

Neaps occur in the same interval before quarters with a very small rise.

The current, caused by the prevailing wind in the open part of Makasar Strait, seldom exceeds 1 knot. In the roadstead this current generally runs southward in the strength of the Northwest Monsoon, and northward in the Southeast Monsoon. When the Djene Berang is in flood there is a north-going current in the roadstead, while outside the reefs the current is setting southward.

DEPTHS—DANGERS

11A-15 All the reefs lying on the west side of the roadstead are surrounded by steep-to banks, extending a considerable distance from their west sides. In the month of July, when the mean water level is lowest, these reefs partly dry.

Pulau Laelae is an artificial island, which partly dries, prolonged by a breakwater. Pulau Laelae Tjadi is a bare sandflat, surrounded by a reef which only dries near its east end at the lowest tides. A breakwater is built over this surrounding reef.

A detached shoal with depths of $1\frac{1}{2}$ to 2 fathoms lies about 600 yards south-southeastward of Pulau Laelae Tjadi.

Gosong Boni is a small islet marked by some houses and some tall conspicuous trees which stand on its east side.

Between Gosong Boni and Pulau Laelae Tjadi there is a passage about 200 yards wide, with depths of 7 to 9 fathoms.

A 5-foot patch lies about 800 yards west-northwestward of Gosong Boni.

A dangerous wreck lies sunk about 900 yards and 660 yards west-southwestward of the south end of the breakwater on Pulau Laelae.

HARBOR

11A-16 The port lies between the mainland and the line of reefs about $\frac{1}{2}$ mile offshore. The berthing facilities are located on the mainland extending about $1\frac{1}{2}$ miles northward from Tandjung Pandan and will accommodate deep-

sea vessels at two of the quays. The areas surrounding Makasar are low and swampy and the RADIO MASTS eastward of Mariso provide a conspicuous landmark from seaward.

NAVIGATIONAL AIDS

11A-17 A light is shown at Mariso, southward of Makasar.

A light is shown on the lookout tower of the harbor office at the south end of Pangkalan Sukarno.

A light is shown on a warehouse on Pangkalan Sukarno.

A light beacon, with a red reflector, is located about $\frac{1}{4}$ mile southwestward of Gosong Boni and another light beacon, with a green reflector, is located about $\frac{1}{4}$ mile northwestward of Pulau Laelae Tjadi. These light beacons, marking either side of the channel into the harbor, are shown on request.

A red beacon surmounted by two red cylinders marks the 5-foot patch west-northwestward of Gosong Boni.

A green conical buoy is moored about 1-1/3 miles northeast of Gosong Boni.

A beacon with two black cones, points up, is located close eastward of Pulau Laelae Tjadi.

A beacon with a black ball topmark is located about 700 yards south-southwestward of the south end of the breakwater on Pulau Laelae.

A conical buoy, painted in black and white checkers with a black conical topmark, is moored about $\frac{1}{2}$ mile westward of Pulau Laelae Tjadi.

A light buoy marks the south side of the detached shoal lying south-southeastward of Pulau Laelae Tjadi.

Numerous mooring and warping buoys are moored off the quays and in the roadstead.

ANCHORAGE

11A-18 The anchorage between the town and the line of coral reefs westward is protected and the holding ground is good, in depths of 7 to 10 fathoms. Although in the western monsoon, it may blow hard and some sea sets in, it seldom happens that vessels discharging

at the wharves are compelled to leave their berths. Strong winds from seaward may raise a considerable sea in the anchorage. Vessels with high superstructures should always have a second anchor ready, and take all necessary precautions against dragging. If the harbor master considered it necessary, vessels must moor.

Anchorage about $\frac{1}{2}$ mile outside the breakwater is practically unlimited, in depths of about 9 fathoms, but is unprotected except from easterly winds.

CAUTION.—Makasar Anchorage Regulations state that merchant vessels awaiting pilotage for the inner harbor may anchor in the outer roads, but no passengers or cargo may be discharged or loaded while in the outer roads.

PILOTAGE

11A-19 Pilotage is compulsory for merchant vessels. Vessel's signals are answered from the lookout station at the harbor office at the south end of Pangkalan Sukarno. Pilots meet incoming vessels at the following places:

Vessels approaching by South Passage—outside Pulau Laelae.

Vessels approaching by Hoven or Northwest Passage—outside the channel between Pulau Laelae Tjadi and Gosong Boni.

Vessels approaching by Northern Passage—outside the channel between Gosong Panjoa and the Celebes coast.

The pilot boat is a motor boat and carries a blue flag with a white star. Pilots are available from 0700 to 1700 hours. It was reported (1963) that no ships, merchant or naval, are permitted to move without a civilian pilot aboard.

See chapter 1 for signals in Indonesian waters.

FACILITIES

11A-20 MAKASAR ($5^{\circ}08' S.$, $119^{\circ}24' E.$) is a great storage and distributing place for products of Celebes and the Moluccas. The port is controlled by the Indonesian Army and by harbor police. The largest ship to enter the

port had a length of 700 feet. The population was about 500,000 (est.) in 1959. The imports are cotton and manufactured goods, hardware, petroleum, and rice. Exports consist of copra in bulk, rattan, coffee, pepper, wood, gums, and other forest products.

WHARVES.—Naval Pier, close northward of Tandjung Pandan, serves as a boat landing and has a depth of 13 feet alongside the steps at the pier.

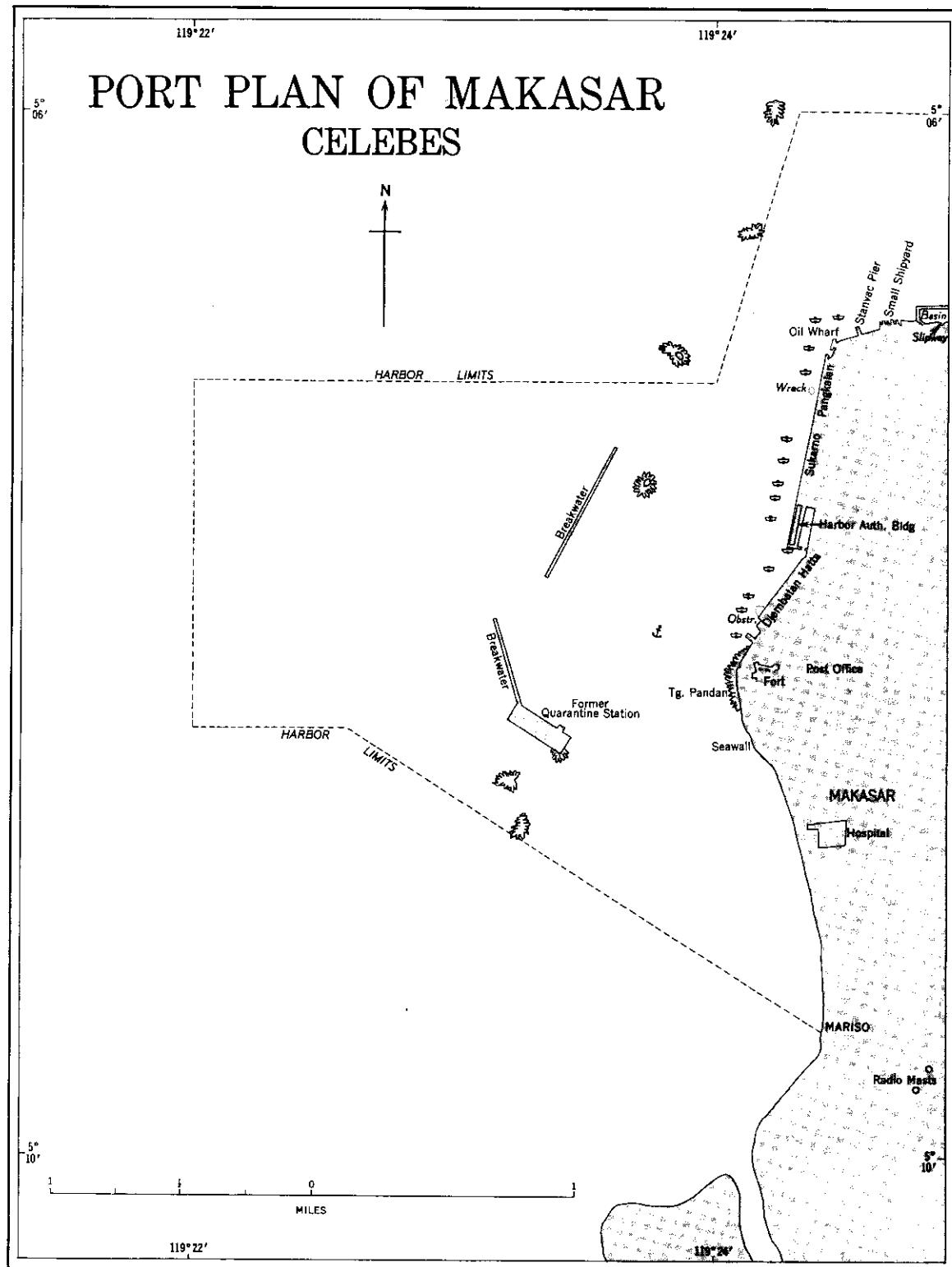
Djemabatan Hatta is about 1,625 feet long, and has a least depth of 29 feet alongside. There are no facilities for working cargo, and the wharf is used by vessels having no other berth assigned to them.

At the north end of Djembatan Hatta there is a prau harbor with depths of 9 feet alongside.

Pangkalan Sukarno is 4,462 feet long and has a least depth of $25\frac{1}{2}$ feet (1962). The regular steamship lines berth at this quay. The south face of the quay, known as Pangkalan Sultan Hassanudin, is 260 feet long with depths alongside of 14 to 26 feet. The north end of Pangkalan Sukarno is partly used for coaling and the naval coaling sheds are located here. One crane is available. Vessels berthing at the coaling quay must bear in mind that the north-going tidal current in the road sets strongly here, while the south-going tidal current sets out.

Strong winds create considerable sea against the wharves, especially at Pangkalan Sukarno. To assist in holding off the fore part of the vessel when proceeding to berth, large vessels and those with high superstructures are advised to let go an anchor at some distance from the quays. During the Northwest Monsoon vessels are required to berth 20 feet off the quay wall by means of lines to the warping buoys.

An oil wharf, close northward of Pangkalan Sukarno, is 197 feet long and has a depth alongside of $28\frac{1}{2}$ feet. Another oil pier (Stanvac), 39 feet long at the head, with berthing dolphins, and with a depth of 26 feet at its head, extends



from the shore close eastward of the above oil pier.

One tug, several towing launches, and numerous barges are available for cargo work. Explosive cargo of any quantity must be discharged by lighter. Other facilities include two 10-ton mobile caterpillar cranes, two small floating cranes, several fork lifts, and about 1,128,000 square feet of covered storage.

REPAIRS.—Small repairs can be made in a machine shop. Several marine railways with maximum lifts of 90 tons are available. There are divers and diving gear.

Reclamation of an area for the construction site of a shipyard was reported in progress in 1962.

It was reported (1963) that a slipway with an estimated capacity of 800–900 tons was available.

SUPPLIES.—Fresh provisions such as meat, vegetables, and local fruits are obtainable. Engineering supplies in small quantities are procurable. Water can be supplied by hydrants at the quay. Water barges are often used because of the inadequate pressure at all wharves. All drinking water should be treated before using. It was reported that water was available in limited quantities only. Fuel and diesel oil and gasoline may be obtained, but advance notice should be given.

COMMUNICATION.—There are government cables that connect directly with Surabaya, Balikpapan, and Manado. There is a telephone system. There is a government-owned radio station.

There is no railroad, but good roads lead through the south and central Celebes.

MEDICAL.—Local sanitation is good. The common tropical diseases are endemic. The harbor doctor runs a clinic in the harbor area

for ships' personnel. Treatment by dentist or specialist is possible after previous arrangement. There are eight hospitals, with a capacity of about 800 beds. Two days per week ships' personnel can be X-rayed in the Stella Mans hospital.

For quarantine and deratization, see chapter 1.

PART B. TANDJUNG TONRANGANG TO TANDJUNG MANIMBAJA

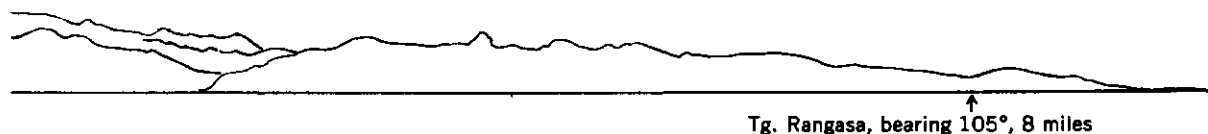
11B-1 TANDJUNG TONRANGANG ($4^{\circ}03' S.$, $119^{\circ}37' E.$), the east entrance of Teluk Parepare, is low with shoal water extending offshore nearly to Taka Tallange. Batu Kiki, eastward of Tandjung Tonrangang, is fairly conspicuous and can be recognized by the small crown-topped trees on its summit.

COAST—GENERAL

11B-2 The coast between Tandjung Tonrangang and Tandjung Lero recedes northward to form Teluk Parepare. There are no prominent landmarks.

The coast northward of Teluk Parepare is low and monotonously covered with vegetation. Batu Manarang and Batu Paletiang, two conical hills 435 and 512 feet high, respectively, are visible 15 miles over the low undulating foreland.

Teluk Mandar, between Tandjung Paria and Tandjung Rangasa about 32 miles westward, is backed by several conspicuous mountains. Batu Tirasa, 3,150 feet high, is sometimes visible 24 miles and the higher mountain land begins to approach the coast from this peak. This peak and the two mountains named above are somewhat less isolated than the chart might suggest. Buntu Letta, 5,249 feet high, is a conspicuous conical knob on a ridge of hills. Buntu Puang, 3,579 feet high, and Buntu Pusu,



Tg. Rangasa, bearing 105° , 8 miles

CELEBES, WEST COAST. Tg. RANGASA

with two summits 3,661 and 4,036 feet high more noticeable from southward than westward are prominent landmarks. Batu Saluwatan, a thickly wooded steep mountain, 2,067 feet high, and Batu Tenggeling, 2,165 feet high, are also conspicuous.

The coast between Tandjung Rangasa and Tandjung Rangas generally rises abruptly from the sea and is steep-to. The mountain ranges form a highly stony tableland, with a broken and fantastic outline, but there are no summits sufficiently conspicuous to guide vessels at sea.

The coast from Tandjung Rangas northward continues bold and high as far as Teluk Belangbelang in about latitude $2^{\circ}28'$ S. Beyond this to Teluk Pasangkaju, about 79 miles northward, the mountains recede, leaving a belt of level land with scattered hills. Northward of Teluk Pasangkaju the coastal hills again merge into the higher ranges, becoming loftier and narrower toward Teluk Palu. With the exception of Loli, 6,710 feet high, near the head of Teluk Palu, none of the summits are sufficiently distinctive to be of service in navigation.

The coast northward of Teluk Palu is high, heavily timbered and steep-to, with rocky points and sandy beaches. A rocky peninsula, terminating in Tandjung Manimbaja, has hills rising to 2,215 feet toward its north part.

DEPTHS—DANGERS

11B-3 The 100-fathom curve along this stretch of coast is from 1 mile to $4\frac{1}{2}$ miles offshore with many dangers within. There are no known dangers outside the 100-fathom curve.

WINDS—WEATHER

11B-4 See section 10-2 for Makasar Strait.

TIDES—TIDAL CURRENTS

11B-5 See section 10-3 for Makasar Strait.

COASTAL FEATURES—LANDMARKS

11B-6 TELUK PAREPARE, entered between Tandjung Tonrangang and Tandjung

Lero, is divided into two parts by a narrow passage; the inner part is known as Teluk Supa. In the outer bay the depths are 9 to 30 fathoms and over the east part of the inner basin 6 to 8 fathoms, mud. The least depth in the narrows leading to Teluk Supa is a 23-foot shoal, with deeper water on either side. There is good anchorage in both parts of the bay.

DANGERS—NAVIGATIONAL AIDS.—A light is shown from a beacon located on the reef extending southward from Tandjung Lero.

Laubang, with a least depth of 1 foot, is marked on its west end by a beacon surmounted by a black cone, point up, and Tete, covered only at springs, is marked on its northeast end by a beacon with a red cylindrical topmark.

Two dangerous wrecks lie sunk about 300 yards and 1,700 yards, respectively, northeastward of Tete.

Can buoys mark the edge of the coastal bank in the southeast part of Teluk Supa.

CAUTION.—A 1962 report indicates minefields exist along the banks of the above described entrance of Parepare.

DIRECTIONS.—Entering the bay from westward Tandjung Lero must be passed $\frac{1}{2}$ mile southward and not less than 200 yards eastward. From the northward Alipang (sec. 11A-2) and the center of Pulau Baki in line 160° , leads in deep water westward of Tandjung Lero. When this point is rounded, steer for Udjunge on the bearing 031° , which course will lead clear of the reefs.

PAREPARE, seat of a civil administrator, stretches nearly 1 mile along the east side of the narrows and is a shipping place for native products. Two piers with depths of 16 and 23 feet, respectively, alongside their heads are located at the south end of the village. The northernmost pier was in poor condition in 1956. A pier is located in the southeast part of Teluk Supa.

COAST.—Tandjung Lanrisan, northward of the mouth of the Sungai Sawito, is marked by a

dense coconut grove and is visible for 4 miles. A conspicuous small white mosque is located near the beach close northward of Tandjung Lanrisan.

Tandjung Salipolo and Tandjung Paria are two conspicuous points covered with tall trees and located at the delta of the Sungai Sadang. The delta of the river has been reported to extend up to $1\frac{3}{4}$ miles farther westward than charted.

Tandjung Kajuangin, marked by a conspicuous tree, is reported to have extended a considerable distance seaward.

REEFS.—Pasi Tangan, a 1-foot patch, lies about 5 miles northward of Tandjung Paria; this coral reef seldom discolors. Two reefs, the northern one with a depth of 3 feet and the southern one drying, lie to the southward of Pasi Tangan.

The bight between Tandjung Kajuangin and Pulau Batoae ($3^{\circ}29'$ S., $119^{\circ}22'$ E.) is full of detached reefs extending out some 5 miles and the whole bight should be avoided.

POLEWALI ROAD.—This bay is entered between Pulau Batoae and Tandjung Lakolako and is protected against swell by the large areas which dry. Pulau Batoae, 314 feet high, is very conspicuous. The passage in, $\frac{1}{2}$ mile wide and with depths of 25 to 35 fathoms, is between the reef extending westward from Pulau Batoae and a detached reef, about 1 mile long. The edge of the reef on the east side of the entrance is generally dry or marked by surf;

the reef on the west side is less easily seen and dries only at low water.

There are many native villages along the shore and several detached reefs in the east part of the bay. A conspicuous white mosque with a zinc roof is situated near the shore at Polewali. Near the mosque is a small landing pier for boats. Another white mosque with a zinc roof, conspicuous from seaward, is situated at Aliali. Coastal vessels make frequent calls.

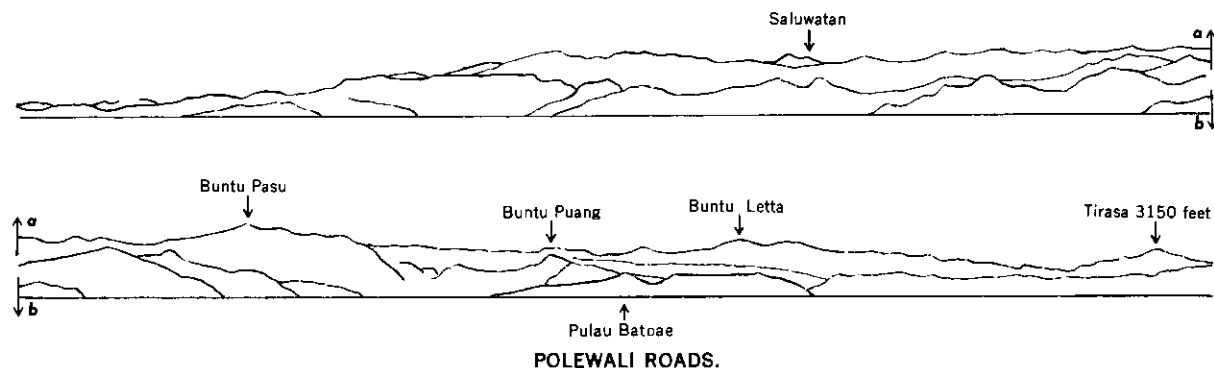
BEACONS.—The passage between the reefs at the entrance of the bay is marked on the starboard hand by a beacon with a white ball topmark and on the port hand by a beacon with a black truncated cone topmark.

