from SW. A power station, 1.5 miles ESE of the village, can be recognized by a white building and a water tower.

Anchorage can be taken during the Northeast Monsoon, in depths of 9 to 13m, sand, SW of the power station and 0.8 mile

offshore. A SE swell is developed in the bay during the Northeast Monsoon.

Pointe Lagan (11°10'N., 108°43'E.) is the extremity of a narrow spit of land. A ledge, with depths of less than 5.5m, extends 2.5 miles SW of the point.

5.41 Off-lying dangers.—The coastal bank, with depths of less than 20m, sand and coral, extends 13 miles SSE from Pointe Lagan. Banc de l'Althea, with a depth of 12.8m, lies 12 miles SSE of Pointe Lagan and is the outermost of several dangerous shoal heads.

Banc Bourayne, with a depth of 8.8m, lies 2.5 miles NNW of Banc de l'Althea. Banc Duchaffaut, with a depth of 8.8m, lies 3 miles farther NW.

The banks off Pointe Lagan are rocky, and there are bamboo fish traps on or near them, sometimes in considerable depths. There are also numerous wrecks in the area. Vessels should give Pointe Lagan a berth of about 15 miles.

Banc de Torcy, with a least depth of 14m, lies 17 miles S of Pointe Lagan.

Vung Phan Ri is entered between Pointe Lagan and Pointe Guio, located 15.5 miles WSW. Hai Tan, a large village, lies 9 miles NNE of Pointe Guio at the mouth of Song Luy. The coast between Pointe Guio and Hai Tan consists of cliffs of reddish color, E of which the slopes of the hills are wooded.

Anchorage can be taken, in depths of 7 to 9m, SW of the mouth of Song Luy, with Pointe Lagan bearing 075°. During the Northeast Monsoon, small vessels can find shelter, in a depth of 6.4m, NW of Pointe Lagan.

Nui Binh Nhon, a 236m high sand hill standing 4 miles W of Pointe Guio, can easily be recognized.

Mui Ne (Pointe Vinay) (10°55'N., 108°18'E.) is the extremity of a low, wooded hill, steep on its S side at the S end of a peninsula. Hon Lao, 25m high and covered with grass, lies 0.5 mile SE of the point. A tower is conspicuous on the W side of the peninsula, 1 mile N of the point.

Caution.—Banc Rivier, with a depth of 12.8m, coral, and Banc Madge, with a least depth of 12.8m, coral, lie about 18 miles SE and 15 miles S, respectively, of Mui Ne. Banc Hollandais and other off-lying dangers have been previously described in paragraph 5.2.

5.42 Vinh Phan Thiet (Vung Phan Thiet) occupies the bight between Mui Ne and Mui Ke Ga, 22 miles SW. Depths in the bay are irregular, and a bank with depths of less than 5.5m, extends 1.5 miles W of Mui Ne. Fishing nets may be found at a distance of 10 miles offshore abreast Ving Phan Thiet and Mui Ne.

Mui Ke Ga (10°42'N., 108°00'E.) is the extremity of a low tongue of land and the prolongation of a spur of Nui Ta Kou. The latter mountain, 694m high, rising 9 miles NW of Mui Ke Ga, is the most conspicuous of the mountains W of Vung Phan Thiet, and stands detached from any other high land. Ilot Ke Ga lies close S of the point. A light is shown from the islet.

Caution.—A mined area lies 1.5 miles S of Ilot Ke Ga; the area is charted and extends approximately 10 miles N to S and 7 miles E to W. Another mined area lies 10 miles SW.

5.43 The town of Phan Thiet, an important fishing center, lies 15 miles NNE of Mui Ke Ga, at the mouth of Song Cai. The light structure, on the E side of the river entrance, is not very visible among the trees. The best landmarks are a water tower, with a red roof, and a tower marked by red obstruction lights, 1 mile NNW and 2.2 miles W, respectively, of the light structure.

Anchorage can be taken, in a depth of 7.9m, mud, with the light structure at Phan Thiet bearing 314°, distant 2 miles.

During the Northeast Monsoon, anchorage can be taken, in a depth of 6.4m, in the NE part of the bay, off Hai Long (Khan Thien), keeping clear of the bank extending W of Mui Ne.

5.44 The coast between Mui Ke Ga and Mui Ba Kiem, 31 miles WSW, is low, and the coastal bank, with depths of less than 11m, extends up to 6 miles offshore in places. A bank, with depths of 4 to 5.5m, extends 2.5 miles WSW from a position lying 2 miles WSW of Mui Ke Ga.

Hon Ba, a 38m high islet, is wooded and lies 11.5 miles WSW of Mui Ke Ga and 1.3 miles offshore.

A spit, with a depth of 4m at its S extremity, extends 4.2 miles offshore from a position lying 3 miles WSW of Hon Ba.

Caution.—Banc de Britto, with a least depth of 0.9m, lies near the outer edge of the 20m curve, 16 miles SW of Mui Ke Ga. Vessels are advised not to pass between Banc de Britto and the coast without local knowledge and, in adverse weather, should not approach the bank in depths less than 29m. Bancs de l'Astrolabe, farther S, and the shoals in the vicinity were previously described in paragraph 5.5.

5.45 Mui Ba Kiem (10°30'N., 107°31'E.) is 119m high. Nui Ho Linh, 162m high, lies 0.8 mile NW of the cape. A chain of yellowish-white sand hills, 36 to 46m high, extends along the coast between Mui Ba Kiem and Mui Ho Tram, located 4.5 miles WSW; the hills lie a short distance inland, 1 to 3 miles NE of Mui Ho Tram.

Caution.—Rocher Rosslyn, with a depth of 0.6m, lies 6.2 miles SSE of Mui Ba Kiem.

Haut Fonds de Ba Ke, a number of isolated patches, with depths of 4 to 9.2m, extend 7 miles SSE of Mui Ho Tram. These shoals are separated from each other by depths of 11 to 12m, causing overfalls. Detached shoals, with depths of 10.1m and 7.3m, lie 8 and 11 miles S, respectively, of Mui Ho Tram.

During restricted visibility vessels should pass the above dangers in depths of 22m or more.

5.46 Mui Ky Van (10°23'N., 107°16'E.), 12 miles WSW of Mui Ho Tram, rises to several peaks, the highest of which is Nui Chau Vien, 327m high, located 2 miles N of the cape. A conspicuous red building stands near the shore, 2 miles NE of Mui Ky Van.

Rocher Pernambuco, with a depth of 5.2m, lies 2 miles SE of Mui Ky Van. The depths in the vicinity are irregular, with several shoal patches nearby; the shallowest and outermost, with a depth of 5.2m, lies 3.2 miles SSE of Mui Ky Van.

Between Mui Ky Van and Mui Vung Tau, 11 miles WSW, there is a shallow bay, the shores of which are low and backed by sand hills.

Song Sai Gon

5.47 The delta of Song Sai Gon lies in a bay entered between **Mui Vung Tau** (10°19'N., 107°05'E.) and Pointe du Mirador, the NE entrance point of Cua Tieu, 20 miles WSW. The delta is composed of numerous islands, separated by rivers or canals which are connected with each other. The delta provides access to the important port of Sai Gon (Than Pho Ho Chi Minh), situated 35 miles NW of Mui Vung Tau.

Song Sai Gon has its source 80 miles NW of Mui Vung Tau and pursues a winding course as far as Sai Gon. About 4 miles SE of Sai Gon, the river is joined by Song Dong Nai. At Pointe Phami, 5 miles below this junction, the river divides into two branches. The E branch, consisting of Song Long Tao and Song Nha Be, flows through the middle of the delta and enters Vung Ganh Rai, 9 miles NW of Mui Vung Tau. This branch is the principal access to Sai Gon, being the deepest and best marked, and ascends for a distance of 46 miles from Mui Vung Tau to Sai Gon. The W branch, consisting of Song Nha Be and Cua Soirap, is entered 12 miles WNW of Mui Vung Tau. Banc du Soirap, with a least depth of 1.2m, extends 12 miles SE from the E entrance point of Cua Soirap.

Mui Vung Tau and Approaches

5.48 Mui Vung Tau is the S extremity of an island which has three steep hills on its W side. These hills are the first high land seen when approaching from SW and appear as islands at a distance. Nui Nho, 182m high, the S of the three hills, lies nearly 1 mile NNW of Mui Vung Tau. The highest hill, 245m high, lies 1.5 miles farther NNW. Nui Dinh, 491m high, the S peak of a group of mountains, lies 13.5 miles NNE of Mui Vung Tau. Mui Ky Van, 11 miles ESE of Mui Vung Tau, was previously described in paragraph 5.46.

A light is shown from the summit of Mui Vung Tau and a racon transmits from the tower; a signal station is situated near the light.

The climate at Mui Vung Tau is tropical and there is heavy rainfall from May to October.

Dangers in the Approach

5.49 In adverse weather the banks in the S approach to Mui Vung Tau should be cleared with close regard to the soundings. Approaching from NE, **Britto Bank** (10°29'N., 107°50'E.) and other dangers off the coast should be given a wide berth. A dangerous wreck lies on the E side of the bank. Additionally, there are dangerous wrecks lying 4 miles NE and 10 miles E of Britto Bank.

Banc du Cap has a least depth of 7.6m and lies 2.2 miles SE of Mui Vung Tau. A detached shoal, with a depth of 7m, lies 3 miles SE of Mui Vung Tau.

Banc du Requin, farther E, has least depths of 6.4 and 5.8m lying 5.5 and 6 miles ESE, respectively, of Mui Vung Tau.

Banc Formosa, 1 mile ESE of Mui Vung Tau, has a least depth of 4.4m in its W part, and a rock, with a depth of 1.5m, lies 2 miles ESE of the cape.

Banc Ranza, with a least depth of 5.8m and extending in a WNW-ESE direction, is centered 0.7 mile W of Mui Vung Tau. A considerable number of wrecks and obstructions, some of

which are marked by buoys, lie near the bank and in the access to the E branch of the river.

Ilot Archinard, 15m high, lies 0.4 mile NE of Mui Vung Tau, on the outer edge of a reef extending 0.2 mile offshore and another islet lies 0.2 mile SW of Ilot Archinard. There is a rock, with a depth of 6.4m, lying 0.3 mile SE of Mui Vung Tau.

On the W side of the approach, Bancs de Can Gio, which dry 0.3 to 2.4m, extend nearly 2 miles offshore between **Mui Dong Tranh** (10°20'N., 106°53'E.), located 10 miles NE of Pointe du Mirador, and Mui Ganh Rai (Pointe Can Gio), lying 6.5 miles farther ENE.

Banc du Sud-Ouest, with depths of less than 9.1m, extends farther SE, between Banc du Soirap and a position lying 1.5 miles SW of Mui Vung Tau.

Banc du Phare, with depths of 0.8 to 1.9m on its E edge, lies on the W side of the access to Vung Ganh Rai. The bank is separated from Mui Do Cao Trang, located 2.5 miles NNW of Mui Vung Tau, by a deep channel 1.2 miles wide.

Tides—Currents.—The tidal rise at Mui Vung Tau is 3.5m at MHHW and 3.3m at MLHW.

At Mui Vung Tau the flood current begins shortly after LW and the ebb shortly after HW.

At Sai Gon the flood current begins about 4 hours 45 minutes after LW at Mui Vung Tau; the ebb current begins 4 hours 15 minutes after HW at Mui Vung Tau. The duration of slack water is about 20 minutes. The flood current attains its maximum velocity quickly, the ebb current slowly.

The current attains velocities of 1 knot to 3.5 knots. The local pilots anticipate a velocity of 1 knot for every meter of tidal range. According to the pilots, if the range of tide is less than 0.9m, there is no flood current for that flood tide.

The duration and velocities of the tidal currents are greatly influenced by the rainy season (August through September) and the flood current is often completely negated, so that the ebb flows continuously.

5.50 Off **Pointe du Lombard** (10°36'N., 106°52'E.) violent crosscurrents and undertows are experienced.

During the Northeast Monsoon, a vessel may be set leeward of Mui Vung Tau toward Bancs de Can Gio by the prevailing current, accelerated by the flood tidal current. During the ebb, however, the current is at times overcome and there may be a NE set. During the flood tide the current sets W over Banc Formosa. Westward of the bank it sets more N into Vung Ganh Rai. On the ebb tide it sets in a S direction out of the bay and E over Banc Formosa. Slack water occurs about 1 hour after high and low waters at Mui Vung Tau, and the currents attain velocities of about 2 knots; this velocity is maintained for the middle 2 hours of the rising and falling tides.

Pilotage.—Pilotage is compulsory. The pilot station is situated at Baie des Cocotiers (Vung Dua). Request for a pilot should be made by radio or VHF at least 24 hours in advance, stating the draft and any possibly dangerous material. The pilot boards 2.5 miles NW of Mui Vung Tau. The customs official usually boards with the pilot.

Anchorage.—Anchorage can be taken, in depths of 10 to 20m, off the high land NNW of Mui Vung Tau, on either side of the entrance channel. The anchorage is excellent during the Northeast Monsoon, but there is often considerable swell during the Southwest Monsoon.

Vessels in quarantine anchor at Nha Be.

Anchorage is prohibited, except in case of emergency, within 1 mile of either side of the sharp bends of the river, or in the vicinity of the channel through Banc du Corail.

It has been reported (1989) that vessels anchoring S of 10°19'N will be asked to proceed closer to Xa Vung Tau in order to be boarded and cleared by the authorities.

Main Channel

5.51 The entrance to the E and main branch to Sai Gon lies between **Mui Ganh Rai** (10°25'N., 106°59'E.) and the S extremity of Cu Lao Phu Loi, 2 miles NNW. The bar leading into Song Nga Bay lies NE of Mui Ganh Rai and has depths of 7.2m on the recommended track to abreast Mui Ganh Rai. The entrance channel is buoyed. It has been reported that buoys may not be in their charted positions and they may no longer exhibit lights.

There are least depths of 6.4m on either side of the recommended track, with the exception of a 5.5m shoal, about 1 mile NNE of Mui Ganh Rai, close S of the recommended track.

The channel narrows toward the NW part at the river entrance. Within the bar the depths increase and then there are generally ample depths upriver. The shallowest depths are found on the point side of the bends in most cases. There is adequate room in most reaches of the river for vessels to pass each other.

A bank, with depths of 4.2 and 5.5m at its E edge, extends halfway across the river, abreast **Rach Don** (10°34'N., 106°50'E.), on the W side of the river.

Banc du Propontis (10°35'N., 106°52'E.), with a depth of 5.2m at its W edge, extends halfway across the river from the E bank. About 0.5 mile farther N, a bank with depths of 4.5m at its E edge, extends halfway across the river opposite Rach Tac Roi.

Banc de Corail, which extends across the river, lies with its S end lying 0.5 mile NNW of **Pointe du Lombard** (10°36'N., 106°52'E.), and its N end in the concave side of the bend, 1 mile farther NNW. The least charted depth in the channel through the bank is 5.4m near its S end, although it was reported (1995) that lesser depths may exist, particularly in this vicinity. Shoal depths are reportedly encroaching toward the center of the channel from both sides of the river (1995).

Song Long Tao enters Song Nha Be N of **Pointe Phami** (10°40'N., 106°47'E.). A spit, with a depth of 4.9m at its extremity, extends 0.2 mile NW of the point. Anchorage is prohibited in the area NW of Pointe Phami.

5.52 Nha Be (10°41'N., 106°47'E.) is a subport of Sai Gon and the commercial oil depot for Than Pho Ho Chi Minh, lying on the W bank of Song Nha Be, 4 miles NW of the city.

Tides—Currents.—Vessels proceeding to Nha Be normally cross Banc du Corail at HW, turn opposite the jetty on the flood tide and berth starboard side-to. Vessels crossing Banc du Corail later than 1 hour after HW have to berth on the ebb tide. Vessels berthing on a flood tide must also unberth on a flood tide. Vessels which berth on an ebb tide may only unberth on either the first or last hour of the ebb tide.

Depths—Limitations.—There are jetties equipped with mooring buoys with depths alongside of 8.2, 9.2, and 9.4m,

respectively. There are two wharves with a combined berthing length of 380m and alongside depths of 10 to 13m. Vessels of up to 30,000 dwt can be accommodated.

There are several mooring buoys inside the 10m curve between Pointe du Lazaret and Nha Be.

Banc de la Ville de Paris and a bank close SE, each with depths of less than 5.5m, extend 0.4 and 0.3 mile, respectively, off the E bank of Song Nha Be, opposite the port of Nha Be.

From N of Banc de la Ville de Paris to **Mui Den Do** (Pointe du Feu Rouge) (10°44'N., 106°46'E.), a bank with depths of less than 5.5m, extends off the E bank of Song Nha Be, as far as the middle of the river. A dangerous wreck, marked by buoys close NE and SW of it, lies 0.9 mile SW of Mui Den Do.

Mui Ky Ha (Pointe de Binh Loi), 0.4 mile NNE of Mui Den Do, is the N entrance point of Song Dong Nai. Banc de Caobang, with depths of less than 5.5m, extends 0.7 mile SSE of Mui Ky Ha. Xom Cat Lai lies 2.5 miles ENE of the point.

Song Sai Gon, entered N of Mui Den Do, extends W and winds irregularly for about 5 miles to the mouth of Kinh Te, the S limit of the port of Sai Gon.

Pointe du Rach Bao lies on the N side of the river, 0.8 mile W of Mui Den Do. Banc du Chargeur, with a depth of 4.9m at its outer edge, extends 150m W of Pointe du Rach Bao. Banc du Gange, with a depth of 4.9m at its E edge, extends nearby to mid-river from the W bank, just N of Banc du Chargeur.

Above these dangers the channel is clear except for the fringing banks and several stranded wrecks on the N bank of the river.

Caution—An overhead cable, with an estimated vertical clearance of 40m, spans the river about 0.3 mile E of the mouth of Kinh Te.

5.53 West Channel.—Cua Soirap is an alternate channel and can be used at any stage of the tide by vessels with a maximum draft of 6.7m. The channel entrance, common to Cua Soirap and Cua Tieu, is buoyed.

The bar obstructing the channel to Cua Soirap is covered with fishing stakes. The fairway over the bar is marked by buoys which are moved as necessary and requires local knowledge.

Abreast the entrance of Song Vam Co (10°29'N., 106°44'E.) there is a shelf, with depths of 4.6m, encumbered by rocks and fishing stakes.

Sai Gon (Than Pho Ho Chi Min) (Saigon) (10°46'N., 106°43'E.)

World Port Index No. 57580

5.54 The port of Sai Gon (Saigon) lies on the W bank of Song Sai Gon and is the port for Thanh Pho Ho Chi Minh. The port extends from the mouth of Kinh Te, the S limit of the port, to the mouth of Rach Ben Nghe, 1 mile NW, then to the mouth of Rach Cau Bong, 1 mile farther NNE.

The Port de Commerce, the commercial part, lies in the S part of the harbor, and the navy yard occupies the N part. The N limit of the Port de Commerce is abreast the Statue of General Tra Hung Dau, standing 0.4 mile N of the mouth of Rach Ben Nghe.

The harbor offices and custom house are situated on the N side of the entrance to Rach Ben Nghe.

The Port of Nha Be, the oil port of Sai Gon, is situated about 10 miles below the port, and was previously described in paragraph 5.52.

The military port of Newport lies close E of the navy yard

Tides—Currents

The tidal rise at Sai Gon is 3.7m at MHHW and 3.2m at MLHW.

The tidal currents at Sai Gon can attain velocities of 4 knots. Off the E bank, the current turns 20 minutes before it occurs in mid-river. See also tides and tidal currents at Mui Vung Tau.

Depths—Limitations

Vessels of up to 220m in length and 11m draft can transit the main channel between 0400 and 1600. Vessels must arrive in Sai Gon at least 1 hour before the end of the flood in order to swing at anchor before mooring.

The maximum draft of a vessel transiting the main channel to Sai Gon is limited to the depth in the channel through Banc du Corail. Vessels with less than 6m draft can cross the bank at any hour of the tide. In order to arrive at Thanh Pho Ho Chi Minh at the beginning of the flood, a vessel must be at Mui Vung Tau at the beginning of the flood there.

The least depth in Port de Commerce is 8.2m, on Banc du Canton, nearly in mid-river, off the mouth of Rach Ben Nghe. With this exception, the depths in the fairway are 9.8m or more.

Off the navy yard there are obstructions, with depths of 1.8 to 4.9m, about 0.4 mile SW of the mouth of Rach Cau Bong.

Quay Khanh-Hoi, 249m long, has 11 berths and is situated on the SW side of the river, close upriver of the mouth of Kinh Te, and has depths of 5.5 to 10.3m alongside. The quay at Nha Rong is 488m long and has depths of 6 to 9m alongside. Tan Thuan is 343m long with alongside depths of 9.6 to 10.8m.

There are container and ro-ro facilities at the K-12 berths in depths of 12m. Ore and bulk cargo can be handled at quay K9 which is 100m long and has an alongside depth of 9.5m.

The Vitaico Terminal, which handles wood products, is 126m long, has an alongside depth of 8.7m, and can accommodate vessels of up to 16,000 dwt.

Ben Nghe is 519m long and has depths of 9.5 to 13m. There are five mooring buoys providing berths with lengths of 160 to 200m in depths of 7 to 10m.

The quay at New Port is 618m long and has alongside depths of 7.5 to 9.5m.

There is a passenger terminal with two quays. Quay MM1 is 138m long and has an alongside depth of 9m. Quay MM2 is 147m long and has a depth alongside of 6m.

There are 20 mooring berths in the harbor. Vessels are, as a rule, moored head and stern between buoys, with bows downstream. The buoys provide berths 50 to 200m long in depths of 7 to 13.3m.

Rach Ben Nghe, which connects Thanh Pho Ho Chi Minh with the river port of Cho Lon close SW, has a least depth of 0.9m and is crossed by three bridges.

Vessels can swing at anchor in only two areas; one is near the mouth of Rach Ben Nghe, and the other is N of Port de Guerre, above the navy yard. At the latter point, on the S bank, nearly 0.5 mile E of Rach Cau Bong, vessels place their bows on the bank between two beacons and let the tidal current swing them.

Pilotage

Pilotage is compulsory. Pilots board at the pilot station on Cape St. Jacques during daylight hours only.

Regulations

Vessels, as a general rule, are permitted to shift berth during daylight hours only, as prescribed by the port authorities. A 6-hour notice is necessary.

Signals

There is a coast radio station and a port radio station at Thanh Pho Ho Chi Minh.

Storm signals are shown from a station situated in position 10°46'N, 106°42'E.

At Nha Be, a vessel should display its national flag and number. Vessels can display flag N of the International Code to obtain a motorboat which will take a message to be transmitted by telephone to Sai Gon. Vessels can also use the International Code.

Anchorage

Anchorage is prohibited within the harbor limits. Vessels must anchor below the mooring berths and out of the fairway.

Vessels in quarantine or carrying explosives are instructed to anchor at Nha Be.

The Mekong River

5.55 The Mekong River, one of the world's great rivers, is 2,800 miles long and has its source in the mountains of Tibet. It flows through China, Burma, Laos, and Cambodia before reaching its delta in Vietnam. For the greater part of its length it runs through steep gorges and over dangerous rapids. At Kracheh, in central Cambodia, 105 miles above Phnom Penh, it becomes a wide, slow-flowing river, suitable for navigation by ocean-going vessels.

At **Phnom Penh** (11°36'N., 104°54'E.), the Mekong River divides into two principal arms, flowing nearly parallel to each other through Vietnam to the South China Sea. The E arm, and principal waterway used by ocean-going vessels, is known as Song Tien Giang, and the W arm is known as Song Hau Giang or Bassac.

At Phnom Penh, the Mekong River is joined by a river extending NW, which connects with Tonle Sap, a lake about 80 miles long.

Depths over the bars at its entrances are the controlling factor in the navigation of the Mekong River. There are depths of 2.1 to 3m over the bars of the principal mouths of the river.



Than Pho Ho Chi Minh (Sai Gon Harbor)

The river depths generally increase within the bars, but local knowledge is necessary.

The land in the vicinity of the mouths is low and subject to frequent change due to the accumulation of alluvial deposits brought down by the different branches of the river.

Tides—Currents.—The water level in the river is low from February to June, the lowest levels occurring in April and May, and high from July to December, the highest levels occurring from August to October. When the river is low, the current is influenced by the tidal current as far as Phnom Penh; when the river is high, the effect of the tidal current is felt to about **Sadec** (10°18'N., 105°45'E.). At and above **Vinh Long** (10°15'N., 105°58'E.) the direction is continuously seaward.

Tidal currents in the river mouths attain velocities of 3 to 4 knots during the high river season on the ebb current. In the low river season it may attain velocities of 1.5 to 2 knots with large tides.

Pilotage.—Pilotage is compulsory in the Mekong River; it is compulsory from Mui Vung Tau to the Cambodian border. Pilots board and disembark in Baie des Cocotiers, NW of Mui Vung Tau.

Vessels bound for Phnom Penh should send, 48 hours in advance, their ETA at Mui Vung Tau to Mekong Pilotage Sai Gon, and their ETA at Phnom Penh to the Port Captain Phnom Penh through Sai Gon coast radio station.

Cambodia and Vietnam each maintain a pilot station in their respective territories near the border on the Mekong River. The Cambodian station is at **Kaam Samna Kraom** (10°56'N., 105°11'E.), and the Vietnamese station is at **Tan Chau** (10°48'N., 105°15'E.).

Vessels subject to pilotage are piloted by Cambodian pilots between the Vietnam border and Phnom Penh.

Regulations.—Vessels in the Vietnamese part of the Mekong River are only permitted to be underway from sunrise to sunset, except in unfavorable circumstances of the tide.

Vessels waiting overnight for the tide are only permitted to anchor at **My Tho** (10°21'N., 106°22'E.) or at certain points indicated by the pilot.

Vessels proceeding to Phnom Penh and requiring the services of a pilot must first obtain permission from the Cambodian authorities.

Song Tien Giang

5.56 Song Tien Giang, the E and principal waterway of the Mekong River, enters the sea through six main mouths. Cua Tieu, the N mouth and principal entrance, is entered between the NE extremity of Cu Lao Loi Quan and **Pointe du Mirador** (10°16'N., 106°45'E.).

Banks, with depths of less than 5.5m, extend up to 13 miles off the entrance of Cua Tieu; breakers generally mark the edges of the banks. Fish nets and large, isolated fish stakes, invisible at night, constitute a danger to navigation, especially near Pointe de Mirador.

Banc Norodom dries to a distance of 5 miles ESE of Pointe de Mirador. A light is shown from the S side of the bank, about 2.7 miles ESE of the point.

Depths—Limitations.—There are depths of 2.1m over the bar of Cua Tieu, which extends 11 miles from the entrance, and vessels without local knowledge should not cross it.

The allowable draft of a vessel proceeding to Phnom Penh depends on the depth of water on the bar at Cua Tieu plus the tide at Mui Vung Tau. There are also bars at distances of 70, 78, and 120 miles above the entrance, but these, although possibly affecting the times of anchoring, do not necessarily diminish the practicability of the passage.

Vessels should arrive at the entrance of the bar at such time as to be able to cross with an underkeel clearance of 1.2m, and proceed up the river on the flood.

The allowable drafts vary from 4.4m in April to 5.5m in August through November.

Speed is limited to 10 knots in the entrance.

The seaward entrance to the channel, and the channel itself, are buoyed.

Caution.—There are many fishing stakes in Song Tien Giang, but these are generally well lit at night with the end stake normally being marked by a red light.

The passage is not as difficult as it may appear; the river is wide and there are few sharp turns. The bottom consists of soft mud and if a vessel goes aground serious damage is unlikely.

Vessels should be cautious of the high density of river craft, which in general, do not observe the regulations.

5.57 Phnom Penh (11°36'N., 104°54'E.), 178 miles above Cua Tieu, is the capital of Cambodia. The limiting draft for a vessel proceeding to Phnom Penh is dependent upon the draft of a vessel able to cross the bar at Cua Tieu.

The height of the river at Phnom Penh has a tidal range of of 9.2m from LW to HW. The current at Phnom Penh flows seaward, attaining a maximum velocity of 3.8 knots.

The port consists of a commercial harbor and a naval harbor. Pontoon Wharves Nos. 1 and 3, each 58m long, and Pontoon Wharf No. 2, in the commercial harbor, can accommodate vessels up to 2,000 tons. A wharf, 200m in length, two T-headed quays, and a wharf, 60m in length, have least depths of 5m alongside. Additional pontoons allow the berthing of vessels up to 100m in length.

Shell POL Pier, a T-head pier, with a berthing length of 76m, can accommodate vessels of 5,200 dwt, with drafts of 3.3 to 5m.

Song Hau Giang

5.58 Song Hau Giang (Bassac), the W arm of the Mekong River, is used mainly by vessels bound for Can Tho, Long Xuyen, and Chau Doc (Chau Phu). It has two mouths, Cua Dinh An and Cua Tran De, which are fronted by shallow banks extending 10 miles offshore.

Cua Dinh An, the entrance most used, is fronted by a bank which dries in parts. North of the bank there is another bank, which also dries in parts, and on which there is a stranded wreck.

The entrance channel to Cua Dinh An, which is buoyed, leads past Pointe de Long Kanh, the NE point of the river mouth. Caution should be exercised when approaching the entrance channel, due to the drying bank mentioned above, the lack of prominent landmarks, and the reported unreliability of the buoyage in the channel.

5.59 Can Tho (10°02'N., 105°47'E.) is situated 50 miles above the entrance to Cua Dinh An. The port handles gasoline, fertilizers, chemicals, cement, and rice.

Depths—Limitations.—There are two quays with a total berthing length of 142m in depths of 9m. Vessels of up to 18,800 dwt, 140m in length, with a draft of 7m can be accommodated.

Pilotage.—Pilotage is compulsory. The pilot boards at Zero Buoy (9°29'N., 106°30'E.). Pilotage must be requested by VHF 24 hours in advance of arrival through Vietnam Ocean Shipping Agency. The harbormaster will advise the vessel of an alternate boarding station in the event of poor weather conditions. Pilotage is available during daylight hours only.

Anchorage.—Vessels awaiting a pilot may anchor in the vicinity of the Zero Buoy, in a depth of 12m.

The Mekong River to Mui Bai Bung

5.60 The coast of Vietnam, off the mouths of the Mekong River and then to **Mui Bai Bung** (8°37'N., 104°43'E.), is low, and at times inundated by the sea. In most parts the tops of the trees are only just visible at a distance of 11 or 12 miles. The coastal bank, with depths of 1.8 to 5.5m, borders this entire coast, extending up to 13 miles off the Mekong Delta. Off the delta, the depths seaward of the coastal bank increase abruptly to 11m, then to 18m.

Vessels bound for Mui Vung Tau from the W or SW are recommended to give Hon Khoai a wide berth, then pass E or W of the Con Son Islands, previously described in paragraph 5.6, and continue to navigate toward Mui Vung Tau, keeping well seaward of the coast. Many vessels have grounded on the banks off the Mekong delta due to the absence of landmarks and the rapid decrease in depths. If it becomes necessary to

approach this coast, a vessel should not proceed in depths of less than 20m, especially during the Northeast Monsoon, when there is a strong current which sets onto the banks.

The mouth of **Song Ganh Hao** (9°00'N., 105°25'E.) is obstructed by a bar which dries at very low tides. Mooring buoys have been established 6 miles SE of the river mouth. Junks ascend Song Ganh Hao as far as Quan Long (Ca Mau), 20 miles NW of the mouth, and can reach the Gulf of Thailand through inland waterways during the Southwest Monsoon.

Cua Bo De, 20 miles SE of the mouth of Song Ganh Hao, is the mouth of a small river that runs across the peninsula and connects with the Gulf of Thailand. Bouys, lighted buoys, and a directional light lead into Cua Bo De.

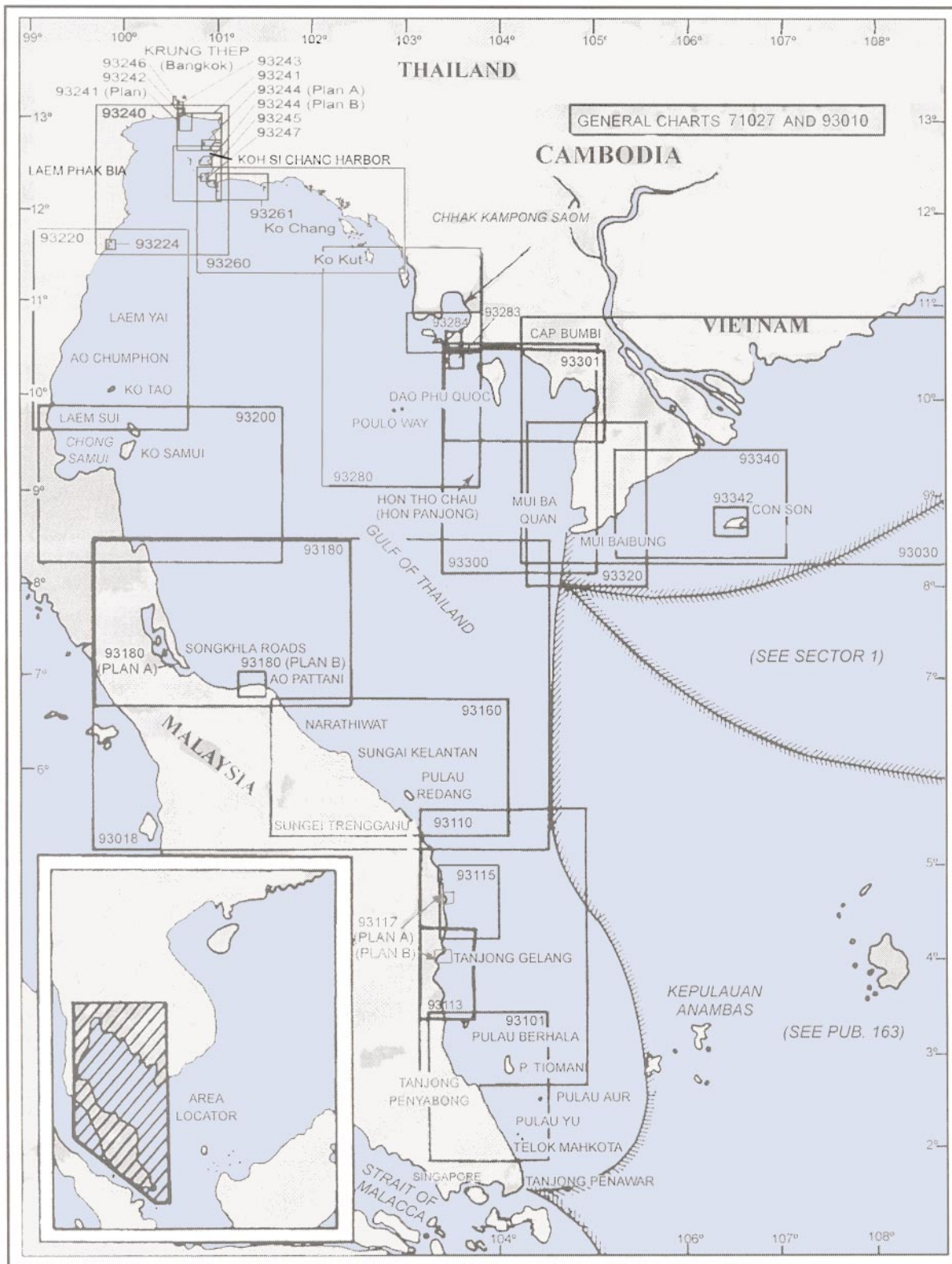
5.61 Hon Khoai (8°26'N., 104°50'E.), 12 miles SE of Mui Bai Bung, the SW extremity of Vietnam, is 318m high at its S end and densely wooded. A light is shown from the E side of the summit.