The channel between the reefs off the village of Polewali is marked by a beacon with a white ball topmark on the starboard hand and a beacon with a black truncated cone topmark on the port hand.

The **ANCHORAGE** is in the west part of the bay, $1\frac{1}{4}$ miles east of Tandjung Mampije, in about 10 fathoms, sand and mud. There is also anchorage off Polewali village.

DIRECTIONS.—The summit of Pulau Batoae in range with Buntu Puang, bearing 073° , leads in until Saluwatan bears 021° ; the latter bearing leads between the two beacons marking the entrance of the bay.

11B-7 THE COAST WESTWARD OF POLEWALI ROAD is fairly steep-to, and between this bay and Tandjung Rangasa there are three points which are conspicuous, Tand-



jung Buku, with a large village, Tandjung Labuham, a steep rocky point, and Tandjung Baurung, a low, round point covered with high trees. Tandjung Baurung, when seen at a distance, gives the appearance of a low, dark island detached from the higher land northward.

The Salo Mapili flows out through a delta in the bight between Tandjung Buku and Tandjung Labuham. A very conspicuous white monument is located at the village of Lapeo and close northward is a mosque with a white minaret, 131 feet high, which is visible a great distance. Temporary ANCHORAGE can be taken by vessels with local knowledge in about 8 fathoms, sand, about 550 yards offshore to the southeastward of the village of Panjampe.

BALANGNIPA ROAD.—In the bight between Tandjung Labuham and Tandjung Baurung temporary ANCHORAGE can also be taken on the edge of the bank extending south-southeastward from the mouth of the Sungai Mandar, in 4 fathoms, sand and mud. The holding ground is bad. This anchorage is just southward of a 1-fathom coral pinnacle and 400 yards northward of this pinnacle is a rock that dries. A BEACON with a white ball topmark is located close southward of the east entrance of the river.

MADJENE ROAD.—This bay entered between Tandjung Baurung and Tandjung Rangasa is sheltered from westerly winds, and there is anchorage in 15 to 17 fathoms, sand, in a break off the village of Madjene, but here there is only room for one small vessel. Southeast of this position ships may anchor on the edge of the reef in over 20 fathoms. West of the village the coastal reef is very steep and dries out $\frac{1}{3}$ mile. Small quantities of provisions may be obtained here. A pier is located near the flagstaff in the village. Madjene is a central point for native commercial traffic.

A LIGHT is shown on the head of the pier.

11B-8 TANDJUNG RANGASA ($3^{\circ}35'$ S., $118^{\circ}56'$ E.) is a comparatively low headland but rises gradually inland to a mountain range

which can be seen for a considerable distance. The extremity of the point has villages on the south and east sides. Taka Sitodong dries westward for 1,200 yards and southward for 600 yards. The cape has been reported (1957) to be a good radar target at a distance of 19 miles.

The tidal currents sweep around the edge of the reef on the southwest side of the cape at 3 to 4 knots.

A LIGHT is shown on the west side of Tandjung Rangasa.

PAMBAUANG ROAD, about 5 miles northward of Tandjung Rangasa, provides a well-sheltered anchorage in the east monsoon in the south part of the bay in 15 to 18 fathoms, soft mud. The points of the bay are high and rocky, and the reef dries to 400 yards off the south side. A conspicuous house is situated northward of the village of Pambauang.

ANCHORAGE is available off the villages of Binanga and Tjenrana located in bights about 9 and 11 miles, respectively, northward of Pambauang Road. The anchorage off Binanga is in about 20 fathoms. The reef northward of this bight dries out 600 yards, and, coming from northward, the anchorage must not be steered for until Binanga bears 090° . The anchorage off Tjenrana, in 16 to 18 fathoms, mud, is in the south corner of the bay, eastward of Pulau Taimanuk, which affords some protection in the west monsoon. Pulau Taimanuk, about 100 feet high and wooded, is very conspicuous. The north point of this island should not bear northward of 272° . In the center of the bay are two reefs, with a least depth of 5 fathoms.

TANDJUNG PASAWALAHAN (ONGKONA) ($3^{\circ}05'$ S., $118^{\circ}47'$ E.) is the low extremity of a high and well-defined peninsula and is covered with trees which stand in the water at high tide. In the small bay east of Tandjung Pasawalahan there is anchorage in 17 to 20 fathoms, sand, off the village of Lombone, 400 yards offshore.

(2947) **INDONESIA—Celebes—West coast—Tandjung Kai—Reef information.**—Tandjung Kai Reef has been reported to extend in a south southeasterly direction to approximately $2^{\circ}53'08''$ S., $118^{\circ}46'00''$ E.

(N.M. 23/64.)

(N.M. 19(131), Djakarta, 1964.)

H.O. Charts 3054 (Plan B), 3045.

H.O. Pub. 72, 1962, page 413.

TELUK LEBANI, entered between Tandjung Pasawalahan and Tandjung Kai, provides almost no suitable anchorage because the 100-fathom curve runs very close to the shore. The south end of the coastal reef extending southward from Tandjung Kai dries and is generally marked by discoloration or breakers.

At about the middle of the east side of Teluk Lebani the shallow Sungai Malunda empties though a shoal flat and close northward of Malunda there is anchorage in 12 to 15 fathoms, sand, close to a high rock covered with vegetation. There is ANCHORAGE off the village of Kai, $2\frac{1}{2}$ miles eastward of Tandjung Kia, in 20 fathoms, a fair distance from shore and off Tapalang, about $2\frac{1}{2}$ miles farther eastward. The anchorage off Tapalang is in 15 to 20 fathoms, sand. During the east monsoon there is often a swell, especially in the afternoon in the anchorages off Kai and Tapalang.

THE COAST from Tandjung Kai to Tandjung Rangas is high and steep, with a narrow reef. Tandjung Rangas is low and covered with bushes and mangroves, but rises to high land within. Strong tide races and overfalls have been reported off the coastal reef off Tandjung Rangas.

A LIGHT is shown from a white framework structure located on Tandjung Rangas.

TELUK MAMUDJU is divided into two parts by Pulau Mamudju, which is high and thickly wooded; the island is not easily seen from seaward. The passage between the south point of Pulau Mamudju and the shore is not to be recommended for large vessels. Bone Tengah, a large detached drying reef southward of Pulau Mamudju, is marked by a BEACON with a white ball topmark on its northeast extremity and a 3-foot shoal lies close southward of the south end of Bone Tengah.

Several villages line the south shore of the bay, Mamudju, the seat of a civil administrator, being the largest. The Sungai Mamudju empties east of this village, and a small landing pier is located on the west side of the village.

A doctor is available and Mamudju is connected to the regional telephone.

ANCHORAGE can be taken with the head of the landing pier bearing 142° . There is also anchorage about 400 yards northward of the mouth of the Sungai Mamudju.

11B-9 THE COAST, between Teluk Mamudju and Tandjung Lalereh, about 42 miles northeastward, has high land approaching it fairly closely, but the points are low with trees standing in water.

TELUK BELANGBELANG, about 16 miles northeastward of Pulau Mamudju, is of no importance to shipping being much encumbered by reefs and backed by high inaccessible country. Pulau Liutang, 246 feet high and thickly wooded, is conspicuous.

Temporary ANCHORAGE can be taken by vessels with local knowledge off the mouth of the Sungai Budubudung, about 5 miles southward of Tandjung Lalereh, in 14 fathoms, northwestward of some dead trees which stand on a projecting reef about $\frac{1}{2}$ mile southward of the mouth of the river.

TANDJUNG LALEREH is low and covered with trees standing in water.

Between Tandjung Lalereh and Tandjung Pasangkaju, about 50 miles northward, the coast is similar in appearance to that southward, but there are more landmarks. Tobintah, a conspicuous island 486 feet high and thickly wooded, lies about $7\frac{3}{4}$ miles northeastward of Tandjung Lalereh. There is ANCHORAGE in 14 fathoms, mud, westward of the island. There are numerous isolated coral reefs between Tobintah and Dapurang, a village, about 9 miles northward.

TANDJUNG TJENOKA ($1^{\circ}41' S. 119^{\circ}17' E.$) rises steeply up to a round hill covered with trees. A reef projects nearly 1 mile westward from Tandjung Tjenoka.

ANCHORAGE is available off the village of Doda, about 3 miles north-northeastward of Tandjung Tjenoka, sheltered by the reefs that project from the points southwestward of the

village. Anchorage is also available in 5 fathoms about $\frac{1}{2}$ mile offshore on the south edge of the coastal reef off the north entrance of the Sungai Lariang, about $16\frac{1}{2}$ miles northward of Tandjung Tjenoka. A reef with a depth of 3 feet lies $15\frac{1}{8}$ miles southwestward of the north entrance of the river. A conspicuous peak covered with vegetation is located about $6\frac{1}{4}$ miles east-northeastward of the north entrance point of the river.

Tandjung Pasangkaju is pointed and low and is marked by a very tall tree. The coastal reef dries out 800 yards northwestward.

TELUK PASANGKAJU, entered between Tandjung Pasangkaju and Tandjung Baku, has at its head the small Sungai Pasangkaju with a bank of sand and stones drying out $\frac{1}{2}$ mile; the village of Kaluku is located at the south entrance of the river. In the center of the bay there is a reef, $\frac{1}{2}$ mile long, northwestward of the mouth of the river. Other shoals lie north and eastward.

The ANCHORAGE, which only gives shelter from easterly winds, is off the village of Tjenapu, on the middle of the south shore, in 10 fathoms, about $\frac{1}{4}$ mile offshore. To reach the anchorage, steer for a large rectangular white board in the middle of Tjenapu on the bearing 148° , and when near the anchorage bring the board on the bearing 168° .

THE COAST between Teluk Pasangkaju and Tandjung Karang, the west entrance of Teluk Palu, continues in a similar appearance as the coast to the southward, but with low points. The only landmarks on this stretch of coast are Loli, 6,710 feet high (sec. 11B-2), and a 3,573-foot peak about 7 miles southward of Tandjung Karang. A conspicuous vertical structure fitted with a white board is located at Tandjung Balesa (Towali), a point about $6\frac{1}{2}$ miles southwestward of Tandjung Karang.

Towali, a large coral reef, with two dry sandbanks, lies $1\frac{1}{2}$ miles west-northwestward of Tandjung Balesa, and $13\frac{1}{4}$ miles northward of

Tandjung Balesa is a $2\frac{1}{2}$ -fathom patch. The passage inside these dangers is dangerous. A $33\frac{1}{4}$ -fathom patch lies $2\frac{1}{4}$ miles southwestward of Tandjung Karang.

TANDJUNG KARANG ($0^\circ 38'$ S., $119^\circ 44'$ E.) is a high, rectangular, broad spit of land on the west side of the entrance of Teluk Palu. A 338-foot hill is located at the northwest extremity of this spit of land and is easily recognized from seaward.

A LIGHT is shown on Tandjung Karang.

11B-10 TELUK PALU.—The depths in the bay are great, and there is anchorage only in the slightly indented bays on either side and off the village of Palu at the head of the bay. The west side runs steeply up from the sea; the hills, which are near the coast, increase in height from the summit on Tandjung Karang to Loli. On the east side there is a hilly belt of land about 3 miles wide, which merges into the mountain ranges beyond, rising to 6,000 to 7,000 feet high. At the head of the bay a slowly rising plain, with rice fields, stretches far into the interior.

The TIDES in Teluk Palu are diurnal and semidiurnal, the latter being most pronounced.

DONGGALA, the seat of a civil administrator, lies 1 mile southward of Tandjung Karang and is the principal port in Teluk Palu and the center of trade for the surrounding country. There is a small stone landing pier near the flagstaff. Donggala is connected to the regular telegraph system. A customhouse is located at the root of pier.

NAVIGATIONAL AIDS.—A light is shown from a beacon with a white triangular topmark, point up, on the head of the pier. Another light beacon with a red cylindrical topmark marks the north edge of the reef extending northward from the south entrance of the road. The above two lights are shown on request.

A beacon with a white triangle, point up, stands on a hill about $\frac{1}{4}$ mile southwestward of the head of the pier.

WRECKS.—Several wrecks with a swept depth of $7\frac{1}{2}$ fathoms lie about 450 yards offshore northward and northeastward of the customhouse. A wreck with a swept depth of $2\frac{3}{4}$ fathoms, marked by a red buoy, lies about 440 yards east-southeastward of the head of the pier.

ANCHORAGE is available in 17 fathoms, about 400 yards offshore, with the beacon on the hill southwestward of the village bearing about 240° . Other but less desirable anchorage is in 24 fathoms, with the center of the village bearing 204° to 261° ; the bank here is very steep. Small craft can anchor in 10 fathoms off the middle of the village.

TELUK KABUNGAKODI, to the southward of Donggala, is filled by reefs and has two small islands with vegetation on the outer part. On the south side of these islands is a natural basin in the coral reef 330 yards across, with a depth of 8 fathoms, reached by a narrow channel marked by bamboo stakes. For a small vessel this basin gives the best shelter in Teluk Palu. The entrance of this channel is found by approaching with the village, two houses only of which are visible, in range with the south point of the bay.

PALU is a large village on the west shore of a river at the head of Teluk Palu. Shoal water extends about 1,200 yards offshore westward of the village. The usual anchorage is in the east side of the bight near the landing stage located on the coast about 1 mile northeastward of Palu. Vessels lie quietly in the road only at night; in the daytime the sea breeze is so strong that steam must be kept up, and communication with the shore is broken.

Between Palu and Wani there are only two suitable **ANCHORAGES** on the east coast of Teluk Palu. The anchorage off the village of Mamboro, about $5\frac{1}{4}$ miles north of Palu, is fairly sheltered, and vessels can anchor about 400 yards from shore in 15 fathoms, mud and

sand, with the center of the village bearing 020° . At Panteluan about $6\frac{1}{2}$ miles northward of Mamboro, vessels may anchor in 20 fathoms, with the east side of the village bearing 000° .

At Wani the recommended anchorage is in about 27 fathoms with the beacon, with a white triangular topmark, point down, located southeastward of the village bearing 085° , and the beacon, with a cross topmark, and a mosque westward of the village in range 334° . Coastal vessels call regularly.

11B-11 THE COAST BETWEEN TELUK PALU AND TANDJUNG BOH, about 23 miles northward, is steep, but with no landmarks. **ANCHORAGE** can be taken in the bight off the village of Alindu located about $5\frac{1}{2}$ miles southward of Tandjung Boh, in 30 to 40 fathoms, sand. This village is situated on a conspicuous plateau, 30 to 70 feet high. Northward of Tandjung Boh the coast becomes sandy and less steep to the village of Tompe, about 3 miles northward. In westerly winds there is considerable sea and surf on this part of the coast. Immediately northward of Tandjung Boh, **ANCHORAGE** can be taken in the bight off the village of Tondo in 20 to 25 fathoms. Rocks were reported (1948) to lie about $1\frac{1}{2}$ miles southwestward of Tandjung Boh and about $\frac{1}{2}$ mile offshore.

LABUHAN LABEA affords good anchorage in 30 to 40 fathoms, sand. Tandjung Labea, the east point of the bay, is rocky and rises to a height of 1,151 feet; the point can be seen at a great distance from southward.

Batu Mekadja, a drying coral reef, lies about $\frac{1}{2}$ mile off the west side of Labuhan Labea about 3 miles westward of Tandjung Labea.

A $5\frac{3}{4}$ -fathom patch lies outside the 100-fathom curve about $3\frac{1}{2}$ miles southwestward of Tandjung Labea.

The southwest coast of the peninsula terminating in Tandjung Manimbaja should not be neared to less than 1 mile.

PART C. TANDJUNG MANIMBAJA TO TANDJUNG BENAR

11C-1 TANDJUNG MANIMBAJA ($0^{\circ}00'$ $119^{\circ}36'$ E.) is distinguished from the point east-northeastward by a few conspicuous hills. The coastal reef off the point is about 200 yards broad and deepens rapidly outside.

COAST—GENERAL

11C-2 THE COAST between Tandjung Manimbaja and Tandjung Dondo, about 71 miles northeastward, is mountainous, with dense vegetation, and has sandy beaches here and there. There are numerous conspicuous mountain peaks along this stretch of coast and northward of latitude $0^{\circ}25'$ N. is some of the highest land in the Celebes, the summit of Bulu Ogoamas being 9,842 feet high. SODJOLO ($0^{\circ}39'$ N., $120^{\circ}10'$ E.), 8,966 feet high, is a conical peak seen in clear weather as far as the coast of Borneo and giving an excellent bearing point in the north part of Makasar Strait.

This stretch of coast has several conspicuous peaks: A 1,486-foot peak and a somewhat lower peak close eastward, located eastward of Tandjung Siraru, about 31 miles north-northeastward of Tandjung Manimbaja; Soni, 1,732 feet high, northward of Sodjolo; Silumba, 2,834 feet high; Bananga, 2,037 feet high, with a broad, cupola-like top, and Pepeh, 1,771 feet high. Southward of Tandjung Dondo there are many hills and mountains, of which the 1,525-foot peak is sharp and very conspicuous.

The mountains inland between Tandjung Dondo and Tandjung Benar are generally obscured by clouds, but in clear weather the

2,923-foot peak, a sharp cone, located about 21 miles south-southeastward of Tandjung Benar, on the southerly slope of a high mountain can be seen at a great distance. Northward of this highest mountain the mountains become gradually lower. Sikala, 1,870 feet high with a pointed top, southward of Tandjung Benar is also conspicuous.

DEPTHS—DANGERS

11C-3 The 100-fathom curve runs close to the coast except off the bight between Pulau Pangalasian and Tandjung Bau where it continues northward to encompass the above island and Pulau Maputi, and then approaches the coast again at Tandjung Bou. Northward of Teluk Dondo to Tandjung Benar the 100-fathom curve extends offshore to about 13 miles, then approaches the coast again at Tandjung Benar.

There are numerous dangers within the 100-fathom curve, some of which dry. These dangers will be discussed along with the coastal features.

The only known dangers outside the 100-fathom curve along this stretch of coast are Pasie Perombian and Pulau Pasoso lying 3 miles west-northwestward and 6 miles northward, respectively, of Tandjung Manimbaja. Pulau Tuguan, another danger, lies 5 miles northwestward of Pulau Maputi.

PASIE PEROMBIAN is a coral reef which dries at half tide and is very steep-to; the reef is often seen by discoloration. PULAU PASOSO, 354 feet high, is of coral and covered

G. Balesang



Pulau Pasoso,
bearing 140° , 20 miles

CELEBES, WEST COAST; PULAU PASOSO

with trees. In clear weather the trees can be seen about 22 miles. ANCHORAGE can be taken in 25 to 30 fathoms in the basin between the reefs projecting from the southwest and southeast points of the island, with some shelter from west and northwest winds. This anchorage is reached by following that side of the reef which is best seen, anchoring only the distance off necessary to swing clear. The west extremity of Tandjung Dampelas (sec. 11C-6), touching the southeast side of Pulau Pasoso, bearing 049°, leads 1 mile westward of Pasie Perombian. PULAU TUGUAN, 364 feet high, is covered with high trees and can be seen in clear weather a distance of 20 miles. ANCHORAGE can be taken on the south side of the island in 8 to 11 fathoms, coral, between the coastal reef and some 8 to 10 fathom patches southward and southwestward.

A LIGHT is shown on Pulau Tuguan.

WINDS—WEATHER

11C-4 See section 10-2 for Makasar Strait.

TIDES—TIDAL CURRENTS

11C-5 See section 10-3 for Makasar Strait.

COASTAL FEATURES—LANDMARKS

11C-6 TELUK BALELANG, on the north side of the peninsula, has anchorage in 28 to 30 fathoms off the village of Popodi with Tandjung Manimbaja in range with two nearer rocky points, bearing 279°, a conspicuous tree on Tandjung Bau bearing 000°, and Popodi 160°.

TIKUNGAN TAMBU, entered between Tandjung Bau and Tandjung Dampelas, a low point rising inland, has a flat, sandy shore with high mountains behind it. There are eight rocky, wooded islets, 148 to 197 feet high, lying in the bay. The area between these islets and the coast is clear. Laut, the outer islet, lies on a detached reef, which mostly dries. A 1½ fathom patch and a 3½-fathom patch lie about 1 mile northwestward and ¾-mile northward,

respectively, of Laut. The other seven islets are separated from Laut by a channel ½ mile wide and are on a steep-to reef which dries 400 yards to ½ mile beyond the islets. A detached 3-fathom patch lies about ½ mile westward of the central part of the reef.

On the east side of the bay are several isolated coral reefs.

ANCHORAGE can be taken in 30 fathoms off the village of Pomolulu and in 20 to 25 fathoms, in the small bay off the village of Sibaju, about 8½ miles southeastward of Tandjung Dampelas. A partly drying reef extends 1,200 yards from the south point of this latter inlet and 800 yards from the north point. Steering for the village, 047°, will pass between them. A 2¼-fathom patch lies midway in front of the entrance of the inlet off Sibaja.

On the south side of the bight between Tandjung Parepa and Tandjung Bagimpuang, the coast is steep to the village of Sirua, then it becomes low. Eastward of Sirua is a broad plain, through which flow three rivers. Tandjung Ajuang is low and sandy, and between this point and Tandjung Rerang is another small bay into which two rivers discharge. Tandjung Rerang is low and covered with mangroves. The coastal reef around the bay is narrow and disappears at Tandjung Bagimpuang. About ½ mile westward of Tandjung Ajuang is a small coral 3-fathom reef, and close northwestward of this reef and about 1 mile offshore are two partly drying reefs.

ANCHORAGE is available, about 300 yards off Sirua, in 18 to 24 fathoms, with Pulau Tuguan just open of Tandjung Bagimpuang, 349°.

THE COAST from close northward of Tandjung Siraru and parallel to it is fronted by a ridge of coral forming a natural breakwater. An extensive part of the land behind this breakwater is submerged at high water.

PULAU PANGALASIAN AND PULAU MAPUTI, 531 and 561 feet high, respectively, are of coral grown over with tall trees and

steep-to. The latter island can be seen in clear weather a distance of about 25 miles; the former can only be distinguished at a short distance. Pasie Bangilongan, a coral reef, which dries, lies $3\frac{1}{2}$ miles eastward of the north point of Pulau Maputi; this reef, sometimes marked by small fishing stakes, does not show discoloration when submerged. Several reefs, which partly dry, lie from $\frac{3}{4}$ mile to $2\frac{1}{2}$ miles east of Pulau Pangalasian. Irregular currents make it dangerous to approach any of these shoals.

ANCHORAGE can be taken south of Pulau Pangalasian, westward of the entrance of the channel between the island and the mainland, between two rocky points, about 400 yards off, in 20 fathoms, sand. There is also anchorage on the east side of the island in 20 to 25 fathoms, sand. From westward a vessel should steer midway between Pulau Pangalasian and Pulau Maputi until Pulau Tuguan is seen northward of Pulau Maputi, bearing 304° ; then steer for a conspicuous little point on the mainland southeastward of Pulau Pangalasian, and anchor when the passage between Pulau Pangalasian and the mainland opens, avoiding the reef about $\frac{3}{4}$ mile eastward.

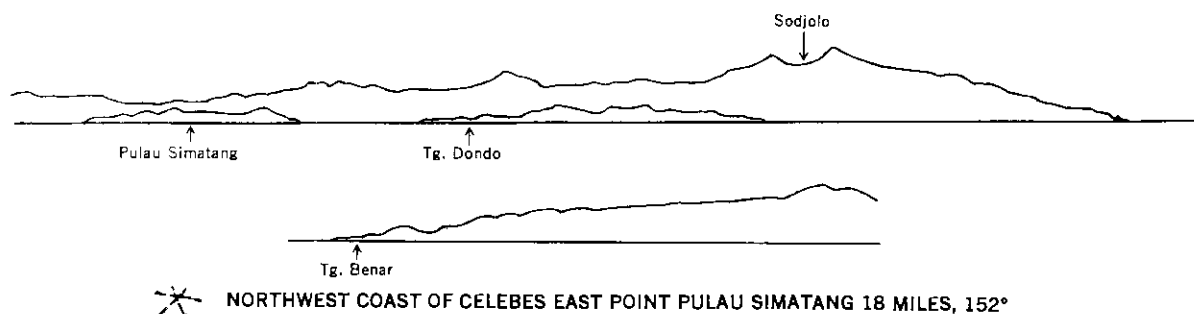
THE COAST between Pulau Pangalasian and Tandjung Bau, forming a bight, is low, swampy, and covered with mangroves on the south coast as far as the village of Dangulan; the north part is sandy. Tandjung Bau is low, with some brushwood on it. Pasie Bau, a drying reef with a sandflat which shows discolora-

tion when submerged, lies 1 mile northwestward of Tandjung Bau. The east point of Taring, bearing 045° , clears this reef.

TANDJUNG BOGOANG ($0^\circ 43' N.$, $120^\circ 03' E.$) is a steep rocky point with a conspicuous tree on it. Taring, an islet 177 feet high and entirely grown over, rises precipitously from the sea and can be approached on its outer side to within 400 yards. The island is connected to the mainland by a reef with a depth of $2\frac{1}{2}$ fathoms. Seijanki, a group of islands lying about $1\frac{1}{2}$ miles east-northeastward of Taring, lie on a coral reef, which dries. These islands are smaller and lower than Taring.

11C-7 TELUK DAMPAL, a large bight, lies between Taring and Pulau Lingajang, 18 miles apart, and is full of dangerous reefs which can not be approached by the lead. Vessels should not pass eastward of the line joining these two islands. Tandjung Ijoh, $1\frac{1}{2}$ miles eastward of Seijanki, is a rocky point about 79 feet high, with a projecting coastal reef around it. There is **ANCHORAGE** in the small bay westward of Tandjung Ijoh in 20 to 25 fathoms. Tandjung Jaga, the north point of the bay, is sandy with a few isolated trees of very striking shape on the extremity, visible for a great distance from southward.

The outer reefs along the 100-fathom curve in Teluk Dampal are Pasie Dongalan, a reef of white sand always above water, easily visible on bright moonlight nights, Pasie Seranga, a $1\frac{1}{4}$ -fathom patch, and Pasie Siokan, awash at low water.



Pulau Lingajang is a low coral island lying on a broad drying reef which shows discoloration. The trees on the island are visible about 14 miles. The island should not be approached within 3 miles because a strong CURRENT frequently runs past it. Koko, a rocky islet, lies on the reef close eastward of the south point of Pulau Lingajang. Koko is marked by a small white sand beach. Between Pulau Lingajang and the coast there are some small islets and rocks.

A shoal with a least depth of $4\frac{1}{2}$ fathoms lies in the south entrance of the passage between Pulau Lingajang and the Celebes coast about $1\frac{1}{2}$ miles southwestward of Tandjung Jaga. This shoal was reported (1950) not to discolor.

Between Tandjung Jaga and Tandjung Dondo there are two small bays separated by Tandjung Sejo.

TANDJUNG DONDO ($1^{\circ}00'$ N., $120^{\circ}17'$ E.), the northwest extremity of a peninsula, is low and about 59 feet high. The land within rises steeply to the 1,525-foot peak, which is seen far out to sea. Tandjung Bobantji, the northeast extremity of the peninsula, is marked by a hillock. Pulau Taidun, an overgrown rock, lies on a reef close east-southeastward of Tandjung Bobantji. The east end of the reef extends further out than charted. Pasie Bambaipula, a $\frac{3}{4}$ -fathom reef lying about $2\frac{1}{2}$ miles northeastward of Tandjung Dondo, and a $3\frac{3}{4}$ -fathom reef close northwestward are marked by discoloration. A $2\frac{1}{2}$ -fathom shoal lies about 1 mile westward of Tandjung Bobantji.

PULAU SIMATANG is thickly wooded, and has a hill in the south part 994 feet high, which can be seen from a considerable distance and affords a good bearing point. The island is surrounded by a partly drying coral reef extending 400 to 600 yards. On the west side are four detached reefs. Pulau Tampalekang, *close southward of Pulau Simatang, is low, and covered with coconut trees.

DIRECTIONS.—From westward, unless the reefs are clearly seen, vessels should pass northward of Pasie Bambaipula and the $3\frac{3}{4}$ -fathom reef northwestward, steering more to the southward for the channel between Pulau Tampalekang and Pulau Taidun when the latter is well open of Tandjung Bobantji. It is advisable to keep in mid-channel because of the strong CURRENTS that sometimes run here.

For the passage northward of Pulau Tampalekang, after passing Pasie Bambaipula, steer for the southeast point of Pulau Simatang on the bearing 089° until Pulau Tampalekang is abeam, when the course is a little more to the southward. If the sharp 2,923-foot high cone (sec. 11C-2) is visible, it may be kept in range with the southeast point of Pulau Simatang for entering this strait. The south coast of the island can be safely passed at a very short distance.

11C-8 **TELUK DONDO**, entered between Tandjung Bobantji and Tandjung Pangaluang about $17\frac{1}{2}$ miles eastward, is very steep along its west shore, and from the south and east sides the 100-fathom curve extends offshore 1 mile to 5 miles. Teluk Santi, a small bay southward of Tandjung Bobantji, affords sheltered ANCHORAGE in all winds for two or three small vessels in 18 to 20 fathoms 400 to 600 yards off the village at its head. The passage in is southward of Pulau Taidun, but the creek should only be entered at low water, when the reefs are seen. Batu Banga, about 4 miles southward of Tandjung Bobantji, is fairly conspicuous from northward.

Teluk Bananga has a sandy shore along its west and south coasts and rocky along its east coast. ANCHORAGE can be taken about 500 yards off the village of Stadang on the west coast of the bay in 38 fathoms, with a point southward of Batu Banga bearing 012° , a zinc roof in the village 298° , and Tandjung Senjangang 080° ; there is a pier built of light native material. Vessels call from time to time to

load copra. Anchorage is also available about 350 yards from shore off the village of Luals in 34 fathoms with Tandjung Senjangang bearing 030° and the zinc roof at Stadang 309°.

Limbana Luak, a small bay in the southeast corner of Teluk Bananga, affords sheltered anchorage in 18 to 30 fathoms. The entrance is narrow but clear and the low west point can be rounded at sight.

Anchorage can be taken almost everywhere along the south part of Teluk Dondo. There is anchorage in 30 fathoms northward of the village of Laisi, about 550 yards from shore, with Tandjung Senjangang bearing 321°, Laisi 180°, and Tandjung Ogotili 091°.

Pasie Beluwah, a reef that is marked by discoloration when submerged, lies about 2 miles north-northeastward of Tandjung Ogotili. A 2½-fathom patch lies about 1¼ miles north-westward of Tandjung Ogotili.

Teluk Pagalungian (0°57' N., 120°39' E), in the southeast corner of Teluk Dondo, has densely wooded hills along its east side rising steeply out of the water; the west side is low and covered with mangroves. Tandjung Malalang, the west entrance point can be passed close to, but the coastal reef extends for a considerable distance from the opposite point, narrowing the channel to 600 yards, with depths of 26 fathoms. A coral reef surrounds the entire bay. Steering close by Tandjung Malalang on a southwesterly course there is anchorage in a basin about ½ mile in diameter in 18 to 28 fathoms, mud.

The east coast of Teluk Dondo from Teluk Pagalungian northward to Tandjung Pangaluang provides no suitable anchorages. Tandjung Maraja, a low point covered with shrubs and mangroves, is conspicuous from northward. Tandjung Pangaluang is a steep spur of a mountain ridge.

THE COAST FROM TANDJUNG PANGALUANG NORTHEASTWARD to Tandjung Totitoli is mountains, densely wooded, forming islets and deep inlets inclosed by the

partly drying coastal reef. Pulau Latungan, northwestward of Tandjung Tolitoli, open northward of Pulau Samuyan, a high, thickly wooded islet on the coast 4 miles northeastward of Tandjung Pangaluang, bearing 060°, clears the reefs northward of Tandjung Pangaluang.

Pulau Tingi Langa is a thickly wooded island with a 709-foot peak in its northeast part; this peak is very conspicuous particularly from northeastward. The area between the south and southeast coasts of Pulau Tingi Langa and the mainland is called Teluk Bulias, a narrow bay with depths of 20 to 25 fathoms at the entrance, east of Pulau Tingi Langa, decreasing farther in to 16 fathoms. The shores of the bay are lined by a coral reef, with narrow passages between. A small reef awash lies in the entrance of the bay. About ¾ mile northward of the east end of Pulau Tingi Langa is the east end of a large coral reef, consisting of two parts, awash at low water, with 10 fathoms between.

To enter the bay make good course 212° on the small islet southward of the east end of Pulau Tingi Langa, and thence in midchannel by sight of the reefs to the anchorage in 16 to 18 fathoms, mud.

OFF-LYING ISLANDS AND DANGERS.—Pulau Kapetan is a long, narrow, thickly wooded island separated from the Celebes coast by a clear, deep channel nearly 2 miles wide. A ridge of hills runs almost the entire length of the island, and a small, flat part in the middle, gives it the appearance of two islands. The most conspicuous summit, 571 feet high, is in the south part. From the northeast point the coastal reef extends 1 mile, with Pulau Bool lying ½ mile from the point. A 1¼-fathom patch lies about ½ mile northward of Pulau Bool.

Pulau Tumpangan, with the smaller Pulau Boloh to westward, lie on the same drying reef. Between this reef and that extending from Pulau Bool is a passage 1,400 yards broad, with depths of 30 fathoms. Pulau Pamanukan, a

rock with a conspicuous white peak, visible about 7 miles, lies on a detached reef northeastward of Pulau Tumpangan. A 2-fathom patch lies about $\frac{3}{4}$ mile northeastward of this rock.

For the reefs and dangers northward see section 11C-10.

11C-9 TELUK TOLITOLI is entered between Tandjung Tolitoli, a low point covered with mangroves, and Tandjung Labuan Dedeh, a steep-to rocky point. Mountains make a wide circle around the bay leaving a large cultivated plain. The shores of the bay, with several streams emptying into it, consist of gently sloping sand, drying out about 400 yards.

The village of Baru, the center of trade in the area, lies in the middle of the east shore of the bay. The landing pier at Baru is for small craft only. Close eastward of Tandjung Labuan Dedeh is a conspicuous customhouse. Coastal vessels visit the bay regularly.

The bay affords secure ANCHORAGE in depths of 18 fathoms, mud and black sand; in the north part there is coral. Within the 10-fathom curve the depths rapidly decrease, and it is advisable not to anchor in less than 16 to 18 fathoms. Hawsers can be made fast to trees on the shore. With strong westerly winds it is advisable to moor with head to the southwest, and there is ample swinging room.

Pulau Latungan, 522 feet high and thickly wooded, lies across the entrance of the bay. Reefs project about 600 yards from south point of the island, and 200 to 400 yards from the north point.

A detached reef, partly drying, lies $1\frac{1}{3}$ miles west-southwestward of Tandjung Tolitoli. A 3-foot patch lies about $1\frac{1}{2}$ miles southwestward of Tandjung Tolitoli.

DIRECTIONS FOR TELUK TOLITOLI.—The passages to the north and south of Pulau Latungan are safe, but when the visibility of the reefs is poor, then the north passage should be used. Vessels coming from westward, north of Pulau Simatang, can enter the bay by passing 1 mile north of Pulau Pamanukan.

11C-10 THE COAST FROM TANDJUNG LABUAN DEDEH NORTHWARD to Tandjung Benar is high, with rocky points and shallow bays between with sandy beaches. There are no dangers inshore, but a ridge of reefs, most of which dry, runs at about 5 miles distance, with depths of 25 to 50 fathoms between them and the coast.

Tandjung Kekoh ($1^{\circ}07' N.$, $120^{\circ}47' E.$) is a rocky point $3\frac{1}{2}$ miles northward of Tandjung Labuan Dedeh; on the point is a hill 561 feet high. Pulau Tende is 175 feet high, with three hills; the west hill is of light green color and shows well against the dark background. The island is joined to the point on the mainland by a partly drying reef. ANCHORAGE can be taken near the shore in the bight between Pulau Tende and Tandjung Kumbol. In the south part of the bight a steep mud bank extends $\frac{1}{2}$ mile, and a 4-fathom patch lies just outside the drying part of the bight. Northward of Tandjung Kumbol the coast is sandy, with a few settlements.

OFF-LYING DANGERS BETWEEN PULAU KAPETAN AND PULAU KAPAS.—Pasie Lolah, about 2 miles northward of Pulau Pamanukan, partly dries at low water, and can generally be seen by discoloration. Pasie Bulu Mata lies near the edge of the 100-fathom curve, 4 miles northward of the north end of Pulau Kapetan. A drying reef, with a radius of 300 yards, was reported (1959) to lie on the north part of Pasie Bulu Mata. Pasie Dalamang, a drying reef, lies about $5\frac{3}{4}$ miles northward of Pulau Tumpangan.

Pasie Batang, a $3\frac{1}{4}$ -fathom patch, and Pasie Sinoat, a 6-fathom patch, lie about 4 miles westward and $2\frac{3}{4}$ miles northwestward, respectively, of Pulau Tende. The discoloration of these two reefs can only be seen at a very short distance.

Pasie Besar is a cluster of reefs, partly dry at low water. The outer edge of this reef is very steep. Pasie Kambala, a $2\frac{3}{4}$ -fathom patch, lies close eastward of the north point

of Pasie Besar. Pasie Selumpis, a $6\frac{1}{2}$ -fathom patch, lies 1 mile farther eastward.

PULAU KAPAS, near the south entrance of Selat Kapas, is highest on its west side and heavily timbered. The surrounding reef projects 600 to 800 yards on the north and south sides, with reefs of $2\frac{3}{4}$ fathoms immediately outside. Between Pulau Kapas and the coast there is a narrow passage, which can be easily navigated when the reefs are clearly seen. The east shore should be held with a northerly course in depths of 12 fathoms, decreasing to 8 and 9 fathoms off the east point of the island.

ANCHORAGE in 15 to 17 fathoms, sand, can be taken in the bight northeastward of Pulau Kapas. In the south part of this bight is the village of Kapas, and northward of the village the coast is flat and covered with mangroves. The coastal reef projects 600 to 800 yards. If approaching the bight from southward the reef extending from the south point of the bay may be rounded when the small stream that flows in the middle of the village of Kapas bears 115° .

KEPULAUAN SALANDO are two islands lying on the north end of Pasie Salando, a coral reef. The western is 79 feet high and bare; the eastern and larger is 138 feet high and covered with dark vegetation. Many parts of Pasie Salando dry, and at low water springs it is almost entirely dry.

A LIGHT is shown on the eastern islet of Kepulauan Salando.

SELAT KAPAS, lying between Pasie Salando and the coast, is safe and navigable with a least breadth of $\frac{1}{2}$ mile and depths varying from 30 fathoms in the south entrance to 11 fathoms in the north.

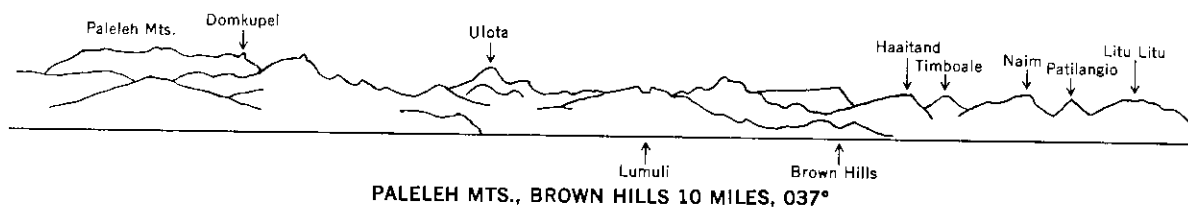
Entering from southward the course through the strait is 006° , keeping rather on the reef side, and Kepulauan Salando must be kept well in line before rounding the cape. A current of 1 knot to 2 knots sometimes runs through the strait, and outside the north entrance is frequently a short and turbulent sea.

PART D. NORTH COAST—TANDJUNG BENAR TO TANDJUNG UTARA

* 11D-1 TANDJUNG BENAR (STROOMEN KAAP) ($1^\circ 20' N.$, $120^\circ 49' E.$) is a prominent rocky bluff bordered by a coral ledge about 400 yards wide. On the end of the ridge forming the cape is a small wood, which appears as an island when first seen. Within this are Lakopamea, 1,545 feet high, and, more to the southward, Sekala (sec. 11C-2). These hills are conspicuous and can be recognized at a great distance.

COAST—GENERAL

11D-2 THE NORTH COAST OF THE CELEBES is almost everywhere precipitous and may be approached closely. The coast is generally high and most of the capes are spurs of the high mountains, which follows the more or less hilly coast at a short distance. In several places there are narrow, bright sand beaches between the dark points of land. The only conspicuous peaks in the west part of the north coast are the Paleleh, a mountain range, visible only in clear weather. They rise at a short distance from the coast and attain an elevation of 7,546 feet.