Hon Sao, 175m high and wooded, lies 1 mile E of the S end of Hon Khoai. Rocher Hull, 10 m high, lies 2.5 miles SE of Hon Sao; a rock, with a depth of less than 1.8m, lies close SW of Rocher Hull. In 1971, Rocher Hull was reported to lie 0.4 mile SSE of its charted position.

A bank, with depths of less than 5.5m and about 1 mile wide, extends E, then ENE, to a position lying 32 miles ENE of Hon Khoai.

Caution.—Banc du Royalist, with a depth of 11m, lies 26 miles SE of Hon Khoai. Another bank, with a depth of 11m, lies 20 miles ENE of Royalist Bank.

St. Marcouf, a bank with a depth of 6.7m, lies 32 miles E of Hon Khoai. A 14.6m shoal was reported (1966) to lie about 8 miles SW of St. Marcouf. A dangerous wreck was reported (1925) to lie 59 miles ESE of Banc du Royalist.



Additional chart coverage may be found in CATP2 Catalog of Nautical Charts.
SECTOR 6 — CHART INFORMATION

SECTOR 6

THE GULF OF THAILAND (COASTS OF CAMBODIA AND THAILAND) AND MALAYSIA— EAST COAST

Plan.—This sector describes the Gulf of Thailand and the E coast of Malaysia, and includes the port of Bangkok (Krung Thep). The E and N shores of the Gulf of Thailand to Bangkok are first described. The W coast of the Gulf of Thailand and the E coast of Malaysia to **Tanjung Penawar** (1°31'N., 104°17'E.) are then described. The arrangement of the sector is N, NW, S, and then SE.

General Remarks

6.1 The Gulf of Thailand is one of the major coastal indentations of Southeast Asia. The gulf extends NW about 400 miles from its entrance to its head. The entrance is 205 miles wide between Mui Bai Bung, the SW extremity of Vietnam, and **Sungai Kelantan** (6°13'N., 102°14'E.), on the E coast of Malaysia.

The NE shore of the gulf is more indented and irregular than the W shore and the islets and dangers lie farther offshore.

The NW and W shores of the gulf are backed by coastal ranges that extend to the coast in places. This coast is composed of sandy beaches interspersed by ridges and rocky points. The hinterland consists of dense forests with numerous streams.

Most of the ports are small coastal trading centers. Bangkok, at the head of the gulf, and Chuk Samet Harbor, on the SE side of Ao Sattahip, are the only major ports.

The E coast of Malaysia between Sungai Kelantan and Tanjung Penawar, 310 miles SSE, is characterized by low swampy areas with numerous rivers discharging into the sea. Coastal ridges and hills extend to the coast at isolated points. In general, the off-lying islands are quite high and wooded. They provide good landmarks for coastal navigation.

Caution.—Several areas of the Gulf of Thailand, which are best seen on the appropriate chart, contain oil and gas fields with a network of pipelines. Lighted and unlighted structures, both above and below water are associated with these fields, and pose a danger to navigation. Specialized offshore tanker berths, complete with production platforms and storage barges are present, and will be described. Several pipelines, carrying petroleum and natural gas are laid on the sea bed of the gulf, and are best seen on the appropriate charts. However, not all the features are charted and vessels navigating in the vicinity are required to exercise special caution. Flares at structures may be seen from distances exceeding 20 miles.

Mariners risk prosecution by anchoring or trawling near a pipeline and damaging it. Gas from a damaged pipeline can cause a fire, or loss of a vessel's buoyancy.

Several areas containing production fields have been designated as restricted areas, and vessels not associated with them are advised to avoid the areas by as wide a margin as practicable.

The Gulf of Thailand—East and North Shores

6.2 Mui Bai Bung (8°37'N., 104°43'E.), the NE entrance point of the Gulf of Thailand, is low and wooded. Hon Khoai and the dangers SE have been described in paragraph 5.61. The point is fronted by a coastal bank, with depths of less than 11m, extending 7 miles SW and 8.5 miles W, respectively, from the point. The coastal bank shoals sharply, and has depths of less than 1.8m close within its W edge. Depths of less than 14.6m extend up to 13 miles SW of the point.

A rock, uncovering 1.2m, lies 14 miles SW of Mui Bai Bung.

Hon Khoai is the primary landfall for vessels entering the Gulf of Thailand.

Caution.—An extensive unexamined bank, with depths of 14.6 to 18.3m, lies with its center lying 70 miles WSW of Mui Bai Bung.

Hon Chuoi, 150m high and wooded, is located 22 miles NNW of Mui Bai Bung; it is cliffy, steep-to, and appears as two islands from S. Hon Buong, 50m high, with a small islet off its E side, lies 4 miles SSE of Hon Chuoi. A rocky ledge extends 0.3 mile E of the islet.

Mui Bai Bung to Chrouy Samit—Off-lying Islands and Dangers

6.3 The islands and dangers described below lie up to 81 miles off the coast and outside the 20m curve between Mui Bai Bung and **Chrouy Samit** (Pointe Samit) (10°52'N., 103°07'E.), 166 miles NW.

Hon Panjang (Hon Tho Chau) (9°18'N., 103°29'E.), flat-topped and 167m high, lies 84 miles NW of Mui Bai Bung. The island has the appearance of a tableland. Two islets, the outer islet being 45m high, lie on a coral bank extending 2 miles ENE of the island. Rocher Blanc (Hon Da Bac), 23m high, lies 2 miles S of the SW end of the island. A reef, consisting of two rocky heads, with a depth of 1.2m, lies 1.2 miles ENE of Hon Da Bac.

Anchorage.—A bay on the W side of the island offers good anchorage and shelter, in a depth of 29m, sand and coral. A rock, 0.6m high, with sunken rocks close E and W, lies 0.5 mile SW of the N entrance point of the bay.

Caution.—It has been reported (1998) that Hon Panjang and its associated islets may lie 1.3 miles E of their charted positions.

6.4 Hon Da Ban, 34m high, and Rocher Table, 12m high and 0.3 mile SE, lie 8.5 miles ENE of Hon Panjang.

Dewagougee Shoal, with a depth of 5.5m, was reported to lie 17 miles NNW of Hon Panjang. A shoal, with a depth of 7.3m, was reported (1961) to lie 3 miles NW of Dewagougee Shoal.

Poulo Wai consists of two wooded islets, separated by a channel 0.7 mile wide, with depths of 18.3m in the fairway.

The W island is 91m high at its SE end. A light is shown from the E end of the W island. The E island is 61m high, and Rocher Saracen, awash, lies 0.8 mile NNW of the island. A rock, 0.9m high, with sunken rocks close E and W, lies 0.7 mile E of the E island. A patch, with a depth of 8.2m, lies 2 miles S of the latter rock, and an 8.5m shoal was reported to lie 7.5 miles E of Poulo Wai.

Recif Depond, which dries 0.6m, lies 12 miles ENE of Poulo Wai.

Anchorage.—Good anchorage can be found off the N side of the E island of Poulo Wai, but the best berth is in a depth of 14.6m, off the sandy bay on the NE side of the W island, 0.3 mile offshore.

6.5 Ilot Veer (10°14'N., 102°53'E.), 36m high and steep-to, lies 18.5 miles N of Poulo Wai.

Kas Prins (Kaoh Pring), 61m high, lies 9 miles farther NNW. An islet, 46m high, and an islet, 7m high, lie 0.5 mile, and 1.5 miles, respectively, W of Kas Prins.

Kas Tang (Kaoh Tang), 10 miles ESE of Kas Prins, is wooded, inhabited, and 134m high at its N end. Ile Abri, a small islet, lies 0.5 mile N of the S entrance point of the sandy bay on the E side of the island. Another small islet lies 1 mile SE of Kas Tang.

Ilots Sud Est consists of two islets lying 4.5 ESE of Kas Tang. The NW islet is 43m high, and a shoal, with a least depth of 6.7m, extends 1.5 miles SSE of the SE islet.

Recif Condor, which dries 0.3m, lies 22 miles NNW of Kas Prins, and 17.5 miles WSW of Chrouy Samit.

Mui Bai Bung to Baie de Ream

6.6 Mui Ba Quan (8°46'N., 104°48'E.), 12 miles NNE of Mui Bai Bung, is the N entrance point of a shallow estuary.

The coast between Mui Ba Quan and the S entrance point of Vinh Rach Gia, 64 miles N, is low, wooded, and intersected by small streams. The coastal bank, with depths of less than 5.5m, extends 2 miles offshore along this stretch of coast. The only landmark along this coast is Hon Da Bac, 30m high, wooded, and standing close to the coast, 24 miles N of Mui Ba Quan.

A 5.8m shoal, existence doubtful, was reported (1965) 37 miles WNW of Hon Da Bac; a 9.2m patch was reported to lie 2.5 miles farther NNW.

Vinh Rach Gia has general depths of 0.6 to 1.5m. **Hon Tre** (9°57'N., 104°50'E.), cone-shaped and 323m high, lies near the middle of the bay entrance. The N entrance point of the bay rises to several peaks.

Rach Gia (10°01'N., 105°05'E.), a small port, lies at the entrance of a channel which provides access to a canal network extending to the Mekong River. The canal is navigable by boats with drafts of up to 1.8m.

Vung Cay Duong, close NW of Vinh Rach Gia, has depths of less than 5.5m and is backed by low land.

Mui Hon Chong (10°08'N., 104°39'E.), the W entrance point of Vung Cay Duong, is a rocky headland, 161m high. Rocher Sans Nom, 1.5m high, lies 4.5 miles SE of Mui Hon Chong, on a bank with depths of 3.4m which extends 3 miles W of Rocher Sans Nom.

Mui Ong Thoa (Mui Hon Troc), 2 miles W of Mui Hon Chong, is a rocky headland. A range of hills, rising to an altitude of 201m, extends 4 miles NE of the headland.

Quan Dao Balua (Iles Balua) is an extensive group of islands extending 12 miles W and SSW of Mui Ong Thoa. Numerous rocks, reefs, and shoals, with depths of less than 5.5m, lie between and near the islands. A vessel should not attempt to navigate within the islands without local knowledge.

Hon Nghe (10°01'N., 104°33'E.), conical and 323m high, is wooded, inhabited, and lies 7 miles SSW of Mui Ong Thoa. It is the largest of the islands. Outer Island, 4 miles SW of Hon Nghe, is the S island of the group. A shoal lies 9.2 miles W of Outer Island with a least depth of 7.9m. Ile Escarpe lies 3.5 miles W of Hon Nghe.

Hon Heo (10°11'N., 104°32'E.), 102m high, lies 4.5 miles WNW of Mui Ong Thoa. Ile Ouest, 8 miles WSW of Hon Heo, is the W of Quan Dao Balua.

6.7 Quan Dao Nam Du (Iles de Poulo Dama) (9°41'N., 104°22'E.) in the approach to Vinh Rach Gia, consists of two parallel chains of islands in a N-S direction. **Hon Nam Du** (9°41'N., 104°21'E.), the principal island of the group, has a sharp peak, 309m high, near its center and a monument stands on the E side of the island, 1.5 miles from its S extremity. Hon Mong Tay, 103m high, lies 1 mile S of Hon Nam Du and a 4.6m steep-to shoal lies 0.3 mile S of Hon Mong Tay. A reef, with a depth of 0.9m, lies 1.3 miles W of the summit of Hon Nam Du; a rock, with a depth of 1.5m, lies 2 miles farther N. Hon Gian, 105m high, lies 1.5 miles N of Hon Nam Du. An islet, 48m high, with a rock above-water 0.2 mile W, lies 1.2 miles WSW of Hon Gian.

Hon Mau, over 61m high, and the S of the E chain of islets, lies 2.5 miles SE of the S extremity of Hon Nam Du. Hon Truoc, 90m high, and the N islet of the E chain, lies 1.5 miles E of the NE side of Hon Nam Du. Roche de l'Aspic, with a depth of 0.6m, lies 0.4 mile N of Hon Truoc; a rock awash lies 0.3 mile WNW.

Anchorage, during the Northeast Monsoon, can be taken in a depth of 12.8m, 0.5 mile SW of the W extremity of Hon Mau. During the Southwest Monsoon, the best anchorage for vessels with local knowledge is in a depth of 7.3m, good holding ground, E of the summit of Hon Nam Du, in the passage between the islands.

6.8 Hon Rai (Ile Tamassou) (9°48'N., 104°38'E.), 405m high, table-topped, wooded, and with a steep summit, lies 14 miles NE of Quan Dao Nam Du. A rock, with a depth of 0.6m, lies 0.3 mile off the W end of the island. A 3.2m patch, existence doubtful, lies 1.2 miles SE of the W end of the island.

Iles d'An Thoi (9°57'N., 104°02'E.) is a group of small islands and islets extending 6.5 miles S of **Mui Hanh** (10°01'N., 104°01'E.), the SW extremity of Dao Phu Quoc. Hon Dua, 101m high, the N island, is separated from Mui Hanh by a channel, about 0.5 mile wide, with a deep fairway. The channels between Iles d'An Thoi are apparently deep, but should not be used.

Hon May Rut, 87m high, lies in the SW end of the group. Hon Kim Qui, 53m high, and Hon Trang, 33m high, lie 0.5 mile NW and 0.3 mile SSE, respectively, of Hon May Rut. Hon

Xuong, 75m high, and Hon Mong Tay, 0.5 mile S of it, are the SE islands of the group.

A 10.3m depth was reported (1966) to lie 5.5 miles W of Hon May Rut.

Hon Tay (9°49'N., 104°03'E.), 69m high, with a rock, 1m high, lying 0.3 mile W, is separated from Iles d'An Thoi by a channel 5 miles wide.

Hon Da Ban, 6m high, lies 1.2 miles SE of Hon Tay. A rock, 1.5m high, lies 0.8 mile E of Hon Da Ban. Hon Dong, 118m high, lies 3 miles ENE of Hon Tay.

Dao Phu Quoc

6.9 Dao Phu Quoc (10°15'N., 104°00'E.) is a mountainous island. **Nui Chua** (10°22'N., 104°03'E.), 565m high, the summit of the island, rises at the N extremity of a mountain range that dominates the E coast of the island.

Cay Dua (An Thoi) (10°01'N., 104°01'E.) is an important fishing harbor in the small bay E of Mui Hanh. There are two piers at Cay Dua. The W pier, 101m in length, serves as a fuel pier, and is supported by concrete pilings. The pier can accommodate vessels up to 152m in length and 4.2m draft.

The SW side of Dao Phu Quoc is mostly low with isolated hills rising inland. Sommet Carre, 161m high, rises close to the coast, 2.8 miles NNW of Mui Hanh. This coast is fringed by a bank with depths of less than 9.2m extending up to 0.5 mile offshore.

Duong Dong (10°13'N., 103°58'E.) (World Port Index No. 57520), the center of an important fishing industry, lies on the S side of a river entrance, 13 miles NNW of Mui Hanh. A large rock, surmounted by a white mast, with a pagoda nearby, lies on the S side of the river entrance.

Anchorage.—Anchorage can be taken, in a depth of 11m, about 1 mile W of the light structure on the S entrance point of the river.

During the Northeast Monsoon, anchorage can be obtained anywhere off the SW side of Dao Phu Quoc.

Mui Dai Trai (10°22'N., 103°50'E.), the W extremity of Dao Phu Quoc, is backed by Day Nui Bai Dai, a range of hills extending 6 miles E. Hon Thay Boi, 18m high and wooded, lies 1.3 miles W of Mui Dai Trai; a 1.8m patch lies 0.4 mile ENE of the islet. Hon Ban, 14m high, lies 1 mile N of Hon Thay Boi. Hon Don Moi (Hon Do Moi), with rocks close off it, lies 2.3 miles S of Mui Dai Trai, and 0.5 mile offshore.

6.10 Mui Ganh Dau, the NW extremity of Dao Phu Quoc, lies 1 mile NNE of Mui Dai Trai. Rocher Plat, a rock above water, lies 0.8 mile N of Mui Ganh Dau; a rock, with less than 1.8m, lies 0.3 mile SE of Rocher Plat.

The island of Kaoh Ses, 89m high, lies 2.3 miles NW of Mui Ganh Dau. Ile Cone lies 0.5 mile W of the S extremity of Kaoh Ses, and a shoal with a depth of 3m lies 0.5 mile SSE of the same extremity. Kaoh Thmei, close NW of Kao Ses, has two summits; the highest, 172m high, rises in its N part.

Mui Kwala, the N extremity of Dao Phu Quoc, rises to Nui Chao, 382m high, 1 mile S. Nui Ham Rong, 366m high, lies 3 miles farther SSW. Dangerous ground extends nearly 2 miles W and N of the cape. Banc du Loire Inferieure, with a depth of 3m, lies 1.5 miles N of Mui Kwala, and is the N danger. A

shoal, with a least depth of 4.2m, extends 3 miles ENE of the cape.

The E side of Dao Phu Quoc is bordered by shoal water, with depths of less than 1.8m extending up to 4 miles offshore in places.

Nui Da Bac, 448m high, lies at the S end of the tableland mountain range on the E side of Dao Phu Qui. Nui Ham Ninh, 376m high, lies 3 miles farther SW. The village of Ham Ninh, where a light is shown, lies 1 mile SE of Nui Ham Ninh.

Mui Ong Doi, at the SE end of Dao Phu Quoc, is the SE extremity of a peninsula with a rounded summit, 120m high. Depths of less than 5.5m extend 3 miles SE of Mui Ong Doi.

Anchorage.—The irregularity of the bottom makes anchorage difficult off the E side of Dao Phu Quoc. Anchorage can be obtained, in a depth 8.5m, about 3 miles E of Ham Ninh.

During the Southwest Monsoon, the most sheltered anchorage is in the bay NW of Mui Ong Doi, in a depth of 10m.

Caution.—Exercise care when utilizing the coast of Dao Phu Quoc and the adjacent islands from Duong Dong to Hon Do Mai for position-fixing purposes. Some features on and off this coast have been reported to be incorrectly charted.

Approach to Ha Tien—Islands and Dangers

6.11 Poulo Cici (10°12'N., 104°15'E.) consists of two islets, the N of which is 65m high and covered with trees. The islets lie near the S end of a bank, with depths of less than 5.5m, extending S of the coast between **Cap Bumbi** (10°32'N., 104°11'E.) and Pointe Kep, 8 miles ESE.

Rocher Rosita, which dries 0.6m, lies 4.5 miles NNW of Poulo Cici.

Iles Des Pirates (Quan Dao Hai Tac), a group of islands and islets, lie on a bank, with depths of less than 5.5m, extending 13 miles S of Pointe Kep. Vessels should not attempt to pass between the islands without local knowledge.

Hon Duoc (10°15'N., 104°19'E.), the S island of the group, lies 5 miles NE of Poulo Cici. Hon Doc lies 3.5 miles NNE of Hon Duoc.

Kaoh Tunsay, 155m high and wooded, rises 3 miles SE of Pointe Kep, and is the N island of the group.

6.12 Ha Tien (10°23'N., 104°29'E.) (World Port Index No. 57530) lies at the mouth of Rach Giang Thanh, which discharges 2.5 miles ENE of Mui Nai. Hills on either side of the river entrance form a gap that is conspicuous from SW. A light is shown on Mui Nai. Lights, in range 044°, on the NW side of the river entrance, are moved as necessary to conform to the channel over the bar; the range passes between a rock, with a depth of 1.2m, and a wreck farther E.

The bar at the river mouth has depths of 0.6m for a distance of about 100m. The mud, however, is very soft and vessels with drafts of 3.4m, and with sufficient power, can enter the river.

A quay on the N side of the river has depths of 2.4m alongside.

Anchorage.—Vessels drawing 4.6m can anchor 1.5 miles seaward of Mui Nai.

During the Southwest Monsoon, small vessels with local knowledge can anchor, in a depth of 6.4m, about 0.5 mile E of Hon Doc.

Directions.—Vessels should approach between **Ile Ouest** (10°09'N., 104°24'E.) and **Iles des Pirates** and proceed to steer according to the range lights in line. Vessels should not enter the harbor without local knowledge.

Kampot (10°36'N., 104°11'E.)

World Port Index No. 57500

6.13 Kampot, the principal town of the area lies on the E bank of a river, 3.5 miles N of Cap Bumbi. There are three channels by which junks can enter the river; the E and best has a depth of about 0.6m on the bar.

Vessels of moderate size, with local knowledge, can approach to a position 6.5 miles SW of Cap Bumbi where anchorage, in depths of 11 to 16.5m, can be taken.

There are two approaches to the anchorage off Kampot. **Kinh Gan Dau** (Chenal Ouest), the channel N of **Dao Phu Quoc**, should be used by vessels with a draft of more than 4.6m. The depths in the fairway to the anchorage are not less than 10m. **Chenal Sud**, the channel E of **Dao Phu Quoc**, is only navigable by vessels with a draft of 4.6m or less.

Phnum Pouvankhone (Massif de L'Elephant), a range of mountains rising to an elevation of 1,000m, on the mainland N of **Dao Phu Quoc**, is very conspicuous when approaching Kampot. A round peak lies at the SE extremity of the range. **Pnom Dong**, 97m high, is conspicuous 1 mile N of Cap Bumbi. The N coast of **Dao Phu Quoc** was previously described in paragraph 6.9.

Pointe Kep (Chrouy Kab) (10°29'N., 104°18'E.), 7.5 miles ESE of Cap Bumbi, is prominent with a hill, 297m high, rising 0.5 mile inland.

Kaoh Kras (Koh Kras), 8m high, lies 5.5 miles W of **Pointe Kep**. **Ile Temple** lies 1.2 miles ESE of **Kaoh Kras**.

Anchorage.—Anchorage can be taken, in a depth of 16.5m, with Cap Bumbi bearing 055°, distant 6 miles. Smaller vessels can anchor, in a depth of 4.9m, about 1.5 miles S of Cap Bumbi, or W of **Kaoh Kras**.

Directions.—**Kinh Gan Dau** is the channel leading to the sea of **Chhak Veal Renh**. Vessels should steer to pass close N of **Hon Ban** and **Rocher Plat**, avoiding the 3.1m shoal lying 0.5 mile SSE of **Kaoh Ses**. Then steer to pass at least 2 miles N of **Mui Kwala** to avoid **Banc du Loire Inferieure** and the shoals off the cape. Then steer for the anchorage SW of Cap Bumbi, taking care to avoid the steep-to, rocky coastal bank on the N side of the fairway.

Vessels using **Chenal Sud** should round **Mui Ong Doi**, the SE extremity of **Dao Phu Quoc**, at a distance of at least 5 miles. Vessels then steer to pass W of **Rocher Rosita** (10°17'N., 104°21'E.) and E of the banks extending up to 4 miles off the E coast of **Dao Phu Quoc**. The E side of Cap Bumbi in range 000° with **Pnom Sor**, a 125m high hill standing 8 miles N, leads 0.5 mile W of **Rocher Rosita** and over 3 miles W of **Poulo Cici**. Care should be taken to avoid an obstruction lying 4.5 miles S of Cap Bumbi.

Baie de Ream

6.14 Baie de Ream (10°31'N., 103°36'E.), backed by high land, is fronted by five reef-fringed islands. A bank, with

depths of less than 5.5m, extends 2.5 miles from the head of the bay. Range lights, in line bearing 348°, are situated on the SE entrance of the bay.

Phsar Ream (Ream) (10°30'N., 103°36'E.) (World Port Index No. 57490) lies on the SE entrance point of the bay.

Kaoh Sra Maoch (Channel Island) lies 1.2 miles SE of the SE entrance point of the bay. **Kaoh Ta Kiev** (Bay Island), 115m high at its NW end, lies 0.8 mile W of **Kaoh Sra Maoch**, and is the largest island. **Kaoh Roessei** (**Kaoh Russei**) (Southwest Island), 105m high, is the SW island. **Kaoh Praeus** (Northwest Island) lies 1 mile WSW of the NW entrance point of the bay.

Rocher Blanc (White Rock), which dries 1.8m, lies on a reef that extends 0.5 mile SSW from the NW entrance point of the bay.

A concrete jetty, 45m long, close NW of the SE entrance point of the bay, has a depth of 3.7m alongside its head, and is accessible to vessels up to 61m in length.

The main channel, leading between **Kaoh Ta Kiev** and **Kaoh Sra Maoch**, has a least depth of 5.5m in the fairway. Range lights, in line bearing 348°, stand on the SE entrance point of the bay and lead into the main channel.

Vessels with drafts of less than 4.6m can enter by any passage between the islands, except between **Kaoh Sra Maoch** and the mainland.

Kaoh Khteah (Round Island) lies in the NW approach to the bay, 1.8 miles NW of the NW entrance point, and less than 1 mile offshore.

Anchorage.—**Baie de Ream** offers fairly secure anchorage during the Southwest Monsoon, off the NE end of **Kaoh Ta Kiev**. The best anchorage, in a depth of 11m, is with the N side of the pier bearing 105°, distant 0.2 mile. Vessels should not proceed farther N of this anchorage as depths shoal sharply.

During the Northeast Monsoon, strong currents set in the channel. During the Southwest Monsoon a heavy swell enters the bay. At this anchorage, tidal currents have been observed setting N on the flood tide and SSE on the ebb tide, attaining velocities of up to 1 knot.

Chhak Kampong Saom

6.15 **Chhak Kampong Saom** (**Baie de Kampong Som**) is entered between a point close ESE of **Kaoh Poah** (Koh Pos) (10°37'N., 103°29'E.) and **Chrouy Samit** (**Pointe Samit**), 27 miles NW. The bay is sheltered from SW by a chain of islands extending SSE from **Chrouy Samit**. The N shore of the bay is low and bordered by mangroves. The N part of the bay is shoal and encumbered with fishing stakes. Vessels should not proceed to the head of the bay without local knowledge.

The port of **Kampong Saom** lies in the SE part of the bay.

The Approach to Chhak Kampong Saom—Islands and Dangers

6.16 Kaoh Rung Samloem (10°35'N., 103°18'E.), the S island in the approach, rises to an elevation of 210m in its NW part, and is thickly wooded; its SW and SE sides are steep-to. **Kaoh Kon** (**Ile Cone**), 157m high, lies close N of the island. **Chhak Saracen** (**Baie du Saracen**) indents the E side of the island, and have depths of 7.6 to 11m shoaling gradually towards its shores. No dangers lie more than 0.3 mile offshore.

Anchorage.—During the Southwest Monsoon, anchorage can be taken, in a depth of 7.3m, about 0.3 mile off a cascade, at the SE end of a sandy beach in the S part of the bay. The NE part of the bay offers better shelter during the Northeast Monsoon.

Kaoh Rung, 2.2 miles NW of Kaoh Rung Samloem, is steep to on its SW and NW sides. The island is wooded, and its summit is 317m high on its SW side. A bank, with a depth of 5.2m near its outer end, extends 3.5 miles NE from the NE end of Kaoh Rung. Banc de Kas Rung, with a least depth of 2.1m, lies on the SE part of the bank.

Anchorage, during the Southwest Monsoon, can be taken, in depths of 7.3 to 14.6m, sand and mud, off the NE side of Kaoh Rung. Anchorage can also be taken in the bay on the SW side of the island.

Kaoh Ta Team (Ile du Chenal) and Kaoh Mano (Ile du Milieu), with an islet close N, lie 0.7 mile apart, about midway between Kaoh Rung and Chrouy Samit. The coastal bank, with depths of less than 5.5m, extends up to 4 miles offshore in the bay NE of Kaoh Mano.

Kaoh Damlong (Ile Plate) lies 2.5 miles SE of Chrouy Samit.

Kaoh Kaong Kang (Koh Kong Kang) (10°36'N., 103°25'E.) lies in the approach to Kampong Saom, midway between Kaoh Rung Samloem and the mainland. A reef extends 0.3 mile WSW from the island. A shoal, with a depth of 8.5m, lies 0.9 mile N and 1.2 miles S, respectively, of the E end of the island. A light is shown from the E end of Kaoh Kaong Kang.

Kaoh Poah (Koh Pos), close off the SE entrance, lies 1 mile WNW of Kaoh Poah. A light is shown from Kaoh Dek Koul.

Chhak Kampong Saom—Channels

6.17 The best channel into Chhak Kampong Saom is between Kaoh Rung Samloem and Kaoh Kaong Kang. This channel is 3.5 miles wide and clear, with depths of over 18m.

The passage between Kaoh Rung Samloem and Kaoh Rung has a least depth of 11m. However, a bank, with depths of less than 10m extends 3.5 miles SE from the SE side of Kaoh Rung, and a depth of 6.4m lies on this bank, 2.5 miles SE of the island. On the S side of the passage, a depth of 7.7m lies 1 mile E of the N extremity of Kaoh Kon.

Kaoh Ta Team (Ile du Chenal) lies in the middle of the passage between Kaoh Rung and Kaoh Mano (Ile du Milieu). There are least depths of 10.1m in the passage, but depths of less than 9.2m and 5.5m extend about 3 miles NNE and NE, respectively of the NE extremity of Kaoh Rung.

Kampong Saom (Sihanoukville) (10°38'N., 103°30'E.)

World Port Index No. 57485

6.18 Kampong Saom is the principal port of Cambodia and the only port which can berth ocean-going vessels. The port extends from the quay S of Pointe Loune to Kaoh Preap (Rocher Preap) (Rocher Touffu), 1.5 miles NNE. The main pier extends W then SSW from Pointe Loune. A new pier extends 0.5 mile ENE of Pointe Loune, and is sheltered by a breakwater extending NNE of Pointe Loune.

A breakwater extending from Kaoh Preap to Pointe Dominique, 0.7 mile E, forms the N part of the new harbor. A breakwater also extends SSW of Kaoh Preap. Two visible wrecks lie inside this breakwater and another wreck lies close inside the breakwater at Pointe Loune.

An offshore pipeline berth is situated off Pointe du Depart, 3.5 miles NNE of Pointe Dominique.

Tides—Currents.—Tides at Kampong Saom are usually diurnal. The tidal rise is 1.3m at MHHW.

There are strong and irregular currents in the passage between Kaoh Poah and the mainland. The tidal currents at the main wharf run parallel with it. The maximum velocity is 1.5 knots, and the average rate does not exceed 0.5 knot.

A flag shown at the N end of the wharf indicates a N current at the wharf, and a flag shown at the S end of the wharf indicates a S current; during slack water no flag is shown.

Depths—Limitations.—The main pier extends W and SW from Pointe Loune and has a total length of 550m. The principal part of this pier is its SW arm which is 275m in length. It has been reported that two vessels with drafts to 9.5m can berth alongside its W side and two vessels drawing up to 7.5m alongside its E side. Near the inner end of the main wharf a breakwater extends SSW providing shelter to a lighter basin on the E side of which there is a lighter quay.

The entrance and turning basin in the S part of the new harbor were reported dredged to 7.3m.

The wharf in the S part of the new harbor has depths of 7.3m alongside. Two mooring buoys are established between the breakwater and the wharf.

The offshore pipeline berth at Pointe du Depart, which lies 13 miles SW of Rocher Blanc, has two moorings in depths of 15m, capable of accommodating tankers up to 220m in length and 11.5m draft. The facility at Pointe du Depart can accommodate tankers of up to 60m in length with drafts to 4.6m.

Rocher Thmor (Rocher Eiffel), 3m high, lies nearly 0.9 mile N of the NE extremity of Kaoh Poah. A 4m patch lies 0.3 mile NW of Rocher Thmor, and is marked by a buoy. A patch, with a least depth of 3.3m, lies nearly 0.5 mile E of Rocher Thmor, and is marked by a buoy.

A rock, with a depth of 1.6m, lies on a detached shoal, 0.3 mile NW of Kaoh Preap.

The deep passage between Kaoh Poah and the mainland has a least depth of 8.2m on the axis of the buoyed channel, with the white beacon on Pointe Loune bearing 031°36'.

Aspect.—Two warehouses, easily identifiable from a distance, lie close S of Pointe Loune, and nearly parallel to the main pier.

A light is shown from the N tip of the breakwater at Pointe Loune. Kaoh Preap, 5.8m high and prominent, lies at the NW corner of the harbor.

A flare is conspicuous on Pointe du Depart, where there is a refinery.

Pilotage.—Pilotage is compulsory, and should be requested at least 24 hours prior to arrival. The pilot boards close NE of Buoy KS. Berthing is usually carried out in daylight only, while unberthing takes place day or night, weather permitting.

Regulations.—Navigation is prohibited within 0.5 mile of the tanker berth.

Anchorage.—Three anchorage areas are available to vessels awaiting a berth, a pilot, or working cargo. The N anchorage, situated N of Lighted Buoy A, has depths of 9.2 to 11m, good holding ground. The S anchorage, situated S of Kaoh Poah, is used as a lightering anchorage when the N anchorage is too rough. The anchorage has depths of 8 to 10m, mud. The tanker anchorage, in depths of 15.8 to 18m, lies 2 miles NW of Kaoh Dek Koul (Rocher Carre).

Directions.—The port is easy to approach by day or night. Vessels arriving during hours of darkness are advised to approach the port by entering between Kaoh Kaong Kang and Kaoh Dek Koul, passing about 0.4 mile W of the latter.

The most direct route to the harbor at Kampong Saom is via the deep passage between Kaoh Poah and the mainland. This route is marked by buoys and the beacon on Pointe Loune bearing 031°36'.

Vessels can also reach the harbor by the passage W of Kaoh Poah, which has a least depth of 7m. Vessels then pass N of Lighted Buoy A and Lighted Buoy B, moored NW and ENE of Rocher Thmor. See paragraph 6.15 for channels W of Kao Kaong Kang.

Chrouy Samit to Laem Ling

6.19 The coast between **Chrouy Samit** (Pointe Samit) (10°52'N., 103°07'E.) and Chrouy Yai Sen (Pointe Yeay Sen), 22 miles N, is hilly near the coast, forming rocky bluffs with sandy bays between. The bays afford good anchorage with offshore winds.

A group of islands lies within 3 miles of the coast N of Chrouy Samit. Kas Samit, the S island, is 120m high.

Rocher Table, 60m high, is located 6 miles N of Kas Samit, and 3.5 miles offshore. A 7.3m rocky shoal extends 0.5 mile SW of the islet. Roche du Branlebas, which dries 0.3m, lies 2.3 miles NE of Rocher Table.

Ilots Kussat (Kaoh Putsa) consists of three islets. The outer islet is 90m high, and lies 1.5 miles SW of **Pointe Koh Kussat** (11°05'N., 103°06'E.).

Caution.—Rocher Kusrovie (Kaoh Kusrovie), 11m high, lies 17.5 miles W of Pointe Koh Kussat. Banc Ubon Boratit, composed of sand and coral, with a least depth of 1.2m, lies 1 mile N of Rocher Kusrovie.

Banc de Yai Sen, with a least depth of 12m, and Banc de Kas Kong, with a least depth of 12.8m, lie 9.5 miles NE and 13.5 miles N, respectively of Rocher Kusrovie.

6.20 Koh Kong (Koah Kong) (11°20'N., 103°00'E.) fronts Baie de Kas Kong (Chaak Kaoh Kong), a shoal bay between Chrouy Yai Sen and Lem Dam (Phum Lamdam), 12 miles N. The island is wooded and attains an elevation of 406m near its central part.

Ilot Cone (Kaoh Mul) (11°26'N., 103°00'E.), 1 mile NW of Lem Dam, is 37m high and joined to the mainland by a causeway. A light is occasionally shown from the islet. A pagoda is conspicuous at Kas Kapig, 1.5 miles NNE of Ilot Cone.