The coast from Teluk Kuandang to Bolaang-mongondow, a village about 75 miles eastward, is high, with many conspicuous summits rising at a short distance inland affording good bearing points. Between this village and Teluk Amurang there are several conspicuous mountains, Mariri, a rounded hill, 1,539 feet high, Sinong Sajani and Lolombulan, 3,419 and 4,626 feet high, respectively, and a 2,054-foot summit. Northward of Teluk, Amurang is a sharp summit, 2,303 feet high, and eastward of this ridge is Gunung Lokan, 5,197 feet high, with four peaks. Gunung Tumpa, 2,142 feet high, is located on the north side of Teluk Manado.

DEPTHS—DANGERS

11D-3 The 100-fathom curve along the north coast of the Celebes is from less than $\frac{1}{2}$ mile to 10 miles offshore with many dangers along and within the curve. These dangers should offer little difficulties since almost everywhere they show discoloration.

The only known danger outside the 100-fathom curve are KARANG BULOLIO and KARANG BULIOGUT, two large sand and coral reefs. These reefs are steep-to and dry at low water. A BEACON with a white ball topmark stands on the northwest point of Karang Bulolio and a BEACON stands on the northeast point of Karang Buliogut.

OFF-LYING ISLANDS

11D-4 PULAU NAIN-BESAR, lying about 11 miles westward of Tandjung Utara, appears saddle shaped when seen from east or west; the north summit, 630 feet high, is the high peak. PULAU NAIN-KETJIL, a wooded islet, 115 feet high, lies on the surrounding coral reef, eastward of Pulau Nain-besar.

PULAU MANTEHAGE is flat and wooded; the fringing reefs extend about $1\frac{1}{4}$ miles from its north side.

PULAU MANADOTUA is a very steep circular island rising to a height of 2,697 feet in

the form of a truncated cone, and having the appearance of a volcano. This island can be seen from a long distance from the west or north. PULAU BUNAKEN is low, but gradually rises up to a round-topped hill 361 feet high in the west part. PULAU SILADENT is low and nearly covered with coconut trees.

The channels between these islands are deep and clear.

WINDS—WEATHER

11D-5 See section 11-2.

TIDES—TIDAL CURRENTS

11D-6 See section 11-3.

COASTAL FEATURES—LANDMARKS

11D-7 PULAU DOLANGAN ($1^{\circ}22'$ N., $120^{\circ}54'$ E.) about 5 miles east-northeastward of Tandjung Benar, is a flat, thickly wooded island, 147 feet high, lying on a broad, steep-to coastal reef extending from the coast. The island is visible in clear weather for about 16 miles and is very conspicuous from eastward and westward. A very slight wind causes a troubled sea outside Pulau Dolangan, with some smooth places having a mirror appearance.

There is a basin in the coastal reef entered by a narrow channel $2\frac{1}{2}$ miles southwestward of Pulau Dolangan. Lingadang, a village, is located on the south shore, and a detached reef, partly awash at low water, lies northward of the village, narrowing the fairway between it and the coast to about 200 yards across. There is sheltered ANCHORAGE off the village in $3\frac{3}{4}$ to $7\frac{1}{2}$ fathoms. With good visibility of the reefs vessels can enter safely. A 2-fathom shoal lies in the road about 2 miles east-northeastward of Lakopamea.

TELUK BELONLIGUN is entered between the north end of the peninsula southeastward of Pulau Dolangan and Tandjung Bonto. A conspicuous hill, with a sharp summit 670 feet high, is located in the north part of this penin-

sula. A conspicuous tree stands on the north extremity of the peninsula. The coast between Tandjung Bonto and the village of Belonligun, situated on a narrow tongue of land on the east side of the bay, is low and covered with mangroves. The west and south shores of the bay are hilly and densely wooded. The village of Santiği is located on a sandy point on the west side of the bay opposite Belonligun. Southward of Belonligun is Teluk Assaan, a small inner bay divided into two basins by a coral reef projecting from a conspicuous mangrove point. The northern of these provides little room for a vessel, but there is swinging room in the southern. The channel continues in a south-southwesterly direction from this bay and then penetrates inland with three arms.

A large drying reef extends across the entrance of the bay from Tandjung Bonto, with shoal patches up to $1\frac{1}{4}$ miles westward of that point. A BEACON with a white ball topmark marks the edge of the coastal reef extending eastward from Santiği.

A reef of 5 fathoms lies in the middle of the entrance of the bay, about $\frac{1}{2}$ mile northeastward of Santiği. There is very good sheltered ANCHORAGE in 20 to 25 fathoms, sand, about midway between Santiği and Belonligun villages. There is anchorage for small vessels in Teluk Assaan in 18 fathoms, mud.

To enter Teluk Belonligun steer for Santiği, making good course 190° . When the south end of Pulau Dolangan touches the main coast, alter course to 160° between the coastal reefs on both sides, avoiding the 5-fathom patch. When Santiği bears 262° round the coastal reef on the west side of the channel and steer for the anchorage making good course 227° . The depths in the channel vary from 20 to 40 fathoms.

THE COAST between Teluk Belonligun and the bight off the village of Pindjang, about 8 miles eastward, is high and rocky, and a number of ridges from the mountains form capes with sand beaches between. Tandjung Koko

can be recognized by two large rocks in the water near the beach. Anchorage may be found everywhere along this part of the coast in 10 to 20 fathoms. The depths increase rapidly outside the 20-fathom curve.

DJULIH, a flat rock about 10 feet high and almost submerged at high water, lies about $1\frac{1}{4}$ miles eastward of Tandjung Koko, abreast Dule village. It is surrounded by a coral reef with depths of 3 to 10 fathoms. The passage between the reef and the coast is clear, and by keeping to the shore side a least depth of 14 fathoms will be found.

PINDJANG, two small rocky islets, with several detached rocks surrounded by a drying reef, lie in the bight off the village of Pindjang. The anchorage, protected by the above islets, is northward of the village in 20 to 25 fathoms, sand, and is well sheltered from northerly to northwesterly winds. In a heavy sea in the north monsoon there is better shelter under the islets.

TANDJUNG MANTOK ($1^\circ 19' N.$, $121^\circ 06' E.$) is a high cape rising steeply out of the sea. It can be recognized as distinguished from the high point which forms the east side of the bight off Pindjang village by some yellow patches in the forest which covers the mountains on the coast. Several detached rocks lie at the foot of the cape.

11D-8 THE COAST between Tandjung Mantok and Tandjung Lutumoh is low and flat in the west part, and cliffy, with sand beaches between the rocky points in the east part. There are no dangers on this part of the coast, and anchorage may be found everywhere; the depths, however, rapidly decrease inside the 20-fathom curve. A narrow reef of coral fringes the coast.

TELUK BUSAK, lying between Tandjung Lutumoh and Tandjung Kano, is a fairly spacious bay with good anchorage in 10 to 20 fathoms, although entirely open to northerly and northwesterly winds. Heavy squalls may come at any time in the year from the northwest,

quickly raising a heavy sea and surf. In the east part of the bay is a $\frac{1}{2}$ -fathom coral reef, and in the west part is a 1-fathom reef. Both reefs are very small and not always visible by discoloration.

BUSAK, a heavily timbered, rocky island off the entrance of the bay, is 246 feet high, and surrounded by a narrow reef except on the north-west side. Outside the reef there is deep water. Busak is sometimes difficult to distinguish from the dark background. Some shoal patches with a least depth of 5 feet lie within $1\frac{1}{2}$ miles north-eastward of Busak.

ANCHORAGE can be taken in about 14 fathoms, about 1,800 yards southwestward of Busak.

The bay should be entered by passing westward of Busak, and if it is difficult to see, a very conspicuous valley in the high mountains inland, bearing 112° , should be steered for until near Busak.

TANDJUNG KRAMAT AND TANDJUNG KANDI, the north and northeast extremities, respectively, of a high promontory form a conspicuous landmark. The land between Tandjung Kramat and a sharp-pointed hill, 1,132 feet high, southward appears as an island from a distance westward. The 1,545-foot summit and the 1,348-foot peak southward of Tandjung Kandi are easily seen from eastward. Gantale, immediately eastward of Tandjung Kandi, is a very conspicuous, high rock. Karang Pantuluta, a 6-fathom shoal, lies $1\frac{1}{2}$ miles southeastward of Gantale. Teluk Bilang, on the southeast side of the peninsula, is almost taken up by a drying part projecting from the shores.

ANCHORAGE can be taken in 10 to 20 fathoms between Tandjung Kramat and Tandjung Kandi at a suitable distance from the shore.

There is a strong CURRENT off the head of the promontory and a short turbulent sea.

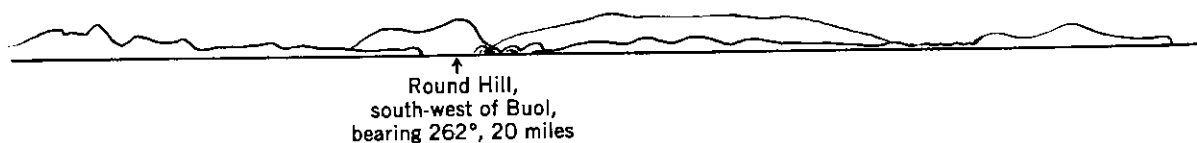
LEOK and BUOL are two villages located southward of Teluk Bilang, and they are visited regularly by coastal vessels. Anchorage can be taken in 30 fathoms about $\frac{1}{2}$ mile offshore. It is not advisable to approach in less than 15 fathoms, as inside the depths decrease rapidly. These two roadsteads are unsafe during easterly winds, since heavy rolling quickly arises.

A large house with a zinc roof and the flag-staff are conspicuous at Buol. The 1,493 foot hill southwestward of Buol is a good landmark.

A LIGHT is shown at Leok.

11D-9 THE COAST forms two small inlets, Lokodidi and Lokodoko, about midway between Buol and Tandjung Kandjai; these are, however, of little importance, and the entrances are very narrow. A reef of 2 fathoms lies in the middle of Lokodoko, the eastern bay. Close to the coast, between these two bays, there is a wooded hill, 443 feet high, affording a good landmark. Between Tandjung Kandjai and Lokodoko several reefs consisting of sand and coral, lie inside the 100-fathom curve. Westward of Lokodoko there are no known dangers.

PULAU RADJA and BOKKI are two low islets with vegetation surrounded by extensive drying reefs. There is a safe passage between them as the reefs are sharply defined by discoloration. Karang Belanda, a rock above water surrounded by a reef, lies 3 miles eastward of Pulau Radja.



Round Hill,
south-west of Buol,
bearing 262° , 20 miles

CELEBES, NORTH COAST, EAST APPROACH TO BUOL.

PALELEH, a village in ruins, lies on the west side of the large bay between Tandjung Kandjai and Tandjung Lobu. The coastal village of Lintidu lies northward of Paleleh, and a short distance inland are the abandoned mines of the former Paleleh Mining Co. There is a landing pier southward of Paleleh at the village of Tang. Pulau Palele lies abreast the high tongue of land between Paleleh and Tang; the island has a hill, 98 feet high, near its south end and is surrounded by a partly drying reef.

The best anchorage is southward of Jellesma, a small islet south of Pulau Palele, although care must be taken not to approach too closely because of the shoal water extending $\frac{1}{4}$ mile from it. A small $2\frac{3}{4}$ -fathom patch lies about 1 mile eastward of the south end of Pulau Palele.

Three reefs lie in the entrance of the bay and within the 100-fathom curve. Karang Lobu, a $6\frac{1}{2}$ -fathom shoal, 1 mile northwestward of Tandjung Lobu, Karang Taonala, a $2\frac{3}{4}$ -fathom shoal, 1 mile farther westward, Karang Bulilanga, a $3\frac{3}{4}$ -fathom shoal, $1\frac{3}{4}$ mile northward of Pulau Palele.

THE COAST between Tandjung Lobu and Tandjung Sumalata ($1^{\circ}03' N.$, $122^{\circ}27' E.$), forms a large number of small bights and inlets separated by high points projecting far into the sea, spurs from the lofty mountains. Within the 100-fathom curve the depths rapidly decrease and the bottom is irregular. Pulau Tolinggula, 197 feet high, about 1 mile eastward of Tandjung Huludebango, has a drying reef

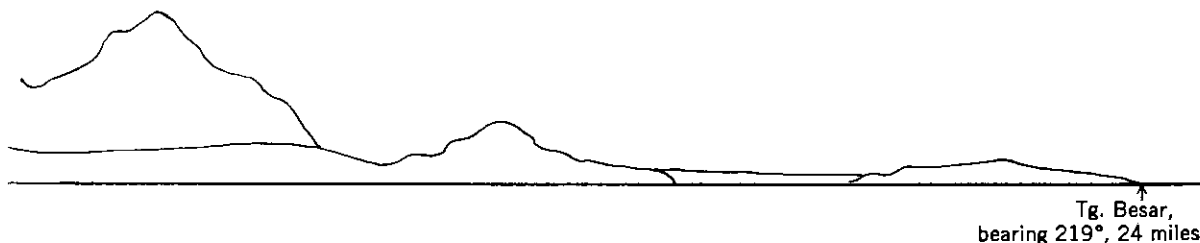
projecting $\frac{1}{2}$ mile from its north point, and Pulau Bulaedo, about $2\frac{1}{2}$ miles westward of Tandjung Buloli, is surrounded by a drying reef. A $2\frac{1}{2}$ -fathom shoal lies about 3 miles west-northwestward of Tandjung Buloli, and a 5-fathom shoal lies about $2\frac{1}{2}$ miles west-northwestward of Tandjung Sumalata. The remaining known dangers all have 8 fathoms or more water over them.

See section 11D-3 for Karang Bulolio and Karang Buliogut.

The roadstead off the village of SUMALATA, about $4\frac{1}{2}$ miles southeastward of Tandjung Sumalata, affords very good anchorage in the south monsoon and fair anchorage in the northwest monsoon. The road is protected from easterly winds by the wooded Pulau Dujonumo and the reef southward of its east point. Ulawa, a low islet, lies about 1 mile northwestward of Pulau Dujonumo and $\frac{3}{4}$ mile northeastward of the island is a large reef drying at low water. A $3\frac{3}{4}$ -fathom shoal lies about $\frac{3}{4}$ mile south-southeastward of the east point of Pulau Dujonumo. In the Northwest Monsoon there is safe ANCHORAGE in 17 fathoms southward of Pulau Dujonumo with a hawser to the shore. Loading and unloading is carried on by lighters.

Vessels call regularly at Sumalata.

11D-10 TELUK KUANDANG, lying between Tandjung Dondo and Tandjung Besar, is full of islets and reefs, the latter generally seen by discoloration. Most of the islets are fairly high and closely wooded, and several of



CELEBES, NORTH COAST, NORTH-EAST APPROACH TO TELUK KUANDANG.

them are inhabited. Pulau Motuo, northeastward of Tandjung Dondo, has a densely wooded summit 863 feet high, visible from a long distance. Pulau Papaja westward of Pulau Motuo is flat. Pulau Huha lies northward of Tandjung Besar.

NAVIGATIONAL AIDS—DANGERS.—

A light is shown on Pulau Hulawa.

A light is shown from the coast southward of Pulau Pajunga.

A beacon surmounted by a square topmark marks the west side of Antoinette, a 2-foot shoal, lying about 2 miles southwestward of Tandjung Besar. A beacon with a black cone topmark marks the north edge of Phoenix, a reef, lying about $2\frac{1}{2}$ miles south-southwestward of Antoinette, and a beacon surmounted by two red cylinders marks the south side of a drying reef about $1\frac{3}{4}$ miles northeast of the north extremity of Pulau Otangala. A $1\frac{1}{2}$ -fathom patch lies about $1\frac{3}{4}$ miles north-northwest of the northern extremity of Pulau Otangala.

Laimula Reef, with a least depth of $3\frac{1}{4}$ fathoms, lies $2\frac{1}{2}$ miles northward of Pulau Motuo, and Haarlemmermeer, and extensive reef, with a least depth of $1\frac{1}{2}$ fathoms, lies near the 100-fathom curve, and is the northernmost danger off Teluk Kuandang.

The usual ANCHORAGE is on the east side of the Pulau Pajunga in 6 fathoms or more, mud, and is safe in both monsoons.

The village of Kuandang is located south of the anchorage and can not be seen from the road. A customhouse is located on the point southward of Pulau Pajunga. Poultry and fish are the only provisions obtainable. Vessels call at Kuandang regularly.

DIRECTIONS.—From westward vessels may pass either north or south of Pulau Papaja and Pulau Motuo and thence between Pulau Otangala and the drying reef northward. In the passage southward of Pulau Papaja are two reefs with depths of less than 6 feet. At night it is advisable to stay outside the 100-fathom curve and approach the anchorage from eastward.

From eastward the passage to the anchorage is between Pulau Huha and Pulau Hulawa and

then passing westward of Antoinette and eastward of Phoenix.

THE COAST between Tandjung Besar and Teluk Domisil, about 48 miles eastward, is generally high, with mountains rising a short distance inland. There are several anchorages located along the coast.

Lokokaja and Malo are two islets about 6 miles eastward of Tandjung Besar. Kuala Reef, with a depth of 6 feet, lies about $\frac{3}{4}$ mile eastward of Lokokaja. Anchorage can be taken in 12 fathoms about $\frac{1}{2}$ mile westward of Malo. It was reported (1961) that two steep-to coral reefs were located about $\frac{1}{2}$ mile southwestward and $1\frac{1}{4}$ miles westward of Malo.

TELUK HIMANA ($0^{\circ}56' N.$, $123^{\circ}05' E.$), about 9 miles east-southeastward of Tandjung Besar, affords sheltered anchorage from all except northerly winds in depths of 5 to 7 fathoms in a circular basin just inside the entrance of the bay, which is about 600 yards wide. The inner part of the bay is greatly taken up by a bank of sand, mud, and stones, which partly dries.

TELUK BUKO, about 4 miles eastward of Teluk Himana, is entirely open to northwest winds and unsafe during the Northwest Monsoon.

LABUAN BROKO, about 2 miles southward of Tandjung Dulang, affords anchorage south-southeastward of the rocky north point of the bay, but is unprotected from easterly and northerly winds. There is also anchorage for small craft in a basin southward of Pulau Damar and Nanggulet, two islets lying on an extensive reef projecting westward from Tandjung Lobok, forming the east side of the bay. The basin about 600 yards broad, with depths of $\frac{3}{4}$ fathom to $2\frac{1}{4}$ fathoms, is entered through a narrow passage with a least depth of 1 fathom.

A LIGHT is occasionally shown in a position near the edge of the reef which extends northwestward from Pulau Damar.

Anchorage can be taken off the village of Kaidipang, southward of Tandjung Lobok, in about 9 fathoms, sand. There is also anchorage off the village of Bolaangitam, about $2\frac{1}{2}$ miles farther eastward, in about 13 fathoms.

OFF-LYING REEFS AND DANGERS.—

There are numerous reefs and dangers along and within the 100-fathom curve between Tandjung Besar and Tandjung Binta, about 40 miles eastward. Beontong, the eastern of these, a $1\frac{3}{4}$ fathom patch, lies about $6\frac{1}{2}$ miles west-northwestward of Tandjung Binta. A $6\frac{1}{2}$ -fathom patch lies about 5 miles northward of Tandjung Binta. A $5\frac{1}{2}$ -fathom shoal lying about 10 miles northeastward of Tandjung Dulang is the northernmost danger. The remaining reefs and dangers can best be seen on the chart.

11D-11 TELUK DOMISIL affords sheltered anchorage in the upper part from all winds except north-northwest to north. The shore of the bay is fringed by a narrow drying reef very steep to at the entrance. A detached drying reef lies $\frac{1}{2}$ mile southward of the eastern entrance.

KEPULAUAN TIGA are three wooded islets, each surrounded by partly drying reefs. Pulau Paniki, 310 feet high, is the northern islet, Pulau Tenga, 369 feet high, the middle islet, and Pulau Tundonia, 231 feet high, the southern islet. In the narrow passage between Pulau Tundonia and the coast there are depths of 17 to 26 fathoms. A 1-fathom reef lies in this passage about 400 yards from the coast.

TELUK BOLAANGUKI, about 7 miles eastward of Kepulauan Tiga, affords very good and sheltered anchorage, with protection from the strong westerly winds. Tikus, an islet covered with vegetation, lies on the east side of the entrance. A steep, partly drying reef projects 400 yards from the islets south side. The general depths in the bay are 10 to 16 fathoms. A $5\frac{1}{2}$ -fathom patch lies about 800 yards eastward of the west entrance of the bay, and a detached drying reef lies about $\frac{3}{4}$ mile south-southeastward of Tikus.

MOLOSSO is a hilly islet lying about 2 miles offshore. A $1\frac{1}{4}$ -fathom patch lies about $1\frac{1}{2}$ miles southwestward and $4\frac{3}{4}$ miles east-northeastward, respectively, of Molosso.

A $5\frac{3}{4}$ -fathom patch lies about $2\frac{1}{4}$ miles northwest and $3\frac{3}{4}$ miles north-northeastward, respectively, of Molosso.

THE COAST between Molosso and Tandjung Nonapang has several hills which are conspicuous. Ompu, 705 feet high, Banka, 564 feet high, close northeastward, and Mariri (sec. 11D-2). There is good anchorage in 18 to 20 fathoms about 600 yards off the village of Bolaang-mongondow, although open to westerly winds. Northward of the road a line of reefs, some of which partly dry, runs parallel with the coast over a distance of about 4 miles. It is advisable to pass outside these reefs if without local knowledge and coming from eastward. The foot of the hills Banka and Ompu close together, with the right side of Bokki, 1,978 feet high, located southward of Teluk Bolaanguki, bearing 235° , will lead between the reef and the coast.

A white BEACON, surmounted by two black cones, points up, stands close within the 3-fathom curve off Bolaang-mongondow.

The bank off the mouth of the river close northeastward of the beacon is gradually extending and partly dries.

Anchorage can also be taken in about 30 fathoms off the village of Inobonto, close eastward of Banka, with the flagstaff in line with the customs shed bearing about $213\frac{1}{2}^\circ$.

All along this section of coast rollers quickly arise, and communication with shore may be broken.

THE COAST northeastward to Teluk Amurang has hills running close along it, except near Poigar where there is a low plain, with a strip of land in front covered with mangroves. Anchorage can be taken off the mouth of the Sungai Poigar in 30 to 35 fathoms about 400 yards offshore, and of Poigar, in a small bay 1 mile to the northward, in 36 to 40 fathoms, the same distance offshore.

11D-12 TELUK AMURANG ($1^\circ 15' N.$, $124^\circ 32' E.$) is entered between Tandjung Wa-

lintau and Pulau Tetapaan, a low, thickly wooded island, lying on a drying reef projecting from the coast. Close eastward of Pulau Tetapaan and in Pelabuhan Luak, farther eastward on the north shore, are two small inlets affording shelter for small vessels against the Barat.

Tandjung Mobongo, located close southeastward of the northeast point of the peninsula forming the west side of the inner bay, bearing 144° , or a round-topped tree, northeastward of Amurang, in line with a hill, 138° , leads clear of the reef off Pulau Tetapaan. The latter mark is difficult to find without local knowledge, but Tandjung Mobongo can be seen from a great distance.

The roadstead off the village of Amurang in the inner bay is safe during the whole year but the bottom is very steep, and it is necessary to secure astern with a land-fast.

A LIGHT is shown at Amurang.

The best ANCHORAGE is in 40 fathoms, sand, about 200 yards from the beach, with the flagstaff of an old fort bearing about 148° . Vessels should approach the shore with about 40 fathoms of chain out, veering to 90 and 95 fathoms when the anchor holds, and then securing with a land-fast or stern anchor. There is another anchorage about $\frac{3}{4}$ mile northwestward of Amurang, near a coffee warehouse, taking care during the Selatan season to bring a stern fast to southward.

AMURANG is connected with the general telegraph system and regional telephone system. Vessels call at Amurang regularly. A few lighters are available.

THE COAST between Pulau Tetapaan and Tandjung Kelapa is fringed by a broad coastal reef extending nearly 2 miles offshore, with several reefs outside, all very steep but plainly marked by discoloration. There are some deep inlets in this coastal reef, in one of which the village Arakan is situated. This stretch of coast should not be approached within 3 miles.

TELUK TANAHWANGKO lying between Tandjung Kelapa and Tandjung Kokupa has a narrow coastal reef except near the latter point where it projects about $\frac{1}{2}$ mile.

TELUK MANADO, entered between Tandjung Kalasei and Tandjung Pisok is fringed by a narrow coastal reef, except off Tandjung Pisok where it projects 800 yards westward. This part of the reef is steep-to, and the greater part dries at low water. The depths in the bay are very great except close under the shore.

MANADO ($1^{\circ}30' N.$, $124^{\circ}50' E.$)

11D-13 MANADO is located on both sides of the mouth of the Salo Manado, which empties into the head of the bay. A mole extends from the north entrance of the river and a short mole from the south entrance. A basin for praus, with a depth of 3 feet, is located on the south side of the river inside the moles. The roadstead lies off the town.

WINDS AND WEATHER.—Although the bay is spacious and free from dangers, the road affords an insecure anchorage, especially in the months of December, January, and February when it becomes unsafe. The Barat during these months brings such a high sea and swell that it entirely interrupts communication with the shore. When this happens, a blue flag will be displayed by day, and by night, a red light will be shown under the light at the head of the south mole. Vessels should have steam kept up during this time.

The Barat seldom occurs without the warning sign of black clouds which envelop Pulau Manadotua (sec. 11D-4) or a dark lead-colored sky to seaward, usually about $\frac{1}{2}$ hour before the wind starts to blow. Two or three hours' warning may be expected if the wind is going to be severe.

During other months of the year, it is squally, particularly in the evenings after the land breeze sets in, and during the Selatan. Communications with the shore are not interrupted.

September, October, and May are the best months of the year. (See appendix for Climatological Table.)

NAVIGATIONAL AIDS.—Manado Light is shown from a position about $\frac{1}{4}$ mile south-eastward of the river mouth. A light is shown on the head of the north and south moles, respectively.

A beacon, surmounted by a white ball, marking the north limit of the roadstead, stands about 700 yards northward of the river entrance.

A beacon, surmounted by a red diamond, stands on the root of the south mole. Two beacons, each surmounted by a red ball, in range 108° , stand about 275 yards southward of the root of the south mole.

A beacon surmounted by two black triangles stands on the reef lying about 400 yards west-northwestward of Tandjung Tokabene, located about $\frac{3}{4}$ mile southward of the river mouth.

Four prominent silver painted tanks stand on Tandjung Tokabene.

HARBOR LIMITS.—The north limit of the roadstead is the parallel through the north beacon described above; the south limit is the parallel of a position on the coast about $1\frac{1}{2}$ miles south-southwestward of the river entrance.

ANCHORAGE.—Anchorage may be taken in about 30 fathoms less than $\frac{1}{2}$ mile from the shore. The foul areas mentioned below should be avoided. A vessel should approach the anchorage with about 45 fathoms of chain out. Anchoring southward of Tandjung Tokabene is inadvisable. If compelled to leave the anchorage because of bad weather, vessels may take shelter in Selat Bangka, or anchor off the village of Kima in Teluk Wori (sec. 11D-15). Cargo for Manado can be discharged at the latter place.

FOUL AREAS.—Lost anchors and chains have fouled the bottom off Manado in several places. Three foul areas lie between 400 and 800 yards northwestward of the head of the south mole. Another foul area lies about 550 yards westward of the head of the south mole.

Foul areas also lie about 875 yards west-southwestward and about 1,000, 1,100, and 1,400

yards westward, respectively, of Manado Light.

Anchorage should not be taken within 150 yards of these positions.

11D-14 MANADO is the capital of the province of North Sulawesi, and from seaward the galvanized roofs are first sighted. The estimated population (1962) was 200,000. The town extends in two long tree-planted avenues parallel with the shore. The principal export is copra. Other exports are coffee, rubber, cloves, resins, ebony, maize, and nutmeg.

There are no wharves for large vessels. Harbor and port facilities include four towing launches, 10 lighters of 10 to 15 tons capacity, 6 lighters of 50-ton capacity, a small dredger, and about 40,000 square feet of covered storage space.

The oiling berth is about one mile south of Manado Light structure. Vessels let go both anchors in about 30 fathoms and moor the stern to three buoys in about 4 fathoms. This berth is not suitable for vessels over 220 feet in length.

SUPPLIES.—Local produce is obtainable. No water is available to shipping.

Fuel oil in drums is delivered by lighter. Coal is unattainable.

REPAIRS.—Repairs may be had for small boats and small metal castings may be made.

A small marine slipway capable of handling vessels up to about 100 tons is available.

There is a small government wrecking tug.

COMMUNICATIONS.—Manado is connected to the general telegraph system and the regional telephone system. Coastal vessels call regularly at Manado. There is bi-weekly air service with Surabaya. There is a radio station at Manado.

HOSPITALS.—There is a government hospital with 500 beds and X-ray facilities. There is a wing for infectious diseases. Disinfecting appliances are available.

COASTAL FEATURES—LANDMARKS (CONTINUED)

11D-15 THE COAST between Tandjung Pisok and Tandjung Utara is low and covered

with mangroves to the water's edge. It is broken by several creeks, on which there are fishing villages, and is bordered by a generally narrow reef.

TELUK WORİ (1°37' N., 124°52' E.) affords a sheltered anchorage when landing at Manado is impracticable. Three reefs, with a least depth of 13¼ fathoms, lie off the entrance of the bay, and discolor poorly. A dangerous sunken rock lies on the northeast side of the entrance of the bay. The passage between the two western reefs is nearly 500 yards wide, with a least depth of 17 fathoms. The south point of Pulau Siladeng, bearing 288° astern,

leads between the above two western reefs.

Anchorage can be taken inside the above reefs in 24 fathoms, with the west entrance point of the bay bearing 180°. Another anchorage is farther up in the bay off the village of Kima, in 18 fathoms with a hawser to the shore.

The village of Wori lies on the south shore of the bay.

TELUK KORA KORA affords good sheltered anchorage in about 19 fathoms. The entrance of the bay between the reefs on either side is only about 150 yards wide. A fairly strong tidal current may set across the entrance of the bay.

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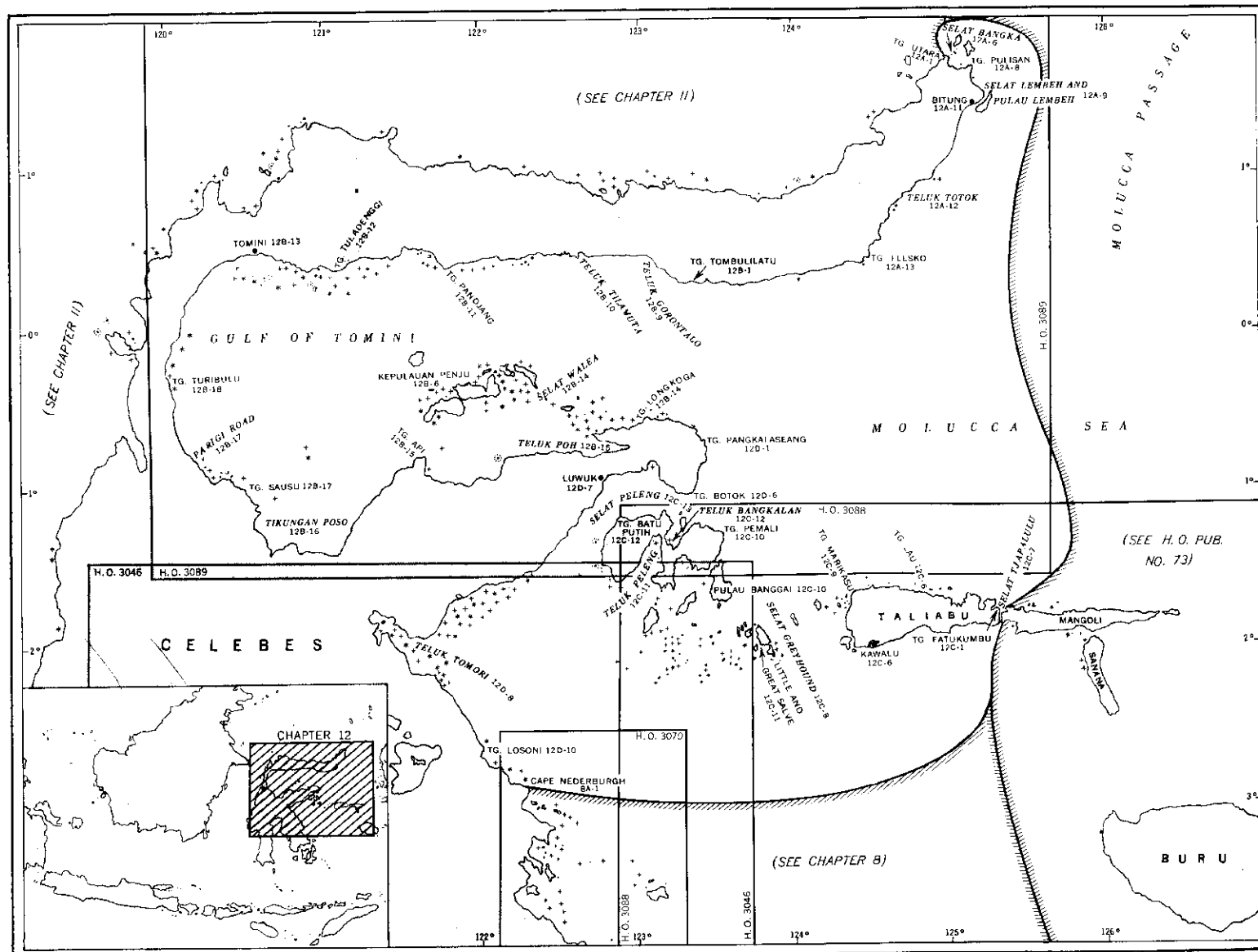
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CHAPTER 12

EAST COAST OF CELEBES

- Part A. Tandjung Utara to Tandjung Tombulilatu.
- Part B. Teluk Tomini.
- Part C. Kepulauan Sula and Kepulauan Banggai.
- Part D. Tandjung Pangkalaseang to Cape Nederburgh.

PLAN.—This chapter describes the east coast of Celebes from Tandjung Utara to Cape Nederburgh, including the Kepulauan Banggai and the western island of the Kepulauan Sula, and intervening straits. The coastal description is from north to south.

GENERAL REMARKS

12-1 The eastern peninsula of the Celebes separating Teluk Tomini and Teluk Tomori is the least known of all the peninsulas of the Celebes. A chain of islands, consisting of the Kepulauan Banggai and the Kepulauan Sula, extends about 200 miles eastward from this peninsula.

Bitung, the only port of importance, stands on the Celebes coast at the south end of Selat Lembeh. Good anchorage can be taken in the numerous inlets and bays along the east coast of the Celebes during both monsoons.

WINDS—WEATHER

12-2 In the north entrance of the Molucca Sea the monsoons are powerful and constant; they blow chiefly from the north and south. The south monsoon prevails from June to November and the north monsoon blowing from north to northeast prevails from December through April. The south monsoon is somewhat more powerful and regular than the other, but a force of more than six has not been reported, and hard gusts of wind are rare in the south part of this entrance.

Rain falls all year round with the greatest in June, July, and January, and the least in February, March, September, and October.

For the description of the winds and weather on the remaining part of the east coast of Celebes see section 8-2.

For the description of the winds and weather in Teluk Tomini see section 12B-4.

CURRENTS—TIDAL CURRENTS

12-3 Currents in the Molucca Sea are chiefly drift currents, with the general directions of north-northwest or south-southeast. A rate of 2 knots may be reached during the south monsoon, but as a rule is about $\frac{1}{2}$ knot. During the north monsoon the rate may exceed 2 knots, but as a rule is about $\frac{3}{4}$ knot. The greatest known set is 57 miles to the north-northeastward in a 24-hour period.

A rather high swell can develop with north winds, and during the south monsoon, especially in July and September, high seas frequently occur.

For a description of the currents in the Banda Sea see section 8-3.

PART A. TANDJUNG UTARA TO TANDJUNG TOMBULILATU

12A-1 TANDJUNG UTARA (1°45' N., 124°59' E.) is conical when seen from east or west, rising gradually to the hilly land. The point is fringed by a coral reef about 50 yards wide and very steep-to, and on its east side there is a beach of white coral.

COAST—GENERAL

12A-2 The coast between Tandjung Utara and Tandjung Pulisan, forming the south side of Selat Bangka, is low and of little importance to navigation. The islands forming the north side of the strait are more or less hilly and heavily wooded.

The coast between Tandjung Pulisan and Tandjung Flesko, about 85 miles southwestward, is steep-to with the spurs of high land standing fairly close to the sea forming conspicuous points along the entire coast. Gunung Klabat is a very conspicuous cone standing by itself, rising to a height of 6,634 feet from a low base visible 60 miles in clear weather. Gunung Duasudara, eastward of Gunung Klabat, has a double peak, the western 4,478 feet and the eastern 3,888 feet high. Gunung Batu Angus, 3,721 feet high, has a more rounded summit than Gunung Duasudara. A crater has opened on the east slope of Gunung Batu Angus; it is a truncated cone, 1,447 feet high, with less vegetation than the other mountains.

During the south monsoon these mountains are generally entirely visible in the mornings, but are frequently hidden by 0800. Gunung Klabat, it was noticed, often remained clear while the mountains more eastward were covered.

A densely wooded ridge, attaining a greatest height of 3,868 feet, parallels the coast, about 5 miles inland, and south of Donau Tondano, between Gunung Klabat and Gunung Kaweng. Numerous spurs approach the coast from this ridge, with occasional sandy beaches between.

Southward of the high volcanic group formed by Gunung Sopotan, Sempo, Manimporok, and Kawatak is a low plain extending to the coast.

From a position about 24 miles northward of Tandjung Flesko the mountains are closer to the coast. Some of the more conspicuous peaks are Pegunungan Mata Mata, a round summit 3,921 feet high, a 5,223-foot peak west-northwestward, and a 5,010-foot and a 5,788-foot summit farther to the southwestward. Gunung Ambang, 5,981 feet high, is also conspicuous.

During the south monsoon mountains above about 3,300 feet are hidden in clouds from about 0800 for the rest of the day.

There are few conspicuous peaks between Tandjung Flesko and Tandjung Tombulilatu. Bali Hill, 3,126 feet high and the peaks of the Pegunungan Sinandaka are the most prominent but like the rest of the above coast these mountains are hidden in clouds during the south monsoon from about 0800 for the rest of the day.

DEPTHS—DANGERS

12A-3 The 100-fathom curve from a position close northward of Tandjung Utara encompasses the islands forming the north side of Selat Bangka, then approaches the coast again at Tandjung Pulisan. From Tandjung Pulisan the 100-fathom curve follows the coast and is from less than ½ mile to about 5½ miles off-shore with many dangers within the curve.

There are no known dangers outside the 100-fathom curve.

WINDS—WEATHER

12A-4 See section 12-2.

TIDES—TIDAL CURRENTS

12A-5 See section 12-3.

SELAT BANGKA

12A-6 SELAT BANGKA lies between the northeast coast of Celebes and a group of islands of which Pulau Gangga, Pulau Talise, and Pulau Bangka are the principal ones. A

straight course from one entrance point to the other will pass north of Karang Korrier, a $2\frac{3}{4}$ -fathom patch lying about $7\frac{1}{4}$ miles east-south-eastward of Tandjung Utara. This shoal patch is usually marked by tide rips. The water is generally very clear, and the bottom can often be seen in 8 to 10 fathoms.

DANGER AREA.—Selat Bangka is a dangerous area because of mines. See H.O. Pub. No. 110 DAPAC.

TIDAL CURRENTS.—The currents in the strait are semidiurnal and attain a rate of 2 to 3 knots at springs. The current sets westward during the rising tide and eastward during the falling tide. The west-going current has a branch to northward, and one that runs between Pulau Gangga and Pulau Lehaga. Vessels should not pass too closely along the south point of Pulau Gangga or Pulau Bangka.

The east-going current is joined with a south-east set between the islands, particularly along the west coast of Pulau Bangka. Tide rips are formed off all the salient points.

THE SOUTH SIDE OF SELAT BANGKA is low and only important for making the road off the village of Likupang. Tandjung Bohoi, about 2 miles southeastward of Tandjung Utara, is a low, rounded point fringed by a reef, which dries. Tamperong is a low island lying southward of Tandjung Bohoi. The reefs in the bight between Tandjung Bohoi and Likupang are well marked by discoloration.