Koh Yor (11°35'N., 102°56'E.), 118m high and prominent, lies 10 miles NNW of Ilot Cone and appears as an island.

The coast is low and bordered by sandy beaches between Koh Yor and **Khao Hua Maew** (11°55'N., 102°47'E.), a rocky

bluff, 71m high, 22 miles NNW. A mountain range, rising to elevations of 300 to 600m and with its S end lying 4 miles N of Koh Yor, backs this coast 1 to 3 miles inland.

Ao Trat is entered between Khao Hua Maew and **Laem Nam** (Laem Sok) (12°03'N., 102°35'E.), 14 miles NW. The bay has depths of less than 5.5m except in its outer part, and there are drying flats at its head. A light is shown on Laem Nam, and on Laem Ko Pu, 7.5 miles N.

Anchorage can be taken, in a depth of 7.3m, about 4 miles E of Laem Nam.

Off-lying Islands and Dangers

6.21 Ko Kut is the SE of a group of islands lying SSE of **Laem Ling** (12°10'N., 102°17'E.). It is a high, level island, rising to an elevation of 344m in its S part. A light is shown near the S end of the island (11°34'N., 102°36'E.).

Ko Mak, 4 miles NW of Ko Kut, has a rocky headland, 107m high at its W extremity. The channel between the two islands has depths of over 11m. Ko Rayang Nok, an 81m high islet, lies 0.5 mile S of the W extremity of Ko Mak. Ko Kradat, 57m high, lies near the middle of a coral flat extending 4.5 miles NE of Ko Mak. A depth of 5.5m lies 2 miles SE of the SE extremity of Ko Kradat. A rock, with a depth of 7m, whose position is approximate, lies 0.5 mile SSE of the 5.5m depth.

Ko Rang Yai (Ko Rang), 193m high, lies 3 miles WSW of Ko Mak. Ko Mapring, 70m high, lies 0.8 mile N of the latter island. Rocks, above and below water, extend up to 1 mile off the N end of Ko Rang Yai.

Hin Phrai Nam, awash, lies 2.5 miles NE of Ko Mapring.

6.22 **Ko Chang** (12°03'N., 102°21'E.), the largest island of the group, has several peaked hills intersected by rocky and precipitous ravines. The summit is a table peak, 744m high, in the SW part of the island.

Ko Khlum, 242m high, lies 3 miles SE of Laem Bang Bao, the SW extremity of Ko Chang. Hin Rap, 1.5m high, lies 1.5 miles W of the S end of Ko Khlum. A rock, 1m high, lies 1.5 miles NE of Hin Rap. A rock, with a depth of 5.6m, lies 0.5 mile E of Hin Rap.

Hin Luk Bat, 1.5m high, lies 2 miles WSW of Laem Bang Bao.

Ko Yuak (Ko Yauk), 40m high, and the NW of three islets, lies 5 miles NW of Laem Bang Bao, and 1.8 miles off the W coast of Ko Chang.

Hin Sam Sao (Hin Samsau), 2.4m high, and Hin Rai (Hin Rarb), 1.2m high, lie 1.5 and 2 miles, respectively, NW of Ko Yuak. Hin Rai, 2.5 miles offshore, is the outermost danger off the W side of Ko Chang.

Caution.—An area dangerous for anchoring or fishing due to mines lies up to 8 miles W of the W coast of Ko Chang and is best seen on the chart.

Chong Ko Chang

6.23 Chong Ko Chang (Ko Chang Chong), the channel between Ko Chang and the mainland, has depths of 6.4 to 9.2m in the fairway. Vessels drawing more than 4.5m should not use this channel without local knowledge.

Ko Ngam, 120m high, bordered close SE by rocks above and below water, lies close SE of the SE end of Ko Chang.

Ko Mai Si Yai (Ko Maisi Yai), 1.5 miles E of Ko Ngam, lies on the E side of the entrance to Chong Ko Chang. Several islets extend up to 2 miles E and ENE of Ko Mai Si Yai.

Ko Baidang, 125m high, and Ko Wai, 128m high, lie 2 miles SSW, and 3.5 miles SW, respectively, of Ko Mai Si Yai, in the S approach to Chong Ko Chang, and the W approach to Ao Trat.

The coastal bank, with depths of less than 5.5m, on the SW side of Chong Ko Chang, extends up to 1 mile from the NE side of Ko Chang. Ko Salak (Ko Lim), 60m high, lies on the SW side of the fairway, 6 miles NNW of Ko Mai Si Yai; a 4.6m patch lies 2.5 miles NW of the islet.

The coast on the N side of Chong Ko Chang is low and mangrove-covered. A light is shown at Ban Laem Ngop, 7 miles NNW of Ko Salak. The coastal bank, with depths of less than 5.5m, extends 1 mile off Ban Laem Ngop, and 6.5 miles offshore in the SE part, extending SW from Laem Sok to the islets off the SE end of Ko Chang.

Chong Ko Chang is entered from NW between Ko Chang Noi, 87m high, close off the NW extremity of Ko Chang, and Laem Ling, located 3 miles NNE.

Hin Khi Chang (Hin Kee Chang), 1.2m high, lies on the N side of the fairway, 3.3 miles E of Ko Chang Noi. A light is shown from Hin Khi Chang.

Anchorage.—There is anchorage, in depths of 8.2 to 9.2m, about 0.7 mile SE of Hin Khi Chang. Small vessels can obtain anchorage, in a depth of 4.6m, about 1.5 miles SW of Ban Laem Ngop. Vessels approaching from NW should steer for the light structure on Hin Khi Chang bearing 110°, and then pass 0.1 to 0.2 mile S of the rock, and anchor when the structure comes in range, or opens SW of Laem Ling.

Laem Ling to Ko Saba

6.24 Laem Ling (12°12'N., 102°17'E.) is bordered 0.3 mile W by a rocky patch, awash. A hill, 163m high, rises 1 mile ESE of Laem Ling.

The coast between Laem Ling and the E entrance point of Mae Nam Chanthaburi, 20 miles NW, is low and fringed with mangroves.

Ko Chik Nok, 82m high, standing 5.5 miles NW of Laem Ling, fronts the mouth of Mae Nam Welu. The bar of the river, with depths of 1.8 to 2.1m in the fairway, extends 2 miles SW of Ko Chik Nok. A light is shown from the NW extremity of Ko Chik Nok.

Ko Proet, 65m high and connected to the coast by a spit, lies 10 miles NW of Ko Chik Nok. Ko Kwang and Ko Nang Ram, lie 0.5 mile SE, and 1 mile NW, respectively, of Ko Proet. Hin Phin, with a depth of 4.4m, lies 1 mile SSE of Ko Kwang.

Hin Bojesen, consisting of two rocks nearly 0.5 mile apart, each with a depth of 2.1m, lies 4 miles SW of Ko Proet. Hin Phut, two steep-to rocks above water, lies 6.2 miles SW of Ko Proet and is marked by a buoy.

Laem Sing (12°28'N., 102°04'E.), the W entrance point of Mae Nam Chanthaburi, rises to Khao Laem Sing, 172m high, about 0.8 mile NNW. A light is shown from the point.

Ko Nom Sao, 108m high, lies 2 miles W of Laem Sing. A rock, with a depth of 9.4m, lies 1.8 miles SSE of the islet. Khao

Sa Bap rises to an elevation of 932m about 10 miles ENE of Laem Sing.

Mae Nam Chanthaburi is entered W of Laem Sing. The town of Ban Paknam stands on the low E entrance point, 0.8 mile farther N. Ko Chula, a 16m high islet, lies 0.4 mile SE of Laem Sing. Rocks, below water and awash, extend up to 0.2 mile N and SSW of the islet. Hin Sukhrip, with a depth of 2.3m, lies 0.5 mile SW of Ko Chula.

A rocky bank extends 0.1 mile E from Laem Sing, leaving a channel about 0.2 mile wide, with a depth of 3.6m in the fairway.

Vessels drawing 3.6m can proceed up the river 2.3 miles N of Ban Paknam, to Ban Laem Pradu, where there is a customhouse, church, and wooden pier, on the W side of the river. Vessels moor in the river as the tidal currents are strong.

Tha Chalaep, on the N bank of the river 1.7 miles farther N, is the port for Chanthaburi and is accessible to vessels of 2.7m draft. There is a jetty, with a T-head about 25m long, which can accommodate vessels of 500 tons and a draft of 3m at HW. Pilotage is not available.

Ao Mu Yai, a shoal bay, backed by a low and wooded coast, lies between Laem Sing and Ko Saba, 7 miles WNW. There are numerous fishing stakes off this bay during the Northeast Monsoon.

Ko Saba, 65m high, lies close off a prominent hilly point. Ko Luk Saba, a reef awash, extends 0.2 mile S of Ko Saba. Mae Nam Khem Nu, entered E of Ko Saba, is obstructed by a bar with a depth of 1.8m.

Ko Saba to Laem Samae San

6.25 Khao Khung Kraben (12°34'N., 101°53'E.), a promontory, 126m high, and joined to the mainland by a narrow isthmus, lies 5.5 miles NW of Ko Saba.

Ao Khung Kraben, entered N of Khao Khung Kraben, has depths of less than 1.8m, with mud and sand flats extending over most of the bay.

The coast between Khao Khung Kraben and Laem Thoraphim, 15 miles WNW, recedes to form a bight. The coast is hilly between Kao Khung Kraben and Khao Taphao Khwam, which rises to an elevation of 128m about 4.5 miles NNW; then the coast is low to Laem Thoraphim. A low hill, 44m high, lies close W of Laem Thoraphim, and Ko Khi Pla, 9m high, lies 1 mile WSW of the point, and 0.3 mile offshore.

The coastal bank, with depths of less than 5.1m, extends 2.5 miles off the NE shore of the bight. Islets and foul ground extend 8 miles S of the NW shore. **Ko Man Nok** (12°34'N., 101°42'E.), 5.5 miles SE of Laem Thoraphim, is the southernmost islet of the above group. The islet is 22m high and rock-fringed; a light is shown from the summit. Hin Loftus, the outermost danger of the group, is awash at LW, and lies 0.8 mile SE of Ko Man Nok. Vessels should not pass inside this group of dangers.

Caution.—Hin Ai Lop, which dries, lies 5.5 miles W of Khao Khung Kraben. Hin Ritthidet, with a depth of 3.7m, lies 0.7 mile SSW of Hin Ai Lop.

Hin Alhambra (12°26'N., 101°40'E.), a coral bank which uncovers, lies 13 miles S of Laem Thoraphim. Parts of the reef

are reported to break in heavy weather. Depths of 0.3m lie 0.8 mile E and 0.3 mile W of its drying part.

6.26 The coast between Laem Thoraphim and Laem Ya, 14 miles WSW, is mostly low and wooded, except for a few isolated hills. **Laem Ya** (12°35'N., 101°25'E.) rises to an elevation of 121m close N. Khao Taphao Khwam, 551m high, rising 5.5 miles N of Laem Ya, is the S peak of a range of mountains extending 10 miles N.

Caution.—Ko Thalu, 65m high, and with rocks extending 0.3 mile S, lies 7 miles SW of Laem Thoraphim. Hin Klang Rong, which is awash, lies 1 mile N of Ko Thalu.

6.27 Ko Kudi (Ko Kut), 49m high, with the rocky islet of Ko Thai Khangkhao close S, lies 3.5 miles NW of Ko Thalu. It is the southernmost of a chain of islets and rocks extending 3 miles from the coast. Vessels should pass S of Ko Thai Khangkhao.

Ko Samet, with its N extremity lying 2 miles E of Laem Ya, is the largest island off this coast. The island is hilly, attaining an elevation of 112m at its N end. A light is shown from the NW end of Ko Samet.

Hin Khao, 7m high, and Ko Chan, 21m high, lie 1 mile NE and 0.3 mile S, respectively, of the S extremity of Ko Samet. Hin San Chalam, 1.5m high, lies 0.5 mile S of Ko Chan; rocks above water extend 0.2 mile E, and depths of less than 5.5m extend 0.3 mile SE of Hin San Chalam.

Chong Samet, the passage between Ko Samet and the mainland, has several sunken rocks and shoals with depths of less than 3.7m and should only be used by vessels with local knowledge. Marine farms have been established in the approaches to Chong Samet and in the strait itself.

The coast between Laem Ya and Laem Samae San, 27 miles W, is low and wooded, except for Khao Sap, 62m high, an isolated hill, located 2.5 miles NW of Laem Ya.

Hin But, with a depth of less than 1.8m, and marked S by a buoy, lies 2.5 miles W of Laem Ya. Hin Redang lies 1.3 miles NW of Hin But.

6.28 Mae Nam Rayong (12°39'N., 101°17'E.) discharges 9.2 miles WNW of Laem Ya; the bar of the river is constantly shifting, and the bar nearly dries. A light is shown close within the river mouth. A pagoda stands on the S side of the promontory. A pier is reported (1988) to lie 1 mile E of the mouth of the river.

Rayong (12°38'N., 101°19'E.), a terminal enclosed by breakwaters, lies W of the mouth of Mae Nam Rayong.

Depths—Limitations.—The pier is capable of accommodating a general cargo vessel up to 20,000 dwt and there are two berths for liquid cargo vessels.

Aspect.—Range lights, in line bearing 345°30', lead into the harbor. The channel to the terminal is marked by lighted buoys. Range lights, in line bearing 330°, lead to the wharf.

Ko Saket, 7m high, lies 6.5 miles W of the entrance to Mae Nam Rayong, and 1.2 miles offshore. The islet lies on a bank, with depths of less than 1.8m extending 2 miles offshore.

Pilotage.—Pilotage is compulsory; the pilot boards near the fairway lighted buoy. Berthing and unberthing of vessels takes place during daylight hours only.

Anchorage.—Anchorage can be taken, in depths of 7.3 to 12.8m, S of Mae Nam Rayong Light, but there is no shelter in either monsoon season. Vessels with a draft over 15m needs to contact port control for an anchoring position.

Caution.—Marine farms exist in the approaches to, and in Mae Nam Rayong.

Head of the Gulf of Thailand—East Side

6.29 Laem Samae San (12°36'N., 100°58'E.), 58m high, is the E entrance point of the bight which forms the head of the Gulf of Thailand. Hin Chula, a rock marked by a light, lies on foul ground extending 0.2 mile E of Laem Samae San.

Islands and islets extend 8 miles S of Laem Samae San. **Ko Chuang** (12°31'N., 100°58'E.), 148m high, lies with its summit 4.5 miles S of Laem Samae San. Hin Lak Bet, 8m high, and Ko Chan, 38m high, lie 1 mile NW, and 0.5 mile E, respectively, of Ko Chuang. Two islets lie 0.3 mile off the NE end of the island. A light is shown from the summit of Ko Chuang.

Hin Chalam (12°28'N., 100°58'E.), 9m high, white and steep-to, lies 2.5 miles S of Ko Chuang. Hin Yai, a coral patch with a depth of 11m, lies 1.8 miles SSW of Hin Chalam.

Caution.—An ammunition dumping ground surrounds Hin Chalam.

6.30 Ko Samae San, 167m high and located 1.2 miles N of Ko Chuang, is the largest of the off-lying group of islands and islets. Ko Chang Klua, 28m high, lies 1 mile E of the S extremity of Ko Samae San. Hin Lak Kun Chae, 4m high, and Kho Kham, 64m high, lie 1 mile, and 1.8 miles, respectively, NW of the same extremity.

Ko Raet, 106m high, lies 0.3 mile S of Laem Samae San, and about the same distance off the NE end of Ko Samae San.

The coast between Laem Samae San and Laem Chao, 2.3 miles WNW, is indented by two bights with low and wooded shores, separated by a rocky point. **Laem Chao** (12°36'N., 100°57'E.), a rocky headland, 62m high, is bordered 0.5 mile WSW by Ko Chorakhe, a 57m high islet.

A submarine pipeline carrying natural gas has been laid from seaward to a position 9 miles W of Rayong, and is best seen on the appropriate chart. Vessels should exercise caution when anchoring in the vicinity.

Chuk Samet Harbor (Laem Thong Lang) (12°37'N., 100°55'E.)

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6.31 Chuk Samet Harbor is approached between Ko Chorakhe and Ko I Lao, 2.3 miles WNW. Ko Yo lies close NE of Ko I Lao, on the same reef. Ko Maeo, 16m high, lies 0.4 mile SE of Ko Yo, at the SE end of a bank, with depths of less than 5.5m. Ko Mu, 68m high, lies 1.3 miles NW of Ko Chorakhe with a breakwater, which shelters Chuk Samet Harbor, extending 0.5 mile from the SE extremity of the island. Ko Nang Ram, 29m high, lies on the E side of the harbor entrance, nearly 0.5 mile E of the breakwater head. The harbor consists of a tanker pier, connected to the shore by a pipeline trestle, on the E side of the harbor entrance, and deep-draft cargo berths farther N. There is a naval base at the port.

Winds—Weather.—The winds and swells in the area are strong only during the Southwest Monsoon (April through September). The prevailing winds are WSW at 5 knots in January; S at 6 knots from February through May; SW at 8 to 10 knots from June through September; and N at 5 to 6 knots from October through December.

The mean relative humidity varies from 68 per cent in January to 82 per cent in October. The mean temperature throughout the year is 13°C to 15.8°C.

Tides—Currents.—The tide at Ao Sattahip is usually diurnal. The tidal rise at MHHW is 2.1m.

In the channel between Ko Chorakhe and the mainland the tidal current sets NW on the rising tide and SE on the ebb, attaining a velocity of 1 knot to 1.5 knots. A 2 to 3 knot current has been reported in the entrance channel, running generally W with the flood and E with the ebb.

Depths—Limitations.—The buoyed channel to the harbor has depths of 8.9m across its seaward end, and depths of 9.4m in the fairway of the remainder of the channel.

The tanker berth has depths of 10.1 to 11m alongside and can accommodate a vessel of up to 250m in length with a draft of 9.1m.

Five general cargo berths are available to ocean-going vessels. The West Quay has a length of 540m and can accommodate three vessels of up to 180m in length with drafts to 9m. The North Quay is 350m long and able to accommodate two vessels of up to 150m in length, with drafts to 7.8m.

Aspect.—In the approach, the lights on Ko Chuang and Laem Phu Chao are easily visible up to 20 miles on a clear day. The breakwater light may be seen up to 10 miles.

Range lights on the W side of the cargo pier lead through the buoyed channel to the harbor.

Pilotage.—Pilotage is compulsory and is available only in daylight hours. Pilots board off the entrance to the buoyed channel. Contact Sattahip Port Control on VHF channel 16 from 35 miles distant from the point of arrival. The working frequency is VHF channel 12. Vessels are requested to ensure arrival time is prior to 1600 as pilots will not berth during darkness due to the absence of navigation lights.

The vessel's ETA should be sent at least 36 hours in advance, along with the ship's length and draft. Vessels are required to keep continuous listening watch while approaching, at anchor, and moving within the harbor.

Anchorage.—Anchorage is available, in depths of 22 to 31m, shells and mud, in the two charted anchorage areas situated approximately 4 miles SW and 3.5 miles WSW of the Chuk Samet breakwater. These areas are exposed and may not be tenable during the Southwest Monsoon.

A quarantine anchorage is situated 6 miles SSE of the Chuk Samet breakwater and can best be seen on the chart.

6.32 Ao Sattahip (12°38'N., 100°54'E.) is shoal and encumbered with several reef-fringed islands which lie in the approach and entrance. **Laem Pu Chao** (12°39'N., 100°51'E.) is the W entrance point of Ao Sattahip; a light is shown from the summit. Unauthorized entry into Ao Sattahip is prohibited.

Ko Tao Mo, 146m high, and the largest island, lies 0.8 mile SE of Laem Pu Chao.

Tides—Currents.—West of Kao Tao Mo the currents set NW on the flood and SE on the ebb attaining velocities of 1

knot to 1.5 knots. The tidal currents in the channel between Ko Tao Mo and Ko Phra flow in the same directions, attaining velocities of 1 knot.

Depths—Limitations.—Ko Phra, 103m high, lies 0.3 mile ENE of Kao Tao Mo. An oil pier with a T-head, 67m long, and a depth of 5.8m alongside, is situated on the N side of the W end of Ko Phra. A prominent radio mast, with oil tanks close E, stands close SE of the pier. A drying bank, marked N by a lighted buoy, extends 0.3 mile N of the E end of Ko Phra. The approach to the pier from W is difficult and a vessel should turn and secure alongside, heading W.

An L-head pier extending S and W of Laem Thian, is 152m long and 18m wide, with a depth of 7m alongside. Two concrete LST ramps and mooring platforms are situated close E of the L-head pier.

In the narrow channel between Ko Tao Mo and the mainland there are least depths of 5.5m between the coastal banks.

Aspect.—The N coast of Ao Sattahip between Laem Pu Chao and Laem Thian, 2 miles E, is mostly hilly and fringed by stony beaches.

The buildings and radio masts of the naval base at Ao Sattahip extend N of Laem Thian.

Anchorage.—Anchorage, with local knowledge, can be taken, in depths of 6.4 to 8.2m, N of the NE end of Ko Tao Mo, but anchorage NE of the island has been reported to be unsafe, especially in the Southwest Monsoon.

Caution.—There are areas dangerous due to mines in the approach to Sattahip and Chong Khram.

A seaplane landing area is situated in the central part of Ao Sattahip. Vessels are prohibited from anchoring, fishing, or transiting the area.

Ko Khram Yai

6.33 Ko Khram Yai (12°42'N., 100°47'E.) is separated from the mainland by Chong Khram, which is about 1.7 miles wide. The S extremity of Ko Khram Yai lies 4 miles WNW of Laem Pu Chao, and the island rises to an elevation of 233m near its S end.

Hin Yai, 4m high, and Hin Ta, 5m high, lie 0.3 mile SE and 0.5 mile E, respectively, of the S extremity of Ko Khram Yai. A rock, with a depth of 1.6m, lies 0.3 mile E of Hin Yai.

The W side of Ko Khram Yai is fairly steep-to, and fringed by a rocky bank with depths of less than 1.8m extending 0.2 mile offshore.

A shoal, with a least depth of 4m, lies 1.5 miles N of Ko Khram Yai. A bank, with depths of less than 10m, extends 2 miles farther N.

Ko Khram Noi, a 37m high islet, with a small islet close N, lies 0.5 mile NNW of the NE extremity of Ko Khram Yai.

Hin Rang Kwian (12°48'N., 100°48'E.), a 9m high rock, marked by a light, lies 4.5 miles N of the NE end of Ko Khram Yai.

Chong Khram

6.34 Chong Khram is the strait between Ko Khram Yai and the mainland. Ko I Ra, 47m high and rock-fringed, lies in the middle of the S entrance to the strait. Hin Khi Sua, with rocks

extending 0.2 mile SE, lies 0.3 mile NE of Ko I Ra. A light is shown from Hin Khi Sua.

Ao Thung Prong lies on the E side of the strait where there are depths of 13 to 22m in the fairway. A 9.4m patch lies 0.3 mile E of Hin Khi Sua.

On the W side of the strait, a bank with depths of 5.5 to 11m extends 1.5 miles SE from the SE side of Ko Khram Yai. Hin Ki Pla, 11m high, lies 0.7 mile SE of the E extremity of Ko Khram Yai. An islet, 4m high, and a rock, with a depth of less than 1.8m, lie 0.3 mile W, and 0.4 mile ESE, respectively, of Hin Ki Pla.

Hin Wua Lai Khwai Wing, which partly dries, lies 0.8 mile NE of the E extremity of Ko Khram Yai.

Winds—Weather.—Winds and swells are strong in Chong Khram during the Southwest Monsoon. During the Northeast Monsoon season, commencing about mid-September, reasonable shelter from winds and swells are afforded in this area.

Tides—Currents.—The flood current sets N through Chong Khram and the ebb current S, with velocities of 1 knot to 2 knots. The current attains velocities of 2 to 3 knots W of Ko I Ra. However, tidal currents are difficult to predict in this area and vary according to local winds, swells, and river currents.

6.35 Chong Khram—East side.—The coast from **Laem Pu Chao** (12°39'N., 100°51'E.) to Ko Klet Kaeo, 6.5 miles N, is composed of high rocky bluffs, with sandy bays between. Khao Hat Yao rises to an elevation of 290m, nearly 4 miles N of Laem Pu Chao. Ao Thung Kai Tia and Ao Thung Prong, in the S part of this coast, are separated from each other by a promontory which rises to an elevation of 186m. The bays have depths of less than 5.5m, and the 10m curve fronts the entrance points of these bays close offshore.

6.36 Thung Prong (12°42'N., 100°50'E.) (World Port Index No. 57445) lies close N of Ao Thung Prong. It consists of a T-shaped pier and De Long Pier, situated 0.3 mile N.

Tides—Currents.—The strong currents in Chong Khram create a significant hazard as they run under De Long Pier. Approaching De Long Pier at other than slack water can be dangerous. Tidal currents have been reported to attain velocities of as much as 6 to 8 knots in the vicinity of the piers at Thung Prong.

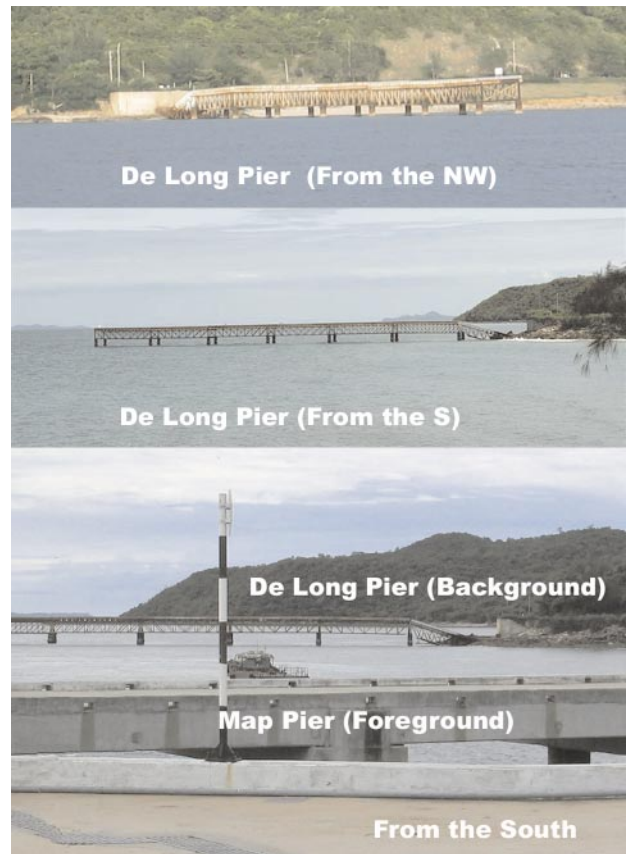
Depths—Limitations.—Map Pier, the T-shaped pier, a tanker berth, is 135m long, prolonged by dolphins, and can accommodate vessels up to 183m in length. The pier has depths alongside of 10.1m at MLW and 9.1m at LWOS. Vessels up to 8.5m draft can remain alongside at LWOS.

The De Long Pier has a length of 183m, with a depth of 12.8m alongside.

Pilotage.—Pilotage is not compulsory, but is strongly recommended due to the strong tidal currents.

Anchorage.—Anchorage while waiting for a berth or pilot can be taken, in a depth of 13.7m, good holding ground, NE of Ko Khram Yai between 12°43'N and 12°44'N.

Between the port of Thung Prong and Ko Klet Kaeo, 74m high, located 3.5 miles N, depths of less than 10m extend 0.8 mile offshore. A bay, with low and wooded shores, indents the coast between Ko Klet Kaeo and **Laem Phatthaya** (Patthaya) (12°55'N., 100°51'E.), about 9 miles N. A bank, with depths of less than 6m, extends 2 miles S from a position lying 2 miles



Photos courtesy of Len Fernandez

De Long Pier

SSW of Laem Phatthaya; a least depth of 4.4m lies near the N end of the bank.

Off-lying Islets and Dangers

6.37 A chain of islets and dangers extends 2.5 miles offshore between Ko Khram Yai and **Laem Krabang** (13°05'N., 100°53'E.).

Ko Lin (Ko Rin), 108m high, lies 5.5 miles W of Hin Rang Kwian. Hin Ton Mai, and Hin Khao, each 14m high, lie 0.5 mile S and 0.8 mile NE, respectively, of Ko Lin.

Ko Phai, 138m high at its S end, lies 7 miles N of Ko Lin, and 11 miles W of Laem Phatthaya. A light is shown from the middle of the W side of Ko Phai.

Ko Man Wichai, 53m high and steep-to, lies 2.5 miles S of Ko Phai. Ko Klung Badan, 44m high, lies 1.2 miles N of Ko Man Wichai. Ko Hu Chang, a 2m high islet, lies 0.5 mile farther N.

Ko Luam, 108m high, lies 1 mile NW of Ko Phai, and is the westernmost of the off-lying islets. A bank, with depths of less than 6m extends 2.5 miles N of Ko Luam.

Ko Lan, 205m high, lies 5 miles E of Ko Phai. Ko Sak, 33m high, and Ko Khrok, 41m high, lie 0.5 mile N and 1 mile ESE, respectively, of the N end of Ko Lan. A rock, with a depth of

2.7m, lies 0.8 mile S of Ko Khrok. A rock awash lies 1.3 miles ESE of Ko Khrok, and is marked E by a buoy.

Laem Phatthaya to Ko Si Chang

6.38 Laem Phatthaya (Laem Patthaya) (12°55'N., 100°51'E.), a rocky bluff, rises to a hill, 98m high, about 0.5 mile SSE, on which stands a radio tower, marked by red lights. Ko Chun, low, rocky, and marked by a light, lies 1 mile N of Laem Phatthaya.

A shallow bay, with low and wooded shores, indents the coast between Laem Phatthaya and Laem Krabang, 9 miles N.

Ko Nok, 3m high and marked by a light, lies 4.5 miles SW of Laem Krabang.

Ao Phatthaya, close NE of Laem Phatthaya, is a popular beach resort. Excellent anchorage has been reported off Laem Phatthaya. Ships generally anchor in the vicinity of position 12°56'N, 100°51'E, in depths of 16.5 to 24m, sand, good holding ground.

Approach to the anchorage can be made from SW or NW, but vessels generally favor the approach from SW due to currents which run in a SW-NE direction. Currents have been reported to attain velocities of up to 6 knots.

Laem Krabang is a hilly point, rising to Khao Laem Krabang, 100m high, about 0.5 mile N. Khao Pho Bai rises to 201m high, about 2.5 miles NNE of Laem Krabang.

6.39 Laem Krabang (Laem Chabang) (13°05'N., 100°53'E.), a multi-purpose bulk, cruise, and container terminal situated on the Gulf of Siam, has no depth limitations. This deep water port acts as a sub-port for Bangkok.

Depths—Limitations.—The port can accommodate vessels up to 70,000 dwt, with a maximum draft of 13m.

The South Quay consists of five terminals, all with an alongside depth of 14m. Terminal B1 through Terminal B4 are container terminals, each with a berth length of 300m. The Laem Chabang International Terminal, located at Terminal B5, is 400m long.

The North Quay consists of six terminals, all with maximum depths alongside of 14m, except terminal A0. Terminal A0, which is used for coastal traffic, has a length of 250m and a maximum depth of 10m. Terminal A1, a cruise terminal, has a 365m long berth, and can handle vessels up to 70,000 dwt. Terminals A2 and A3 are multi-purpose, and have lengths of 400m and 350m respectively, with berths to accommodate vessels carrying sugar and molasses. Terminal A4 is for agri-bulk, with a length of 350m. Terminal A5 is for coal and general cargo and has a length of 225m.

Pilotage.—Pilotage is compulsory. Pilots, who be contacted on VHF channels 13, 14, and 16 board in the following positions:

1. North Entrance — 13°13.3'N, 100°51.9'E.
2. South Entrance — 13°03.0'N, 100°47.3'E.

Regulations.—There is a VTS to monitor traffic and assist with navigation within the Laem Chabang harbor limits.

Anchorage.—Anchorage can be taken, in a depth of 14m, off Laem Krabang in position 13°04'N, 100°50'E.

Ko Si Chang

6.40 Ko Si Chang is the largest of a group of islands lying 4 miles NW of Laem Krabang. Khao Sao Thong, 192m high, lies 0.5 mile S of the N end of the island, and is the island's summit. The middle of the S part of the island is a wooded tableland, 59m high, surrounded by hills rising steeply from the coast.

Ko Khangkhao, 77m high, lies 0.3 miles S of Ko Yai Tao, an islet close off the S end of Ko Si Chang.

Ko Thai Ta Mun, a 25m high islet, lies close SW of Ko Khangkhao, to which it is connected by a reef. A light is shown from the summit of the islet.

Hin Sampayu, 3.6m high and marked at its S end by a light, lies 0.6 mile NNW of the NW end of Ko Si Chang.

Hin Kong Nok, a group of rocks nearly awash at LWS, lies 0.6 mile ENE of Hin Sampayu.

Ko Kham Yai, 62m high, lies 0.8 mile off the NE side of Ko Si Chang. An obelisk, prominent from N, stands on the NW extremity of Ko Kham Yai. Hin Kong Nai, a group of rocks which partly dries, lies 0.3 mile NNW of the NW end of Ko Kham Yai, on a bank with depths of less than 5.5m extending 0.3 mile farther NNW.

Ko Kham Noi, 20m high, and Ko Prong, 9m high, lie 0.2 mile NE and 0.3 mile E, respectively, of Ko Kham Yai. Depths of less than 5.5m extend 0.2 mile S of Ko Kham Noi.

Ko Ran Dok Mai, 15m high and reef-fringed, lies little more than 0.7 mile SE of Ko Kham Yai.

Laem Wang (Laem Wat), a narrow promontory with a prominent obelisk on its extremity, lies on the E side of Ko Si Chang, nearly 1 mile W of Ko Ran Dok Mai. A light is shown from Laem Wang.

Caution.—The waters around Ko Si Chang in depths of less than 5.5m are dangerous for anchoring or fishing due to mines, but are open to surface navigation. Ko Si Chang Anchorage is usually approached from N. Laem Sommuk Anchorage is available for small vessels in case of adverse conditions at Ko Si Chang.

6.41 Ko Si Chang Harbor (13°10'N., 100°49'E.) (World Port Index No. 57470), in the NE part of Ko Si Chang, is utilized by vessels hampered by the bar of Mae Nam Chao Phraya. Vessels proceeding to or from Bangkok (Krung Threp) may either load from or discharge to lighters here.

Pilotage.—Pilots board in the following positions:

1. North Entrance — 13°13.3'N, 100°51.9'E.
2. South Entrance — 13°03.0'N, 100°47.3'E.

Regulations.—Berthing is allowed during daylight hours only, but unberthing may be permitted at night.

Anchorage.—During the Northeast Monsoon, large vessels generally anchor between Ko Kham Yai and Ko Ran Dok Mai, in depths exceeding 9m, with the S extremity of Ko Kham Yai bearing 315°.

During the Southwest Monsoon, large vessels anchor N of Ko Kham Noi. Anchorage can be taken, in a depth of 9m, with the N extremity of Ko Si Chang bearing 253°, distant 1.2 miles.

Anchorage, sheltered from both monsoons, can also be taken, in depths of 9.2 to 16.5m, between Laem Wang and Ko Ran Dok Mai.

Caution.—A stranded wreck lies 1 mile ENE of Laem Wang.

Sriracha (Ao Udom) (13°07'N., 100°53'E.)