The road off Likupang affords good shelter during the south monsoon in 7 to 9 fathoms with the middle of the village bearing 200° and Tandjung Bohoi bearing 314° . Smaller vessels can anchor closer in but care should be taken to remain northward of the line of a black pyramidal rock, 18 feet high, lying close off the point about $3\frac{1}{2}$ miles westward of Tandjung Pulisan and the first point eastward of Likupang. Vessels approaching the roadstead should take care to avoid Karang Korrier and the $3\frac{3}{4}$ -fathom patch lying about $1\frac{1}{2}$ miles west-southwestward. Only vessels with local knowledge

should approach the road, and then under the most favorable conditions.

Likupang is a village of little importance standing on the west side of a small river. The two points eastward of the river are covered with trees to the edge of the water.

TANDJUNG PULISAN is a bold point with large boulders off it and a narrow fringe of coral. From the cape the land rises abruptly to a high tableland 909 feet high, 1 mile long, and thickly wooded, easily distinguished from all sides by its square, boxlike aspect. **BATU PANDITA**, lying close off Tandjung Pulisan, is a sharp pointed rock, about 30 feet high, with a white top.

12A-7 THE NORTH SIDE OF SELAT BANGKA consists of several islands, all of which lie within the 100-fathom curve. **PULAU GANGGA**, about 330 feet high at its south end, is steep-to on its east side, and fringed by a reef on its south and west sides. **PULAU LEHAGA**, 109 feet high, lies close westward of Pulau Gangga. **PULAU TINDILA**, separated from Pulau Gangga by a narrow channel available only for boats, is rocky in its north part and has a white sandy beach on its south end. A reef extends about 800 yards from the west side of the islet, and depths of 6 fathoms or less extend about 400 yards northwestward from its north end. The channel between Pulau Tindila and Pulau Talise is about 400 yards wide, and has depths of 8 to 15 fathoms.

PULAU TALISE is a high, narrow island, with a ridge extending nearly the entire length, the central peak being 1,148 feet high. Tandjung Arus, the north point of the island is a bold cliff with large broken rocks at its base and is steep-to. Along the west side of the island the coastal reef dries out to about 200 yards. The south end of the island is low.

A **LIGHT** is shown on Tandjung Arus.

TALISE ROADSTEAD lies between the southeast point of Pulau Talise and Pulau Kinabohutan, a low, wooded island with a hill

about 60 feet high on its south side. There is a narrow channel, available for small boats, between Pulau Talise and Pulau Kinabohutan.

There is a stone mole with a house near the inner end of the mole at Talise. Mooring buoys are located in the roadstead.

A $4\frac{1}{2}$ -fathom patch lies about 600 yards southeastward of the head of the mole. A $1\frac{3}{4}$ -fathom patch, with a 3-foot shoal close north-eastward of it, lies about 200 yards south-south-eastward of the head of the mole. A detached patch with a depth of less than 6 feet lies about 700 yards westward of the southwest extremity of Pulau Kinabohutan.

ANCHORAGE is available, in 10 to 12 fathoms, off the head of the mole, with the west extremity of Pulau Kinabohutan bearing 047° . Vessels call at Talise regularly.

PULAU BANGKA is of irregular contour, and densely wooded, with the exception of several clear spaces of coarse grass. The summit of the island is 1,158 feet high. To the westward of it are several round-topped conical hills ranging from 600 to 800 feet high. The north point of the island is formed by low mangroves. Batu Kapal, a rock, 14 feet high, rises at 400 yards from the point and is connected with it by a coral reef. Tandjung Batu Gosoh, the east point of the island, is a sharp, conical hill, 266 feet high, wooded, and joined to Pulau Bangka by a low neck of land. To the northeast the point ends in a succession of sharp needle rocks, the outermost of which are surrounded by water and are 15 to 20 feet high. Off Tandjung Toto, $1\frac{1}{2}$ miles to the southward, there are some rocks above water.

In Djiko Sago there is ANCHORAGE in about 20 fathoms, $\frac{1}{2}$ mile from shore. The south side of this bay is formed by a narrow tongue of land with an extensive reef projecting to the southward, on which are Pulau Sahaong and several rocks above water, against which the sea breaks.

The south point of Pulau Bangka is a low, cliffy point rising to a conical hill 266 feet high.

There are heavy tide rips off the point. The west coast of the island is low and fringed by coral extending about 200 yards from shore.

The west point of the island is a low, dark, red cliff with trees.

The island has been reported to be a good radar target at a distance of 20 miles.

DIRECTIONS FOR SELAT BANGKA.—From westward Tandjung Utara may be passed at a distance of $\frac{1}{4}$ mile and then a course 097° , keeping the south end of Pulau Nain-besar (sec. 11D-4) just touching Tandjung Utara, will lead clear of all dangers, with 8 fathoms least water, until the northeast end of Pulau Talise and the west point of Pulau Bangka are in range; a course may then be steered to pass $\frac{1}{4}$ mile from Tandjung Pulisan.

From eastward steer for the gap between Pulau Gangga and Pulau Tindila until the northeast extremity of Pulau Talise and the west point of Pulau Bangka are in range and do not open them until the south tangent of Pulau Nain-besar is just touching Tandjung Utara, bearing 277° ; then steer for Tandjung Utara on that line.

To pass through the channel between Pulau Bangka and Pulau Kinabohutan from northward, taking care not to stand into less than 10 fathoms, the west point of Pulau Bangka should be steered for, bearing 180° until the south extremity of Pulau Kinabohutan bears 267° . A course of 219° then leads through the channel in the deepest water, over 10 fathoms.

COASTAL FEATURES

12A-8 THE COAST between Tandjung Pulisan ($1^\circ 41' N.$, $125^\circ 10' E.$) and Tandjung Batu Angus, the north entrance of Selat Lembeh, consists of long, steep beaches of coarse, black volcanic sand in the north part, while the south part is low, rocky, and thickly wooded rising continuously at the back to the summit of Gunung Batu Angus.

PULAU KALINAON, about 250 feet high and wooded, is joined to the mainland by a reef

which also extends nearly $\frac{1}{4}$ mile to the southward.

PULAU MOGOGIMBUN is a small, wooded conical island, 163 feet high. A reef, with several rocks on it, two of which show at just about high water, extends from the north side of the island. The sea breaks heavily on these rocks with the least sea or swell.

ANCHORAGE is available in the bay westward of Pulau Mogogimbun, protected from swell and southerly winds, in 19 fathoms, with Pulau Mogogimbun bearing 093° and Batu Pandita (sec. 12A-6) bearing 022° .

PULAU LEMBEH AND SELAT LEMBEH

12A-9 PULAU LEMBEH is a sparsely inhabited and densely wooded island. The east coast of the island is cliffy and steep-to, and the north end, with a well-wooded range of hills about 600 to 700 feet high, is very narrow, precipitous and steep-to on both sides. The north end of the island consists of large masses of black and red rocks covered with vegetation, and the northeast point of the island is a wedge shaped cliff about 200 feet high. Northward of the north end of the island are a number of detached rocks, against which the sea breaks heavily. BATU KAPAL, the largest of these rocks, is 85 feet high and white from bird droppings. Rocks, about 6 feet high and always above water, extend about 400 yards north by eastward from Batu Kapal.

The northeast point of Pulau Lembek and Batu Kapal may be rounded in safety at the distance of $\frac{1}{2}$ mile, but there is generally a strong tide race.

It was reported (1963) that Pulau Lembek was a good radar target at a distance of 15 miles.

PULAU SUSULINA, about 120 feet high, lies close off the southeast point of Pulau Lembek, and PULAU DUA lies about midway along the south coast and has two peaks, the highest being 310 feet. This islet is steep-to on all sides except its south side from which a shoal extends almost $\frac{1}{4}$ mile.

The south point of Pulau Lembek is formed

by a narrow, hilly tongue of land. A reef extends almost $\frac{1}{2}$ mile to the southwestward, and the whole of the south coast, in which are numerous inlets, is bordered by an extensive drying reef.

SANDY ISLAND, encircled by a reef, lies about $\frac{3}{4}$ mile west-northwestward of the south point of Pulau Lembek. On the west and north sides the reef is very narrow, but on the south and east sides it extends from 200 to 300 yards. A small detached $2\frac{1}{2}$ -fathom patch lies about $\frac{1}{4}$ mile northward of Sandy Island.

A LIGHT is shown from Sandy Island.

Pulau Lembek has been reported (1957) to be a good radar target at a distance of 15 miles.

SELAT LEMBEH.—This strait is narrow and somewhat intricate, and in the middle of the strait there are two islets and an above-water rock, encircled by reefs with a channel on either side. The channel north and west of the islets and rock is the best, being straight, and the reefs showing clear discoloration. The passage through the strait is only to be recommended for vessels with a length of up to 330 feet. Selat Lembek has been swept to a controlling depth of 36 feet.

Tandjung Labuan Compenie is the east entrance point of the south end of Selat Lembek.

A LIGHT is shown on Tandjung Labuan Compenie.

In the south approach to Selat Lembek is the village of Girian located on the Celebes Coast about 2 miles northward of Tandjung Merah. A sand and mud bank, which is steep-to, extends about 600 yards offshore at Girian. Shoals with depths of less than 1 fathom extend about 1 mile southward from Tandjung Merah.

DANGERS—NAVIGATIONAL AIDS.—In the north entrance of the strait a $1\frac{1}{2}$ -foot pinnacle reef lies almost $\frac{1}{4}$ mile off Pulau Lembek, about $3\frac{1}{2}$ miles south-southwestward of the north extremity of the island. On the Celebes side off the north entrance point of the strait there are two pillar rocks about 39 feet high. A reef extends $\frac{1}{2}$ mile to the northward

and eastward, with several rocks under water at its edge.

In the northern narrows, shoals and reefs extend about 250 yards offshore from the coast and the two islets.

A $3\frac{1}{2}$ -fathom shoal lies near the middle of the channel about $\frac{1}{2}$ mile northeastward of the north islet.

A rock, about 20 feet high, stands about 200 yards northward of the northeast islet, on the edge of the surrounding reef.

A $4\frac{1}{4}$ -fathom patch lies about $\frac{1}{2}$ mile west-southwestward of the south islet in the strait. It is marked by a red can buoy. A $1\frac{1}{4}$ -fathom patch lies about $\frac{1}{4}$ mile southwestward of the south islet, just inside the 10-fathom curve, and is marked by a red can buoy.

Two reefs of $4\frac{1}{4}$ and 5 fathoms lie just outside the 10-fathom curve in the southeast part of the strait. Each reef is marked by a black and white checkered buoy.

An obstruction with a depth of $4\frac{1}{4}$ fathoms, possibly a wreck, lies about $\frac{1}{2}$ mile northwestward of Tandjung Labuan Compenie, in a position about $\frac{1}{4}$ mile from the north shore. A red can buoy is moored on the south side of the obstruction.

Two patches, with depths of 7 and 9 fathoms, lie about 700 yards northeastward of Tandjung Labuan Compenie.

TIDAL CURRENTS.—The tidal currents in Selat Lembeh are mixed, but predominantly semidiurnal. The flood current sets northward through the strait and the ebb southward at the rate of 3 to 4 knots at springs in the narrowest parts. Southward of the narrows, on the Pulau Lembeh side, there is little current, with at times a counter current.

ANCHORAGE can be taken under the Celebes coast at the north entrance of Selat Lembeh, in about 19 fathoms, about 400 yards northward of the two pillar rocks off the north entrance of the strait and with Batu Kapal bearing 056° .

Excellent anchorage is available in 17 to 20 fathoms, sheltered from all winds and sea, southward and southwest of the two islets in

the middle of the strait. There are no strong tidal currents at this anchorage.

BITUNG ($1^\circ 26' N.$, $125^\circ 11' E.$)

12A-10 Bitung, a deep-water port under Indonesian Naval Control, is situated on the Celebes coast northward of Tandjung Labuan Compenie, at the south entrance of Selat Lembeh.

Aer Tembaga is a government fishing station about 1 mile northeastward of Bitung. A private **LIGHT** is occasionally shown from sunset to 2400 on the head of a short pier at Aer Tembaga. Midway between Bitung and Aer Tembaga is a small pier; close southeastward of the head of this pier is a drying reef.

BUOYS.—Two conical buoys, painted in black and white checkers, are moored off the wharf at Bitung. They mark two detached patches with depths of $6\frac{1}{2}$ and 7 fathoms, respectively, which lie on the starboard side of the fairway when viewed from the south entrance of Selat Lembeh.

A red can buoy marks the outer end of a reef which extends about $\frac{1}{4}$ mile eastward from Aer Tembaga.

TIDAL CURRENTS.—The flood tide sets easterly and the ebb westerly, both running parallel to the wharf at Bitung. The turn of the tidal current nearly coincides with the times of high and low water; there is a very short period of slack water. The rate of the current at the wharf is from 1 knot to 2 knots, with the flood the strongest.

PILOTS.—Two pilots are available for berthing vessels and for piloting vessels through Selat Lembeh. Vessels arriving from southward at the southwest end of the strait should anchor in 20 fathoms, sand, about one mile east-northeastward of Tandjung Labuan Compenie, and wait for the Port Authorities and the pilot. Pilots disembark about $\frac{3}{4}$ mile northeastward of the north islet when piloting vessels through the strait. Marine traffic and navigation is prohibited in the waters of Bitung harbor and Selat Lembeh between 1700 and 0630 hours.

DIRECTIONS.—There are no navigational difficulties in approaching the south entrance of Selat Lembah and the wharf at Bitung. The fairway to the wharf is buoyed on its starboard side. To come alongside the wharf, a vessel dropped her starboard anchor when a ship length away. She berthed port side to on the ebb tide. The vessel left the wharf at the end of the flood tide, turning on her anchor without difficulty.

12A-11 **BITUNG**, which has an estimated population of 40,000, has a concrete wharf with four godowns, one of which is partially destroyed. The wharf is 1,410 feet long, but in 1959 only 600 feet of it was used for berthing. There is an obstruction close off the west side of the Wharf. Several ballards are unuseable. The reported depth alongside was 33 feet (1962). Cargo is handled by ship's gear. Exports include copra, cloves, nutmeg, and timber.

The port had one tug in 1961 to assist vessels in docking and undocking. At that time water was obtained by barge.

There is a boatyard in the north part of the town, where fishing vessels are built and repaired.

Bitung is connected with Manado by a partially paved road.

COASTAL FEATURES—LANDMARKS (Continued)

12A-12 **KEMA ROAD.**—This roadstead lies off the village of Kema about $3\frac{1}{4}$ miles southwestward of Tandjung Merah. The village is situated on a plain at the foot of Gunung Klabat, and with the many coconut palms on the beach provides a mark for the approach from seaward. The landmarks most plainly visible are the mosque, a rocky point about $\frac{1}{2}$ mile southward of the mosque, and Batu Nonna, a rock on the drying coastal reef extending from the point. There is a landing at the village.

A small river, the entrance of which is dry at low water, discharges close northeastward of Kema.

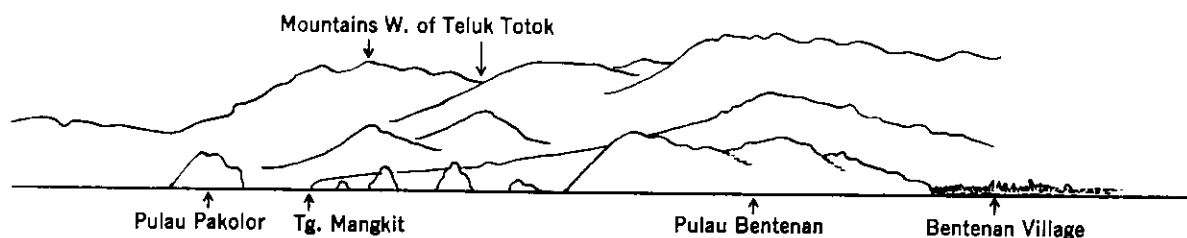
A $3\frac{1}{4}$ -fathom patch and a $5\frac{1}{2}$ -fathom patch lie about 300 yards eastward and 900 yards east-northeastward, respectively of Batu Nonna. A $2\frac{3}{4}$ -fathom patch lies on the north side of the road, about $\frac{1}{4}$ mile offshore, about $1\frac{1}{2}$ miles northeastward of Batu Nonna.

Good **ANCHORAGE** is available in the road throughout the greater part of the year, although open to easterly and southerly winds. In the south monsoon, during the months of June, July, August, and September the swell breaks heavily on the beach, but landing can always be effected in the south part of the road.

There is anchorage southeastward of the village in 5 to 10 fathoms; in 6 fathoms there is fair holding ground. When approaching from southward, vessels must avoid the reef extending from the south point of the bay. When Manado (sec. 11D-13) is unsafe because of the Northwest Monsoon goods can be landed at Kema and sent by road. Kema is connected to the telephone system.

THE COAST between Kema and Pulau Bentenan is low and monotonous, and is fronted by a drying reef projecting 200 to 300 yards, except immediately southward of Kema, where it is 600 yards broad. In northerly and easterly winds there is generally a heavy surf on the coast, and landing can only be effected in places where the coastal reef is broken, where a strip of sand and a few houses and coconut trees are generally found. The only villages on this part of the coast are Rumbia and Bentenan, near Pulau Bentenan. There is good **ANCHORAGE** $\frac{1}{2}$ mile southeastward of the village of Bentenan.

PULAU BENTENAN ($0^{\circ}58'$ N., $124^{\circ}55'$ E.) is a saddle-shaped island, the eastern and highest summit of which is 500 feet high. The island is surrounded, except on its east side, by a drying reef on which there is frequently surf. Near the east side are four steep rocks, and southward of the island three small islets or rocks, of which **PUNTEN** is the southernmost



CELEBES, NORTH-EAST COAST. EAST POINT OF BENTENAN, BEARING 249°.

and is surrounded by a reef. **PAKOLOR**, the outer islet, is 216 feet high with a 3-foot patch lying 400 yards southeastward of it. This patch is visible during calm water because of current rips and during swell by rollers.

The passage between Pakolor and Pulau Bentenan is clear and safe, although the water is very troubled with the wind against the current. Strong currents may flow at times in the passages between Pulau Bentenan and the islets to the southward, and between these islets and the Celebes coast.

THE COAST between Pulau Bentenan and Tandjung Flesko is generally low and monotonously forested. This stretch of coast is indented with numerous bays, and several islets lie off the coast. The more conspicuous mountain peaks inland along this part of the coast have been discussed in section 12A-2.

BELANG ROADSTEAD.—This road lies off the village of Belang, about 7 miles west-southwestward of Pulau Bentenan, and affords shelter during the greater part of the year. The village is fairly large, a few white houses with zinc roofs can be seen at a great distance. Good **ANCHORAGE** is in 10 fathoms about 390 yards offshore with the flagstaff in the village in line with a guest house bearing 326°.

TELUK TOTOK.—This spacious bay affords sheltered anchorage in both monsoons. The village of Totok is of little importance, although there are several large warehouses and storage places as well as a pier about 330 feet long. From seaward, on the mountain slopes the zinc roofs of the buildings where ore

is worked are conspicuous. The south side of the bay is formed by a narrow, hilly tongue of land running to the east-northeastward, terminating in a reef on which lie the Kepulauan Dakokaja. Further to the northeastward are the high, rocky islands Pulau Hogow and Pulau Tulang. The bay can be entered between Pulau Tulang and the coast northward or between Pulau Hogow and the Kepulauan Dakokaja. Both these channels are wide and clear. The saddle-shaped Pulau Babi lies on the north side of the bay, with two rocks westward of it.

The **ANCHORAGE** is eastward of the loading place in 12 to 15 fathoms. The river north of the village generally makes the water a brown color, so that the edge of the coastal reef cannot be seen.

Vessels call at Totok regularly.

12A-13 KOTABUNA ROAD.—This roadstead lies between Pulau Kumeke, a rocky, densely grown over island, and the Celebes coast off the village of Kotabuna. Ratjun, a low rock with vegetation and shoal water extending about 400 yards eastward from it, lies about 1 mile eastward of Pulau Kumeke. Pulau Bambajan, southward of Pulau Kumeke, is separated from the coast by a clear channel and is a very fertile island.

There is safe but confined **ANCHORAGE** in 12 to 15 fathoms abreast some coconut trees on the northwest point of Pulau Kumeke, and as the vessel swings around very sharply at the change of the current it is advisable to moor with two anchors.

Vessels call regularly at Kotabuna.