World Port Index No. 57460

6.42 Situated on the mainland, 4 miles ESE of Ko Si Chang, the port is contained within a restricted area, the limits of which are best seen on the chart. There is one dry cargo pier and three tanker terminals.

Winds—Weather.—Occasional squalls may be experienced.

Tides—Currents.—The tidal rise at Ko Si Chang is 2.3m at MHHW, and 1.9m at MLHW.

A N set may be experienced with a rising tide.

Depths—Limitations.—The port is able to accommodate tank vessels up to 118,000 dwt, 274m in length, with drafts to 15.3m. Dry cargo vessels of up to 150,000 dwt, having a maximum length of 265m, and draft of 12.8m can be accommodated.

There are four berths at a 450m long jetty for the handling of scrap metals. Vessels of up to 60,000 dwt can be accommodated.

The Siam Seaport Terminal has four berths, with a total quayside of 745m. The terminal can handle bulk, break bulk, steel, wood, chemical, and agricultural cargoes.

From N to S; the berths at Sriracha Oil Terminal are, as follows:

1. TORC (Thai Oil Refining Company) Sea Berth consists of six mooring buoys at the seaward end of a pipeline. A tanker, 274m long having a maximum draft of 14m, can be accommodated. Torc Jetty lies on the pipeline 0.5 mile from the shore.

2. PTT Jetty, a gas separation terminal, extends 0.7 mile offshore. A pipeline with mooring buoys at its extremity extends NW from the jetty head. No. 1 Berth, which accommodates vessels up to 100,000 dwt, is situated at the head of the jetty, and No. 2 Berth and No. 3 Berth, which accommodate vessels up to 5,000 and 2,000 dwt, respectively, are situated on a spur on the N side of the jetty. A tanker 280m long and having a draft of 15m can be accommodated.

3. Esso Sea Berth consists of six mooring buoys at the end of a pipeline. A tanker 274m long and having a draft of 15.3m can be accommodated. A platform flanked by dolphins is situated on the pipeline 0.5 mile from the shore and Esso Jetty, also on the pipeline, is 0.1 mile from the shore.

Vessels may berth both N or S at all berths depending on the tide and weather. Tankers berth in daytime only.

A hulk is moored offshore close N of the restricted area.

Aspect.—A conspicuous flare stands about 0.3 mile E of **Kaho Pho Bai** (13°07'N., 100°54'E.). A conspicuous radio tower painted in red and white bands stands 1 mile SW of the peak.

Pilotage.—Pilotage is compulsory. Pilots can be contacted on VHF channels 10, 12, 13, 14, and 16 and board in the following positions:

1. North Entrance — 13°13.3'N, 100°51.9'E.
2. South Entrance — 13°03.0'N, 100°47.3'E.

The following information should be passed to Supply Operations Division (PPT):

1. Name and call sign of vessel.
2. Flag.
3. LOA, draft, and width of vessel.
4. ETA at terminal.
5. Nature of cargo, technical name, UN number (if applicable), and quantity.
6. Distribution of cargo (and that to be left on board).
7. Is vessel fitted with an inert gas system?
8. Any defects of vessel or its machinery which may affect navigation, safety, or the marine environment.

The port authority should be notified immediately if there is a change of more than 1 hour in vessel's ETA. Radio contact should be established 12 hours in advance through Bangkok.

Pilots should be contacted by VHF 24 hours and 6 hours in advance. Contact the terminal 3 hours in advance.

Anchorage.—Anchorage may be taken in an area 1 mile in radius, centered in position 13°04'N., 100°51'E, in a depth of 22m, mud and sand, good holding ground. Anchorage is prohibited within the restricted area.

Directions.—The following positions and courses mark a recommended track that reportedly give a least depth of 17m. From position 12°43'00"N, 100°44'36"E, steer 000° to position 12°56'14"N, 100°44'36"E.; then steer 022° to position 13°00'N., 100°46'12"E. Proceed to steer 037° to position 13°06'20"N, 100°51'00"E and then steer for the port.

Caution.—Vessels are advised to contact local authorities for the latest information on depths and approach routes.

Sea suction intakes are likely to get blocked by vegetation and floating garbage.

Ko Si Chang to Mae Nam Chao Phraya

6.43 Laem Samuk (13°19'N., 100°54'E.) rises to an elevation of 74m about 10 miles NE of Ko Si Chang, and appears as an island. Khao Phu, a 314m high hill, rises 5.5 miles SE of Laem Samuk. Khao Khieo, 798m high and located 4.5 miles NE of Khao Phu, is the highest of a range of hills along this stretch of coast.

Khao Phra Bat, 146m high, lies 7 miles NE of Laem Samuk, and is at the N end of the high land on the E side of the Gulf of Thailand. Mae Nam Bang Pakong, entered 10 miles NNE of Laem Samuk, is accessible only to small craft.

The coast between the mouth of Mae Nam Bang Pakong and the mouth of Mae Nam Chao Phraya, 22 miles W, is low and bordered with mangroves. This coast is fronted by a bank with depths of less than 11m, extending from 6 to 9 miles offshore. The bank is encumbered by fishing traps.

Mae Nam Chao Phraya Entrance (13°32'N., 100°36'E.) and Bangkok (Krung Thep) (13°45'N., 100°30'E.)

World Port Index No. 57450

6.44 Mae Nam Chao Phraya is entered at the head of the Gulf of Thailand between the fort at **Pom Phra Chulachomklao** (13°32'N., 100°35'E.) and a point 1 mile NE. The river provides access to the city of Bangkok, 25 miles upstream.

Krung Thep (Bangkok) New Harbor lies 15 miles above the river entrance.

The entrance to Mae Nam Chao Phraya is fronted by a bar extending about 8 miles seaward. Extensive banks of mud and sand dry on the bar, which is encumbered with numerous fishing stakes. Lights may be shown from the stakes at night. A channel dredged to a depth of 8.5m leads across the bar for a distance of 10 miles to the river entrance.

Samut Prakan (Changwat Samut Prakan), a town situated 3.5 miles above the river entrance, is the quarantine station, where customs officials will board.

Winds—Weather.—At Bangkok during the day, winds from between S and SW predominate from February to June, and are from the SW and W from July to September, with an average of Force 2 on the Beaufort scale. Northerlies predominate from October to December, and the winds are variable in January, with the average being Force 1 to 2 in these months. At night, the wind is calm most of the time throughout the year, with the average wind being less than Force 1.

Tides—Currents.—The tidal rise at Bangkok Bar is 3.5m at MHHW and 3m at MLHW.

There are great irregularities in the time and heights of the tide on the bar. The morning tides are greater than the evening tides from October to March, or when the declination of the sun is S; the evening tides are greater than the morning tides from April to September. There are usually two tides per day, but at times the weak tide disappears and there is only one tide per day.

Depths are also affected by the wind, S winds increasing them. Depths will be increased when a strong NE or E wind is blowing in the gulf. Depths are reduced with strong W winds and heavy NW or W squalls when the flood current is retarded.

A typhoon in the South China Sea, in the vicinity of Mui Vung Tau, has been known to decrease the depth of the bar by as much as 0.9m.

High tide at Bangkok is 3 hours after high tide on the bar. The river is at its lowest level in July and August, and at its highest level in February.

Outside the bar, the flood tidal current sets NW and the ebb sets SE; both attain rates of 0.2 to 1 knot. During the Northeast Monsoon the current occasionally sets W along the edge of the bar with considerable strength.

In the channel across the bar the currents follow the direction of the channel and are influenced by the tidal currents and currents from the river. They attain velocities of 0.5 knot to 3.5 knots.

At Bangkok, the tidal currents are usually weaker than the river currents from September to December; during this period the flow is almost continuously seaward. During the rainy season the currents may occasionally attain velocities of 4 to 5 knots.

Depths—Limitations.—Entering vessels are restricted in the maximum length and draft they may carry over the bar to Bangkok. The maximum draft a vessel may possess when transiting the bar is calculated by adding a factor called the “Bar Adder” to the predicted height of tide at the bar as published in the Thai tide tables. The “Bar Adder” is dependent on

the vessel’s length, and is given below. In any event, vessels are restricted to a length of 183m and a maximum draft of 8.2m.

Length of Vessel	Bar Adder
128.4 to 135.6m	4.8m
135.6 to 143.3m	4.6m
143.3 to 152.4m	4.4m
152.4 to 161.5m	4.2m

Vessels of deep draft and lengths exceeding 150m should take into consideration their handling characteristics, and the winding nature of the fairway before attempting the channel. Vessels unable to cross the bar fully loaded can anchor off Ko Si Chang, or leeward of Laem Samuk during the Northeast Monsoon, and work cargo.

Three overhead cables span the navigable channel of the river. The first two, with vertical clearances of 71m and 53m, lie respectively 5 miles N, and 7.2 miles NNE of the fort at the river mouth. The third cable, with a vertical clearance of 40m, is situated 341 mile SE of the **Grand Palace** (13°45'N., 100°30'E.).

Four bridges cross the fairway from seaward to a point above the Royal Thai Navy anchorage. The lower two, situated 3 miles S, and 0.7 mile SSE of the Grand Palace, have moveable center spans. The two bridges above the Grand Palace have fixed spans.

Several submarine cables and pipelines cross the channel at various places, and are best seen on the chart.

By Thai regulation, all inbound cargo and passengers must be discharged at the Klongtoi Wharves, unless a special permit is obtained from the port authorities in advance. The wharf complex is situated in the approximate position 13°42'N, 100°35'E, and offers facilities for handling container, bulk, liquid, and general cargo. A row of 36 mooring dolphins off the complex offers seven mid-stream berths for vessels not exceeding 172m in length. Vessels loading cargo use these berths, as well as private wharves and other mooring berths throughout the harbor area.

Aspect.—The coast on either side of the river entrance is low and mangrove-covered, presenting no natural landmarks. The first conspicuous features seen will be the Bangkok Bar Pilot Light Station (13°23'N., 100°36'E.).

The harbor is divided into three zones, the limits of which are marked by pairs of obelisks, one on each riverbank. Zone II, situated roughly between the meridians of 100°31'E and 100°35.5'E is termed the New Port, and is of the greatest commercial significance. Zone I, which takes in the waterfront of Bangkok proper, is considered the old port. Royal Thai Naval installations and anchorages are situated throughout the area.

Pilotage.—Pilotage is compulsory and available 24 hours. Vessels 50m and over must board a pilot when transiting the river between the Bangkok Bar Channel entrance and the upper limits of the port. The pilot may be boarded within about 0.3 mile of the Bangkok Bar Pilot Light Station, situated 13°23'N, 100°36'E. The ETA should be sent 48 hours, 24 hours, and 12 hours in advance.

The following information is required by the port authorities:

1. Vessel's name and nationality.
2. Last port of call.
3. ETA at pilot station.
4. Fresh water draft.
5. General cargo tonnage.
6. Any dangerous cargo.
7. If a heavy lift is required.
8. If fresh water is required.
9. Number of passengers.
10. Time of anchoring at pilot station if applicable.

Vessels should establish contact by VHF within 10 miles of port and maintain listening watch on VHF channel 16.

Regulations.—In addition to a request for radio pratique, the harbormaster must be contacted at least 24 hours prior to arrival, and a request made to berth at Klongtoi Wharves. Departing vessels must notify the harbormaster at least 6 hours prior to leaving berth. Vessels requesting a berth, or a shift of berth should fly Flag T of the International Code of Signals.

Customs and health officials will board in the river off Samut Prakan Changwat Samut Prakan (13°36'N., 100°36'E.).

Where the channel is divided by mooring berths or vessels are moored in midstream, the channel to the E of these obstructions shall be used by all vessels exceeding 50 tons.

A vessel drifting in the harbor shall fly Flag G of the International Code of Signals forward, and shall keep to midstream or as near to vessels moored in midstream as safe navigation permits when being passed by a vessel with a following current.

Vessels anchoring off the seaward end of the bar channel should provide watchmen and adequate lighting, and should ensure that all ladders are kept up.

Signals.—Radio and VHF facilities are available in the port, and may be used to contact the port officials or pilots.

Tide and berthing signals are displayed from a flagstaff at the E end of a quay at the mouth of **Khlong Phra Khanong** (13°42'N., 100°35'E.).

A vessel in distress should use the following code groups via flashing light or signal hoist to summon assistance:

1. DQ—I am on fire.
2. ST—I require a police boat.

The above signals should be supplemented by the code group X, sounded on the ship's whistle. Vessels requesting assistance by VHF should use the above code groups, giving vessel's name and location in English.

Anchorage.—Vessels intending to cross the bar usually anchor about 2 miles SE of the Pilot Light Station, in charted depths of 12.5 to 14m. The dangerous goods, quarantine, and naval anchorages are situated 4.5 miles ESE, 6.25 miles E, and 2.5 miles E of the Pilot Light Station, respectively. The quarantine and dangerous goods anchorages have general depths of 14m, while the naval anchorage has lesser depths. A dangerous wreck lies near the center of the naval anchorage. If these anchorages become untenable, vessels can anchor off Ko Si Chang, or in the Northeast Monsoon leeward of Laem Somruk.

Vessels waiting for a berth or loading cargo usually anchor in midstream. The pilot should be consulted before anchoring.

Several areas prohibited to anchorage and the laying of submarine cables, pipelines, and other obstructions exist in the waters of the port, and are best seen on the appropriate chart.

Directions.—Taking into consideration the vessel's draft, there may be a need to proceed to an appropriate anchorage and discharge cargo before attempting the bar.

Keeping a good lookout for fishing vessels and other traffic, proceed to the Pilot Light Station described above. Take care to avoid the charted anchorage areas, and the shoal area charted 3 miles E of the Pilot Light Station. The shoal has a least depth of 4.9m. Several dangerous wrecks are charted in the approaches to Bangkok. Dangerous wrecks are charted within the Naval Anchorage, and about 2 miles SSE of the Pilot Light Station, just W of the general anchorage. An extensive expanse of drying flats studded with fishing stakes fronts the coast in the vicinity of Mae Nam Chao Phraya, crossed only by the river entrance channel.

The channel is about 12 miles long, has a width of 100m in the reaches and 250m in the bends. The least depth in the middle of the channel is about 5m (1996). The fairway is well marked by beacons, buoys, lighted ranges, and unlighted ranges, some of which are moved as necessary as the channel shifts.

Caution.—See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for details on areas dangerous due to mines in the vicinity of Bangkok.

The Gulf of Thailand—West Shore—Mae Nam Chao Phraya to Prachuap Khiri Khan

6.45 The coast at the head of the Gulf of Thailand, between the mouth of Mae Nam Chao Praya to the mouth of Mae Nam Mae Khlong, 37 miles WSW, is low and wooded. There are numerous fishing stakes off this section of coast and depths of less than 9m extend up to 11 miles off the coast.

Midway along the coast, the mouth of Mae Nam Nakhon Chai Si, obstructed by a shallow bar, is difficult to distinguish. A light is shown from the W entrance point of the river, at Ban Hua Phong. A radio tower, 64m high and marked by an obstruction light, stands 2.5 miles farther N, at Samut Sakhon.

Mae Nam Mae Khlong is fronted by a shallow bar and drying mud banks extending about 3.5 miles offshore. A radio tower, 76m high and marked by an obstruction light, stands 2.5 miles N of the river mouth.

6.46 Laem Phak Bia (13°02'N., 100°06'E.), a low point marked by a light, lies 20 miles SSE of the mouth of Mae Nam Mae Khlong.

A marine farm is situated 2.5 miles SSW of Laem Phak Bia.

A bank, with depths of less than 10m, stretches 24 miles S from Laem Phak Bia, and extends up to 9 miles offshore.

Khao Chao Lai, 372m high, rises 15 miles SSW of Laem Phak Bia, 3 miles inland from the coast.

A large cement factory and four storage silos are situated close S of Khao Chao Lai. A canal, 18m wide, extends 1.5 miles inland from the coast E of the factory. The canal entrance is protected by parallel rock jetties extending 0.7 mile seaward. The depth of the jetty channel and canal is about 4m.

Khao Chong Muong rises to an elevation of 642m about 6 miles SW of Khao Chao Lai. Khao Pak Pla, 469m high, lies 7.5 miles farther SSE.

Hua Hin Light, 5.5 miles SE of Khao Pak Pla, is shown from a rock close offshore.

Khao Takiap, a 124m high hill, lies on a small headland extending prominently from the coast, 3.5 miles SSE of Hua Hin Light. Hin Sao, 3m high, lies 1 mile E of Khao Takiap.

Caution.—See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia, for areas dangerous to anchoring or fishing.

6.47 Ko Sai, a 35m high islet, lies 2 miles S of Hin Sao. Ko Sadao, 29m high, with Ko Khi Nok, 15m high, close E, lies 0.8 mile farther S.

A hill, 190m high, and **Khao Kalok** (12°20'N., 100°00'E.), 131m high, lie close to the coast, 1.7 miles SW, and 8 miles S, respectively of Ko Khi Nok.

Ko Kolam (Ko Koram), 197m high, lies 5.5 miles S of Khao Kalok.

Ko Sattakut, 150m high, and marked at its NE end by a light, lies 2 miles SE of Ko Kolam, and 0.5 mile NE of a hilly headland.

Khao Sam Roi Yot, a remarkable range of mountains, lies W of Ko Sattakut, and 5 miles inland. The two highest peaks, the highest 605m high, are located at the N end of the range. The range has the appearance of a serrated tableland at a distance, and is unlike any other land in the Gulf of Thailand.

Khao Mong Lai (Khao Ta Mong Rai) (11°50'N., 99°50'E.), a 269m high summit, is located at the N end of a promontory, 24 miles SW of Ko Sattakut. The sides of the hills forming the promontory fall steeply to the shore.

The stretch of coast between Khao Mong Lai and Laem Phak Bia is known as Chai Fung Somdet Phra Naresuam Maharat (the coast of King Naresuan the Great).

Prachuap Khiri Khan

6.48 The coast between the promontory caled **Prachuap Khiri Khan** (11°48'N., 99°48'E.) and another promontory, 6 miles SSW, is indented by two shoal bays, separated by a third promontory. The heads of the bays are low, wooded, and marshy.

Ao Prachuap Khiri Khan, the N bay, is fringed by a drying coastal bank, and has depths of less than 5.5m. The town of Prachuap Khiri Khan lies in the SW part of the bay.

The promontory separating the bays rises to a conspicuous horn-shaped hill, 207m high. Ko Raet, 130m high and marked by a light on its summit, lies 0.5 mile NE of the promontory; a rock awash lies 0.5 mile SE of the drying coastal bank.

Ao Manao, the S bay, dries at its head, and has depths of less than 5.5m. Ko Luam, 122m high, is located in the approach to Ao Manao, 1.8 miles NE of the S entrance point of the bay. Ko I Aen, 82m high, is located inside the entrance of the bay, 1 mile WNW of Ko Luam.

Khao Khlong Wan (11°45'N., 99°48'E.), a conspicuous rocky horn, 250m high, is located 1 mile NE of the S entrance point of Ao Manao.

Caution.—See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia, for areas dangerous to anchoring or fishing due to mines.

An airplane target practice area extends 35 miles NE and 20 miles SE from Ao Manao. Navigation is prohibited in the area during aerial bombing exercises.

Prachuap Khiri Khan to Ao Chumphon

6.49 The coast between Khao Khlong Wan and Laem Mae Ramphueng, 37 miles SSW, is low, wooded, and regular except for a group of conical hills. The highest of these hills rises to 218m about 14 miles N of Laem Mae Ramphueng. Khao Noi, 165m high, lies 3.5 miles farther N and 2.5 miles inland.

This coast is relatively steep-to, all dangers lying within 2 miles of the coast except for Ko Chan.

Ko Phing, 63m high, with a rock awash close W, lies 1.8 miles S of Khao Khlong Wan. Ko Phang, 64m high, lies 0.8 mile farther SSW.

Ko Chan, 63m high, with another small islet close S, lies 7.5 miles SSW of Khao Khlong Wan.

Laem Mae Ramphung (11°11'N., 99°34'E.) is the S extremity of a peninsula which appears as an island from a distance due to the low elevation of the coast W of it; the point rises to an elevation of 248m.

A port has been constructed NW of Laem Mae Ramphung. The port is designed to handle steel, rubber, pineapples, and containerized cargo. The approach to the port is marked by a lighted buoy. Pilotage is compulsory and pilots board in position 11°11'N, 99°36'E.

An islet lies close N of Laem Mae Ramphung; a dangerous wreck lies 0.5 mile N of the islet.

The coast between Laem Mae Ramphung and Laem Yai, 18 miles SSW, continues mostly low except for a few isolated hills inland. About midway between the points, the coastal bank, with Ko Thalu, 89m high and flat-topped at its outer end, extends 4 miles seaward. Ko Sing lies on the coastal bank between Ko Thalu and the coast; Ko Sang lies 1.5 miles farther SSW. A shoal, with a depth of 4.3m, sand, lies 0.5 mile NE of Ko Sang.

Laem Yai, a prominent craggy headland, rises to an elevation of 301m, at the NE end of a peninsula. Laem Chong Phra, the S extremity of the peninsula, lies 2.5 miles SSW of Laem Yai. Ko Wiang, 247m high in its N part, lies close SW of Laem Chong Phra.

6.50 Off-lying islets.—Ko Rang, 100m high and exhibiting a light at its summit, lies 1.5 miles SE of the SW end of Ko Wiang. Ko Chikong, 51m high and with a rock awash close NE, lies 1 mile NNE of Ko Rang.

Ko Ran Kai, 30m high, and Ko Ran Pet, 26m high, the outermost islets, lie 3.2 miles ESE and 3.5 miles SE, respectively, of Ko Rang.

The coast between Laem Yai and Laem Kho Kwang, 27 miles SW, is hilly, rocky, and reef-fringed, except for several small coves. These coves dry at their heads and are suitable only for small craft.

Khao Yai Bang Chak, steep and marked by a beacon, rises to a height of 192m close to the coast, 9 miles SW of Laem Yai. Table Rock, 26m high, lies 2.5 miles S of the summit, and 0.5 mile offshore. Ko Khai, a 108m high islet, is located 2.5 miles farther S.

Laem Thaen, a small peninsula, with an elevation of 33m, projects from the coast, 3 miles SW of Ko Khai; there is a red cliff at its S extremity.

Khao Din So rises to an elevation of 350m and stands 5.5 miles SW of Laem Thaen. Laem Pho Bae, 5 miles farther S,

rises to an elevation of 107m close inshore. A rock with a depth of 6.8m lies 2.7 miles E of Laem Pho Bae.

Laem Kho Kwang (10°31'N., 99°16'E.), 2 miles farther SSW, has a hill 56m high at its extremity which is connected to the coast SW by a low isthmus covered with trees. Another hill, 118m high, lies 1 mile SW of the point.

Off-lying Islands and Dangers in the Approach to Ao Chumphon

6.51 Ko Chorakhe, 42m high in its N end, lies 7 miles ENE of Laem Kho Kwang, in the NE approach to Ao Chumphon. A reef extends 0.5 mile W of the SW end of the island, and a shoal, with a depth of 6.8m, extends 0.8 mile farther W.

Ko Ngam Yai (10°30'N., 99°26'E.), 103m high, the outermost island in the approach, lies 9 miles E of Laem Kho Kwang. Hin Lak Ngam, an above-water rock, and Ko Ngam Noi (Ko Ngam Lek), lie close NNE and 0.3 mile S, respectively, of Ko Ngam Yai.

Ko Lak Ngam, 19m high, lies 2.2 miles SSW of Ko Ngam Yai. Hin Lak Mattra, 3m high, lies 2.5 miles farther WSW. A 5.4m depth and an 8.2m depth lie 0.5 mile W and 0.7 mile NNE, respectively, of Hin Lak Mattra.

Ko Kalok, 40m high and rock-fringed, lies 3 miles WSW of Ko Ngam Yai. Ko Thalu, 29m high, lies 1 mile farther SW.

Ao Chumphon (10°28'N., 99°16'E.) is entered between Laem Kho Kwang and a point lying 5.5 miles S. Hin Chumphon, a dangerous rock, lies 1.8 miles SE of Laem Kho Kwang. A shoal, with a depth of 3m, lies between Hin Chumphon and the shore WNW.

Ko Kho Thian lies on a reef close NE of the S entrance point of the bay. Ko Samet, 82m high, lies 1 mile NE of Ko Kho Thian. An 8.9m patch lies 0.7 mile E of the N end of Ko Samet, and a rock awash lies 0.3 mile W of the SW end of the islet.

Ko Mattaphon, an islet marked by a light, lies 2.5 miles W of the N end of Ko Samet, and 0.5 mile NE of the mouth of Mae Nam Chumphon.

Anchorage.—During the Southwest Monsoon, anchorage can be taken, in depths of 7.3 to 9.2m, mud and sand, about 1.5 miles NE of Ko Mattaphon.

Caution.—During the Southwest Monsoon, there are numerous fishing stakes in Ao Chumphon.

Ao Chumphon to Lang Suan Roads

6.52 The coast between **Ko Kho Thian** (10°25'N., 99°19'E.) and Laem Tian, 4.2 miles S, has hills rising to elevations of about 100m close to the coast. Ko Maphrao, 55m high, lies 0.5 mile offshore midway along this coast.

A group of islands and islets, oriented NE, lies off the above coast, in the SE approach to Ao Chumphon. Ko Mattra, 132m high, with rocks extending a short distance NE and SW, is the outermost and highest of the group, and lies 4.5 miles ESE of Ko Kho Thian. Ko I Raet, 94m high, lies 1.3 miles SW; Ko Lak Raet and other rocks above water lie close NE of Ko I Raet. A bank, with a least depth of 6.4m, is centered 1.8 miles S of the SW end of Ko Mattra. Ko Sak, 37m high, lies 2.5 miles NW of Ko Mattra.

Ao Sawi, entered between Laem Tian and Laem Pracham Hiang, 8 miles SSW, is a shoal bay with drying flats at its head. Several islets lie across the entrance of the bay. Ko Rang Kachiu, 69m high and the outermost islet, lies 2.5 miles SSE of Laem Tian.

Laem Pracham Hiang rises to Khao Pracham Hiang, 255m high. Ko Kula rises to a sharp peak, 175m high, about 1 mile NE of Laem Pracham Hiang.

The coast between Laem Pracham Hiang and the mouth of Khlong Lang Suan, 18 miles SSW is bordered by hills, 100 to 300m high.

Ko Mat Wai Noi, 47m high, with Ko Mat Wai Yai, 55m high, close S, lies 1.5 mile S of Laem Pracham Hiang. Ko Khang Sua, 60m high, lies 3 miles farther SSW, and 2.5 miles offshore.

Ko Rang Banthat (Ko Rang Prathat), 25m high and marked by a light, lies 2 miles S of Ko Khang Sua.

6.53 Nang Nuang Oil Field (10°07'30"N., 99°26'12"E.) consisting of a production platform to which a storage tanker is moored, is situated 14 miles ENE of Ko Rang Banthat. A light is exhibited from the production platform.

Depths—Limitations.—The depth alongside the terminal is 29m.

Four lighted buoys mark the extent of an area in which navigation is restricted within 500m of the production platform and storage tanker.

Pilotage.—Pilotage is compulsory for tankers berthing at the terminal, and can only be carried out in daylight hours.

Ko Phithak, 100m high, lies 0.4 mile NE of Laem Thong Sai. Hin Phithak, above water, lies on a ledge of rocks extending 0.5 mile E of Ko Phithak.

Laem Riu, 2.5 miles S of Ko Phithak, rises to an elevation of 119m.

6.54 Lang Suan Roads lies off the mouth of **Khlong Lang Suan** (Mae Nam) (9°57'N., 99°10'E.). The approach to the river is encumbered by rocks and shoals, and during the Southwest Monsoon, numerous fishing stakes may be encountered N and S of the river entrance. A light is shown from the entrance. Entrance Lighted Buoy No. 1 is moored 0.6 mile ENE of Lang Suan Light.

Hin Thong Wo, a rocky shoal with a least depth of 7.7m, lies in the NE approach, 7 miles NE of Lang Suan Light. Hin Haeng, with a depth of 4.4m, lies 3.5 miles SW of Hin Thong Wo.

Hin Klang Ao, a stony patch with a depth of 3.1m, lies 5.5 miles SE of Lang Suan Light, and is the N danger in the S approach to Lang Suan Roads. Hin Hemawanit, a 5.5m rocky patch, lies 2 miles SE of Hin Klang Ao.

A group of dangerous rocks lies up to 2.5 miles offshore abreast the mouth of Khlong Lang Suan. Hin Folk Hon (Hin Falkhon), is the northwesternmost rock; Hin Charas is the southwesternmost rock of the group.

Anchorage.—It is reported that small vessels with local knowledge can obtain secure anchorage in the inner part of Lang Suan Roads, W of the inner line of dangers, in a depth of 5.5m, sand.

Lang Suan Roads to Chong Samui

6.55 The coast between the mouth of Khlong Lang Suan and Laem Duat (9°42'N., 99°10'E.), 15 miles S, is wooded and bordered by numerous dangers. The outermost dangers are Hin Chen Thale, with a depth of 8.6m, lying 12.2 miles SE of the mouth of Khlong Lang Suan, and Hin Phum, with a depth of 7.9m, lying 3.8 miles farther S.

Khao Khan Thuli, a prominent sharp peak, 247m high, is located 2.5 miles SSW of Laem Duat.

Khao Prasong, 372m high, located 7.5 miles farther SSE, is the most prominent feature on this part of the coast.

Ao Ban Don, a shallow bay, is entered 12.5 miles farther SE. The bay is entered between Laem Sui, a low point, and Laem Khung Mo, 14.5 miles ESE. Ko Prap, a 60m high islet, marked by a light on its summit, lies 6 miles WSW of Laem Khung Mo.

Anchorage.—Small vessels with drafts of 4m and over can anchor 6 miles N of Laem Sui.

6.56 Thathong (9°11'N., 99°22'E.), situated at the mouth of the Mae Nam Ta Pi river, is a general cargo terminal.

Tides—Currents.—The average fall and rise of tide is about 0.6m. Extreme tides are 2.5m.

Depths—Limitations.—The channel leading to the port is maintained at a depth of 4.8m.

There is one berth with an overall length of 194m and another with a length of 94m. The depth at the docks is 5m at MLLW.

Pilotage.—All vessels 1,000 gross tons and over are required to have a pilot.

6.57 A chain of islands and islets extends 28 miles N of **Laem Thuat** (9°20'N., 99°41'E.), which lies 10 miles ENE of Ao Ban Don. Ko Palikan, 22m high and marked by a light, lies 1 mile N of Laem Thuat.

Ko Tung Ku (9°48'N., 99°43'E.), the N islet of the chain, is 59m high, with a smaller islet close S. Ko Mae Ko (Ko Wao Yai), 100m high, lies 2.5 miles WSW of Ko Tung Ku. Islets and dangers extend 0.8 mile S of Ko Mae Ko.

Ko Nai Phut, 193m high, lies 4.5 miles S of Ko Mae Ko. Above-water rocks extend 0.3 mile N of Ko Nai Phut, and islets extend up to 0.8 mile W of the island.

Chong Nua, with depths of 13 to 22m, between the dangers S of Ko Mae Ko and the rocks N of Ko Nai Phut, is the N passage through the chain.

Ko Ang Thong, rising to 396m at its S end, lies 3 miles S of Ko Nai Phut, with numerous islets and rocks between. Ko Phai Ruak, 162m high, lies 2 miles E of the S end of Ko Ang Thong. Ko Wua Te, a 92m high islet, lies 0.8 mile SE of Ko Phai Ruak.

Ko Phaluai, 342m high, lies 3.2 miles S of Ko Ang Thong. Hin Hlak, above water, with a small islet lying 0.3 mile W, lies 0.2 mile N of the N end of Ko Phaluai. Ko Tao Pun, surrounded by rocks, lies 0.5 mile off the NW side of Ko Phaluai.

Chong Ang Thong, between Ko Ang Thong and Ko Phaluai, has a least depth of 6.8m in the fairway. The channel is entered from E between Ko Wua Te and Hin Hlak.

Islands, islets, rocks, and dangers lie S of Ko Phaluai, between the latter island and the mainland. The channels between are dangerous and shoal.

6.58 Chong Ko Tao (9°55'N., 99°55'E.) is a deep passage, separating **Ko Tao** (10°06'N., 99°51'E.) from Ko Phangan, 18 miles SSE. The passage has general depths of 22 to 35m.

Hin Bai, 14m high and steep-to, lies near the middle of Chong Ko Tao, 8.5 miles N of Ko Phangan. A submerged rock, with a depth of 11.3m, lies 4 miles WNW of Hin Bai.

Caution.—A circular area with a 5 mile radius, centered on Hin Bai, is declared a dangerous exercise area.

6.59 Ko Tao, 40 miles ENE of the mouth of Khlong Lang Suan, is 358m high near its NW end. An islet 170m high, with an islet close S, lies 0.8 mile off the NW extremity of the island. The N and E sides of the island are steep-to, and an islet lies 0.2 mile off its SE extremity. The bight on the W side of the island is foul up to 0.5 mile offshore.

A submerged rock, with a 5m depth, lies 4.5 miles SSW of the S end of Ko Tao; another rock, with a depth of 7.1m, lies 4 miles NW of Ko Tao.

Ko Phangan (9°45'N., 100°02'E.) attains an elevation of 627m near the middle of its N part. Ko Ma, an islet, lies close off the NW end of the island, and Ko Kong Nui, another islet, lies 0.5 mile off the W end of the island. Ko Kong Kiang lies 1.5 miles SW of Ko Kong Nui. Ko Phangan is the northernmost of islands and islets extending 37 miles NNE of **Laem Kho Khao** (9°13'N., 99°53'E.).

Chong Phangan, the passage between Ko Phangan and Ko Samui, 5 miles S, has depths of 13 to 20m in the fairway.

On the N side of Chong Phangan, Ko Kong Rin, 3m high, lies close S of the SE extremity of Ko Phangan. Ko Tae Nai lies 0.8 mile off the SW end of Ko Phangan with Ko Tae Nok lying nearly 1.5 miles farther W.

On the S side of Chong Phangan, Ko Kong Ok lies 1.2 miles NE of the NE extremity of Ko Samui, with numerous above-water rocks between. Ko Som, 2 miles WSW of Ko Kong Ok, has two above-water rocks and dangers extending about 1 mile W. Laem Na Lan lies 4.5 miles W of Ko Som and a depth of 1.4m lies 1 mile NE of the point.

A light is shown from Laem Yai, the NW extremity of Ko Samui.

Ko Samui, with its SE extremity **Laem Ret** (9°25'N., 100°01'E.) located 3.5 miles ENE of Ko Katen, is part of the province of Nakhon Si Thammarat. Khao Yai summit, 635m high, is located 4.5 miles N of Laem Ret. The island is covered with dense forest, and there are several villages.

6.60 Chong Samui is entered between **Laem Kho Khao** (9°13'N., 99°53'E.) and Laem So, the S extremity of Ko Samui. Laem Kho Khao is conspicuous, consisting of five peaks, one of which is 237m high. Khao Chai Son, 535m high, lies 2.5 miles NW of Laem Kho Khao. Hills back the coast NNW of the latter point, and depths of less than 10m extend up to 1.5 miles off the intervening points.

The W, and best, channel, lies between the mainland and Ko Wang Nai, 6 miles N of Laem Kho Khao. Ko Wang Nai, 72m high and rock-fringed, is marked by a light. The channel has depths of 10 to 14m in the fairway. The channel is partly encumbered by fishing stakes. A 10.1m patch lies 6 miles SE of Ko Wang Nai.

Ko Wang Nok lies 1 mile E of Ko Wang Nai; a rock, 52m high, lies 0.3 mile ESE of Ko Wang Nok.

Ko Rap, 2 miles farther E, lies nearly in the middle of the entrance to the strait. A rock, with a depth of 6.8m, lies 0.5 mile NE of Ko Rap.

Hin Nam Lai, above water and surrounded by foul ground, lies nearly 2 miles NW of Ko Rap. Ko Mat Khaeng lies 0.7 mile farther NNW.

Ko Katen, 225m high, lies nearly midway between Ko Mat Khaeng and the S extremity of Ko Samui. An islet 17m high and reef-fringed, lies close off the SW end of Ko Katen. Ko Mat Sum lies 1 mile E of the SE end of Ko Katen. Hin La Lek, 3m high in its E part, lies 1 mile N of Ko Mat Sum.

In the NE approach to Chong Samui, Hin Ang Wong, 0.7m high, lies on the E end of a detached reef, 2 miles SSE of Laem Ret, on the SE side of Ko Samui.

6.61 Khanom (9°14'N., 99°52'E.) is a small port which provides a bulk berth E of the delta of the Khlong Khanom. Vessels anchor, in depths of 12.8m, mud and sand, E of the river mouth. A conspicuous red and white chimney stands on the NW bank of the river.

There is also a jetty where vessels are moored to six buoys, three forward and three aft, to berth 3m off the jetty in a depth of 9.2m. Vessels should be able to provide six lines.

Caution.—A submarine power cable is laid from a position close E of the power station in a NE direction.

A wreck lies 0.6 mile NE of the river mouth.

6.62 Middle Passage.—Middle Passage is the wide passage between Ko Phangan and Ko Samui on the E side, and the chain of islands and islets extending N of **Laem Thuat** (9°20'N., 99°41'E.) on the W side. It leads from Chong Ko Tao to Chong Samui at its S end.

On the E side of the passage, Ko Kong Kliang and Ko Tae Nok and the dangers W of Ko Phangan were previously described in paragraph 6.59.

Mooring buoys, 2 miles SSE of Laem Yai, the NW end of Ko Samui, lie at the seaward end of a water supply pipeline; a can buoy marks the end of the pipeline.

Ko Mao Thap (Ko Ha), 2 miles WNW of Laem Hin Khom, the SW extremity of Ko Samui, is the outermost of five islets off the SW end of Ko Samui. Ko Thalu, with Ko Din close S, and Ko Malaeng Pong lie 0.5 mile NE and 0.5 mile SSE, respectively, of Ko Mao Thap.

On the W side of the passage, **Ko Tung Ku** (9°48'N., 99°43'E.) is the N islet. A bank with depths of less than 10m extends 12 miles E of Ko Ang Thong and 8 miles E of **Ko Chuak** (9°28'N., 99°41'E.). There are depths of 11 to 18m between the above bank and the dangers off Ko Phangan and Ko Samui.

Chong Samui to Songkhla Harbor

6.63 A restricted area, enclosing several oil and gas fields is situated 90 miles NE of Laem Talumphok.

Rectangular in shape, approximately 60 miles long in a N-S direction, and 25 miles wide in an E-W direction, the area encloses a region of producing oil and gas fields, with the associated structures both above and below water, which

present a hazard to navigation. Vessels are advised to avoid the area by as wide a margin as is practicable.

Erawan Gas Field Terminal A (9°05'N., 101°19'E.) is connected by pipelines to four other lighted platforms; Platform B through Platform E, within its group, are situated 54 miles NE of Ko Kra. A single point mooring buoy (SPM) is situated 2.5 miles NE of Terminal A. The Erawan group is also linked with pipelines to three other oil fields in the area. Baanpot Oil Field is situated 15 miles SSE of Erawan; Satun Oil Field is 16 miles NNE; and Platong Oil Field is 21 miles further N from Satun Oil Field. Funan Oil Field, Jakrawan Oil Field, Kaphong Oil Field and Surat Oil Field have been more recently established within the restricted area as well.

The pipeline leads N passing close W of an explosive dumping ground centered on position 9°50'N, 101°15'E and continuing N, landing 8 miles W of Rayong.

A storage tanker is moored 2.5 miles NE of Platform A at the center of Erawan Gas Field. Tankers up to 250m in length and up 100,000 dwt berth alongside to load.

Pilotage.—Pilotage is compulsory within the terminal area and boarding locations are specified by Marine Control, except when proceeding to anchor. When approaching Erawan Terminal from the E, the pilot boards at the anchorage in position 9°04'N, 101°25'E; from the W the pilot boards at the anchorage in position 9°05'N, 101°10'E. When approaching Platong Terminal from the N, the pilot boards at the anchorage in position 9°40'N, 101°29'E. Tankers can only berth in daylight hours, but can unberth at any time.

The vessel's ETA should be sent 72 hours in advance, followed by 48-hour and 24-hour confirmations.

Regulations.—Vessels should report to Marine Control or to the Erawan Terminal when approaching from the following areas:

1. Vessels must approach from the E when heading to the Northern Export Anchorage by using the Northern Approach Lane and passing between position 9°37'N, 101°35'E and position 9°42'N, 101°35'E. Reports must be made to Marine Control before coming within 10 miles of the Restricted Area.
2. Vessels must approach from the W and keep clear of the Restricted Area when heading to the Western Export Anchorage. Reports must be made to Marine Control before coming within 10 miles of the Western Export Anchorage.
3. Vessels using the Eastern Approach Lane must report to Marine Control or the Erawan Terminal when passing:
 - a. Position 9°20'N, 101°35'E from the N.
 - b. Position 9°09'N, 101°35'E from the S.
4. Vessels using the Southern Approach Lane must report to Marine Control or the Erawan Terminal when passing:
 - a. Position 8°30'N, 101°31'E from the W.
 - b. Position 8°30'N, 101°37'E from the E.

Caution.—A number of wells lie outside the restricted area.

6.64 Laem Phlai Dam (9°05'N., 99°55'E.), located 8 miles SSE of Laem Kho Khao, rises to an elevation of 474m. Khao Phra, 814m high, lies 3 miles W of the point.

Laem Kho Kwang, 5 miles S of Laem Phlai Dam, rises to an elevation of 148m about 1 mile W of the point. A light is

shown 0.7 mile NW of the point, and a rock awash, lies 0.7 mile NNE of the same point.

The coast between Laem Kho Kwang and the W entrance point of Ao Nakhon, 30 miles S, is low, and backed by a range of mountains with several prominent peaks 13 miles inland.

Ao Nakhon, a shallow bight, is entered between **Laem Talumphuk** (8°31'N., 100°08'E.) and the mouth of Khlong Pak Phaya, 4.5 miles W. Laem Talumphuk is a narrow curved spit, of coarse sand, with a group of trees on its extremity. A light is shown from the spit. The entrance of Khlong Tha Phae lies 3.7 miles NW of the mouth of Khlong Pak Phaya; a light is shown 0.8 mile above the entrance. Depths of less than 10m extend 7 miles N of Laem Talumphuk, and the point and the land behind are low.

Anchorage, during the Southwest Monsoon, can be taken, in a depth of 7.3m about 4.5 miles NE of the mouth of Khlong Tha Phae.

6.65 Off-lying Islets.—**Ko Kra** (8°24'N., 100°45'E.), 162m high and marked by a light, lies 35 miles E of Laem Talumphuk. High Rock, 81m high, with another rock close W, lies 1.3 miles SSE of Ko Kra. Boat Rock, 1.2m high, lies 1 mile SW of High Rock.

The coast between Laem Talumphuk and Songkhla, 82 miles SSE, is low, sandy, and wooded in places. A range of mountains parallels this coast 30 to 35 miles inland. Depths of less than 10m extend 5 miles offshore in the S approach to Laem Talumphuk. Farther S, depths of less than 10m extend up to 3 miles offshore.

A large lagoon, entered from Songkhla Harbor, extends 45 miles NNW, and is separated from the Gulf of Thailand by a low sandy neck of land ranging in width from 2 to 10 miles.

Songkhla Harbor (7°13'N., 100°35'E.)

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6.66 Songkhla Harbor is entered between **Laem Sai** (7°14'N., 100°35'E.) and Hua Khao Daeng, 0.5 mile SW. A short breakwater extends NE from Laem Sai. A spit, parts of which dry, extends 2 miles NW of Laem Sai, and is crossed by a narrow dredged channel close NW of the breakwater.

Islets front the harbor entrance, and Khao Tang Kuan, 101m high, lies 1.5 miles SSE of Laem Sai. The W side of the harbor is hilly, with a range of hills, some over 150m high, extending 2 miles S of Hua Khao Daeng.

Tides—Currents.—The tidal rise at Songkhla Roads is 0.7m.

The tidal current sets NW along the coast outside the harbor while the tide is rising inside the harbor, and in the opposite direction when it is falling.

The current inside the harbor area attains a velocity of 2 knots.

Depths—Limitations.—The channel has a dredged depth of 9m and a width of 120m. There is a turning basin at the W end of the quay with a diameter of 300m.

There are three berths with a total length of 510m and an alongside depth of 9m. Vessels up to 20,000 dwt, 173m long, with a draft of 8.2m can be accommodated.

Aspect.—The channel is marked by lighted buoys and range lights.

Ko Nu (7°14'N., 100°36'E.), the highest islet, 74m high, lies 1.5 miles ENE of Laem Sai. Hin Luk Maeo Nok, a 1.5m high rock, lies 0.7 mile farther NE.

Ko Maeo, 30m high, lies nearly 1.5 miles NNW of Ko Nu. Hin Luk Maeo Nai, a reef with several rocks, the highest 4m high, lies 0.5 mile S of Ko Maeo. A rock with a depth of 3.3m lies 0.7 mile N of the SW end of Ko Maeo; a 3.7m shoal lies 0.2 mile SW of the rock.

A radio tower marked by obstruction lights stands 100m SW of Songkhla Light; two pagodas stand on a hill located 1.5 miles WNW of the same light. An airfield lies SE of the town.

Pilotage.—Pilotage is compulsory. The pilot boards in the vicinity of the Entrance Buoy.

Regulations.—See Pub. 120, Sailing Directions (Planning Guide) Pacific Ocean and Southeast Asia for details on regulations pertaining to vessels in Thai waters.

Signals.—The port may be reached on VHF channel 16. The pilots may be contacted on VHF channel 14.

Anchorage.—It has been reported that three anchorage berths are available, in the following locations:

- 7°17'10"N., 100°36'15"E.
- 7°15'30"N., 100°37'45"E.
- About 0.8 mile E of Ko Maeo.

The anchorages have charted depths of 9.2 to 10.4m, mud and shells. Small vessels can anchor 0.4 mile W of Ko Nu.

Directions.—The turn into the harbor is reported to be difficult, and should be attempted only at slack water.

An overhead cable, having a vertical clearance of 40m, spans the channel 0.3 mile SE of the range lights.

Caution.—Two dangerous wrecks lie 20 miles N and 30 miles NNE of Songkhla, respectively.

Fishing stakes are reported to extend up to 30m from the channel's sides.

Songkhla Harbor to Sungei Kelantan

6.67 A range of mountains extends S of Songkhla. Khao Thiamda, 277m high, and Khao Wang, 305m high, rising 4 and 10 miles, respectively, S of Songkhla, are part of this range.

The coast between Songkhla and Ao Pattani, 43 miles ESE, is mostly low. A projection lies about midway along this coast, with Ko Kham, a 40m high islet, 1 mile NE. Khao Khwang 221m high, lies 2 miles SSW of the projection.

Enemy Chaser Patch, 15.5 miles E of the projection, has a least depth of 3.3m, and lies at the N end of a shoal extending 3 miles offshore.

Ao Pattani, a shallow bay, is entered between **Laem Ta Chi** (6°56'N., 101°15'E.) and the mouth of Mae Nam Pattani, 2 miles S. The town of Pattani, 1 mile S of the mouth of Mae Nam Pattani, is a major rubber exporting center. Lighters which have to be taken over the bar of the river at HW are used in cargo operations.

A dangerous wreck, marked by a buoy, lies 2 miles NNW of Laem Ta Chi.

Laem Ta Chi is the extremity of a low, sandy spit, thickly covered with pine trees. A light is shown from the N side of the spit, 2 miles ENE of the extremity of Laem Ta Chi. Range lights are shown from the W entrance point of Mae Nam

Pattani. A radio tower, 93m high and marked by obstruction lights, stands nearly 2 miles farther SSW.

A bank, with depths of less than 10m, extends 12.5 miles NNW of Laem Ta Chi.

Loftus Bank, consisting of hard sand, and rocks with depths of 1.5 to 3.7m, extends 5.5 miles ESE from a position about 2 miles NE of the N end of the above-mentioned spit; it is almost joined to the coastal bank near its W end.

Beating China Shoal, with a depth of 2.9m, lies 0.7 mile off the N side of Loftus Bank; rocks, with depths of 6.5 to 7.5m, extend 2.5 miles farther E.

Anchorage.—Small vessels can obtain anchorage, in depths of 5.5 to 9.2m, about 5 miles W of Laem Ta Chi. Large vessels can anchor in depths of 10 to 11m about 4 miles NW of Laem Ta Chi, particularly during the Southwest Monsoon (April to September), when the sea is calm. Ships are boarded by immigration and customs officers. There is no quarantine service, but ships are required to have a clean bill of health.

6.68 The coast between Ao Pattani and **Laem Khao Phra** (6°51'N., 101°33'E.) is low. Khao Maruat rises to an elevation of 322m about 2 miles WSW of the cape. Khao Yai, 475m high, lies 6.5 miles SSW of the cape.

Off-lying Islet.—**Ko Losin** (Pulau Lozin) (7°19'N., 101°56'E.), 2m high, lies 31 miles NE of Laem Khao Phra. A light is shown from the islet. Ko Losin is reported to lie 3.75 miles ENE of its charted position.

The coast between Laem Khao Phra and the entrance to Sungai Kelantan, 55 miles SE, is mostly low.

The entrance to Khlong Sai Buri, obstructed by a shallow shifting bar, lies 9 miles S of Laem Ko Phra. A light is shown on the S side of the river entrance.

Khao Nam Khang, 780m high, rising 9.5 miles SSW of the entrance to Khlong Sai Buri, is the N summit of a range of mountains extending SSE.

Hin Rakit, a white rock, 9m high and steep-to, lies 3.2 miles offshore, 6 miles ESE of the entrance to Khlong Sai Buri. Khao Tanyong, 294m high, conical and wooded, rises close to the coast about 17.5 miles farther SSE. A conspicuous dark hill, over 150m high and wooded, is located 3 miles S of Khao Tanyong.

Narathiwat (6°26'N., 101°50'E.) (World Port Index No. 57432), a small rubber and copra port, lies 3 miles NW of Khao Tanyong, 0.5 mile within the shoal entrance of Khlong Bang Nara. Cargo is lightered to the roadstead 1.5 miles off the river entrance. Vessels of light draft are able to cross the bar only at HW.

Sungai Kelantan

6.69 The delta of Sungai Kelantan, low and featureless, is backed by numerous lagoons and waterways. Sungai Kelantan has two main entrances.

Kuala Besar (6°13'N., 102°13'E.), the E entrance is navigable only by boats. The depths are constantly changing, and local knowledge is necessary. A light is shown close inside the E entrance point of Kuala Besar. Discolored water may be encountered several miles seaward of the entrance. The N extremity of the E entrance point of Kuala Besar is the SW entrance point of the Gulf of Thailand.

Kuala Tongkong, the W entrance to Sungai Kelantan, lies 4 miles W of Kuala Besar.

6.70 Tumpat (6°12'N., 102°10'E.) (World Port Index No. 57430) lies on the S side of the entrance of Kuala Besar. Kota Baharu lies 6 miles SE of Tumpat, on the W side of Sungai Kelantan. The principal export at Tumpat is iron ore. An air field is situated 3.5 miles NE of Kota Baharu.

The port area of Tumpat is sheltered from seaward by a curved sandspit, but anchorage inside the sand spit is suitable only for small craft.

Depths—Limitations.—A jetty, 185m in length, projects from the coast about 1 mile WNW of Tumpat. The jetty is used to load iron ore into lighters. At night, when work is in progress, the jetty and immediate vicinity are illuminated by bright lights.

Aspect.—Pantai Sri Tujoh Light is exhibited from a white wooden framework tower, 11m high, standing close within the W extremity of Tanjung Kuda.

Kuala Baru Tumpat Lighted Beacon, a white structure 5m in height, stands on a drying mud flat at the E end of the harbor, 1.7 miles E of Pantai Sri Tujoh Light; its position is approximate.

A light is also occasionally exhibited from a beacon situated 1 mile SW of Pantai Sri Tujoh Light.

Anchorage.—Small vessels can obtain anchorage, in a depth of 6.4m, soft mud, 2 miles NNW of Tumpat Light. Large vessels anchor farther offshore, remaining in depths of 11m or more, but the holding ground is poor.

Anchorage, in a depth of 9.2m, mud, good holding ground, was reported to lie 1 mile N of the entrance to Kuala Besar.

Directions.—Vessels proceeding to Tumpat from SE should keep 2.5 miles from the coast until Tumpat Light bears 180° when course may be steered for the anchorage.

Caution.—A shoal, with a least depth of 3.1m, lies 2.5 miles NNW of Tumpat. A wreck with masts showing lies on the W side of the shoal.

Fishing stakes may be encountered up to 6 miles from the coast.

East Coast of Malaysia—Sungai Kelantan to Tanjung Penawar

6.71 The E coast of Malaysia between Sungai Kelantan and Tanjung Penawar, 310 miles SSE, is characterized by low swampy areas with numerous rivers discharging into the sea. Coastal ridges and hills extend to the coast at isolated points. In general, the off-lying islands are quite high, wooded, and good landmarks for coastal navigation.

Caution.—Fishing stakes may be encountered in depths of less than 15m off the E side of Malaysia.

Oil well structures, transfer platforms, and related equipment are situated off this section of coast.

Sungai Kelantan to Kuala Terengganu

6.72 A light is shown from a framework tower at **Sabak** (6°11'N., 102°19'E.), located 6.5 miles ESE of the E entrance to Sungai Kelantan.

The coast between Sabak and Sungai Besut, 25 miles SE, is low, sandy, and bordered by coconut trees. Depths of less than 11m extend up to 4.5 miles offshore, shoaling gradually shoreward.

The village of Bachok, where a light is shown, is situated 8 miles SSE of Sabak. Bukit Marak, a hill, 112m high, is conspicuous 5 miles WSW of Bachok. Bukit Gunong, with an elevation of 192m, is located 6 miles SW of Bachok.

Kuala Semarak, located 14 miles SSE of Bachok, lies at the entrance of Sungai Semarak, and is obstructed by a bar. A light is shown at the S side of the entrance. Batu Meninjau (Batu Maninjau), 514m high, is conspicuous 14 miles W of the entrance.

Sungai Besut, navigable only by boats, is entered 4 miles SE of Kuala Semarak. A fishing light is shown on the E entrance point of Sungai Besut.

Pulau Rhu, with an elevation of 110m, is located 3 miles E of the entrance to Sungai Besut, and 2 miles offshore.

The coast between Sungai Besut and Tanjung Merang, 30 miles SE, is low and bordered by sandy beach. Kuala Setiu Bharu, an inlet along the coast, lies 17 miles SE of Sungai Besut.

Pulau Chipu, a 23m high islet, scrub-covered and surrounded by shoal water, is prominent about 3.8 miles NE of Kuala Setiu Bharu. Baker Shoal, an 11.3m coral patch, and Dickson Shoal, a 12.8m coral patch, lie 3.5 miles N and 3.8 miles WSW, respectively, of Pulau Chipu.

A range of mountains, with many peaks, backs this coast, attaining its greatest elevation at Gunong Lawit, 1,519m high, about 17 miles SW of Kuala Setiu Bharu.

6.73 Tanjung Merang (5°32'N., 102°57'E.) has an elevation of 47m, and a conical hill, 204m high rises 2.5 miles S of it. A light is shown on Tanjung Merang.

Batu Rusa, two above-water rocks, the S of which is 2.7m high, lies 2.5 miles ENE of Tanjung Merang. Batu Tengah, 0.6m high, with a rock, awash, close SW, lies 0.8 mile N of Batu Rusa.

Batu Bara, 40m high, lies nearly 6.5 miles N of Tanjung Merang; three rocks, the highest of which stands 2.1m high, lie 0.8 mile NW of Batu Bara. Hafther Rock, with a depth of less than 1.8m, lies 0.7 mile SW of Batu Bara.

Batu Rakit, a small group of rocks, 0.6m high, lies 8 miles SE of Tanjung Merang, and 0.5 mile offshore. A light is shown on Batu Rakit.

The coast between Tanjung Merang and Kuala Terengganu, 16.5 miles SE, is low, but at Batu Rakit the high land approaches the coast.

An 11m patch lies 4.5 miles N of Batu Rakit. Depths of less than 11m extend up to 5 miles offshore in the vicinity of Batu Rakit.

Off-lying Islands and Dangers

6.74 Pulau Perhentian Kechil (5°55'N., 102°43'E.), 345m high in its S part, lies 7 miles NE of Pulau Rhu. Pulau Perhentian Besar, 321m high, is located close E of Pulau Perhentian Kechil, from which it is separated by a narrow foul channel. A coral patch, awash, lies 0.3 mile off the W side of the W island. A light is shown from the SW side of Pulau

Perhentian Besar. Anchorage for small vessels with local knowledge can be taken in the S entrance to the channel between the islands.

Pulau Susu Dara, 199m high, lies 3.5 miles WNW of the N end of Pulau Perhentian Kechil. Pulau Serenggeh, 59m high, and Pulau Rawa, 55m high, lie nearly 1 mile S, and 1 mile E, respectively, of Pulau Susu Dara. A rock, 1.2m high, lies 0.5 mile WNW of the W end of Pulau Susu Dara. Several islets and rocks lie between Pulau Susu Dara and Pulau Rawa.

Churchill Patches, with a least depth of 13.7m, sand and shell, lies 7.8 miles N of Pulau Susu Dara.

Pulau Lang Tengah, 128m high, wooded, and cultivated in places, lies 8.5 miles SE of Pulau Perhentian Besar.

6.75 Pulau Redang (5°47'N., 103°01'E.), lying 14 miles ESE of Pulau Perhentian Besar, is the largest, highest, and outermost of the group of islands which lie off the coast between Kuala Semarak and Kuala Terengganu. Pulau Redang, thickly wooded, rises to an elevation of 359m in its N part. Pulau Lima, 76m high, lies 1 mile off the E side of Pulau Redang.

Pulau Redang Harbor, formed by islands off the S side of Pulau Redang, provides sheltered anchorage for small vessels. Pulau Pinang, 126m high, and reef-fringed on its NE side, forms the SW side of the harbor. A light is shown from the island.

The channel N of Pulau Pinang is for boats and is dangerous when the tide is in progress. A 5.2m shoal lies in mid-channel 0.3 mile ENE of the N end of Pulau Pinang. Connell Rock, a coral patch with a depth of 4.9m, lies 0.2 mile E of Pulau Pinang.

Pulau Ekor Tibu, 52m high, is located nearly 1.5 miles E of the E extremity of Pulau Pinang, on the S side of the E approach to the harbor. Pulau Chipor, 11m high, lies 0.5 mile WSW of Pulau Ekor Tibu. Batu Chipor, a round-topped rock, which dries 1.8m, lies 0.2 mile N of Pulau Chipor.

Pulau Koringo Besar, 15m high, lies on the S end of a reef extending 0.5 mile off the SE side of Pulau Redang, and on the N side of the E entrance to the harbor.

Anchorage.—Small vessels can find good anchorage, in depths of 7.3 to 9.1m, with swinging room of about 300m, in the NW part of Pulau Redang Harbor. Larger vessels can anchor, in depths of 16 to 18m, sand and coral, about 0.5 mile N of Pulau Chipor.

Anchorage can also be taken by medium-sized vessels in the bay on the N side of Pulau Redang. The bottom is fine coral sand and the holding ground is reported to be good, especially at the seaward end of the bay where the bottom is hard sand or clay. Approach to the bay can be made with a conspicuous rocky outcrop, located at the head of the bay, bearing about 200°; a thickly-wooded hill lies in the vicinity of the rocky outcrop.

6.76 Pulau Yu Kechil (5°38'N., 103°10'E.), 71m high, is located 11.5 miles SE of Pulau Redang, and is the southeasternmost of the islets off this part of the coast. Pulau Yu Besar, 91m high, is located 1 mile NNW of Pulau Yu Kechil. An 11m depth is charted about 1.2 miles SE of Pulau Yu Kechil.

Pulau Bidong Laut, 293m high, lies 5.2 miles W of Pulau Yu Kechil. The island is thickly wooded and has several bays with sandy beaches on its W and SW sides. A submerged rock was reported (1945) to lie 0.3 mile N of Pulau Bidong Laut. Pulau Gelok, 107m high, lies 1.5 miles N of Pulau Bidong Laut. Pulau Tengkorak, 34m high, with a 9m high islet close N, lies 0.5 mile farther NNE. Pulau Kapak, 65m high and thickly wooded, lies 0.5 mile S of Pulau Bidong Laut.

6.77 Kuala Trengganu (5°21'N., 103°08'E.) (World Port Index No. 57420), a small coastal port, is fronted by a shifting bar, which had a least depth of 1.4m in 1972. The town of Trengganu lies on the S bank close within the harbor entrance.

Depths—Limitations.—Depths in the inner channel decrease from 9m at the river entrance to 2m above the inner navigational buoys. Four jetties, with depths of 3.7m alongside, are situated between the town and 1.5 miles upstream.

Aspect.—A fort lies on a 31m hill about 0.3 mile SW of the S entrance point of the harbor. A light is shown from a white brick pillar in front of the fort. Bukit Besar, a hill rising 2 miles S of the entrance, is surmounted by a radio mast with an elevation of 202m and marked by red obstruction lights.

Pilotage.—The pilot boarding place lies within a 1 mile radius of the fairway lighted buoy.

Anchorage.—Exposed anchorage can be taken, in 9m, sand, with the light near the fort bearing 243°, distant 1.5 miles. Small craft with local knowledge can obtain good anchorage, in a depth of 4.3m, just within the entrance.

Kuala Trengganu to Tanjung Dungun

6.78 Tanjung Chenering (5°16'N., 103°11'E.), 74m high, is located 5 miles SSE of Kuala Trengganu, and is conspicuous being the only rocky headland in the vicinity. Bukit Panji, 203m high, is located 1.5 miles SW of Tanjung Chenering.

Pulau Kapas, 124m high and densely wooded, lies 5 miles ESE of Tanjung Chenering. An islet lies close off its NW end. A light obscured from seaward between bearings of 154° to 300° is shown from the S end of Pulau Kapas. Depths of less than 11m extend 1 mile NNW and SSE of the island. A 4.9m shoal lies 0.5 mile WSW of Pulau Kapas, on the coastal bank, with depths of less than 9m, extending between the island and the mainland.

Kuala Merchang, an inlet along the coast, is located 10.5 miles S of Pulau Kapas. Batu Siatin, 3 miles NNE of Kuala Merchang and 1.5 miles offshore, consists of two steep-to rocks, 0.2 mile apart, the outer rock with a least depth of 0.6m.

The coast from abreast Pulau Kapas to Tanjung Dungun, 28 miles SSE, is flat, covered with jungle and scrub, and backed by many low hills. A range of wooded hills is located 3.5 miles inland, in the S part of this coast; the range terminates at its S end in Bukit Laba, 232m high, 5 miles W of Tanjung Dungun. The 10m curve lies 1 mile offshore abreast Batu Siatin and approaches to about 0.5 mile offshore abreast Tanjung Dungun.

6.79 Off-lying islands.—Pulau Tenggol (4°48'N., 103°41'E.), 283m high and densely wooded, lies 14.5 miles E of Tanjung Dungun. The island has three peaks, the N and center of which have twin summits. The island is steep-to and

rocky, except for a small bay on its W side; there are several sunken rocks in the bay.

Anchorage off the bay can be taken, in a depth of 48m, about 0.3 mile N of the S entrance point of the bay. An old light tower stands on the NE extremity of the island.

A bare rock, 10m high, lies 0.8 mile SSE of Pulau Tenggol. The channel between the rock and Pulau Tenggol has depths of 20m in the fairway and appears to be free of dangers.

Pulau Nyirih, lying 2 miles NNW of Pulau Tenggol, has two summits, the N and higher of which has an elevation of 108m. A rock, which dries 1.8m, and a rock with a least depth of 6.1m, lie 0.1 mile NNW, and 0.3 mile E, respectively, of the N point of the island.

A bare rock, 26m high and steep-to, lies 1 mile N of Pulau Nyirih. A small rock, 3m high, and another 4.6m high, each steep-to, lie 0.2 mile NW, and 0.8 mile ESE, respectively, of the above-mentioned bare rock.

6.80 Tanjung Dungun (4°47'N., 103°26'E.) rises to an elevation of 60m, and is marked at its summit by a light. The town of Kuala Dungun, 1 mile SW of Tanjung Dungun, serves the port and the iron mines at Bukit Besi, 19 miles inland, to which it is connected by a light railway. The port limits extend N to 4°47'00"N, E to 103°28'15"E, and S to 4°42'00"N.

Winds—Weather.—Vessels load and discharge into local lighters, but this is practicable only during the Southwest Monsoon season from about March 1 to October 31.

Depths—Limitations.—Sungai (Sungei) Dungun, discharging close SW of Tanjung Dungun, is accessible to vessels of 2m draft. A rest house is conspicuous 1 mile S of the W entrance point of Sungai Dungun; Sura Jetty is situated 0.5 mile farther S. Sura Jetty can only be used in calm weather. Mooring buoys are situated E of the rest house and Sura Jetty.

Pilotage.—Pilotage is compulsory for all ore vessels. Pilots board 10 miles off the coast. The pilot boat flies Flag H of the International Code. Custom and immigration authorities board at the anchorage.

Anchorage.—Anchorage can be taken, in a depth of 10m, mud and sand, about 1.5 miles E of Sura Jetty.

Tanjung Dungun to Kuantan

6.81 Bukit Bauk (4°42'N., 103°25'E.), 474m high and densely wooded, is located 5 miles SSW of Tanjung Dungun, and is the summit of a range extending SE to the coast. Bukit Belakang Parang lies 1 mile E of Bukit Bauk, in the same range.

Tanjung Labohan, 16 miles S of Tanjung Dungun, is marked by a light, and rises to Bukit Labohan, 378m high, about 0.8 mile NNW. Paton Bank, with a depth of 15.5m, is located 3 miles ENE of Tanjung Labohan.

Kertih Oil Terminal (4°34'N., 103°28'E.) (World Port Index No. 57415) is situated close N of Tanjung Batu Lata. Kertih Control Tower light is shown from a gray metal framework tower, 35m high. A lighted yellow beacon is shown from Paka Power station cooling water intake nearly 2 miles N of the terminal.

Gas pipelines lead ENE from Kertih Oil Terminal to Tapis Marine Terminal and Sotong Platform, 108 miles NE and 86 miles E, respectively.

A T-head pier projecting to the 5m curve consists of three berths lying in position 4°35'N, 103°28'E. The pier is protected by a detached breakwater, lighted at its N and S ends, established close E. A buoyed channel leads to the berths.

Depths—Limitations.—Single Anchor Leg Moorings (SALM) No. 1 and SALM No. 2, lighted, with sound fog signals, are situated 2.2 miles E and 2.7 miles ESE respectively of the terminal. Tankers between 40,000 dwt and 250,000 dwt can berth at them. The maximum loaded draft is 17.4m at SALM No. 1 and 20.4m at SALM No. 2.

A Single Point Mooring (SPM) is moored 1.3 miles ENE of the terminal, in a depth of 16.5m. A tanker between 15,000 and 85,000 dwt can berth there to load from a refinery ashore to a maximum draft of 11.1m.

Lighted Buoy No. 1 and Lighted Buoy No. 2 are at the 15m curve to mark shallow waters for deep draft tankers. A tug and a mooring launch attend during the mooring operations.

Pilotage.—Pilotage through the mooring master is compulsory. Pilots board, as follows:

1. About 4.5 miles NE of Tanjung Batu Lata Light.
2. About 5 miles E of Tanjung Batu Lata Light.

Regulations.—Vessels should send their ETA to Kertih Marine Control via telex upon departure from the previous port. The ETA should be confirmed 72 hours, 48 hours, 24 hours, and 12 hours in advance.

Vessels should contact Kertih Marine Control on VHF channel 16 when within range and maintain a continuous listening watch on that channel.

A Vessel Traffic Management System is maintained with radar surveillance encompassing the area within 24 miles of the port. The service provides vessels with advice on navigational conditions, traffic, weather, and tidal information upon VHF contact.

A restricted area extends about 5 miles seaward of the terminal. The N limit of the restricted area is marked by a lighted buoy moored 4.5 miles NE of Tanjung Batu Lata.

Caution.—A sudden outbreak of severe weather may be experienced in the area, resulting in the offshore current exceeding 3 knots. The currents are the result of the monsoon seasons. During the Northeast Monsoon (November-March) the current sets S and in the Southwest Monsoon (May-September) it sets N.

6.82 The village of Kemasik, from which a light is shown, lies 5.5 miles S of Tanjung Labohan. Batu Bau, with a least depth of 7.6m, lies 1.5 miles E of Kemasik. Caslon Bank, with a least depth of 13.7m, extends 4 miles NW of Batu Bau.

Tanjung Penunjuk (4°20'N., 103°30'E.) lies 11.5 miles S of Tanjung Labohan; a light is shown 0.8 mile NW of the point. Radio masts, marked by red obstruction lights at an elevation of about 335m stand on Bukit Kijal, 1.5 miles SW of Tanjung Penunjuk; the lights are visible for a considerable distance from NE and SE, but are obstructed from E. A shoal, with a least depth of 11.3m, and Beting Karang Baru, with a depth of 10.7m, lie 3.5 miles NE, and 4.2 miles SE, respectively, of Tanjung Penunjuk.

Sungai Kemaman (4°14'N., 103°27'E.) discharges 6 miles SSW of Tanjung Penunjuk. Bukit Gemok, 174m high, is located close to the coast, 4 miles NNE of the river entrance. A light is shown from a hill close N of the E entrance point.

Vessels with a draft of 2.4m, with local knowledge, can enter the river. The entrance to the river is marked by lighted ranges.

Chukai lies 2 miles within the river entrance. Iron ore is exported through Chukai by lighters to vessels at anchor off the river entrance.

Two shoals, one with a depth of 4.2m and the other with a depth of 3.9m, lie 2 miles ESE and 2.5 miles SE, respectively, of the E entrance point of Sungai Kemaman.

Anchorage can be taken in a depth of 12.8m, mud and sand, about 0.7 mile SE of the E entrance point, with the light structure bearing 305°.

Kemaman Harbor (4°15'N., 103°27'E.)

World Port Index No. 57416

6.83 Kemaman Harbor is protected by East Wharf, which extends 850m SSW from Tanjung Berhala, and the S breakwater, which extends 730m E then N from Tanjung Sulung.

Depths—Limitations.—In the N part of the harbor, the offshore oil and gas supply Base Wharf is 360m long with a depth of 7.8m alongside. The W side of East Wharf is 630m long, with a depth of 14.5m alongside for vessels up to 220,000 dwt and 13m draft. In the S part of the harbor, there is a berth at the head of the LPG terminal jetty for tankers up to 40,000 dwt and 12m draft.

A bank with depths of less than 11m extends 0.4 miles SSE from the head of East Breakwater. A rock, Batu Belacan, with a depth of 4.6m, lies 0.1 mile N of the S extremity of the bank.