At TELAGA, in the small bight northward of Tandjung Salimburing, there is anchorage in 20 to 23 fathoms eastward of the village, about 500 yards offshore. A rock awash lies on the coastal reef off Telaga.

DJIKO BULUNTAJA affords ANCHORAGE in 14 fathoms off the village of Molobog, with the south point of the bay bearing 110° and the pier, which is in ruins, bearing 262° . There is also anchorage in 20 fathoms about 500 yards offshore, near the village of Motongkat. There is anchorage for vessels with local knowledge farther northward in the small inlets Djiko Tehi and Djiko Dodap, but there are no villages here.

KEPULAUAN LAGA, two small, rocky islets lie at the extremity of a tongue of land jutting southward from a position 7 miles north-eastward of Tandjung Flesko. The large village Nuangan is on the river of the same name in the bay west of the above islets. There is ANCHORAGE off the mouth of the river in 25 fathoms about 500 yards from shore. Southward are two smaller inlets, Djiko Matabulu and Djiko Ho-ujoh, affording anchorage close under the coast.

TANDJUNG FLESKO ($0^{\circ}28' N.$, $124^{\circ}31' E.$) is high and rocky, and there is frequently a strong current and surf near the point. A small peak, 2,077 feet high, is located about $2\frac{1}{2}$ miles northward of Tandjung Flesko.

Batu Mandi, a reef submerged at high water, lies about 900 yards eastward of Tandjung Flesko with a narrow channel of more than 10 fathoms between. A $3\frac{3}{4}$ -fathom patch lies about $2\frac{1}{4}$ miles south-southwestward of Tandjung Flesko, and a 6-fathom patch lies close eastward of the $3\frac{3}{4}$ fathom patch.

DJIKO BELANGAN and DJIKO PASILANGAN are two deep bays lying westward of Tandjung Flesko. There is unsheltered ANCHORAGE in the bight on the west side of Djiko Belangan, the eastern bay, close to the shore in 20 fathoms. Djiko Pasilangan affords

excellent ANCHORAGE in the upper part, sheltered from all except easterly winds. At about 900 yards from shore a sounding of 23 fathoms was obtained, the depths generally decreasing from there. Pulau Kalap is connected to a reef on the south side of the entrance of Djiko Pasilangan.

PULAU PONDANG lies off the entrance of Djiko Pasilangan. On the south side of this islet there is a large reef, which shows good discoloration and on which lie three above water rocks.

A LIGHT is shown on Pulau Pondang.

THE COAST between Tandjung Pajunga and Tandjung Tombalilatu (sec. 12B-1), the north entrance of Teluk Tomini, is very steep, and can be closely approached; the detached reefs along the east half of this coast are all close under the shore. There are numerous inlets along this stretch of coast in which it is possible to anchor with safety, and there are a number of collecting points for forest products at some of these inlets.

Kepulauan Batutolu are two islets, the northern of which is practically joined to the coast by a drying reef. The southern islet is surrounded by a drying reef. The passage between these two islands is deep and navigable when the reefs show good discolorization. Tandjung Tolu, about 8 miles west-southwestward of Kepulauan Batutolu, is marked by a round hummock on the end. Between these islands and the point, there are three of the most important collecting points for forest products, Motandi, Tobajangan, and Mataindo.

Between Tandjung Tolu and Tandjung Panango there are numerous detached reefs, some of which dry, but all of which lie within the 100-fathom curve. Close westward of Tandjung Panango are two reefs which dry; the west extremity of the north reef is marked by a BEACON with a white ball topmark, and a BEACON with a black cone topmark marks the edge of the coastal reef about $\frac{1}{2}$ mile northward.

An 8-foot patch lies about $\frac{1}{2}$ mile westward of the northern reef. These beacons mark a passage that leads west and north of the above reefs to a small bay. Anchorage can be taken by small vessels in this bay in 20 fathoms with Tandjung Panango bearing 147° , the beacon with a black cone topmark 228° , and a stone pier at a village on the northeast shore of the bay 038° . ANCHORAGE can also be taken off the village of Tolondado in 18 fathoms with the village bearing 355° and Tandjung Panango 079° .

TANDJUNG SALONGAN, about 5 miles westward of Tandjung Panango, is low, but can be recognized from eastward by a large roof of the storage sheds for forest products. There is very good anchorage 300 to 400 yards from shore in 13 fathoms, inside a $2\frac{1}{2}$ -fathom patch, lying about $\frac{1}{2}$ mile east of the mouth of a river which empties into the sea close east of Tandjung Salongan. Vessels call here about every 2 months.

PART B. TELUK TOMINI

12 B-1 TANDJUNG TOMBULILATU ($0^\circ 18' N.$, $123^\circ 20' E.$), the north entrance of Teluk Tomini, is at the foot of the Pegunungan Sinandaka, and the coast in this vicinity is steep-to, with a coastal reef only here and there.

COAST—GENERAL

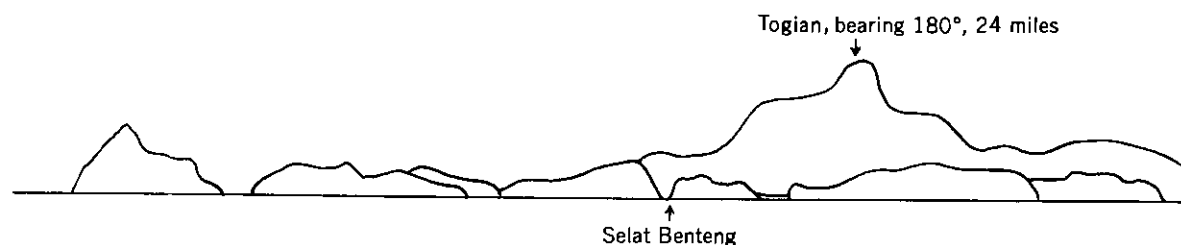
12B-2 TELUK TOMINI separates the north and east peninsulas of Celebes, and is about 60 miles wide at its entrance between

Tandjung Tombulilatu and Tandjung Pangkalaseang. The gulf is surrounded by very high mountain land with lower plains in front, except where there is no barrier reef, when the mountains generally approach the coast. The coastal description for this part is divided into four sections, the north coast, the south coast, the west coast, and the Kepulauan Penju (Togian), and from east to west.

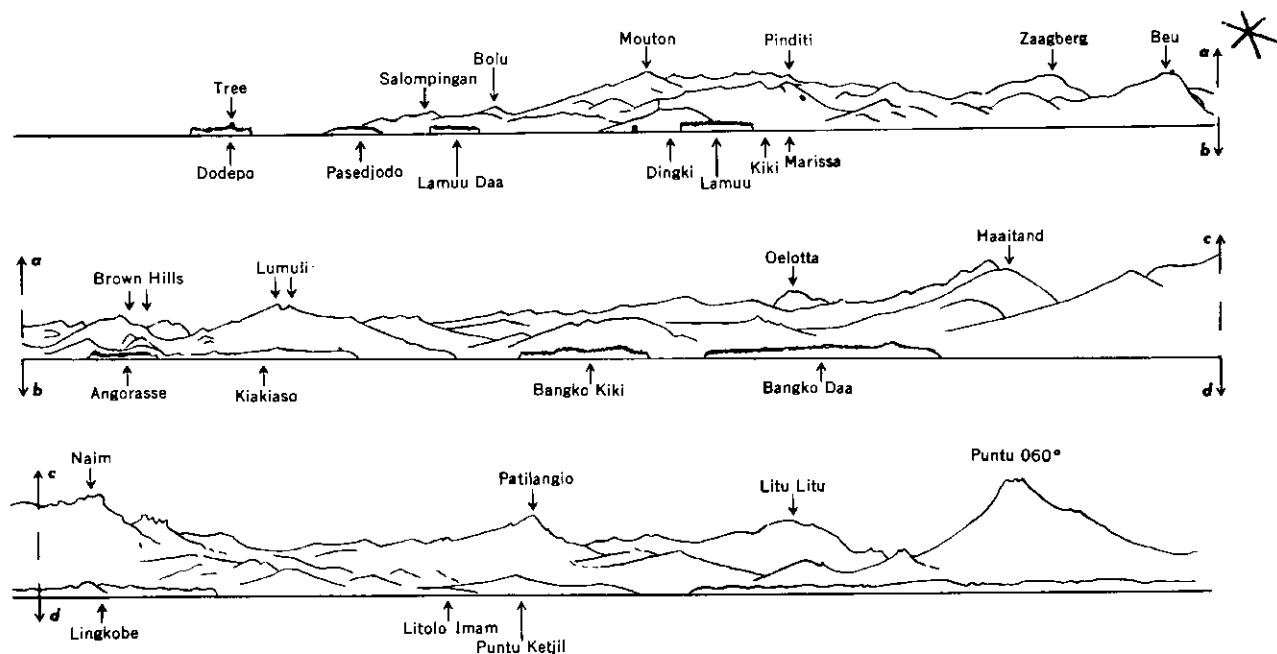
THE KEPULAUAN PENJU are hilly and densely wooded. Togian, 1,778 feet high, on Pulau Togian is visible from nearly the whole gulf. The other principal landmarks are the 1,470-foot peak on Pulau Waleabahi, the 1,306-foot peak on Pulau Waleakodi, and the 1,666-foot peak on Pulau Unauna.

THE NORTH COAST OF TELUK TOMINI has several conspicuous mountain peaks, but during the south monsoon the mountains of more than 3,000 feet are obscured by clouds from about 0800 for the rest of the day. Even though the mountains are close to the coast, it is not always easy to distinguish the summits, but the points are defined, and the reefs discolor. Between Tandjung Tombulilatu and Teluk Limba, about 50 miles west-northwestward, the mountains rise steeply from the sea, with only an occasional coastal reef.

The coast between Teluk Limba and Tandjung Pandjang, about 44 miles westward, provides some good landmarks in the mountain peaks inland. Tiolo, 3,330 feet high, is the highest peak of a long chain and has two peaks with a dip between. Dulantangan, 1,821 feet.



TELUK TOMINI. KEPULAUAN PENJU



TELUK TOMINI, NORTH COAST, PUNTA 2½ MILES, 060°

is the highest summit of a ridge running about 2 miles from the coast. Sirupu has a rounded summit 3,625 feet high with two lower summits east and west. Baginte is very conspicuous with two peaks, the highest 2,654 feet. Fartherest inland are the Pegunungan Dapi, a very conspicuous range. Oleonuhe, 2,300 feet high, northward of Tandjung Pandjang, stands by itself and is particularly conspicuous. Between it and the Pegunungan Dapi is Lampuloto, 3,015 feet high.

The mountains approach the coast between Tandjung Pandjang and Tandjung Torosiadje, about 22 miles further westward, and are particularly conspicuous. The 2,139-foot summit, northwestward of Tandjung Pandjang, the 2,706-foot summit further northwestward, and Gunung Ulota, 2,900 feet high are all visible. Beau, 2,365 feet high, the highest summit of a group, is also conspicuous.

Northward of the bight between Tandjung Torosiadje and Tandjung Tuladenggi, about 18 miles westward, there are three conspicuous

peaks. Dingki, 1,066 feet high, the pointed Boloo, 2,743 feet high, and further westward Salumpengu, 2,283 feet high.

The mountains inland between Tandjung Tuladenggi and Tomini form a long arched chain that reaches a height of 8,015 feet, but has no conspicuous peaks. Bosago, to the southwestward of the above summit, is easily recognized. Santigi, a conical peak 994 feet high, is conspicuous from all directions.

THE SOUTH COAST OF TELUK TOMINI is backed by hills that rise steeply from the coast, while the interior consists of high mountains with rugged peaks, which are difficult to distinguish. Gunung Tompotiga, westward of Tandjung Pangkalaseang, is a massive mountain plateau with two summits, the eastern and highest being 5,216 feet. In fine weather Gunung Tompotiga is visible from the opposite shore of the gulf.

The conspicuous peaks near the coast will be discussed with the coastal features and landmarks.

THE WEST COAST OF TELUK TOMINI has a few landmarks, but low hills just south of the equator from a very striking feature in contrast to the high mountains both northward and southward. To the northward is the Bulu Ogoamas (sec. 11C-2); the deep saddle formed between the summit of Bulu Ogoamas and Sodjolo is very conspicuous, but these peaks are frequently obscured by clouds. Gunung Tomini, 5,787 feet high and conical is also conspicuous. To the southward is a 3,543-foot peak with an arched summit, and further southward there are two dome-shaped mountains, 4,872 feet and 5,423 feet high, respectively.

DEPTHS—DANGERS

12B-3 The depths in Teluk Tomini are very great, soundings of over 1,000 fathoms having been obtained over a considerable portion. Over a great part of the coast a barrier reef runs along the edge of the 100-fathom curve, with numerous reefs and some islets inside.

Along the north coast of Teluk Tomini the 100-fathom curve lies close off the coast as far as Teluk Limba, thence it lies farther offshore as far as Tomini. Westward of Teluk Limba a barrier reef with numerous islets lies along and within the 100-fathom curve. There are several dangers lying outside the 100-fathom curve and they will be discussed with the coastal features.

The 100-fathom curve lies close along the south coast of Teluk Tomini, except between Tandjung Pangkalaseang and Tandjung Batu Hitam, about 44 miles westward, where it parallels the coast to Pulau Mentawatudaa and then runs westward to the Kepulauan Penju. There are many dangerous reefs lying outside the 100-fathom curve and with the exception of Haarlemmermeer and the shoal north-northwestward, they will be discussed with the coastal features.

HAARLEMMERMEER, lying northward of Tikungan Poso in position $0^{\circ}46\frac{1}{2}'$ S., $120^{\circ}55'$ E., is a coral patch partially dry at low

water. At high water it is entirely covered but can be clearly seen by surf and discoloration. The danger is marked by a BEACON with a black truncated cone. A shoal with a least depth of $2\frac{3}{4}$ fathoms, lies about $3\frac{1}{2}$ miles north-northwestward of Haarlemmermeer.

Along the west coast of Teluk Tomini the 100-fathom curve generally runs near the coast, and where it widens somewhat, there are a series of reefs. The only danger outside of this depth curve discussed in this section is Raaf; the other known dangers will be discussed with the coastal features.

RAAF, a steep-to reef, with a depth of 3 feet over it, lies about $5\frac{1}{2}$ miles southward of Tandjung Pelasa; it shows discoloration and is marked by a BEACON with a black truncated cone.

The main group of the Kepulauan Penju, with the exception of Pulau Taupan, is almost surrounded by a barrier of reefs with depth of over 100 fathoms immediately outside. The dangers outside the 100-fathom curve will be discussed with the coastal features.

WINDS—WEATHER

12B-4 In Teluk Tomini monsoons are weak and variable, with large percentages of circulating and varying winds. The north monsoon lasts from December to March, with winds principally from northwest to northeast, but also from the west. The monsoon slackens in April and the northeast winds returns. From July to October south-southeast to south-southwest winds prevail, while in May, June, and November no predominant direction can be noted.

The east part of Teluk Tomini, eastward of the Kepulauan Penju, lies more open to the south monsoon, which blows from a south-southeast to south-southwest direction. Southward of the Kepulauan Penju protection from the south monsoon is found, unless the winds find their way across the mountains, as is frequently the case eastward of Tandjung Api. During the mornings the south monsoon can

blow strongly in this area, and the sea quickly becomes turbulent. The south monsoon also brings a dense haze with it.

Constant strong winds are seldom experienced; heavy squalls and thunderstorms are rare. There are no regular wet and dry seasons, and showers occur any time in the year. Land and sea breezes are fairly regular.

TIDES—TIDAL CURRENTS

12B-5 In Teluk Tomini little or no tidal currents have been noticed. The wind drift west of Pulau Unauna, and southwest and south of the Kepulauan Penju does not seem to be of any importance.

During the south monsoon a current enters the gulf and leaves, following along the west and north coasts toward the northeast.

KEPULAUAN PENJU (TOGIAN)

12B-6 PULAU WALEABAH (0°16' S., 122°20' E.) is a long, hilly island with steep coasts and five small peaks, which provide good points on which bearings can be taken. Along the north and east coasts there are many coconut plantations; the more important villages are on these coasts.

Tandjung Kramat, about 3 miles east-southeast of Tandjung Komali, the north extremity of Pulau Waleabahi, is rocky and marked by two hillocks. A bay lies on both sides of this point. A small rocky islet covered with vegetation, with a reef projecting about 400 yards eastward, lies on the west side of the entrance of the bay to the west of Tandjung Kramat. An 11-foot patch, marked by discoloration, lies in the entrance of this bay about ½ mile northwest of Tandjung Kramat. A course of 210°, steering for the conspicuous roof of a house at Kanari, a village at the head of the bay, will lead clear of the above dangers. ANCHORAGE can be taken in about 27 fathoms, mud and sand, about ¾ mile from the conspicuous roof on this heading.

PULAU WALEAKODI, separated from Pulau Waleabahi by a fairly broad channel, is also a hilly island with the hills coming very close to the coast. There are numerous coconut plantations on the island. Boloko and Miloh are two hilly islets lying off the south and southwest extremities, respectively, of Pulau Waleakodi. Mekeja, another hilly islet lies off the east extremity of the island.

PASSAGE BETWEEN PULAU WALEABAH AND PULAU WALEAKODI.—Several dangers lie outside the 100-fathom curve west of Tandjung Balikpapan and should be avoided. Navigation between the islands demands the utmost caution. This passage, one of the two main routes (see sec. 12B-7) through the islands, can be entered from southward by steering close along the reef projecting from Tandjung Balikpapan, the south extremity of Pulau Waleabahi, and then proceeding with the utmost caution on a northwesterly direction between this island and the innumerable reefs westward.

The passage is entered midway between the reef projecting from Tandjung Balikpapan and a drying reef about 1,200 yards west-southwestward; the reef projecting from Tandjung Balikpapan is marked by discoloration. A drying reef, marked on its east edge by a black BEACON with a black cone topmark, lies about 2 miles west of Tandjung Balikpapan. This course leads about 800 yards northeast of a 23-foot patch about 5¼ miles northwest of Tandjung Balikpapan, and ½ mile southwest of some islands lying close off the middle of the west coast of Pulau Waleabahi. An 8-foot patch and a 19-foot patch lie on the southwest side of the passage about 3 miles and 2½ miles, respectively, east-southeast of Mekeja.

Vessels should then steer for the narrowest part of the strait between the two islands, passing northeast of Mekeja and west of an islet lying on the east side of this narrow section. Course can then be altered to clear the rest of the strait.

12B-7 **TAOLEH AND MALINGI** lie west of the western extremity of Pulau Waleakodi. On Taoleh a conspicuous tree stands on its summit. A fairly wide coastal reef surrounds the island, and other than that the channel around it is deep and clear. On the east side of the passage east of Taoleh, and outside of the coastal reef of Pulau Waleakodi and Miloh, there are three shoals of 1, 2, and 3 fathoms.

The north coast of Malingi is steep and rocky with some small beaches, and the south coast is covered with coconut plantations on the slopes. A settlement is located on the northeast side of the island. Langkara, a hilly island, 466 feet high, lies close southwest of Malingi.

Selat Malingi, lying between Malingi and Pulau Talatakoh, is not recommended because in 1950 the coastal reefs on both sides of the strait had extended almost across the passage.

PULAU TALATAKOH is hilly, but there are no prominent landmarks. The rocky points along the east coast are easily recognized by the islets lying off them. Three islets lying on a drying reef lie close northward of Tandjung Uting, the southeast extremity of the island. Another islet lies about 1 mile northeast of Tandjung Uting, and Towoh, an islet, lies close off the east end of the island.

PASSAGE ALONG THE EAST SIDE OF PULAU TALATAKOH.—This passage, one of the two main routes (see sec. 12B-6) through the islands, can be used with safety. From southward the 100-fathom curve is crossed through an opening in the barrier reef about $3\frac{1}{2}$ miles east-southeast of Tandjung Uting, with the east end of Malingi in line with the east side of Towoh bearing 330° . When Tandjung Uting is in line with the east side of the easternmost of the three islets close northward, and the west side of the islet 1 mile to the northeast, bearing 209° , alter course to 000° . This course passes to the east of a drying reef and close westward of a 16-foot patch lying about $1\frac{1}{2}$ miles east of Towoh. When Towoh bears 244° , alter course to 316° ; on this heading the

west side of Taoleh is in line with the east side of Malingi. Course can then be shaped to pass on either side of Taoleh.

PULAU TOGIAN, the middle of three islands, is separated from Pulau Talatakoh by Selat Benteng. The north coast of Pulau Togian is high, precipitous and rocky, and this coast as well as the remaining coasts of the island are covered with coconut plantations. Numerous islets and dangers lie off the north coast.