Aspect.—The main channel leading to the turning basin in the harbor is 15m deep, and is approached from a position 2 miles SSE of Tanjung Berhala. Lighted Beacon No. 1 marks the channel, which is guided by two pairs of leading lights into the harbor. The first pair lead from Lighted Beacons No. 8 and Lighted Beacons No. 10 aligning on bearing 310°; the second pair lead from Lighted Beacon No. 7 and Lighted Beacon No. 9 on bearing 327°30'. Fairway Lighted Buoy is moored on the alignment of the first pair of leading lights, 5.2 miles SE of the harbor entrance.

Lighted Beacon No. 5 stands close S of East Wharf head. A light is shown from the head of the S breakwater.

Pilotage.—Pilotage is compulsory, except for offshore supply vessels, and is available between 0700 and 1900. The pilot boards at the channel entrance, about 2.5 miles SE of the head of East Wharf. Deep draft vessels are boarded about 5.5 miles SE of the head of East Wharf.

Anchorage.—The quarantine anchorage and the deep draft anchorage are situated NE of the approach channel and are best seen on the chart.

The petroleum anchorage is situated SW of the approach channel and is best seen on the chart.

The supply vessel anchorage is situated NE of the approach channel, 1.5 miles SE of Tanjung Berhala.

6.84 Coastal features.—Tanjung Geliga (Tanjung Guliga), 4 miles S of Sungai Kemaman, rises to an elevation of 92m.

The coast between Tanjung Geliga and Tanjung Gelang, 12.5 miles S, is low and featureless except for a 97m hill rising close to the coast, 1 mile N of Tanjung Cherating.

Offshore oil platforms are situated 100 miles W of Tanjung Geliga.

Oil fields on the W side of Main Route.—Kapak Natuna Oil Field and Terminal lie 30 miles NW of the main route between Singapore and Hong Kong. Platforms may also be encountered within 7 miles of either side of the main route, between S and SE of Kapak Natuna Oil Field.

Oil fields on the E side of Main Route.—Udang Oil Field is situated 40 miles NNE of Kepulauan Anambas and 20 miles SE of the main route between Singapore and Hong Kong. There may exist extended chains of platforms, particularly leading NW in Udang Oil Field, a distance of 2 to 5 miles E of the main route.

6.85 Tanjung Gelang (3°58'N., 103°27'E.) rises to an elevation of 112m. Bukit Pengorok, 196m high and conical, is located 2 miles farther NW. Beting Gebing, a shoal having a least depth of 3.7m, lies 2.2 miles NE of Tanjung Gelang. Depths of 6.7 to 11m extend 3.8 miles N, and 5.5 miles SSW of Beting Gebing. A 12.5m depth, and Skua Shoal, with a least depth of 10.3m, lie 3.5 miles E, and 4.5 miles SSE, respectively of Tanjung Gelang.

Tanjung Tembeling (3°48'N., 103°23'E.), located 10.5 miles SSW of Tanjung Gelang, rises to an elevation of 100m. A light is shown 0.3 mile N of the point. Bukit Pelindong, 267m high, is located 2 miles NNW of Tanjung Tembeling. A group of radio masts, 37m high, marked by red lights at the mast heads and green lights at the base of the masts, stands on the summit of Bukit Pelindong. The lights are visible a considerable distance to seaward. Red obstruction lights are shown at an elevation of 335m, from a conspicuous radio mast, 76m high, 0.3 mile farther E. Bukit Beseher rises to an elevation of 366m about 2 miles farther NW.

There are several obstructions, with depths of less than 9m, within 3 miles of Tanjung Tembeling.

Off-lying Shoals in the Approach to Kuantan

6.86 Asquith Shoal (3°44'N., 103°43'E.), with a depth of 12.3m, lies 21.5 miles ESE of Tanjung Tembeling. Boys Shoal, with a least depth of 13.7m, and Campbell Shoal, with a least depth of 11.2m, coarse sand and rock, lie 6 miles SE, and 10 miles SSE, respectively, of Asquith Shoal.

Elliot Shoal, with a least depth of 14m and Allen Shoal, with a least depth of 13.1m, extend 3.5 miles SSE and 4.5 miles S, respectively, of Asquith Shoal.

Haslam Shoals consists of fine sand and shells; the main shoal, 4 miles long in a N-S direction, has a least depth of 6.7m at its S end, which lies 6 miles WSW of Asquith Shoal. Robinson Rock, with a depth of 10.9m lies 3 miles SE of the main shoal, with depths of 11m between.

Herring Shoal, with a depth of 9.1m, lies 10 miles E of Tanjung Tembeling. An 11m shoal lies 3.5 miles farther E. Clark Shoal, with a depth of 8.2m, lies 2 miles SSE of Herring Shoal. A 10.4m shoal, and a rock with a depth of 10.7m, lie 2 miles E and 2 miles ESE, respectively, of Clark Shoal.

Martin Ridge, composed of sand and rock, extends S for a distance of 9 miles from a position 8.5 miles ESE of Tanjung Tembeling. There is a patch, with a least depth of 7.3m at the N

end, and there is a least depth of 6.7m about 2 miles from its S end.

Karang Tanjong, with a least depth of 4.9m, sand, shell, and shingle, lies with its shallowest part lying 3 miles SE of Tanjung Tembeling. Depths of 5 to 7m lie 1 mile SSW of the shallowest part, and depths of 6.7 to 9.4m extend 6 miles NNE of the shallowest part. Stork Rock, with a depth of 10.6m, lies 9 miles ENE of Tanjung Tembeling. An obstruction, with a depth of less than 6.4m, lies 0.8 mile W of the N end of Karang Tanjong.

Appleby Rock, Harris Shoal and Taylor Shoal, with depths of 4.2m, 5.5m, and 4.2m respectively, lie 5, 6.5, and 9.5 miles, respectively, SSE of Tanjung Tembeling.

Kuantan New Port (3°58'N., 103°26'E.)

World Port Index No. 57410

6.87 Kuantan New Port is situated on the N side of Tanjung Gelang; the **Old Port** (3°48'N., 103°20'E.) is located at the mouth of the Kuantan River, 11 miles SSW. The New Port is the only deep water port on the E side of the Malay Peninsula and it can accommodate vessels of 45,000 dwt, except at the palm oil berth where vessels of 54,500 dwt can be accepted with a draft of 11.2m. The main exports are timber and palm oil.

There is a basin in the harbor and the harbor is protected by N and S breakwaters, each marked by a light at the head. From the basin entrance, the N breakwater extends SE and then SSE 1 mile, to a point 0.5 mile NNE of Tanjung Gelang Light. The S breakwater extends 0.1 mile from a point N of the same light.

Winds—Weather.—The wind is predominantly NE. The monsoon season is from November to February.

Tides—Currents.—The tidal range at spring rise is 3.5m. The predominant current sets N across the harbor entrance attaining a velocity of 2 knots, which decreases as it flows seaward. The current may reverse its direction to the S after a storm during the monsoon.

Depths—Limitations.—Within the breakwaters is a turning basin, 500m in diameter, with a least depth of 12.2m.

There are 11 berths in the port. A jetty, on the S side of the entrance to the basin, has inner and outer palm oil berths. The outer berth is 315m long for vessels with 11.5m draft and can accommodate vessels of up to 54,000 dwt. The inner berth is 150m long for a vessel with a maximum draft of 8m and can accommodate vessels of up to 8,000 dwt. At the N entrance to the basin, there is a jetty with mineral oil berth 150m long for vessels with an 8m draft.

On the S side at the W section of the harbor basin there are general and container cargo berths, numbered from seaward, with a total quayage of 750m for vessels having a maximum draft of 11.2m. The container berth is 225m long with an alongside depth of 11.5m. The three multipurpose berths have a total length of 525m. Passenger vessels may dock at the multipurpose berths. The container, ro-ro, and multipurpose facilities can accommodate vessels up to 45,000 dwt. Stern-ramp vessels can also be accommodated.

The Chemical Berth and the MTBE Terminal, each have a length of 240m, at which vessels of up to 53,000 dwt, with a maximum draft of 11.4m, can berth.

The Service Jetty, close N of the Naval Basin, is 140m long and has an alongside depth of 4m. Berth No. 1A is a coastal berth, 70m long in a depth of 8m.

Pilotage.—Pilotage is compulsory. Vessels are to forward their ETA at least 24 hours in advance and to confirm the ETA on VHF channel 12, 13, or 16 at least 2 hours before arrival. Pilots board vessels at a point 0.3 mile E of Fairway Lighted Buoy.

Anchorage.—Vessels with drafts up to 13m draft anchor NE and SW of the approach channel, good holding ground, mud and sand, although this anchorage is exposed to the Northeast Monsoon.

Directions.—From the pilot boarding place the channel leads in a straight line for a distance of 3 miles to the break-water entrance. The range lights, bearing 311°04', will guide a vessel in maintaining the centerline of the channel; it is 220m wide and dredged through a ridge 1.5 miles SE from the break-water entrance. The channel has a least depth of 12.2m. An underkeel clearance of 3.5m is required to enter harbor during the Northeast Monsoon.

Caution.—A dangerous wreck, marked by a lighted buoy, lies 0.6 mile ESE of Tanjung Gelang. Another dangerous wreck lies 1.1 miles ENE of the point.

6.88 Tapis Marine Terminal A (4°31'N., 105°01'E.) (World Port Index No. 57417) is situated within a restricted area that should not be entered by unauthorized vessels. Several groups of platforms from the surrounding oilfields are connected by pipelines. Dulang Platform is situated 5 miles NW of Semangkok Platform. A tanker mooring buoy is established 1 mile S of Dulang Platform.

Pipelines are laid from Tapis Terminal and Sotong Platforms WSW to Kertih Terminal. Semangkok Field, with two platforms, is situated 47 miles WNW of Tapis Marine Terminal A; Sotong Collector Platform is situated 42 miles SSW of Tapis Marine Terminal A; and Kakap Oil Field is situated 55 miles SE of Tapis Marine Terminal A. Two Duyong Platforms are situated 24 and 29 miles ENE of Satong Platform.

A platform, with a SPM close E, is situated 40 miles E of the E Duyong platform.

Pilotage.—Pilots board in the waiting area 17 miles SSW of the storage tanker, where ships usually remain underway. Port radio station and administrative offices are aboard the storage tanker.

6.89 Sungai Kuantan (3°48'N., 103°21'E.), entered 1.7 miles W of Tanjung Tembeling, provides access to Kuantan, which is the outlet for a considerable tin mining industry. Kuala Kuan-tan, the mouth of the river, is fronted by a drying bank. A dredged channel, marked by a lighted range and lighted buoys, leads across the bank. The channel is subject to constant change, especially during the Northeast Monsoon; the range lights and buoys are moved as necessary. No vessel should enter the river without local knowledge.

Tides—Currents.—The tidal rise at Kuantan is 2.7m at MHHW and 1.8m at MLHW.

Depths—Limitations.—The river is accessible to vessels of up to 3m draft. The main wharf in the harbor is 43m long, with a depth of 2.1m alongside, and a depth of 4.9m a short distance off. A private wharf, close SW of the main wharf, has depths of

3m alongside. Two T-head oil jetties, on the N side of the river, have depths of 5.5 and 5.8m alongside.

A bank, with depths of less than 5.5m, extends up to 2 miles offshore for a distance of 5 miles SSW of Tanjung Tembeling.

Two 5.5m patches lie 1.8 miles S, and 2.2 miles SSW, respectively, of Tanjung Tembeling.

Aspect.—A cluster of three oil tanks stands on the N bank of the river, close within the entrance, and provides a good landmark. A water tank is conspicuous 0.3 mile S of the W entrance point of the river. A conspicuous radio mast, 105m high and marked by obstruction lights, stands 2 miles SW of the same entrance point.

Anchorage.—Anchorage can be taken, in depths of 8.2 to 9.2m, mud and sand, good holding ground, 0.8 mile SSE of Tanjung Tembeling.

Anchorage is also available 2.3 miles SE of Tanjung Tembeling, in a depth of 12m.

Kuantan to Tanjung Penyabong

6.90 The coast between the entrance to Sungai Kuantan and the N entrance to Sungai Pahang, 18 miles SSE, is low and densely wooded.

Sungai Pahang has two mouths formed by **Pulau Syed Hasan** (Pulau Syed Hassan) (3°31'N., 103°29'E.). The river is shallow and the banks constantly change.

Kuala Pahang Light is shown close N of the N entrance point of Sungai Pahang.

Batu Serandu, a reef supporting a fishing reserve, has a depth of 5.5m, and lies 3 miles NNW of the N entrance point of Sungai Pahang.

Bass Shoals, consisting of several heads with depths of 9.8 to 10.7m, extends up to 7 miles E of the entrance to Sungai Pahang. Cardno Shoals, with a least depth of 8m, lies 4 miles SE of Pulau Syed Hasan.

Anchorage can be taken, in a depth of 8.2m, mud and sand, 1 mile NE of Kuala Pahang Light.

Wardlaw Shoals, consisting of patches of coral rising steeply from the bottom, and with a least depth of 1.2m, lies 3.5 miles S of Pulau Syed Hasan; depths of less than 5.5m extend about 1 mile farther S.

The coast from the S entrance of Sungai Pahang to abreast Wardlaw Shoals is densely wooded, then the coast to Tanjung Batu, 16 miles S, consists mainly of sandy beaches. A wooded hill, 41m high, rises 1 mile N of Tanjung Batu.

A narrow shoal, 1.5 miles long in a N-S direction, and with a least depth of 3m, lies with it S end lying 2.5 miles NE of Tanjung Batu. A shoal, with a least depth of 3.4m, lies 6.5 miles farther N. A 7m patch lies 5 miles ENE of the above-mentioned narrow bank.

A light is shown at Nenasi, a fairly large fishing settlement, situated 3.5 miles S of Tanjung Batu.

6.91 Off-lying islets and dangers.—**Pulau Berhala** (3°15'N., 103°39'E.), a wooded, steep-sided islet, 28m high and marked by a light, lies 13 miles ENE of Tanjung Batu. A ledge of rocks, 0.3m high, over which the sea breaks in bad weather, extends 0.3 mile NNE of the islet. A shoal, with a least depth of 10m, and a 10m patch, lie 4.5 miles NW, and 7.5 miles N, respectively, of Pulau Berhala.

Jubilee Shoal, a steep-to coral patch, with a least depth of 8.8m, lies 9 miles E of Pulau Berhala. A depth of 15.5m lies 10.5 miles NE of Jubilee Shoal.

Bell Shoal, with a depth of 15.8m, lies 18 miles NNE of Pulau Berhala. Tucker Shoals, a number of detached shoals, with a least depth of 12.8m, extends 10 miles SSE from Bell Shoal.

The coast from **Nenasi** (3°08'N., 103°27'E.) to the entrance of Sungai Rompin, 19 miles S, consists of a series of long, sandy beaches, fringed by a line of casuarinas and backed by flat jungle country. Settlements are distinguished by the coconut palms which surround them.

Sungai Bebar, navigable at HW, enters the sea from within a sandy spit, parallel with the coast and extending S of Nenasi. Sungai Mercung, suitable for boats, lies 6 miles farther S.

Margaret Shoal, a detached bank 13.5 miles in length within its 5.5m contour, lies with its N end lying 5.5 miles E of Nenasi light structure. A patch, with a least depth of 1.5m, lies near its S end, 3 miles offshore. An extensive shoal, with a least depth of 10m, lies 6.5 miles E of the S part of Margaret Shoal.

A radio tower, marked by a red obstruction light, stands on the N entrance point of Sungai (Sungei) Rompin.

The mouth of Sungai Rompin is fronted by a bar with a least depth of 1.1m. No attempt should be made to enter the river without local knowledge as changes occur every monsoon. The port is little used except by fishing craft. The limits of the port of Kuala Rompin are comprised between the parallels of 2°53'24"N and 2°45'00"N, and W of 103°36'48"E.

A light is shown from the head of the Kuala Rompin Jetty, situated on the S side of the river.

Vessels working cargo via Sungai Rompin should anchor within the port limits N of 2°49'18"N. Vessels working cargo via Sungai Pontian, a river with a drying bar 3 miles SE of Sungai Rompin, should anchor within the limits S of 2°49'18"N.

6.92 Pulau Duchong Laut, 43m high, lies 2.5 miles ESE of the entrance to Sungai Pontian. Drying rocks lie NE of the islet, and another islet, 35m high, lies 0.8 mile S.

Boya Rock, 0.3m high, lies 3 miles E of Pulau Duchong Laut. A light is shown from Boya Rock.

The coast between Sungai Rompin and **Tanjung Penyabong** (2°39'N., 103°45'E.), 19 miles ESE, is fairly low except for an isolated hill, 129m high, standing 3.5 miles from the coast, abreast of Pulau Duchong Laut.

Kuala Endau, entered 6.5 miles WNW is obstructed by a bar, with depths of 0.9 to 1.5m, extending 1.5 miles offshore. A light is shown from the E entrance point of Sungai Endau; the light structure is difficult to identify from seaward. Robb Shoals, an extensive rocky patch, lies with its least depth of 2.4m about 3.2 miles N of the river entrance. Iron ore and tin are exported from the town of Endau, 1 mile within the river entrance.

Anchorage can be taken, in depths of 12.8 to 16.5m, mud, good holding ground, about 5.3 miles NE of the river entrance.

6.93 Pulau Aceh (Pulau Kaban) (2°40'N., 103°46'E.), located 1 mile NE of Tanjung Penyabong, has several summits, the highest rising to 154m at its SE end. A small islet, 43m high, lies close off the NW end of the island.

Pulau Tengah, 76m high, is the N of a group of islets and rocks extending 1 mile N of the NW extremity of Tanjung Penyabong.

Pulau Tunus and Pulau Layak lie on the N side of Blair Harbor, about 1 mile, and 2 miles, respectively, NW of Pulau Aceh. Pulau Tunus consists of three islets, the highest with an elevation of 43m. Pulau Layak is 78m high at its SE end. Batu Doyak, which dries 1.8m, lies 0.7 mile S of Pulau Layak.

A rock awash, and a rock with a depth of 5.5m, lie 0.5 mile SW, and 0.7 mile SE of the S end of Pulau Aceh.

Anchorage for small vessels with local knowledge can be taken, in a depth of 7.3m, stiff mud, W of Pulau Aceh between the islets NW and Pulau Tengah.

Tanjung Penyabong to Tanjung Sekakap

6.94 Two shallow bays, separated by Pulau Mawar, indent the coast between Tanjung Penyabong and Tanjung Resang, 5 miles SE. Pulau Mawar consists of two islets; the SE and larger islet is 72m high, and the NW islet has two conspicuous pillar rocks, 24m high. Malang Gading, 1.3 miles N of Pulau Mawar, consists of two groups of rocks, 0.2 mile apart, the N of which is 3.4m high.

Tanjung Resang rises to an elevation of 75m. Bukit Arong, 238m high, is easily identified 1.5 miles SW of Tanjung Resang. Pulau Puchong, 15m high, is located 1 mile SE of the same point.

Tanjung Selantai, 143m high, is located 5 miles SSE of Tanjung Resang. Pulau Batu Gajah (Batu Gaja), 45m high, is located 1 mile SSE of Tanjung Selantai. Pulau Stindan, 85m high and marked by a light at its SE end, is located 1.5 miles S of the same point.

Caution.—Between Pulau Aceh and Tanjung Selantai, are numerous fishing stakes which extend offshore to depths of 15m in places. During the Northeast Monsoon, these stakes are frequently destroyed, and wooden stakes, often submerged, are dangerous to small craft, and may be encountered anywhere along the coast.

6.95 Mersing (2°26'N., 103°51'E.) lies at the mouth of Sungai Mersing, 2.5 miles S of Pulau Setindan. A light, difficult to distinguish against the lights of the town, is shown on the S side of the river entrance. A green-tiled dome is conspicuous in the town, 0.3 mile S of the light. Batu Chawang, a 10m high red rock, lying 1 mile E of the river entrance, is a good landmark. A meteorological hut with a flagstaff is conspicuous on a hill about 1 mile NW of the river entrance. The bar off the entrance of the river is passable by boats, and has varying depths. The bar was reported to dry at LW.

Anchorage, according to draft, can be taken NE of the river entrance; the bottom is very flat, and consists of mud, sand, and shell.

Two radio masts, marked by obstruction lights, stand at an elevation of 114m, about 3 miles S of Sungai Mersing, at the S end of a range of hills.

Tanjung Sekakap, 107m high, is located 8 miles SE of Sungai Mersing. Pulau Blanah, a small islet, 27m high, lies close to the coast 1.3 miles NW of the point. A shoal with a least depth of 8.2m lies 3 miles NNE of Tanjung Sekakap.

Off-lying Islands and Dangers

6.96 Pulau Sembilang (2°42'N., 103°53'E.), 234m high on its NW side, lies 7.5 miles ENE of Tanjung Penyabong. Pulau Sribuat (Pulau Siribuat), 139m high at its SE end, is separated from Pulau Sembilang, close W, by a foul channel. Pulau Santu, 72m high and grass-covered, lies nearly 0.5 mile E of the NE end of Pulau Sribuat.

Mitchell Patches, an extensive bank, has a least known depth of 10.4m lying 1.7 miles N of the NW end of Pulau Sribuat. A depth of 8.5m lies 1.8 miles SE of the S end of Pulau Sembilang, then a reef, with depths of 7.3 to 11m, extends NW almost to the island.

Anchorage, well-sheltered from S, can be taken, in a depth of 14m, mud, sand, and shell, 1 mile NW of the NW end of Pulau Sribuat, on the S end of Mitchell Patches. Good anchorage can also be taken, in a depth of 16.5m, mud and sand, 1.2 miles SE of Pulau Sribuat, on the bank extending SE from the island.

Pulau Mertang Barat (Pulau Achi), 2 miles SW of Pulau Sribuat, is 59m high, and the NW and highest of three rocky islets lying close together. Depths of less than 11m extend 0.4 mile W of Pulau Mertang Barat, and 0.4 mile SE of the SE islet. A light is shown from Pulau Mertang Barat.

Remora Patches lie with a least depth of 13.7m lying 6 miles NW of Pulau Mertang Barat. Burden Patches has a depth of 10.1m lying 2 miles SW of the same islet and a 10.4m depth lying 2 miles farther S.

Pulau Harimau, located 6.5 miles SE of Pulau Mertang Barat, is 91m high and steep-to except on its SW side where there are sunken rocks. It is the NW and largest of a chain of islets and rocks extending 3 miles SE, and which lie on the same submerged ridge as Pulau Mertang Barat. A bank, with a least depth of 11.6m, lies 2.5 miles NW of Pulau Harimau.

6.97 Pulau Mensirip, 49m high and tree-covered, lies 0.7 mile SE of Pulau Harimau; the fairway between the two islands is free of dangers. Pulau Rawa, 113m high, is located 2 miles farther SE and is the SE islet of the group.

Pulau Babi Kechil North, 122m high, lies 2 miles SW of Pulau Rawa. Pulau Babi Kechil South lies 0.5 mile SSE of Pulau Babi Kechil North, from which it is separated by foul ground. A rock, 4.9m high, lies 0.2 mile off the E side of Pulau Babi Tengah. Both islands are planted with coconut palms, and there are sandy beaches on the SW sides, but the NE sides are steep and rocky.

Anchorage can be taken, in a depth of 20m, mud and sand, midway between Pulau Rawa and Pulau Babi Kechil North.

Pulau Babi Besar, lying 1.2 miles SSE of Pulau Babi Kechil South, is thickly wooded, with four separate summits, the highest of which is 252m high, in its SE part. It is fringed by rocks and reefs extending up to 0.2 mile offshore. A bank, with depths of 5.5 to 11m, extends 1.3 miles S of the island. A detached 5.5m shoal lies 1.3 miles SW of the island. In the channel between Pulau Babi Besar and the mainland, a bank with a least depth of 10.6m and another bank, with a least depth of 8.2m, lie 2 miles WNW and SW, respectively, of the 5.5m shoal.

Batu Sakit Mata, 1.5m high, is located 2.5 miles E of the N end of Pulau Babi Besar, and Batu Tikus, 8.5m high, is located

2.5 miles farther SE. They are rocky outcrops on a bank with general depths of 12.8 to 18.3m.

Pulau Tioman

6.98 Pulau Tioman (2°47'N., 104°10'E.), the largest island off the E coast of Malaysia, consists of lofty mountains. Gunung Kajang, the largest and highest peak, 1,053m high, rises 5 miles NW of Tanjung Lanting, the SE extremity of the island. A light is shown from Tanjung Lanting.

A conspicuous twin-peaked hill, 456m high, is located near Tanjung Lanting; a flat-topped mountain, 957m high, is conspicuous 2 miles farther NW. Bukit Perayon, 419m high, the N summit of the island, is easily identified. The island is covered with jungle, with some cultivation limited to the coastal strip. The presence of coconut palms indicates the location of the inhabitants of the island. The island has been reported visible from distances of more than 50 miles at times.

The E side of Pulau Tioman, apart from Telok Juara, is steep-to, rugged and rocky, with no off-lying dangers. The N entrance point of Telok Juara, 5 miles N of Tanjung Lanting, rises abruptly to a height of 183m. Above-water rocks extend 0.2 mile SE of the point, and a 4.6m rocky shoal, and an 11m patch, lie 0.3 mile SE and 0.4 mile SSW of the same point. The cove is about 1.2 miles wide between its entrance points, and recedes 0.8 mile W to a sandy beach bisected by a small headland. The 10m curve fronts the W shore of the cove nearly 0.5 mile offshore.

Anchorage, in depths of 11 to 18.3m, mud under sand, good holding ground, can be taken in the SW part of the cove.

Telok Mokut, a sandy bay, indents the coast between Tanjung Lanting and Tanjung Duata, located 4 miles W. Two conspicuous outcrops of rock with twin summits, 760m high, rise close N and NW of Tanjung Duata. Anchorage with local knowledge and in fine weather, can be taken in Telok Mokut, in depths of 26 to 28m, sand.

The SW coast of Pulau Tioman from Tanjung Duata to Tanjung Bongkil, 4.2 miles NNW is steep-to, with the 10m curve at no point lying more than 0.3 mile offshore.

Pulau Tumuk, a small wooded islet, 34m high, lies 0.5 mile NNE of Tanjung Bongkil. Tanjung Batu Panjang lies 0.7 mile farther NE. A radio mast stands on Tanjung Batu Panjang.

Telok Tekek (Telok Telek) is entered between Tanjung Batu Panjang and Tanjung Penuba, 3.5 miles NNE. Pulau Rengis, a small rocky islet, 24m high, lies 0.8 mile NE of Tanjung Batu Panjang. A shallow bank of sand and coral, with a depth of 10.4m at its outer end, extends 0.4 mile W of Pulau Rengis. Within the bay the 20m curve fronts the coast 0.3 mile offshore with the exception of the bank off Pulau Rengis. Within the 20m curve the depths decrease very rapidly and there are numerous coral heads.

Anchorage can be taken anywhere in Telok Tekek, NE of Pulau Rengis, in depths of 26 to 37m, mud and shells, good holding ground.

An offshore current flowing NE attaining velocities of 1 to 2 knots has been reported in the vicinity of the bay.

Pulau Soyah, 37m high, lies close offshore, 1.3 miles N of Tanjung Penuba. Between Tanjung Penuba and Tanjung Gua Layang, the N extremity of Pulau Tioman, the 30m curve lies at distances of no more than about 0.4 mile offshore.

6.99 Off-lying islets and dangers.—Magicienne Rock, with a depth of 8.2m, lies 2 miles NW of the N extremity of Pulau Tioman.

Pulau Tulai lies 3 miles WNW of the NW extremity of Pulau Tioman. The island is densely wooded, and has several summits, the highest rising 123m on the E side of the island. Two above-water rocks lie off the S side of the island.

Pulau Chebeh, 72m high and nearly 1 mile NNW of Pulau Tulai, is a steep-to rocky islet with few trees on it.

Pulau Sepoi, a rocky islet, 73m high, lies 3 miles WSW of Pulau Tulai. Pulau Labas, a bare rocky islet, 20m high, lies 1 mile SE of Pulau Sepoi. A comparatively shallow bank extends between the two islets, with a 10.1m depth lying 0.2 mile SE of Pulau Sepoi. Karang Tohor, with a least depth of 14m, lies 1.5 miles SSW of Pulau Labas.

Pulau Burong 9.5 miles W of the W extremity of Pulau Tioman, is a group of three rocky islets; the N and largest islet is 53m high.

Pulau Gut, 4.5 miles SW of Tanjung Lanting, is 49m high to the tops of the trees. It is steep-to except off its S side where depths of less than 5.5m extend 0.2 mile offshore. Batu Sepoy, with a least depth of 2.4m, lies nearly 1 mile N of Pulau Gut.

Pulau Tokong Bahara (2°40'N., 104°04'E.) is a bare rock, 57m high, marked by a light close NNW, and lies 6.5 miles W of Pulau Gut. Two detached rocks lie about 0.3 mile NNW of the islet.

Pulau Pemanggil

6.100 Pulau Pemanggil (2°35'N., 104°20'E.), 9.5 miles SE of Pulau Tioman, has two main peaks and a number of subsidiary peaks. The SE and highest peak, 433m high, rises abruptly from the end of the island; the NW peak, 386m high, is less distinctive. A dome-shaped rocky summit, with smooth vertical sides, rises to a height of 319m about 0.5 mile SSW.

The island is steep-to on all sides, but is partially fringed by narrow coral reefs and rocks close inshore, particularly in the bays. A rock, which dries 2.1m, lies 0.1 mile offshore in the N part of Telok Kador, a bay on the NE side of the island. Coconut-palm plantations distinguish the inhabited part of the island, close to the shore of the two bays on the SW side of the island.

Good anchorage can be found, in depths of 33 to 39m, sand and shell, as convenient, off the SW coast of Pulau Pemanggil.

Pulau Aur (2°27'N., 104°31'E.), 11.5 miles SE of Pulau Pemanggil, is densely wooded, with two conspicuous peaks. The SE peak is 538m high, and the NW peak is 445m high. From NE or SW, the saddle-shaped island often appears as two islands from a great distance.

Pulau Pinang, 0.5 mile off the SE shore of Pulau Aur, is steep-sided, rocky, and 95m high. The channel between these two islands is deep and clear of dangers.

Three rocks and coral shoals, with depths of 9.2 to 10.1m, lie SW of Pulau Pinang, 0.8 mile off the SE coast of Pulau Aur. Strong tidal currents and current eddies may be encountered in this area which should be given a wide berth.

A target, consisting of a group of nine mooring buoys, lies 2.3 miles S of the SW end of Pulau Aur.

Pulau Dayang, 171m high, lies close NW of Pulau Aur, from which it is separated by a deep channel. A group of rocks, the

largest 1.5m high, extends 0.7 mile E from the N end of the island. Pulau Lang, 55m high, lies 0.8 mile SW of Pulau Dayang, and 0.5 mile off the W end of Pulau Aur.

Anchorage.—Large vessels can obtain good shelter during the Northeast Monsoon off Telok To Kaya (Telok Kyahs) on the SW side of Pulau Aur, in a depth of 40m, sand, a distance of 0.5 mile offshore, with the left tangent of Pulau Aur bearing 335° and the right tangent bearing 117°. Within the bay the bottom is irregular and discolored water caused by tidal eddies give the impression of shoal water.

Excellent sheltered anchorage can be found, in a depth of 42m, sand and shell, at the NW end of Pulau Aur, equidistant between that island, Pulau Dayang and Pulau Lang; swinging room is limited to about 0.3 mile. The W approaches on either side of Pulau Lang are deep and clear. The main village of Pulau Aur lies in a sheltered valley on the SE side of this anchorage.

Tanjung Sekakap to Tanjung Penawar

6.101 The coast between **Tanjung Sekakap** (2°21'N., 103°56'E.) and Tanjung Tenggaroh, located 6.5 miles SSE, is mainly steep, rocky, and interspersed with sandy beaches. Tanjung Murang, 2.5 miles SE of Tanjung Sekakap, rises to a height of 111m.

A light is shown from the easternmost part of Tanjung Tenggaroh; an abandoned lighthouse stands close SW.

The coast between Tanjung Tenggaroh and Tanjung Sedili Besar, 22 miles SSE, is mostly low and densely wooded. The coast between Tanjung Tenggaroh and Tanjung Leman, 6 miles SSE, is fringed by a bank with depths of less than 5.5m extending up to 2.3 miles offshore.

Off-lying Islands and Dangers

6.102 Batu Murau, 1.5m high, lies 4 miles E of Tanjung Murau, at the S end of a reef of about 0.5 mile in extent.

Pulau Tinggi (2°18'N., 104°07'E.), 4 miles farther E, rises to a conical peak, 609m high. Gebang Rocks, two rocks which dry 0.6m and on which the sea breaks during the Northeast Monsoon, lie 1.3 miles N of the island. Pulau Iboi, 105m high, with two drying rocks close E, is the outermost of two islets, 0.5 mile off the NE side of the island. Pulau Simbang, 44m high, lies near the SE edge of a bank with depths of less than 11m extending 1.8 miles SE of Pulau Tinggi. One Tree Rock, 22m high, lies close N of Pulau Simbang, with a detached rocky ledge, uncovered at most stages of the tide, close E.

6.103 Pulau Yu (Tokong Yu) (2°07'N., 104°15'E.), a bluff, wooded islet, 47m high, is the SE of a chain of islets and dangers extending 12 miles SE of Pulau Tinggi. A small shoal, with a least depth of 11.3m on its S side, lies 1.3 miles NW of Pulau Yu.

Tokong Chopak, 5m high, Tokong Blalang, 31m high, and Tokong Chondong, 43m high, are located 3.5, 5, and 5.8 miles, respectively, NW of Pulau Yu. A rocky ledge, with a least depth of 1.8m, joins Tokong Chondong to Tokong Gantang, 0.3 mile N, and then extends 0.1 mile N to a rock which dries 1.2m.

Pulau Lima Besar, with five distinctive pinnacles, 52m high, lies on a rocky bank lying 2 miles NW of Tokong Gantang. Tokong Sangoe, 21m high, is located nearly 1 mile W of Pulau Lima Besar, and Tokong Raket, two rocks, the highest 30m high, lies 0.5 mile ESE of Pulau Lima Besar. Karang Ambong, a rock with a depth of 0.9m, lies 0.5 mile SW of Pulau Lima Besar.

Pulau Sibul, 4 miles SW of Pulau Tinggi, is 154m high near its SE end, and 114m high near its NW end. A bank, with depths of less than 5.5m, extends 2 miles SE of Pulau Sibul. Pulau Sibul Tengah, 3.7m high, lies 1 mile SE of Pulau Sibul, and other islets and rocks extending 1 mile farther SE, lie on the SE edge of the above bank. Three patches, with a least depth of 4.3m, lie 0.5 mile NE of the N end of Pulau Sibul.

Sibul Channel, between Pulau Sibul and the mainland, is 2.5 miles wide between the 5m curves on either side, with depths of 9.8 to 15.2m in the fairway. The channel is encumbered by a number of patches on its NE side, the shallowest with depths of 5.2m and 7.6m, about 1.2 miles NW, and 0.8 mile WNW, respectively, of the NW end of Pulau Sibul.

Tanjung Sedili Besar (1°55'N., 104°08'E.) rises to an elevation of 47m. A light is shown from a 3.7m high rock, near the outer end of foul ground extending 1 mile SE of the point.