TELUK TOGIAN, on the south side of Pulau Togian, is a narrow inlet that can be entered by vessels with local knowledge. The drying areas on each side of the channel are marked by discoloration, and the inhabitants have placed stakes on some of the edges. Benteng, a village at the head of the bay, is a collecting place for copra. **ANCHORAGE** can be taken in 9 to 10 fathoms off the village.

Mogo Besar ($0^\circ 26' S.$, $122^\circ 01' E.$) and Mogo Ketjil are two islets lying on a reef extending about 1 mile southeast of the west entrance of the bay. A conspicuous tree stands on the southwest point of Mogo Besar. A 5-foot patch and a 23-foot patch lie about $\frac{1}{2}$ mile, respectively, southward of the east extremity of Mogo Besar.

To enter Teluk Togian, steer for the conspicuous tree on Mogo Besar on the heading 019° , then the south side of Mogo Besar may be closely rounded. Alter course to pass along the northeast coast of Mogo Besar between the reefs on either side, which usually show discoloration. When abreast the north point of Mogo Besar, vessels may steer about northwest on the conspicuous high point on the eastern side of the bay, thence in midchannel to the anchorage.

12B-8 **PULAU BATUDAKA**, separated from Pulau Togian by Selat Batu Daka, a very narrow channel, is hilly, but has no conspicuous summits. On the north and west coasts of Pulau Batudaka the barrier reef runs from $1\frac{1}{2}$ to 3 miles from the coast, with several drying places of sand and coral and occasional gaps.

Between this barrier reef and that extending from the coast are fairly regular depths of about 25 fathoms. The south side of the island rises steeply out of the sea and forms a large bight, the 100-fathom curve running about $\frac{1}{2}$ mile offshore. This coast is inaccessible in many areas because of the numerous reefs lying within the 100-fathom curve.

BATUDAKA ($0^{\circ}24'$ S., $121^{\circ}51'$ E.), a village located on Pulau Batudaka at the northwest entrance of Selat Batu Daka, is a collecting point for the many coconut plantations on the island. There is good ANCHORAGE in 10 fathoms northward of the village.

The passage to the anchorage off Batudaka lies between Pohon Ndongo, a hilly island west-northwest of Batudaka, and Kadidi, a steep, rocky island close off the northwest coast of Pulau Togian. A very conspicuous group of rocks are located on the northwest side of a drying reef $1\frac{1}{2}$ miles northwest of Pohon Ndongo. Two hilly islands lie $\frac{1}{2}$ mile northwest of Kadidi, and another islet about $1\frac{1}{4}$ miles northeast of the two hilly islands is covered with high vegetation; this latter islet is conspicuous from northwestward within a distance of 6 miles outside the barrier reef. A BEACON with a white ball topmark marks a 1-fathom patch about 2 miles east-northeast of the north extremity of Pohon Ndongo, and a similar BEACON marks the north end of a reef extending north from Batudaka.

DIRECTIONS.—The 100-fathom curve is crossed about $2\frac{1}{2}$ miles north of Pohon Ndongo with the north beacon bearing 135° . This course is held until the small sand beaches with a few coconut palms on the southwest point of Kadidi are abeam, thence alter course to 123° , passing north of a 23-foot patch lying about $\frac{1}{2}$ mile

northwest of the north beacon. On this course the southwest extremities of the two islands northwest of Kadidi will gradually come in line, bearing 318° . When the north beacon is in line with the southeast side of Pohon Ndongo, bearing 226° , vessels can then head for the anchorage off the village. On this course the western of the two islands northwest of Kadidi will gradually come in line with the north beacon, bearing 325° . Vessels can anchor when the south beacon is in line with the conspicuous group of rocks on the reef northwest of Pohon Ndongo, bearing 287° .

OFF-LYING ISLAND AND DANGERS—PULAU TAUPAN, about 2 miles southwest of Tandjung Tjipatana, the southwest extremity of Pulau Batudaka, is a densely wooded island about 272 feet high. The island is surrounded by a drying coral reef.

The only known dangers lying outside the 100-fathom curve off the north and west sides of the main group of Kepulauan Penju are two atolls. Pasir Tengah, an atoll the edges of which dry, lies about 7 miles west of Tandjung Keilumba, the north extremity of a broad peninsula on the north coast of Pulau Batudaka. The other atoll, the edges of which also dry, lies about 2 miles east of Pasir Tengah.

PULAU UNAUNA ($0^{\circ}10'$ S., $121^{\circ}38'$ E.) is a volcanic formation and is covered with vegetation to the top. Coconut groves cover the slopes of the island. The island is steep-to, depths of over 100-fathoms being found at 800 yards distance.

Unauna is the residence of the administrator of the Kepulauan Penju. There is a small pier at the north end of the village. Vessels visit here regularly.



TELUK TOMINI. PULAU UNAUNA, BEARING 278° , DISTANT ABOUT 20 MILES

BEACONS.—A white beacon with a white ball topmark marks the extremity of the reef extending from the north side of the village, and a black beacon with a truncated cone the extremity of the reef extending from the south side of the village.

Vessels approaching the anchorage off the village on a west-southwest heading should run out 35 to 40 fathoms of chain until the anchor holds. There is only room for two vessels in the roadstead.

NORTH COAST OF TELUK TOMINI

12B-9 TELUK GORONTALO.—This bay, lies at the mouth of three rivers that empty into the head of the bay. On both sides of the mouth of the river are steep mountain ridges, with a wide plain between them at the junction of these rivers. The mouth of the river is very deep, but about 600 yards inside the depths suddenly decrease, and further inside only small vessels may proceed. Gorontalo, the principal trading place in Teluk Tomini, is located on the tongue of land at the junction of the rivers. Vessels call regularly at Gorontalo. Provisions are scarce. The only water available is the river water, which the local inhabitants drink. The locality is connected to the general telegraph system.

A landing stage is located on the east side of the road, about 400 yards northward of the east entrance of the bay, and a pier is located on the west side of the road, about 660 yards northward of the west entrance of the bay. A conspicuous concrete house stands on the coast southeastward of the east entrance of the bay. There are four buried anchors on the east side of the bay for landfasts, and one on the west shore for hauling off. An obstruction lies about 300 yards west-northwestward of the landing stage.

PILOT.—A pilot is available and boards

vessels about 700 yards south-southwestward of the light structure.

SIGNALS are shown from a signal mast on the highest point on the west coast of the bay; these signals indicate the approach of vessels.

NAVIGATIONAL AIDS.—A light is shown from the east entrance of the bay.

There are two white mooring buoys and an aircraft buoy at the head of the bay.

WEATHER.—In the south monsoon, especially in July and August, a strong wind from seaward blows during the day, causing a heavy sea and allowing little opportunity for vessels to anchor on the west side of the road. During the night, with the land breeze, the sea remains calm. In the north monsoon heavy squalls from seaward may occur unexpectedly. Other than the squalls there is a land breeze, which is stronger at night.

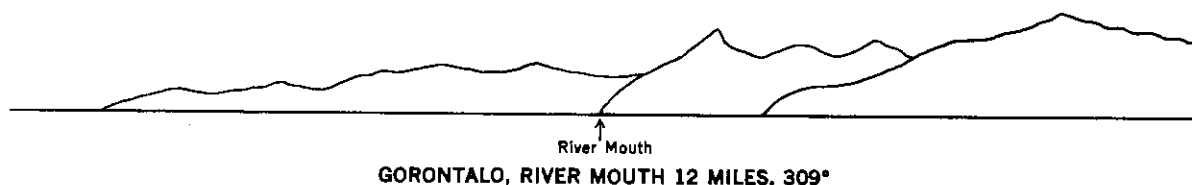
CURRENT.—There is at times a very strong current running out of the river. There is also at times a current running across the entrance of the bay, generally toward the west.

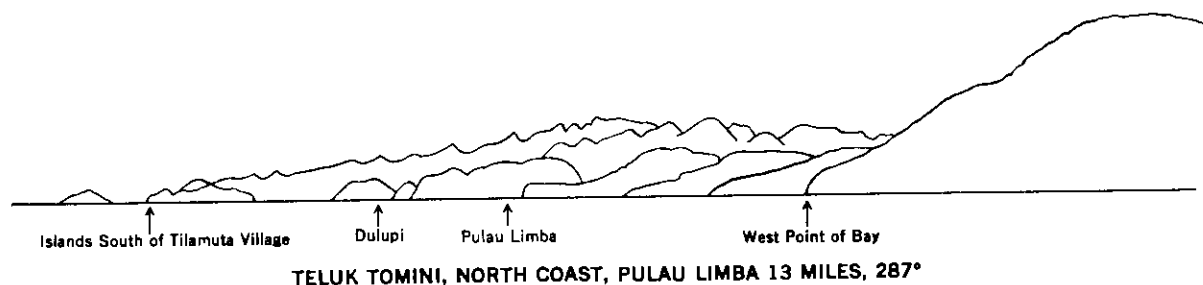
DANGER.—An obstruction lies in about the middle of the bay, about 400 yards north-westward of the light structure.

ANCHORAGE.—There is anchorage outside the bay, in about 44 fathoms, with the light structure bearing 040° about 200 yards outside the 5-fathom curve. It is advisable to use this anchorage if there is a strong wind.

It is possible to moor in the bay, where the area is limited, with the head toward the south only on incoming or weak out-going tide. Vessels are then brought around carefully by means of cables to the landfasts.

TELUK PAGUJAMAN is a deep bay where anchorage is available at the mouth of the Sungai Pagujaman. At this anchorage there is little room for turning. The village of Bilatu is located at the mouth of the river.





TELUK BOBAA is a small inlet affording excellent anchorage in 22 fathoms. The passage between the reefs at the entrance is only 400 yards wide, but the reefs are clearly marked by discoloration. The village of Bobaa is located in the upper part of the bay.

TELUK LIMBA consists of an east and west bay separated by Limba, a high, densely wooded island. The entrance into the east bay, a little more than 200 yards wide, is between the steep reefs projecting from Limba and a tongue of land eastward. There is **ANCHORAGE**, in 23 fathoms, in the east bay, but it is not well sheltered during the south monsoon. A hut at the head of this bay in line with a small peak, about $343\frac{1}{2}^{\circ}$, leads midway between the reefs. A conspicuous 1,420-foot peak lies close north-westward of Limba.

TELUK DULUPI, which divides into three branches, is entered between the coast and Pulau Dulupi. The bay offers little shelter for large vessels. The village of Dulupi is located on the north shore of the east branch. A conspicuous 1,207-foot peak lies close north-westward of Pulau Dulupi.

12B-10 THE COAST between Tilamuta, 6 miles westward of Teluk Dulupi, and Tandjung Pandjang, about 34 miles farther westward, provides good landmarks inland for vessels navigating outside the barrier reef. These landmarks have been discussed in section 12B-3.

Along this stretch of coast a barrier of islands and reef lies just within the 100-fathom curve which is from 2 to 6 miles offshore. Between this barrier and the islands and reefs under the

coast is a broad passage with only a few isolated reefs in it, which are easily avoided. The depths in this channel vary from 12 to 30 fathoms, occasionally a little more, and **ANCHORAGE** can be found everywhere. There are no known dangers outside the 100-fathom curve along this stretch of coast.

TELUK TILAMUTA affords good but confined anchorage in 16 fathoms, mud, in the upper part of the bay. The village of Tilamuta lies on the northwest side of the bay. Tapata Daa, a hilly island, forms the west side of the bay, and is separated from the coast by a narrow, drying channel. The coastal reef projects about 1 mile southward, with the islets Tapata Kiki and Asiangi on it. Vessels call here regularly.

The east entrance of the inner channel between the coast and the islands and reefs near the 100-fathom curve is just before the entrance of Teluk Tilamuta. On the northeast side are the extensive coastal reefs around the islet Lahengo, two detached shoals of $3\frac{1}{2}$ and 4 fathoms, and on the west side a small islet, and small reefs of 1 fathom. On the southwest side, along the 100-fathom curve, are the low, thickly wooded islands Pulau Mohupombodaa, Mohupombo Kiki, and Mopingulo. All of these reefs show discoloration. The east end of Pulau Mohupombodaa is a very conspicuous yellow rocky point. A pole about 5 feet high, which is difficult to distinguish, marks the north edge of a detached reef projecting northward from Pulau Mohupombodaa.

(728) **INDONESIA—Celebes—Teluk Tomini—Marisa approach—Rock.**—A rock with 6 feet or less water over it exists about 6.7 miles $221^{\circ}30'$ from the summit (754) ($0^{\circ}29.3'$ N., $121^{\circ}58.7'$ E. approx.).

(N.M. 5/66.)

(N.M. 32 (1585), London, 1965.)

H.O. Chart 3089.

H.O. Pub. 72, 1962, page 452.

DIRECTIONS.—Teluk Tilamuta may be entered with the 810-foot peak on Tapata Kiki bearing 275° . This course leads in between the above $3\frac{1}{2}$ -fathom patch and pole. When the east point of Pulau Mohupombodaa bears 191° , the harbor may be steered for or a course taken southwestward into the inner passage between Asiangi and Pulau Mohupombodaa.

THE INNER PASSAGE between Teluk Tilamuta and Tandjung Buloolio, about 13 miles westward, can be easily navigated; the various reefs within the barrier are all marked by discoloration, and there are numerous landmarks. There are some passages through the barrier reef, though which some villages can be reached directly.

BATUMOITA, a village about $3\frac{1}{2}$ miles westward of Teluk Tilamuta, can be reached though an entrance in the barrier reef between Mopingulo and Telefoa, a bare sandflat $1\frac{3}{4}$ miles westward. The passage lies between Telefoa and two reefs of 17 and 18 feet, eastward; the reef around Telefoa shows good discoloration. This passage is about $\frac{1}{2}$ mile broad at its narrowest part and a course of 346° from 400 to 500 yards off the reef around Telefoa leads through it. **ANCHORAGE** can be taken about 1 mile off Batumoitia with the large house with a zinc roof bearing north-northwestward.

TAPADAA, a village of little importance about 4 miles eastward of Tandjung Buloolio, can be reached through an entrance in the barrier reef west of Pulau Montuli on a course of 358° , with a group of casuarina trees west of the village used as an approach mark. This course passes between an $11\frac{1}{2}$ -foot patch to westward and a 26-foot patch to eastward; these shoals lie northwestward of Pulau Montuli and are marked by discolorization. Vessels should not anchor in less than 15 fathoms.

12B-11 TANDJUNG BULOOLO is a conspicuous point with a hill on it 210 feet high.

BUMBULAN, a village about $4\frac{1}{2}$ miles westward of Tandjung Buloolio, can be reached through an entrance in the barrier reef east of Pulau Bitila, with Dulantangan (sec. 12B-3) in line with the BEACON with a white board close westward of Bumbulan bearing 322° ; this

course leads close eastward of the BEACON with a black cone marking the reef extending southeastward from Pulau Bitila. A BEACON with a white ball topmark, marking a $19\frac{1}{2}$ -foot patch, is located northeast of the course line in position about $1\frac{1}{2}$ miles southward of Pulau Tomelo. A BEACON with a white ball topmark marks a $2\frac{1}{2}$ -fathom patch lying on the course line about 1 mile southeastward of the above beacon with a white board; a similar BEACON marks a 1-foot shoal northward. The water is murky inside the 10-fathom curve; the 6-foot shoal about 2 miles southward of the village shows good discolorization. The best **ANCHORAGE** is west of the line between the northernmost beacons, in 5 to 7 fathoms. There are some large houses with zinc roofs at the village. The copra warehouse is the most prominent building in Bumbulan and is visible from well out to sea. There is a pilot at the village.

MARISA, a village at the mouth of the Salo Milangotaluhu, is conspicuous from seaward. Pomoliia Daa and Pomoliia Kiki are two islets lying within $\frac{1}{2}$ mile southwestward and south-southeastward, respectively, of Tandjung Tamboo, a point $2\frac{1}{2}$ miles eastward of Marisa. A detached reef lying about $\frac{1}{2}$ mile southeastward of Pomoliia Kiki is marked by a BEACON with a white ball topmark.

Passage through the barrier reef can be made about 1 mile westward of Pulau Lahei, a low islet, with Lampuloto (sec. 12B-2) bearing 000° . When closer in, the mouth of the Salo Milangotaluhu will be in line with Lampuloto. **ANCHORAGE** can be taken southward of the mouth of the river at Marisa in 12 fathoms, mud, with a conspicuous iron warehouse in range with Gunung Lampuloto (sec. 12B-2) bearing 358° , about 800 yards offshore.

TANDJUNG PANDJANG is marked by a group of high casuarina trees near the shore which make this point easily discernible. Pasi Pilato, a drying reef to the southeastward, is always visible. The coast eastward is low, marshy, and grown up in mangroves.

THE COAST between Tandjung Pandjang and Tandjung Torosiadje forms a wide bight, which is greatly encumbered with islands and reefs. Pulau Puntu, 889 feet high, lying about $7\frac{1}{2}$ miles northwestward of Tandjung Pandjang, is conspicuous from the east and west. The remaining islands are low and covered with vegetation. There are no known dangers outside the 100 fathom curve along this stretch of coast.

PAPAJATO, the only village of any importance in this bight, is located about $2\frac{1}{4}$ miles east-northeastward of Tandjung Torosiadje. The zinc roofs of the village can be seen from seaward. Pulau Padjongedaa and Padjonge Kiki are two low islands lying close to the coast about $2\frac{1}{4}$ miles eastward of Papajato. A $2\frac{1}{2}$ -fathom shoal, marked by a BEACON with a white ball topmark, lies about 2 miles south-southeastward of Papajato.

There are two passages through the barrier reef to the anchorage off Papajato. The east passage with the 2,736-foot summit, $3\frac{1}{4}$ miles northwestward of Dingki (sec. 12B-2), in line with a house with a zinc roof, about 1 mile eastward of Papajato, bearing about 316° , leads through the barrier reef between Pulau Sondaa and Dolepo; this course passes close eastward of the BEACON with a black cone marking a detached 10-foot patch northeastward of Pulau Sondaa. The other passage with Dingki bearing about 348° leads through the barrier about $1\frac{1}{4}$ miles westward of Sadu, an islet about $\frac{3}{4}$ mile west of Pulau Sondaa. ANCHORAGE can be taken in about 12 fathoms, sand, southward of the village. Small vessels can anchor in 5 fathoms in the inlet between Pulau Padjongedaa and Padjonge Kiki.

TANDJUNG TOROSIADJE is a wooded point with a high tree near the shore standing above the others.

12B-12 THE COAST between Tandjung Torosiadje and Tandjung Tuladenggi, about 18 miles westward, is low except eastward of Mou-

tong, where spurs of the mountains closely approach the coast. The area within the 100-fathom curve is full of islets and reefs, all of which show discoloration. Pulau Ilossangi and Iloluta are two low, wooded islets lying on the edge of the barrier reef, about $2\frac{3}{4}$ miles southward and $3\frac{1}{4}$ miles south-southwestward, respectively, of Tandjung Torosiadje. Pulau Dulangka, lying just inside the 100-fathom curve about $5\frac{1}{2}$ miles west-southwestward of Iloluta, is a low, wooded islet lying on a large reef.

OFF-LYING ISLETS AND DANGERS.—There are several known dangers lying outside the 100-fathom curve; these dangers lie on plateaus and are separated by deep water. PANABEAN, a small islet covered with fairly tall trees, lies on the northeast end of a large reef $9\frac{1}{2}$ miles southeastward of Tandjung Tuladenggi. From this islet the reef extends south-southwestward for 2 miles, and then bends to the westward, forming a narrow ridge 4 miles long, with irregular depths. Some parts of the reef dry, and on other parts there are depths of only a few feet. MALUANGI, northward of Panabean, is a small islet covered with fairly tall trees. The reef around this islet is very steep except on the southwest side. The south end of a large reef lies about $2\frac{1}{2}$ miles westward of Maluangi. Depths on this reef range from 1 fathom to 6 fathoms. A detached reef, with a least depth of 13 feet, lies about 6 miles westward of Panabean.

A high, bare sandflat lies about 1 mile southeastward of Pulau Dulangka.

MOUTONG is the only village of any importance along this stretch of coast. The village can be recognized by the numerous houses on the shore, and by a small mosque.

The entrance of the anchorage off Moutong leads eastward of Panabean and Maluangi, and then through the channel west of Pulau Lalaijo, an islet covered with low trees lying on a reef which shows discoloration. Lana Lana, a reef