6.104 Telok Mahkota (Jason Bay), a shoal bay, is entered between Tanjung Sedili Besar and Tanjung Sedili Kechil, 4 miles SSE. A wreck, marked by a buoy, lies 5 miles E of Tanjung Sedili Kechil.

Sungai Sedili Besar enters the N end of the bay, between Tanjung Sedili Besar and Pulau Tagal, a densely wooded

island, 0.5 mile W. Kampong Sedili Besar, a fishing village, lies on the E side of the river entrance. A pylon, 15m high, stands on a 0.6m high rock, about 0.1 mile N of Pulau Tagal; an overhead telephone cable extends from the pylon to the jetty at Kampong Sedili Besar. Tanjung Sedili Kechil is 85m high, and a reef extends 0.8 mile E of the point.

The coast between Tanjung Sedili Kechil and Tanjung Kelesa (Tanjung Klesa), 10 miles SSE, is backed by hills close inshore. Depths of less than 11m extend 2 to 3 miles offshore. Then the coast between Tanjung Kelesa and Tanjung Siang 4 miles farther SSE is bordered by trees about 43m high.

Tanjung Balau lies 2.5 miles SSE of Tanjung Siang. A group of rocks, the highest with an elevation of 3m, lies close offshore, 0.5 mile NW of Tanjung Balau.

Bukit Siti rises to a height of 137m about 3.5 miles WSW of Tanjung Siang.

6.105 Tanjung Penawar (1°31'N., 104°17'E.), located 6.5 miles SSE of Tanjung Balau, is a low point, 9 miles N of the NE entrance point of Singapore Strait. The coast for a distance of 1 mile N of Tanjung Penawar is bold, but with rocky patches extending 0.2 mile to 0.8 mile offshore. The 10m curve fronts the point about 2 miles offshore.

Bukit Twatow, 139m high, rises 2 miles WSW of Tanjung Penawar. The coast in this vicinity is rather low and wooded. Bukit Twatow, being discernible during hazy weather much sooner than Bukit Pelali, 191m high, 6 miles farther SSW, is a good landmark when approaching Singapore Strait from N.

Chinese

Chinese	English	Chinese	English
A			
an.....	embankment, bank, shore, coast cliff	ding	top
an-chiao.....	submerged rocks, reef	dizui	landspit
anjiao.....	sunken rock	dong	east
ansha	shoal, sandbank	E	
ao.....	bay, cove, inlet, dock	erh	two
B			
bandao	peninsula	F	
bei.....	north	fangbodi	breakwater
bi	nose	feng	mountain, peak
bodi	anchorage	fou	port
bu	village	fu	province capital
C			
cao	channel	G	
cha	lock, dam, floodbarrier	gang	port, harbour, mound, hill
chau	see chou	gangchi.....	basin
chao.....	bog, marsh	gangkou	port, harbour
chen.....	town, market town	gaojiao	promontory
ch'eng	city, walled town	guanchang	square
chi.....	obstruction, ledges in river	H	
ch'i.....	stream, river, head, cape, point, mountain, seven	hai	sea, gulf
chia.....	cape, bluff	haibin	beach
ch'ia	customs barrier	hai-ching	strait, channel
chiang.....	river, shoal, harbour, port, inlet, channel, sound	haidi	sea wall
chiang-tao.....	channel, strait, sound	hai-hsia.....	strait, channel
chiao.....	creek, rock, reef, shoal, islet, cape, point	haikou	sea mouth
ch'iao	bridge	hai-k'ou	channel entrance
chien.....	mountain, peak	hai-pin	seashore, beach
ch'ien	shallow, shoal	haiqu	water area
ch'ien-lai.....	bank, shoal	hai-wan	bay, gulf
ch'ien-t'an	bank, shoal	haixia	strait
ch'ien-tui	bank	hangdao.....	fairway
ch'ih.....	pong	hang-lu	fairway
chih-chiang-tao	reach	hangmen.....	pass navigable to ships
ching.....	capital, city isthmus, ford, ferry	he	river
chiu.....	nine	hei	black
cho.....	see chou	ho	river, waterway
chou.....	island, bank	hou	rear
chow	see chou	hsi.....	west, mountain, stream
ch'uan	stream, river	hsia.....	strait, gorge, lower
chuang	village	hsiang.....	rural area, village
chueh.....	cape, point	hsiao.....	small
chung.....	middle, centre	hsien.....	district, district capital
ch'un-tao.....	archipelago, group of islands	hisin	new
chu-tao	archipelago, group of islands	hsu.....	island
cun.....	village	hsuan	eddies
D			
da.....	big, great	hu	lake
dao.....	island	huang	yellow
daozi.....	island	hung	red
diantan.....	patches	J	
J			
		ji	village, town
		jia	headland, point
		jian	top, peak

Chinese	English
jiang	river
jiao	reef
jiao	point, cape
jie	street
jiu	old

K

kan.....	dry, harbour, port
kan.....	see Chiang
kang.....	mound, hill
kao.....	high
kao-chiao.....	promontory
kao-juan	plateau
kau.....	see k'ou
kiang.....	see Chiang
kiao.....	see Chiao
kou or k'ou	mouth, river entrance, port, inlet, ravine, gully
kow.....	see kou
ku	valley
ku-k'ou	ravine
kuan.....	barrier, customs
kuo	country, kingdom

L

lan.....	reef, blue
lanjiangsha	bar
lao.....	old
li	gravel, shingle, inner
liedao.....	group of islands
lieh-tao	see liedao
lieh-yeh	group of rocks
lin	forest
ling	ridge, mountain, mountain range
liu	stream, current, six
lu	road

M

man.....	seemen
maodi	anchorage
mao-ti	see maodi
men.....	gate, pass, channel, strait
miao	temple
mu	trees, wood, grave
mun	see men

N

nan.....	south
nei.....	inner
nei-ao	basin
n'i.....	mud

O

o	see ao
ou	see ao

P

pa.....	embankment, quay, eight
pai.....	reef, white

Chinese	English
pang	see peng
pan-tao	see bandao
pao	town village, rampart
p'ao-t'ai.....	port
pei	see bei
peng	creek
pi	cape, nose
piao	rock, islet
p'ing-chou	level shoals
p'o	arm of the sea
po-ti.....	roadstead, anchorage
pu	village
p'u	inlet, creek, village, town, rampart

Q

qian	front
qiantan	shoal, bank
qu	area
qundao	archipelago
qunjiao	reefs

S

san	three
san	see shan
san-chiao-chou.....	delta
seu	see hsu
sha	sandbank, islet, sand, low sandy point
sha-chiao	sandspit
sha-ch'iu	sand dune
shan	mountain, hill, island
shang.....	upper
shan-hu.....	coral
shan-hu-chiao.....	coral reef
shan-mo	mountain range
shan-sha	bar, sandbar
shan-tien.....	mountain summit
shao	small, few
shatan	sandy shoal, sand flats
sha-tsui.....	sandspit
shatui.....	sandbank
shazhou	sandbank
shazui	sandspit
shen.....	deep
sheng.....	province
shi.....	rock
shih.....	city, market, store, rock, hill
thih-t'ai	ridge of rocks
shih-ti	swamp
shu.....	tree
shu-lin	forest
shui.....	water, river
shuidao.....	channel
shui-lu	channel, passage
shui-tao	seeshuidao
si.....	temple
ssu	monastery, temple, four
su.....	seehsu

Chinese	English	Chinese	English
T			
ta.....	tower, great, large	wai	outer
t'a.....	pagoda	wan.....	bay, gulf bend in river
tai	see tui	wei	headland, tail, walled town
tan.....	flat	X	
t'an.....	banks, flats, rapids, lake	xi	west, creek
tang.....	village	xia	strait
t'ang.....	embankment, pond	xian	county
tao.....	island, road, paddy field	xiao	small, little
t'ao.....	bay	xin	new
tao-tzu	islet	xu	village
tau.....	see tao	Y	
tautze.....	see t'o-tzu	yai	cliff
ti	embankment, dyke, earth, ground, place, low, bottom	yan	rock
t'ien.....	arable land, field	yang	ocean, enclosed portion of the sea, channel
ting	summit, mountain	yeh	moorland
t'o.....	stone, rocky eminence	yen	embankment, dyke, rock, reef, cliff
t'o-tzu	stone, rocky knob, islet	yen't'an	salt pan
tou or t'ou	cape, headland, point	yen-tien	saltpan
t'ou-tzu	cape, headland, point	yen-ch'ang	saltworks
tow.....	see tou	yu	island, islet
tsui.....	cape, point, spit	yunhe	canal
tsui-tsu.....	cape, point, spit	yun-ho	canal
tsui-wei.....	cape, point, spit	Z	
ts'unvillage		zhai.....	village
tu	ferry, ford	zhang.....	mount
tuan.....	village	zhen.....	town
tui	mound, bank	zhong	middle, central
tui-tsui	bank, spit	zhou	shoal, islet
tun	village	zhuang.....	village
tung	east	zui	point, spit
W			
wa.....	swamp	zeizi.....	point
		zulangdi	breakwater

Vietnamese

Vietnamese	English	Vietnamese	English
A		nuoc	river, water
ap	hamlet	O	
B		oan	gulf
ban	village	ong	stream
ban dao	peninsula	P	
ben tau	seaport	phnom	hill
bien	sea	pho	branch of river
bot	inlet	phum	village
C		poulu	island
cang	mountain	prek	stream
chu	hill, mountain	Q	
cua	mouth of river	quan dao	archipelago
cudao, culao	island	R	
D		rach	stream
dar, dia	river	ran	breaker, reef
doi	high hill, cape	ranh	canal
duong	ocean	roc	canal
G		S	
giang	large river	sa	sandback
giong	hill	se, son, song	river
H		soung, sung	island
hon	small island	stoeung	river
hoang	lake, lagoon	T	
K		than	shallows, bar of river
kas	island	thom	under water
khum	village	tieu	reef, coral reef
kinh	strait, canal	tong, tot	mountain
kompong	village	tram	woods
L		tranh	village
lang	village	V	
luon	irrigation canal	vam	river mouth
M		vinh	bay, gulf
mui	cape, point	W	
muon	irrigation canal	wat	temple
N		X	
nhai thi	river port	xa, xom	village
nui	hill, mountain	xeo	stream
		xuyen	river

Cambodian

Cambodian	English	Cambodian	English
A			
ap.....	hamlet	lem.....	point
au.....	stream, port	M	
B		meat.....	mouth, estuary
bai.....	bay	mui.....	point
ban.....	village	muang.....	town
banteai.....	fort, fortified place	N	
beng.....	lake, pond	nam.....	river
C		nui.....	hill
camnan.....	bay	O	
chhung.....	cape	ong.....	stream
Chrung.....	cape	P	
chrouy.....	point, cape	phnom, pnom.....	hill, mountain
cua.....	mouth of the river	phra.....	tower
D		phum srok.....	city, capital, urban centre
dac.....	river	poulu.....	island
dai.....	stream	prasap.....	tributary
G		prasat.....	tower
giri.....	mountain	prek.....	stream, river
H		S	
hon.....	island	shrui.....	cape
K		song.....	river, rapids
keng.....	rocks, rapids	T	
khum.....	village	tbong.....	peak
khuon.....	quay	thui.....	water
kinh.....	strait	tonle.....	large river, lake
koh.....	island	tranh.....	village
koi.....	customs house	trep.....	floating island
kok.....	village	tuk.....	water
kompong.....	hill	X	
komput.....	summit	xom.....	village
krong.....	stream		

Malay

Malay	English	Malay	English
A			
ayer.....	water, stream	mas.....	golden
alangan.....	bar	merah.....	red
arus.....	current	muara.....	mouth of a river
ayer masin.....	salt water	N	
B			
bagan.....	landing place	negri.....	town, state
baharu, bahru.....	new	P	
bandar.....	port, trading town	paya.....	marsh, swamp
barat.....	west, western	pangkalan.....	landing place
batang.....	river	panjang.....	long
batu.....	rock	pantai.....	coast, seaboard, beach
besar.....	large, great	parit.....	ditch, stream
beting.....	shoal, bank	pasir.....	sand, beach
biru.....	blue	pekan.....	town, market
bukit.....	hill	pohon or pokok.....	tree
C			
changkat.....	hillock, shoal	prau.....	boat
chetek.....	shallow	pulau.....	island
D			
dalam.....	deep	puteh, putih.....	white
darat.....	land, the interior	R	
G			
gosong, gusong.....	shoal, reef, islet	rendah.....	low
H			
hijau.....	green	rumah.....	house
hitam, hitam.....	black, dark	S	
hutan or utan.....	jungle, forest	selat.....	channel, strait
K			
kampung.....	village	selatan.....	south, southern
karang.....	coral, reef	sungai.....	river
kecil.....	small, little	T	
kering, kring.....	dry	tanah.....	land, country
kuala.....	mouth or a river or confluence of two rivers	tanjong.....	cape, headland, point, promontory
kuning.....	yellow	telok.....	bay, bend in a river
L			
labuan.....	anchorage	terumbu, trumbu.....	dangerous hidden shoal
laut.....	sea, seaward	terusan.....	connecting channel
M			
malang.....	rock, reef, or shoal	timor.....	east
U			
		tinggi.....	high
		tohor.....	shallow
		tua.....	old
		tukun.....	sunken rock
		U	
		umpur.....	mud
		utara.....	north

Thai

Thai	English	Thai	English
	A		
ao.....	bay, creek	lek	small
	B	lom	wind
ban.....	house, or, if with a place name, village	luang	large
bo	lake	lueng	yellow
bung	swamp		M
	C	mae.....	river
chiang.....	town	mai	new
chong.....	strait	mai nam	river
chong.....	khaep	monthol, monthon.....	province or state
	D	muang	town
dam.....	black		N
deng.....	red	nai-kwa	inner
din-nieo	clay	nakhon	town
din-saw-pong	chalk	noi	little
don	high land	nik-kwa	outer
doi	hill		P
	F	pa dong	forest
fai	fire, light	pak	mouth
fang	shore	pak nam.....	mouth of a river
	H	phra-chedi	pagoda
hard	beach	phukhao	mountain
hardzai.....	sand beach	pom	fort
hin	rock		S
hlaem.....	cape, headland	sai	sand, gravel
ho	tower	so-cloke.....	rock
hoioy	stream		T
hyai.....	great	tam	low
	K	thale	sea
kao.....	old	thale saplake	
kaho.....	white	thi samo.....	anchorage
khlon	mud	thitnua	north
khlong	canal or creek	thit tai	south
khok	hill	thit tuan ok	east
ko	island	thit tuan tok	west
	L	tong koong	river bend
laem.....	cape, headland		W
lang.....	lower	wat	temple
			Y
		yot	top

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					BROTHERS POINT						
ABERDEEN HARBOR	22	15 N	114	11 E	2.16	22	21 N	114	01 E	2.30	
ADAMASTA ROCK	22	13.5 N	114	01.2 E	2.26	BUKIT BAUK	4	42 N	103	25 E	6.81
AI ZHOU	22	03 N	113	55 E	2.13	C					
ALICIA ANNIE REEF	9	24 N	115	26 E	1.34	CAM PHA	21	02 N	107	22 E	4.47
ALISON REEF	8	50 N	114	00 E	1.36	CAN THO	10	02 N	105	47 E	5.59
ALLISON REEF	8	50 N	114	00 E	1.36	CANTON	23	06 N	113	14 E	2.51
ALOUETTE BANK	21	11 N	110	24 E	3.21	CAP BANG	19	26 N	105	49 E	4.20
AMBOYNA CAY	7	52 N	112	55 E	1.44	CAP BOUTON	19	13 N	105	45 E	4.19
AMPHITRITE GROUP	16	53 N	112	17 E	1.8	CAP BUMBI	10	32 N	104	11 E	6.11
AN THOI	10	01 N	104	01 E	6.9	CAP CHAO	19	43 N	105	54 E	4.21
ANBO SHOZHOA	7	52 N	112	55 E	1.44	CAP LAY	17	05 N	107	07 E	4.10
ANOVA NATUNA MARINE TERM.	5	13.2 N	105	36.4 E	1.46	CAP PAK LOUNG	21	30 N	108	13 E	4.9
ANTELOPE REEF	16	27 N	111	35 E	1.14	CAP QUAN LAN	20	59 N	107	29 E	4.55
AO SATTAHIP	12	38 N	100	54 E	6.32	CAP SA HOI	14	40 N	109	05 E	5.17
AO UDOM	13	07 N	100	53 E	6.42	CASTLE ROCK	22	15 N	114	01 E	2.25
AP LEI PAI	22	14 N	114	09 E	2.16	CAY DUA	10	01 N	104	01 E	6.9
ARCHIPEL DES FAI TSI LONG	20	50 N	107	25 E	4.30	CENTRAL REEF	8	55 N	112	21 E	1.42
ARDASIER REEF	7	38 N	113	56 E	1.38	CH'I-CHOU CH'UN TAO	19	56 N	111	13 E	3.40
ASQUITH SHOAL	3	44 N	103	43 E	6.86	CH'ING CHOU	21	29 N	111	28 E	3.8
B					CH'ING LING						
BACHDANG	20	52.4 N	106	45.4 E	4.28	CH'UAN-PI CHIAO	22	45 N	113	40 E	2.47
BAI NUM	16	06 N	108	18 E	5.11	CHAI WAN	22	16 N	114	15 E	2.14
BAIAN DAO	18	49 N	110	34 E	3.42	CHANGKENG DING	22	19 N	113	36 E	2.39
BAIE D'APOWAN	20	43 N	107	02 E	4.28	CHARLOTTE BANK	7	08 N	107	36 E	1.49
BAIE DE FAI TSI LONG	20	55 N	107	13 E	4.38	CHAU KUNG TO	22	16 N	114	03 E	2.21
BAIE DE LAN HA	20	45 N	107	07 E	4.32	CHAU LIN	22	37 N	113	09 E	2.57
BAIE DE NHA TRANG	12	15 N	109	14 E	5.32	CHEK CHUE WAN	22	12 N	114	12 E	2.15
BAIE DE PHAN RANG	11	35 N	109	02 E	5.38	CHEK LAP KOK ISLAND	22	19 N	113	56 E	2.29
BAIE DE REAM	10	31 N	103	36 E	6.14	CHENGMAI JIAO	20	04 N	110	09 E	3.37
BAIE DU LUTIN	16	06 N	108	18 E	5.11	CHESTERMAN ROCK	22	11 N	114	12 E	2.19
BAIE DU SUD OUEST	8	40 N	106	32 E	5.8	CHIAO-WEI CHIAO	20	13 N	109	55 E	3.31, 4.3
BAILI DAO	21	59 N	113	45 E	2.33	CHIAO-WEI CHIAO LIGHT	20	13 N	109	55 E	3.27
BAILONG WEI	21	30 N	108	13 E	4.9	CHIA-P'ENG LIEH-TAO	21	52 N	114	00 E	2.11
BANC DU PROPONTIS	10	35 N	106	52 E	5.51	CHIA-PEI CHIAO	20	29 N	110	31 E	3.30
BANC WALLACE	9	29 N	107	38 E	5.5	CHIA-PEI CHIAO	20	29 N	110	32 E	3.26
BANGKOK	13	45 N	100	30 E	6.44	CHI-MOA SHA	20	51 N	110	31 E	3.25
BAOHU JIAO	20	01 N	110	56 E	3.32	CHING-HSIN CHIAO	20	01 N	110	56 E	3.32
BEI SHI	19	59 N	111	16 E	3.40	CHIN-HAING MEN	22	23 N	113	37 E	2.51
BEIHAI GANG	21	29 N	109	04 E	4.6	CHIN-MU CHIAO	18	10 N	109	33 E	3.44
BEIJIAN DAO	21	53 N	114	02 E	2.11	CHISHA SHUIDAO	23	02 N	113	30 E	2.45
BEILI WAN	19	10 N	108	35 E	3.50	CHITAN	22	07 N	113	46 E	2.35
BEN DAM	8	40 N	106	32 E	5.8	CHIWAN HARBOR	22	28 N	113	52 E	2.38
BEN THUY	18	39 N	105	42 E	4.18	CHONG KO TAO	9	55 N	99	55 E	6.58
BEN THUY PIER	18	39 N	105	42 E	4.18	CHROUY KAB	10	29 N	104	18 E	6.13
BINGMA JIAO	19	55 N	109	18 E	3.29, 3.39, 3.54	CHROUY SAMIT	10	52 N	103	07 E	6.3, 6.19
BLACK POINT	22	25 N	113	54 E	2.43	CHU LU KOK ISLAND	22	19 N	113	56 E	2.29
BLACK ROCKS	20	30 N	110	32 E	3.26	CHUANBI SHUIDAO	22	42 N	113	41 E	2.44
BOKHARA ROCKS	22	13 N	114	16 E	2.19	CHUK SAMET HARBOR	12	37 N	100	55 E	6.31
BOMBAY REEF	16	02 N	112	31 E	1.16	COLOSSE	21	01 N	107	27 E	4.52
BOMBAY SHOAL	9	26 N	116	55 E	1.30	COMMODORE REEF	8	22 N	115	14 E	1.37
BOXALL REEF	9	36 N	116	10 E	1.32	CON SON ISLANDS	8	42 N	106	37 E	5.6
BRITTO BANK	10	29 N	107	50 E	5.49	CORNWALLIS SOUTH REEF	8	45 N	114	13 E	1.36
						CU LAO CHAM	15	57 N	108	31 E	5.10, 5.12

	Position				Sec. Para		Position				Sec. Para
	°	'	°	'			°	'	°	'	
CU LAO POULO GAMBIR	13	37 N	109	21 E	5.19	FUNGSTON	23	24 N	111	31 E	2.66
CU LAO RE	15	23 N	109	07 E	5.16						
CU LAO THU	10	32 N	108	57 E	5.2						
CU LAO THU	10	33 N	108	56 E	5.1						
CU LAO XANH	13	37 N	109	21 E	5.19						
CUA DAI	19	58 N	106	06 E	4.24	GAOLAN DAO	21	55 N	113	15 E	2.53
CUA DAY	19	58 N	106	06 E	4.24	GAU TAU	22	28 N	114	25.5 E	2.3
CUA LO PIER	18	49 N	105	42 E	4.18	GAVEN REEFS	10	12 N	114	13 E	1.25
CUA MO	21	13 N	107	37 E	4.53	GEMINI POINT	22	21 N	114	04 E	2.24
CUA NHUONG	18	16 N	106	08 E	4.15	GOPAI POINT	20	29 N	110	32 E	3.26
CUA THAI BINH	20	36 N	106	38 E	4.24	GRAND BANC	12	17 N	109	18 E	5.27
CUA THUAN AN	16	34 N	107	38 E	5.9	GRAND PALACE	13	45 N	100	30 E	6.44
CUARTERON REEF	8	54 N	112	52 E	1.41	GRANDE CATWICK	10	03 N	108	54 E	5.4
						GRANDE NORWAY	20	37 N	107	10 E	4.26
						GREEN ISLAND	22	17 N	114	07 E	2.18
D						GUANGZHOU	23	06 N	113	14 E	2.51
DA NANG	16	04 N	108	14 E	5.10	GUANTOU JIAO	21	27 N	109	02 E	4.3
DA NANG	16	09 N	108	12 E	5.10	GUANYIN JIAO	19	35 N	109	00 E	3.53
DACHAN WAN	22	33 N	113	53 E	2.43	GUISHAN DAO	22	08 N	113	49 E	2.33
DAFANGJI DAO	21	23 N	111	11 E	3.10						
DAHAOZHOU SHUIDAO	23	05 N	113	28 E	2.45						
DAHENGQIN DAO	22	06 N	113	30 E	2.52						
DAHENGQIN DAO	22	06 N	113	33 E	2.36						
DAHU DAO	22	50 N	113	35 E	2.48						
DAHUA JIAO	18	47 N	110	33 E	3.42	HA MEI WAN	22	13 N	114	06 E	2.17
DAHUO	21	39 N	112	07 E	3.6	HA TIEN	10	23 N	104	29 E	6.12
DAJIN	21	52 N	113	02 E	2.53	HAI PHONG	20	52 N	106	41 E	4.28
DALLAS REEF	7	38 N	113	48 E	1.39	HAIKOU	20	02 N	110	17 E	3.36
DANGAN DAO	22	02 N	114	12 E	2.11	HAI-LING-SHAN CHIANG	21	45 N	111	39 E	3.7
DANGAN LIEDAO	22	01 N	114	12 E	2.11	HAILINGSHAN DAO	21	38 N	111	54 E	3.7
DAO CAI BAU	21	31 N	107	37 E	4.60	HAILINGSHAN GANG	21	45 N	111	39 E	3.7
DAO CAT BA	20	48 N	107	02 E	4.30	HAI-LING-SHAN TAO	21	38 N	111	54 E	3.7
DAO CHING LAN XAN	21	01 N	107	50 E	4.54	HALF MOON SHOAL	8	52 N	116	16 E	1.30
DAO LAI TAO	20	43 N	107	28 E	4.30,	HANOI	21	02 N	105	50 E	4.23
					4.41,	HAO CHOU	22	09 N	113	24 E	2.55
					4.54	HAU HOI WAN	22	28 N	113	57 E	2.43
DAO LO CHUC SAN	21	14 N	107	58 E	4.61	HAVEN ANCHORAGE	18	14 N	109	26 E	3.47
DAO PHU QUI	10	32 N	108	57 E	5.2	HEBAO DAO	21	52 N	113	10 E	2.68
DAO PHU QUI	10	33 N	108	56 E	5.1	HEI CHIAO	20	30 N	110	32 E	3.26
DAO PHU QUOC	10	15 N	104	00 E	6.10	HELEN SHOAL	19	12 N	113	52 E	1.6
DAO TAGNE	11	50 N	109	15 E	5.34	HENGGANG DAO	22	02 N	114	01 E	2.13
DAPENG JIAO	22	27 N	114	30 E	2.2	HENG-KANG CHOU	22	02 N	114	01 E	2.13
DAPENG WAN	22	32 N	114	23 E	2.2	HENG MEN DAO	22	34 N	113	35 E	2.42
DATOU ZHOU	22	06 N	113	42 E	2.35	HEUNG KONG TSAI	22	15 N	114	11 E	2.16
DAWANSHAN DAO	21	56 N	113	43 E	2.32	HIN ALHAMBRA	12	26 N	101	40 E	6.25
DAWO SHAN	22	05 N	113	33 E	2.35	HIN CHALAM	12	28 N	100	58 E	6.29
DAZHIZHU DAO	22	07 N	113	53 E	2.33	HIN RANG KWIAN	12	48 N	100	48 E	6.33
DAZHOU DOA	18	40 N	110	29 E	3.42	HOK TSUI	22	13 N	114	16 E	2.14
DENGLOU JIAO	20	13 N	109	55 E	4.3	HON DAT	13	41 N	109	16 E	5.20
DIDO BANK	16	49 N	112	53 E	1.15	HON DAU	20	40 N	106	49 E	4.2,
DIJIAO	21	29 N	109	04 E	4.6						4.25,
DISCOVERY GREAT REEF	10	01 N	113	52 E	1.26	HON DAU LIGHT	20	40.0 N	106	48.7 E	4.28
DISCOVERY REEF	16	14 N	111	40 E	1.17	HON DUNG	12	16 N	109	22 E	5.28
DISCOVERY SMALL REEF	10	01 N	114	01 E	1.26	HON DUOC	10	15 N	104	19 E	6.11
DONG NGAI	16	21 N	107	14 E	4.10	HON HANG TOI	20	49 N	107	20 E	4.44
DONGDAFAN SHI	21	27 N	112	22 E	3.6	HON HEO	10	11 N	104	32 E	6.6
DONGMAO ZHOU	18	11 N	109	41 E	3.44	HON HEO	12	24 N	109	17 E	5.28
DONGTOUSHAN DAO	21	06 N	110	24 E	3.16	HON KHOAI	8	26 N	104	50 E	5.61
DOUBLE HAVEN	22	32 N	114	18 E	2.4	HON LONG DOI	11	43 N	109	14 E	5.37
DOULONG CUN	20	56 N	110	38 E	3.21	HON MAO	12	44 N	109	20 E	5.26
DUNCAN ISLANDS	16	27 N	111	43 E	1.12	HON MAT	18	48 N	105	58 E	4.17
DUONG DONG	10	13 N	103	58 E	6.9	HON ME	19	22 N	105	56 E	4.20
						HON MUI	11	49 N	109	12 E	5.35
						HON NAM DU	9	41 N	104	21 E	6.7
						HON NE	19	55 N	106	01 E	4.21
E						HON NGHE	10	01 N	104	33 E	6.6
EAST LAMMA CHANNEL	22	14 N	114	08 E	2.20	HON NGOAI	12	00 N	109	20 E	5.31
EAST REEF	8	50 N	112	35 E	1.41	HON NIEU	18	48 N	105	46 E	4.17
ENLOA REEF	8	07 N	114	08 E	1.39	HON PANJANG	9	18 N	103	29 E	6.3
ENTREE PROFONDE	20	47 N	107	07 E	4.32	HON RAI	9	48 N	104	38 E	6.8
ERICA REEF	8	07 N	114	08 E	1.39	HON SON CHA	16	13 N	108	12 E	5.9
						HON TAY	9	49 N	104	03 E	6.8
						HON THO CHAU	9	18 N	103	29 E	6.3
						HON TRE	12	12 N	109	17 E	5.27
						HON TRE	9	57 N	104	50 E	6.6
F						HON TRUNG	11	49 N	109	12 E	5.35
FANGCHENG GANG	21	45 N	108	21 E	4.8	HON TRUNG	8	46 N	106	43 E	5.6
FEN-CHIEH CHOU	18	35 N	110	12 E	3.43	HON TRUNG LON	8	36 N	106	09 E	5.8
FENG-CH'UAN	23	24 N	111	31 E	2.66	HON YEN	13	23 N	109	17 E	5.22
FIERY CROSS REEF	9	35 N	112	54 E	1.41	HONAN-CHOU TSUI	23	06 N	113	14 E	2.49
FIRST THOMAS SHOAL	9	20 N	115	57 E	1.34	HONG KONG	22	18 N	114	10 E	2.23
FOUR FEET ROCK	22	09 N	113	46 E	2.36	HONG KONG ISLAND	22	16 N	114	12 E	2.14

	Position				Sec. Para		Position				Sec. Para
	°	'	°	'			°	'	°	'	
HONGKAN POINT	20	19 N	110	24 E	3.30	KAMPOT	10	36 N	104	11 E	6.13
HOPKINS REEF	10	49 N	116	05 E	1.28	KAOH KAONG KANG	10	36 N	103	25 E	6.16
HSIA-CH'UAN SHAN	21	40 N	112	36 E	3.4	KAOH KONG	11	20 N	103	00 E	6.20
HSIAO-TAO CHIAO	20	14 N	110	07 E	3.31	KAOH MUL	11	26 N	103	00 E	6.20
HSIEH-YANG TAO	20	54 N	109	13 E	4.5	KAOH POAH	10	37 N	103	29 E	6.15
HSI-FANG TUI	20	17 N	110	40 E	3.28	KAOH RUNG SAMLOEM	10	35 N	103	18 E	6.16
HSI-TAN TAO	21	58 N	114	08 E	2.11	KAO-YAO	23	01 N	112	28 E	2.63
HU LANG	20	44 N	107	12 E	4.42	KAU YI CHAU	22	17 N	114	04 E	2.22
HUANGPU	23	05 N	113	25 E	2.49	KEMAMAN HARBOR	4	15 N	03	27 E	6.85
HUANGPUXINGANG	23	03 N	113	30 E	2.46	KEP SIANG	22	29 N	113	14 E	2.57
HUE	16	29 N	107	35 E	5.9	KERTIH OIL TERMINAL	4	34 N	103	28 E	6.81
HUIPENG JIAO	22	30 N	113	50 E	2.43	KHANOM	9	14 N	99	52 E	6.61
HUIZHOU OIL TERMINAL	21	21 N	115	25 E	1.4	KHAO HUA MAEW	11	55 N	102	47 E	6.20
HUMEN SHUIDAO	22	46 N	113	38 E	2.44	KHAO KALOK	12	20 N	100	00 E	6.47
HUNG SHAN	21	04 N	110	32 E	3.14	KHAO KHLONG WAN	11	45 N	99	48 E	6.48
HU-TIEH LING	21	33 N	108	26 E	4.7	KHAO KHUNG KRABEN	12	34 N	101	53 E	6.25
						KHAO MONG LAI	11	50 N	99	50 E	6.47
						KHAO TA MONG RAI	11	50 N	99	50 E	6.47
I						KHLONG LANG SUAN	9	57 N	99	10 E	6.54
ILE AUX BRUYERES	21	09 N	107	35 E	4.53	KHLONG PHRA KHANONG	13	42 N	100	35 E	6.44
ILE DAO TRAO	20	52 N	107	22 E	4.45	KO CHANG	12	03 N	102	21 E	6.22
ILE DE KE-BAO	21	31 N	107	37 E	4.60	KO CHUAK	9	28 N	99	41 E	6.62
ILE DE L'ENTREE	20	50 N	107	19 E	4.38	KO CHUANG	12	31 N	100	58 E	6.29
ILE DE LA PAIX	20	45 N	107	07 E	4.32	KO KHO THIAN	10	25 N	99	19 E	6.52
ILE DE LA PLAGE	21	14 N	107	38 E	4.53	KO KHRAM YAI	12	42 N	100	47 E	6.33
ILE DE LA SURPRISE	20	51 N	107	06 E	4.35	KO KRA	8	24 N	100	45 E	6.65
ILE DES PIRATES	21	13 N	107	35 E	4.62	KO LOSIN	7	19 N	101	56 E	6.68
ILE DES SINGES	20	53 N	107	10 E	4.40	KO MAN NOK	12	34 N	101	42 E	6.25
ILE DOUBLE	20	49 N	107	20 E	4.44	KO NGAM YAI	10	30 N	99	26 E	6.51
ILE DU CHENAL	20	56 N	107	17 E	4.46	KO NU	7	14 N	100	36 E	6.66
ILE DU COUDE	21	03 N	107	28 E	4.50	KO PHANGAN	9	45 N	100	02 E	6.59
ILE DU GRAND SINGE	21	17 N	107	41 E	4.53	KO SI CHANG HARBOR	13	10 N	100	49 E	6.41
ILE DU MARQUIS	21	05 N	107	30 E	4.53	KO TAO	10	06 N	99	51 E	6.58
ILE DU MILIEU	20	55 N	107	16 E	4.46	KO TUNG KU	9	48 N	99	43 E	6.57,
ILE DU SUD	20	47 N	107	20 E	4.41						6.62
ILE LO CHUC SAN	21	14 N	107	58 E	4.61	KOH KONG	11	20 N	103	00 E	6.20
ILE MADELINE	21	06 N	107	34 E	4.57	KOH KONG KANG	10	36 N	103	25 E	6.16
ILE NOIRE	21	05 N	107	35 E	4.56	KOH POS	10	37 N	103	29 E	6.15
ILE OUEST	10	09 N	104	24 E	6.12	KOH YOR	11	35 N	102	56 E	6.20
ILE SALACCO	20	50 N	107	08 E	4.34	KRUNG THEP	13	45 N	100	30 E	6.44
ILE TAMASSOU	9	48 N	104	38 E	6.8	KUAI CHIN MUN	21	15 N	107	42 E	4.62
ILE TCHING LAN XAN	21	01 N	107	50 E	4.54	KUALA BESAR	6	13 N	102	13 E	6.69
ILE TORTUE	14	22 N	109	12 E	5.17	KUALA TREGGANU	5	21 N	103	08 E	6.77
ILES CATWICK	10	00 N	108	59 E	5.4	KUANTAN NEW PORT	3	58 N	03	26 E	6.87
ILES D'AN THOI	9	57 N	104	02 E	6.8	KUANTAN NEW PORT	3	58 N	103	26 E	6.87
ILES DE POULO DAMA	9	41 N	104	22 E	6.7	KUAN-TOU CHIAO	21	27 N	109	02 E	4.3
ILES TSIN SAN	21	17 N	107	47 E	4.62	KUAN-TS'AI LING	18	49 N	110	34 E	3.42
ILHA DE COLOANE	22	08 N	113	34 E	2.36	KWAI SHEK	22	21 N	114	03 E	2.28
ILHA DE TAIPA	22	10 N	113	33 E	2.36	KWO CHAU KWAN TO	22	16 N	114	21 E	2.7
ILOT CONE	11	26 N	103	00 E	6.20						
ILOT DA TAI	11	43 N	109	14 E	5.37						
ILOT VEER	10	14 N	102	53 E	6.5						
ILOTS M	20	42 N	107	05 E	4.32	L					
ILTIS BANK	16	46 N	112	13 E	1.10	L'AIGLE	20	58 N	106	59 E	4.40
INVESTIGATOR NORTHEAST SHOAL	9	10 N	116	25 E	1.31	L'AMANDE	20	57 N	107	20 E	4.52
INVESTIGATOR SHOAL	8	10 N	114	40 E	1.38	L'ECHELLE	20	49 N	107	09 E	4.33,
IRVING REEF	10	52 N	114	55 E	1.27						4.39
ISLET POINT	20	14 N	110	07 E	3.31	L'ENCLUME	20	59 N	107	26 E	4.49
ITU ABA ISLAND	10	23 N	114	22 E	1.26	L'ENCHRIER	20	51 N	107	19 E	4.44
						L'ESCARGOT	20	53 N	107	15 E	4.42
J						L'INDEX	20	52 N	107	07 E	4.34
JACKSON ATOLL	10	30 N	115	45 E	1.27	L'ISOLE	21	00 N	107	27 E	4.50
JIAOWEI JIAO	20	13 N	109	55 E	3.31,	L'ORANGE	20	44 N	107	11 E	4.33
					4.0, 4.3	LA CLOCHETTE	20	53 N	107	08 E	4.38,
JIAOWEI JIAO LIGHT	20	13 N	109	55 E	3.27						4.40
JIAPENG LIEDAO	21	52 N	114	00 E	2.11	LA GOURDE	21	02 N	107	34 E	4.56,
JINMU JIAO	18	10 N	109	33 E	3.44						4.57
JINSUO PAI	22	47.5 N	113	36.2 E	2.44	LA MEDUSE	20	51 N	107	17 E	4.43
JOHNSON REEF	9	42 N	114	17 E	1.34	LA MERE	20	48 N	107	15 E	4.42
JOSS HOUSE BAY	22	16 N	114	17 E	2.18	LA QUILLE	20	41 N	107	03 E	4.27
JUNK BAY	22	17 N	114	16 E	2.18	LA SOURIS	21	00 N	107	28 E	4.50
JUNK FLEET ENTRANCE	22	24 N	113	41 E	2.42	LACH HUYEN	20	46 N	106	55 E	4.22
JUNK ROCK	23	02 N	113	24 E	2.50	LACH HUYEN	20	48 N	106	55 E	4.29
						LAEM CHABANG	13	05 N	100	53 E	6.39
K						LAEM CHAO	12	36 N	100	57 E	6.30
KAAM SAMNA KRAOM	10	56 N	105	11 E	5.55	LAEM KHAO PHRA	6	51 N	101	33 E	6.68
KAHO PHO BAI	13	07 N	100	54 E	6.42	LAEM KHO PHRA	9	13 N	99	53 E	6.59,
											6.60
						LAEM KHO KWANG	10	31 N	99	16 E	6.50
						LAEM KRABANG	13	05 N	100	53 E	6.37,
											6.39
						LAEM LING	12	10 N	102	17 E	6.21

	Position				Sec. Para		Position				Sec. Para
	°	'	°	'			°	'	°	'	
LAEM LING	12	12 N	102	17 E	6.24	LUHUITOU-LING	18	10 N	109	34 E	3.46
LAEM MAE RAMPHUNG	11	11 N	99	34 E	6.49	LUKPO	23	08 N	112	28 E	2.64
LAEM NAM	12	03 N	102	35 E	6.20	LU-PU-HSU	23	08 N	112	28 E	2.64
LAEM PATTHAYA	12	55 N	100	51 E	6.38						
LAEM PHAK BIA	13	02 N	100	06 E	6.46						
LAEM PHATTHAYA	12	55 N	100	51 E	6.36, 6.38						
LAEM PHLAI DAM	9	05 N	99	55 E	6.64	MA CHAO	21	09 N	107	51 E	4.54
LAEM PU CHAO	12	39 N	100	51 E	6.32, 6.35	MACAU FORT	23	04 N	113	15 E	2.51
LAEM RET	9	25 N	100	01 E	6.59	MACAU HARBOR	22	11 N	113	34 E	2.37
LAEM SAI	7	14 N	100	35 E	6.66	MACCLESFIELD BANK	15	45 N	114	20 E	1.18
LAEM SAMAE SAN	12	36 N	100	58 E	6.29	MAE NAM	9	57 N	99	10 E	6.54
LAEM SAMUK	13	19 N	100	54 E	6.43	MAE NAM CHAO PHRAYA	13	32 N	100	36 E	6.44
LAEM SING	12	28 N	102	04 E	6.24	MAE NAM RAYONG	12	39 N	101	17 E	6.28
LAEM SOK	12	03 N	102	35 E	6.20	MAGPIE ROCK	20	08 N	110	42 E	3.32
LAEM TA CHI	6	56 N	101	15 E	6.67	MA-LIU T'OU	18	40 N	110	25 E	3.42
LAEM TALUMPHUK	8	31 N	100	08 E	6.64	MALOW T'OU	18	40 N	110	25 E	3.42
LAEM THONG LANG	12	37 N	100	55 E	6.31	MALU	20	35 N	110	28 E	3.26
LAEM THUAT	9	20 N	99	41 E	6.57, 6.62	MANG ZHOU	21	40 N	112	27 E	3.5
LAEM YA	12	35 N	101	25 E	6.26	MARIVELES REEF	8	00 N	113	56 E	1.39
LAMMA ISLAND	22	12 N	114	08 E	2.17	MENZIES REEF	11	09 N	114	48 E	1.27
LAMMA PATCH	22	15 N	114	07 E	2.20	MERSING	2	26 N	103	51 E	6.95
LAN KOK TSUI	22	25 N	113	54 E	2.43	MIAO-WAN	21	56 N	114	01 E	2.12
LAN SHUI TERMINAL	20	50 N	115	41 E	1.5	MIAOWAN DAO	21	56 N	114	01 E	2.12
LANG-YEH CHIAO	18	12 N	109	42 E	3.43	MIRS BAY	22	32 N	114	23 E	2.2
LANKIT ISLAND.	22	42 N	113	38 E	2.42	MISCHIEF REEF	9	55 N	115	32 E	1.33
LANTAU CHANNEL	22	08 N	113	54 E	2.8	MONEY ISLAND	16	27 N	111	30 E	1.14
LANTAU ISLAND	22	16 N	113	57 E	2.25	MORGAN POINT	22	06 N	113	28 E	2.55
LAO DUA	13	10 N	109	20 E	5.23	MUI AN HOA	15	31 N	108	41 E	5.13
LE CANCRELAT	20	50 N	107	18 E	4.43, 4.47	MUI BA KIEM	10	30 N	107	31 E	5.45
LE CHIEN	20	50 N	107	20 E	4.45	MUI BA LANG AN	15	14 N	108	57 E	5.15
LE COLOSSE	21	01 N	107	27 E	4.52, 4.53	MUI BAI BUNG	8	36 N	104	43 E	5.1
LE DOME	20	57 N	107	14 E	4.40	MUI BAI BUNG	8	37 N	104	43 E	5.60, 6.2
LE DOME	21	00 N	107	26 E	4.52	MUI BAN THANG	12	24 N	109	21 E	5.25
LE DONJON	21	07 N	107	32 E	4.53	MUI BANG	19	26 N	105	49 E	4.20
LE GRANDE ILE	21	04 N	107	30 E	4.51	MUI BATANGAN	15	14 N	108	57 E	5.15
LE LAPIN	20	54 N	107	10 E	4.40	MUI CAM LINH	11	53 N	109	17 E	5.34
LE PETIT BANC	21	12 N	107	45 E	4.62	MUI CHAO	19	43 N	105	54 E	4.21
LE ROC AUX AIGLES	20	57 N	107	26 E	4.49	MUI CHON MAY DONG	16	21 N	108	02 E	5.9
LE SPECTRE	20	57 N	107	15 E	4.40	MUI CHUT	12	13 N	109	13 E	5.30
LE TRAPEZE	13	15 N	109	19 E	5.23	MUI DA NANG	16	07 N	108	21 E	5.10
LE TURCO	20	48 N	107	16 E	4.43	MUI DAI TRAI	10	22 N	103	50 E	6.9
LE VAUTOUR	20	58 N	107	19 E	4.46	MUI DAT VIAN KA	15	25 N	108	48 E	5.14
LEI YU MUN	22	17 N	114	14 E	2.19	MUI DEN DO	10	44 N	106	46 E	5.52
LEI YUE MUN	22	17.1 N	114	14.3 E	2.8	MUI DIEU	12	54 N	109	28 E	5.23
LEMA CHANNEL	22	06 N	114	14 E	2.8	MUI DINH	11	22 N	109	01 E	5.1, 5.39
LES OURS	20	59 N	107	21 E	4.47	MUI DONG BA	12	08 N	109	14 E	5.30
LEUNG SHUEN WAN HOI	22	20 N	114	19 E	2.5	MUI DONG BA	12	09 N	109	14 E	5.33
LIANHUASHAN SHUIDAO	22	58 N	113	32 E	2.45, 2.47	MUI DONG TRANH	10	20 N	106	53 E	5.49
LIEN CHIEN	16	08 N	108	08 E	5.10	MUI FALAISE	19	06 N	106	44 E	4.19
LIGHTENING ANCHORAGE	18	14 N	109	27 E	3.47	MUI GA	18	51 N	105	43 E	4.16
LIN-CH'ANG SHIH	19	41 N	109	06 E	3.53	MUI GANH	12	34 N	109	26 E	5.24
LINCOLN ISLAND	16	40 N	112	44 E	1.15	MUI GANH RAI	10	25 N	106	59 E	5.51
LINGAO JIAO	20	01 N	109	43 E	3.29, 3.38	MUI GANH TUONG	13	24 N	109	16 E	5.22
LINGAO JIAO LIGHT	20	00 N	109	42 E	3.27	MUI HANH	10	01 N	104	01 E	6.8
LINGDING SHUIDAO	22	25 N	113	45 E	2.44	MUI HON CHONG	10	08 N	104	39 E	6.6
LINGSHI JIAO	18	23 N	110	03 E	3.43	MUI KE GA	10	42 N	108	00 E	5.42
LING-SHUI CHIAO	18	23 N	110	03 E	3.43	MUI KE GA	12	54 N	109	28 E	5.23
LIN-KAO CHIAO	20	01 N	109	43 E	3.29, 3.38	MUI KE GA	13	34 N	109	18 E	5.21
LIN-KAO CHIAO LIGHT	20	00 N	109	42 E	3.27	MUI KHE GA	12	18 N	109	15 E	5.29
LIUHUA FIELD	20	50.1 N	115	41.8 E	1.5	MUI KY VAN	10	23 N	107	16 E	5.46
LIVOCK REEF	10	11 N	115	17 E	1.27	MUI LANG	13	20 N	109	18 E	5.23
LO AH CHAU	23	10 N	112	50 E	2.61	MUI LAY	17	05 N	107	07 E	4.0, 4.10, 5.0, 5.9
LO CHAO	22	19 N	113	17 E	2.56	MUI LUOI CAY	13	24 N	109	18 E	5.21
LO SA TAU POINT	22	46 N	113	05 E	2.59	MUI MONG	12	30 N	109	19 E	5.25
LOAITA ISLAND	10	41 N	114	25 E	1.24	MUI MU U	13	26 N	109	15 E	5.22
LONG HARBOR	22	27 N	114	21 E	2.3	MUI NAM TRAM	15	21 N	108	52 E	5.15
LONGSHUI LING	21	02 N	110	31 E	3.13	MUI NE	10	55 N	108	18 E	5.41
LONGXUE DAO	22	42 N	113	38 E	2.42	MUI ONG	17	56 N	106	31 E	4.13
LO-P'ANG	23	10 N	111	37 E	2.65	MUI RON	18	07 N	106	26 E	4.14
LORD AUCKLAND SHOAL	10	20 N	117	19 E	1.29	MUI VIAN KA	15	25 N	108	48 E	5.14
LO-T'O SHA	20	22 N	110	35 E	3.28	MUI VUNG TAU	10	19 N	107	05 E	5.1, 5.47
LU PONG	23	10 N	111	37 E	2.65	MULAN TAU	20	10 N	110	41 E	3.33
LU-HUI-T'OU CHIAO	18	11 N	109	28 E	3.46	MULAN TAU LIGHT	20	09 N	110	41 E	3.27
LUHUITOU JIAO	18	11 N	109	28 E	3.46	MY KHE	16	04 N	108	15 E	5.10
						MY THO	10	21 N	106	22 E	5.55

	Position			Sec. Para		Position			Sec. Para
N									
NAMYIT ISLAND	10	11 N	114 22 E	1.25	PING-MA CHIAO	19	55 N	109 18 E	3.39
NANCY DAO	22	00 N	113 13 E	2.70	PO LO TSUI	22	13 N	114 06 E	2.17
NANG NUANG OILFIELD	10	07 N	99 26 E	6.53	PO TOI GROUP	22	11 N	114 16 E	2.9
NANSHAN ISLAND	10	44 N	115 49 E	1.28	PO TOI ISLAND	22	10 N	114 16 E	2.10
NAN-TA-YA TAO	19	53 N	111 12 E	3.40	POINTE DA NHAI	17	40 N	106 30 E	4.12
NAO CHAO	20	54 N	110 35 E	3.13	POINTE DE CAM RANH	11	53 N	109 17 E	5.34
NAOZHOU DAO	20	54 N	110 35 E	3.13	POINTE DU FEU ROUGE	10	44 N	106 46 E	5.52
NARATHIWAT	6	26 N	101 50 E	6.68	POINTE DU LOMBARD	10	36 N	106 52 E	5.50, 5.51
NAU-FANG TUI	20	12 N	110 52 E	3.28	POINTE DU MIRADOR	10	16 N	106 45 E	5.56
NEILINGDING DAO	22	25 N	113 48 E	2.40	POINTE HON KHOI	12	35 N	109 15 E	5.26
NENASI	3	08 N	103 27 E	6.91	POINTE ISABELLE	16	10 N	108 09 E	5.10
NGAN CHAU	22	13 N	114 11 E	2.15	POINTE KEP	10	29 N	104 18 E	6.13
NGAU MEI HOI	22	20 N	114 17 E	2.6	POINTE KOH KUSSAT	11	05 N	103 06 E	6.19
NGHE TINH	18	39 N	105 42 E	4.18	POINTE LAGAN	11	10 N	108 43 E	5.40
NGHIEM KINH CHIEU	13	53 N	109 19 E	5.18	POINTE PHAMI	10	40 N	106 47 E	5.51
NGONG SHUEN CHAU	22	19 N	114 08 E	2.18	POINTE SAMIT	10	52 N	103 07 E	6.3, 6.19
NHA BE	10	41 N	106 47 E	5.52	POINTE VINAY	10	55 N	108 18 E	5.41
NHA TRANG	12	15 N	109 14 E	5.32	POK LIU CHAU	22	12 N	114 08 E	2.17
NIHTIEP	20	51.3 N	106 46.0 E	4.28	POM PHRA CHULACHOMKLAO	13	32 N	100 35 E	6.44
NINEPIN ISLANDS	22	16 N	114 21 E	2.7	PORT REDON	20	59 N	106 46 E	4.29
NIU-CHI CHOU	18	19 N	109 45 E	3.43	PORT WALLUT	21	12 N	107 34 E	4.63
NIUTOU DAO	22	10 N	113 48 E	2.34	POULOU CICI	10	12 N	104 15 E	6.11
NIZHAU SHUIDAO	22	54 N	113 34 E	2.45	POULOU SAPATE	9	58 N	109 05 E	5.4
NIZHOU SHUIDAO	22	54 N	113 34 E	1.	POULOU SEPATE	9	58 N	109 05 E	5.4
NORTH DANGER REEF	11	25 N	114 21 E	1.21	PRACHUAP KHIRI KHAN	11	48 N	99 48 E	6.48
NORTH EAST CAY	11	27 N	114 21 E	1.21	PRATAS ISLAND	20	42 N	116 43 E	1.3
NORTH ISLAND	16	58 N	112 18 E	1.9	PRINCE CONSORT BANK	7	55 N	109 58 E	1.48
NORTH POINT	22	17 N	114 11 E	2.23	PRINCE OF WALES BANK	8	09 N	110 30 E	1.48
NORTH REEF	17	06 N	111 30 E	1.8	PULAU ACHEH	2	40 N	103 46 E	6.93
NORTH WEST INVESTIGATOR REEF	9	35 N	112 54 E	1.41	PULAU AUR	2	27 N	104 31 E	6.100
NUI CHUA	10	22 N	104 03 E	6.9	PULAU BERHALA	3	15 N	103 39 E	6.91
NUI DEN	13	51 N	109 17 E	5.18	PULAU KABAN	2	40 N	103 46 E	6.93
NUI-PI CHIAO	20	29 N	110 32 E	3.26	PULAU LOZIN	7	19 N	101 56 E	6.68
NUOC NGOT	14	08 N	109 13 E	5.18	PULAU PEMANGGIL	2	35 N	104 20 E	6.100
O									
OLD PORT	3	48 N	103 20 E	6.87	PULAU PERHENTIAN KECHIL	5	55 N	102 43 E	6.74
ONE FOOT ROCK	22	15 N	114 22 E	2.7	PULAU REDANG	5	47 N	103 01 E	6.75
OUTER BANK	18	37 N	108 23 E	3.49	PULAU SEMBILANG	2	42 N	103 53 E	6.96
O-YEN SHIH	21	56 N	114 03 E	2.11	PULAU SYED HASAN	3	31 N	103 29 E	6.90
P									
P'AI-WEI CHIAO	20	14 N	110 17 E	3.30	PULAU SYED HASSAN	3	31 N	103 29 E	6.90
P'ING CHOU	21	36 N	112 39 E	3.5	PULAU TENGGOLO	4	48 N	103 41 E	6.79
PAI YEN	21	41 N	112 42 E	3.3	PULAU TINGGI	2	18 N	104 07 E	6.102
PAI-SHA CHIAO	20	05 N	110 18 E	3.34	PULAU TIOMAN	2	47 N	104 10 E	6.98
PAIWEI JIAO	20	14 N	110 17 E	3.30	PULAU TOKONG BAHARA	2	40 N	104 04 E	6.99
PAIWEI JIAO LIGHT	20	15 N	110 17 E	3.27	PULAU YU	2	07 N	104 15 E	6.103
PAK HA MUN	20	58 N	107 34 E	4.31, 4.55	PULAU YU KECHIL	5	38 N	103 10 E	6.76
PAK KOK	22	17 N	114 11 E	2.23	PUQIAN JIAO	20	06 N	110 34 E	3.34
PAK TANK	22	09 N	113 24 E	2.55	PYRAMID ROCK	16	35 N	112 39 E	1.16
PARACEL ISLANDS	16	40 N	112 20 E	1.7	Q				
PASSE DU CASQUE	20	52 N	107 18 E	4.38	QI'AO DAO	22	25 N	113 38 E	2.41
PASSE HENRIETTE	20	48 N	107 09 E	4.33	QING ZHOU	21	29 N	111 28 E	3.8
PASSU KEAH	16	03 N	111 46 E	1.17	QIZHOU LEIDAO	19	56 N	111 13 E	3.40
PATTHAYA	12	55 N	100 51 E	6.36	QUAN DAO NAM DU	9	41 N	104 22 E	6.7
PATTLE ISLAND	16	32 N	111 36 E	1.13	QUANG YEN	20	56 N	106 48 E	4.29
PEARSON REEF	8	59 N	113 42 E	1.37	R				
PEI SHIH	19	59 N	111 16 E	3.40	RACH DON	10	34 N	106 50 E	5.51
PEI-CHIEN TAO	21	53 N	114 02 E	2.11	RACH GIA	10	01 N	105 05 E	6.6
PEI-FANG TUI	20	19 N	110 54 E	3.28	RADE DU CRAPAUD	20	49 N	107 07 E	4.32
PEI-HAI ANCHORAGE	21	29 N	109 04 E	4.6	RAO CO	18	10 N	105 25 E	4.15
PEI-KOU-KENG CHIAO	20	51 N	110 20 E	3.25	RATTLER ISLAND	23	10 N	112 50 E	2.61
PEI-LI CHIANG	19	10 N	108 35 E	3.50	RAU NHAT LE	17	29 N	106 38 E	4.11
PEI-TA-YA TAO	19	59 N	111 16 E	3.40	RAYONG	12	38 N	101 19 E	6.28
PENG CHAU	22	17 N	114 02 E	2.22	REAM	10	30 N	103 36 E	6.14
PETERSON POINT	20	26 N	110 31 E	3.30	RED CLIFF HEAD	22	05 N	113 24 E	2.52
PHNOM PENH	11	36 N	104 54 E	5.55, 5.57	REPULSE BAY	22	14 N	114 11 E	2.15
PHSAR REAM	10	30 N	103 36 E	6.14	ROCHER BLANC	8	46 N	106 43 E	5.6
PIGEON REEF	8	52 N	114 38 E	1.37	ROCHER ROSITA	10	17 N	104 21 E	6.13
PILOT ANCHORAGE	18	11 N	109 26 E	3.47	ROCKY HARBOR	22	20 N	114 20 E	2.23
PING-LO T'OU	21	14 N	110 24 E	3.22	ROCKY POINT	23	00 N	112 51 E	2.60
PING-MA CHIAO	19	55 N	109 17 E	3.29	RON NHAT LE	17	29 N	106 38 E	4.11
					ROUND ISLAND	22	13 N	114 11 E	2.15
					ROUND ISLET	18	46 N	110 30 E	3.42
					ROYAL CAPTAIN SHOAL	9	01 N	116 40 E	1.31
					ROYAL CHARLOTTE REEF	6	57 N	113 35 E	1.45

	Position			Sec. Para		Position			Sec. Para
S									
SABAK	6	11 N	102 19 E	6.72	TAI PANG WAN	22	32 N	114 23 E	2.2
SABINA SHOAL	9	43 N	116 36 E	1.31	TAI TAM BAY	22	14 N	114 14 E	2.15
SADEC	10	18 N	105 45 E	5.55	TAI TAN HOI HAP	22	27 N	114 21 E	2.3
SAI GON	10	46 N	106 43 E	5.54	TAI YUE SHAN	22	16 N	113 57 E	2.25
SAI POK LIU HOI HAP	22	11 N	114 03 E	2.21	TAITAMI CHANNEL	21	57 N	114 06 E	2.11
SAIGON	10	46 N	106 43 E	5.54	TAM KONG CHAU	22	49 N	113 02 E	2.59
SAINT ESPRIT SHOAL	19	33 N	113 03 E	1.6	TAN CHAU	10	48 N	105 15 E	5.55
SAM PUI TSAO	20	39 N	107 09 E	4.43	TANJUNG CHENERING	5	16 N	103 11 E	6.78
SANBAN ZHOU	22	43 N	113 39 E	2.39	TANJUNG DUNGUN	4	47 N	103 26 E	6.80
SANDY SHOAL	11	02 N	117 38 E	1.29	TANJUNG GELANG	3	58 N	103 27 E	6.85
SAN-HSIA KOU	21	47 N	112 52 E	3.5	TANJUNG MERANG	5	32 N	102 57 E	6.73
SAN-MEN	22	03 N	113 59 E	2.13	TANJUNG PENAWAR	1	31 N	104 17 E	6.0,
SANMEN DAO	22	03 N	113 59 E	2.13					6.105
SAN-SHUI	23	11 N	112 50 E	2.62	TANJUNG PENUNJUK	4	20 N	103 30 E	6.82
SANSHUI	23	11 N	112 50 E	2.51	TANJUNG PENYABONG	2	39 N	103 45 E	6.92
SAN-SHUI REACH	23	10 N	112 50 E	2.60	TANJUNG SEDILI BESAR	1	55 N	104 08 E	6.103
SANYA	18	14 N	109 30 E	3.47	TANJUNG SEKAKAP	2	21 N	103 56 E	6.101
SANZAO DAO	22	02 N	113 21 E	2.52	TANJUNG TEMBELING	3	48 N	103 23 E	6.85
SCARBOROUGH REEF	15	08 N	117 45 E	1.19	TAN-KAN LIEH-TAO	22	01 N	114 12 E	2.11
SCARBOROUGH SHOAL	15	08 N	117 45 E	1.19	TAN-KAN TAO	22	02 N	114 12 E	2.11
SCAWFELL SHOAL	7	18 N	106 52 E	1.49	TAP SHEK KOK	22	23 N	113 55 E	2.30
SEAHORSE SHOAL	10	50 N	117 47 E	1.29	TAPIS MARINE TERMINAL A	4	31 N	105 01 E	6.88
SECOND BAR PAGODA	23	00 N	113 30 E	2.48	TCHE LI PAI	20	41 N	107 21 E	4.43
SECOND THOMAS SHOAL	9	49 N	115 52 E	1.32	TECHING DAO	21	09 N	110 25 E	3.16
SHA CHAU	22	21 N	113 53 E	2.29	TENNENT REEF	8	52 N	114 38 E	1.37
SHA TIN HOI	22	26 N	114 13 E	2.4	THAN PHO HO CHI MIN	10	46 N	106 43 E	5.54
SHAI WEI	21	09.5 N	110 25.0 E	3.21	THANH HI	14	01 N	109 15 E	5.18
SHANBAN ZHOU	22	43 N	113 39 E	2.42	THATHONG	9	11 N	99 22 E	6.56
SHANGCHUANG DAO	21	41 N	112 48 E	3.2	THE STRAGGLERS	22	00 N	113 24 E	2.52
SHANGOUHOU	20	26 N	110 31 E	3.30	THITU ISLAND	11	03 N	114 17 E	1.23
SHEK KWU CHAU	22	12 N	113 59 E	2.21	THON NINH CHU	11	35 N	109 02 E	5.38
SHEN-CHIEN CHIAO	19	47 N	109 09 E	3.54	THUNG PRONG	12	42 N	100 50 E	6.36
SHEONG MA KOK	22	16 N	113 21 E	2.56	TIDE COVE	22	26 N	114 13 E	2.4
SHEUNG SZ MUN	22	12 N	114 15 E	2.19	TIEH-SHAN CHIANG	21	35 N	109 35 E	4.3
SHIH-MEN	21	24 N	110 22 E	3.22	TITAO TSUI	22	05 N	113 24 E	2.52
SHIH-WAN	22	00 N	113 24 E	2.52	TOKONG YU	2	07 N	104 15 E	6.103
SHITOU JIAO	21	09 N	110 23 E	3.20	TONG KWA	21	51 N	112 54 E	2.53,
SHIUHING	23	01 N	112 28 E	2.63					3.2
SHUANG SHAN	21	33 N	111 41 E	3.8	TONGGU JIAO	22	23 N	113 37 E	2.39
SHUANG-FAN	19	53 N	111 12 E	3.40	TONGGU ZUI	19	38 N	111 02 E	3.41
SHUANGSHAN DAO	21	33 N	111 41 E	3.8	TOULU ZHOU	22	04 N	113 56 E	2.13
SHUIDONG	21	29 N	111 05 E	3.11	TREE ISLAND	16	59 N	112 16 E	1.8
SICHI YAN	22	09 N	113 46 E	2.36	TRIDENT SHOAL	11	28 N	114 40 E	1.22
SIN COWE ISLAND	9	52 N	114 19 E	1.35	TRITON ISLAND	15	47 N	111 12 E	1.17
SOKO ISLANDS	22	10 N	113 55 E	2.27	TRURO SHOAL	16	20 N	116 43 E	1.19
SONG BACH DANG	20	51 N	106 46 E	4.29	TS'ANG-WU	23	29 N	111 19 E	2.67
SONG CUA DAI	15	53 N	108 24 E	5.11	TSEUNG KWAN O	22	17 N	114 16 E	2.18
SONG GANH HAO	9	00 N	105 25 E	5.60	TSIENG MUN	21	08 N	107 38 E	4.58
SONGKHLA HARBOR	7	13 N	100 35 E	6.66	TSIN SHUI WAN	22	14 N	114 11 E	2.15
SOUTH REEF	11	23.3 N	114 17.9 E	1.22	TSING CHAU	22	17 N	114 07 E	2.18
SOUTH SAND	16	56 N	112 20 E	1.9	TU LING	18	45 N	108 50 E	3.45
SPRATLY ISLAND	8	38 N	111 55 E	1.43	TUMPAT	6	12 N	102 10 E	6.70
SRIRACHA	13	07 N	100 53 E	6.42	TUNG LUNG ISLAND	22	15 N	114 17 E	2.18
SSU-KENG-SHA CHIAO	19	13 N	108 37 E	3.52	TUNG POK LIU HOI HAP	22	14 N	114 08 E	2.20
STANLEY BAY	22	12 N	114 12 E	2.15	TUNG-FAN SHIH	21	27 N	112 22 E	3.6
STONECUTTERS ISLAND	22	19 N	114 08 E	2.18	TUNG-KU CHIAO	19	38 N	111 02 E	3.41
STORM ISLAND	8	38 N	111 55 E	1.43	TUNG-KU TSUI	19	38 N	111 02 E	3.41
SUBI REEF	10	54 N	114 06 E	1.23	TUNG-LO TAO	18	19 N	108 59 E	3.48
SUNGAI KELANTAN	6	13 N	102 14 E	6.1	TUNG-'TOU SHAN	21	06 N	110 24 E	3.16
SUNGAI KEMAMAN	4	14 N	103 27 E	6.82	TUNGTAFAN SHIH	21	28 N	112 23 E	3.1
SUNGAI KUANTAN	3	48 N	103 21 E	6.89	TUNG-YING CHIAO	21	12 N	110 25 E	3.23
SUNGEI KEMAMAN	4	14 N	103 27 E	6.82	TUWU CHIO	22	05 N	113 33 E	2.31
SUNGEI KUANTAN	3	48 N	103 21 E	6.89	TXAT XING CHAO	21	08 N	107 48 E	4.54
SUN-LIN LING	19	48 N	108 25 E	3.39					
T									
T'AN CHIANG	22	26 N	113 04 E	2.68	U				
T'AN WAN	21	44 N	112 08 E	3.5	UNION ATOLL				
TA-YA CH'UN-TAO	19	56 N	111 13 E	3.40	9	45 N	114	25 W	1.34
TA-CH'AN	19	41 N	109 06 E	3.53	V				
TA-CH'ING TAO	21	09 N	110 25 E	3.16	VAN DUOI				
TA-CHING CHIAO	22	06 N	113 28 E	2.55	20	55 N	107	20 E	4.49
TA-CHOU TAO	18	40 N	110 29 E	3.42	21	12 N	107	34 E	4.63
TA-CHU CHOU	21	26 N	111 22 E	3.9	21	00 N	116	00 E	1.5
TA-FANG-CHI TAO	21	23 N	111 11 E	3.10	22	18 N	114	26 E	2.7
TA-HUA CHIAO	18	47 N	110 33 E	3.42	22	18 N	114	10 E	2.23
TA-HUO	21	39 N	112 07 E	3.6	11	53 N	109	10 E	5.36
TAI MIU WAN	22	16 N	114 17 E	2.18	20	55 N	107	05 E	4.35
					10	15 N	105	58 E	5.55
					16	09 N	108	12 E	5.10
					11	35 N	109	02 E	5.38

	Position				Sec.		Position				Sec.
	°		°		Para		°		°		Para
VUNG QUI NHON	13	46 N	109	14 E	5.20						
VUNG RO	12	51 N	109	25 E	5.23						
VUNG XUAN DAI	13	23 N	109	17 E	5.22						
W											
WAGLAN ISLAND	22	11 N	114	16 E	2.9						
WAI SHA	21	29 N	109	05 E	4.6						
WAILINGDING DAO	22	06 N	114	02 E	2.13						
WAI-LING-TING	22	06 N	114	02 E	2.13						
WAMPOA	23	05 N	113	25 E	2.49						
WANG LAN ISLAND	22	11 N	114	16 E	2.9						
WAN-T'OU LING	21	02 N	109	07 E	4.4						
WEI-CHOU TAO	21	03 N	109	07 E	4.4						
WEI-T'SUI LING	21	02 N	110	31 E	3.13						
WEIZHOU DAO	21	03 N	109	07 E	4.4						
WEN-WEI CHOU	21	49 N	113	56 E	2.12						
WENWEI ZHOU	21	49 N	113	56 E	2.12						
WENWEI ZHOU LIGHTHOUSE	21	49 N	113	56 E	2.31						
WEST LAMMA CHANNEL	22	11 N	114	03 E	2.21						
WEST REEF	8	51 N	112	11 E	1.41						
WEST YORK ISLAND	11	05 N	115	00 E	1.27						
WESTERN REEF	10	16 N	113	37 E	1.26						
WHITE POINT	22	19.0 N	114	08.4 E	2.23						
WHITSUN REEF	9	58 N	114	39 E	1.35						
WOODY ISLAND	16	50 N	112	20 E	1.10						
WU CHOU	23	29 N	111	19 E	2.67						
WU-CH'I CHOU	18	19 N	109	45 E	3.43						
WU-LEI CHIAO	20	36 N	108	44 E	4.7						
WUZHU ZHOU	21	36 N	112	53 E	3.2						
						XIACHUAN DAO	21	40 N	112	36 E	3.4
						XIAOHU JIAO	22	50 N	113	34 E	2.47
						XIAOZHU ZHOU	21	26 N	111	22 E	3.9
						XIDAN DAO	21	58 N	114	08 E	2.11
						XIEYANG DAO	20	54 N	109	13 E	4.5
						XIJIANG TERMINAL	21	18 N	114	59 E	1.4
						XUAM HAI PIER	18	40 N	105	42 E	4.18
						Y					
						YA MEN WAN	22	20 N	113	04 E	2.68
						YA-LUNG CHIAO	18	12 N	109	42 E	3.43
						YANG-P'U WAN	19	42 N	109	06 E	3.53
						YANTIAN	22	35 N	114	16 E	2.4
						YI BLUFF	22	16 N	114	18 E	2.7
						YING-KO TSUI	18	30 N	108	41 E	3.48
						YUANGANGSHA ZUI	23	02 N	113	21 E	2.50
						YUBAO JIAO	19	59 N	109	53 E	3.38
						YU-CHI SHAN	22	12 N	113	27 E	2.56
						YUCHU	23	06 N	113	26 E	2.49
						YUEH-CH'ENG	23	04 N	112	E	2.64
						YU-LIN CHIANG	18	11 N	109	31 E	3.46
						YU-LIN CHIAO	19	06 N	108	36 E	3.49
						YU-LIN CHOU	19	06 N	108	36 E	3.49
						YUTSHING	23	04 N	112	E	2.64
						Z					
						ZERO BUOY	13	44 N	109	15 E	5.20
						ZHANJIANG	21	12 N	110	24 E	3.21

