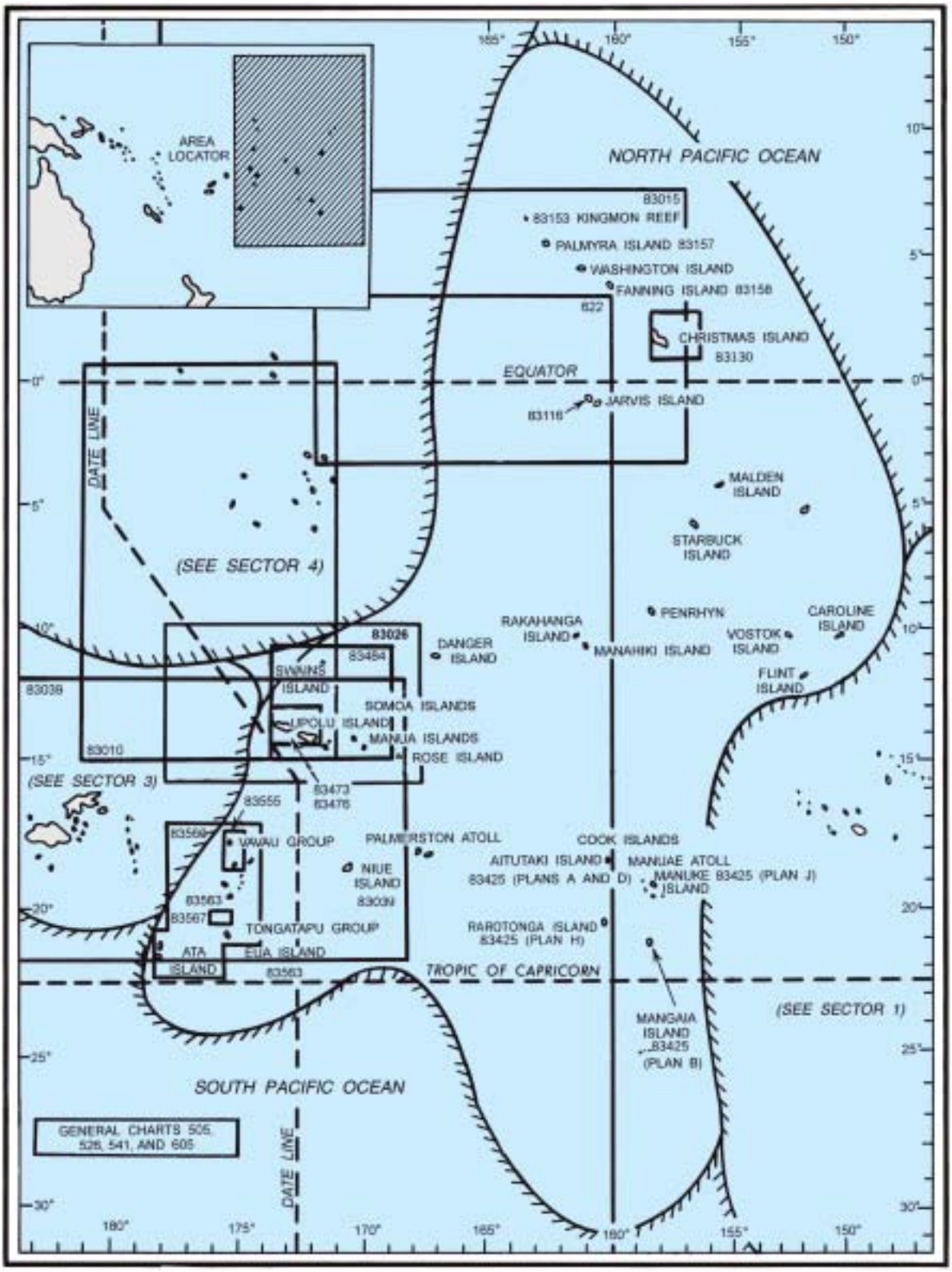
Click on "See Sector" to be hotlinked to that Sector.




**Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.**

SECTOR **2** — CHART INFORMATION

**Table of Contents**

Table of Contents

# SECTOR 2

## THE LINE ISLANDS, THE COOK ISLANDS, THE SAMOA ISLANDS, AND THE TONGA ISLANDS (INCLUDING OFF-LYING ISLANDS AND REEFS)

**Plan.—**In this sector the islands are described from Palmyra in the N; S to Flint, about 1,050 miles SSE; then WSW to Samoa, about 1,080 miles distant; then ESE and S to the Southern Cook Islands and the Tonga Islands. Off-lying dangers are described with the appropriate island or group of islands.

## General Remarks

**2.1** Large-scale coverage for U.S. territory located within this sector is provided by the National Ocean Service (NOS). Regulations pertaining to navigation within U.S. territorial waters may be found in NOS Coast Pilots**,** while additional regulations will be cited in the text along with the navigational feature they affect.

**Tides—Currents.—**The current S of 6˚S, and between 100˚W and 175˚W, is variable and only a small portion of currents have rates between 1 and 2 knots; most, but not all, are in some W direction. The predominance of the W currents decreases with increases in latitude, with a corresponding greater variability of current.

Particular and constant attention must be paid to the currents when navigating among the island groups, since the general current flowing in the region may sometimes be deflected near the islands and is always accelerated, particularly in the narrow passages. The effect of the obstruction is greater in proportion to the area and the complexity of the group. In addition, some of the islands are so low that it is often impossible to see them at night, and vessels may be driven onto their encircling reefs without any warning being obtainable from soundings, since these reefs usually rise abruptly from great depths.

The currents in the barrier reefs and atoll openings are usually strong, and cannot be counted upon to turn with HW and LW, where a barrier reef lies close to the coast, a heavy swell will throw so much water over the reef that the escape of this water causes a constant outgoing current in the opening, and sometimes across the fairway. These facts should be kept in mind before navigating in such localities.

As the Pacific South Equatorial Current and the Pacific Equatorial Countercurrent meet in the waters covered by this sector, heavy and local rippling may be experienced N of 40˚S, especially E of 170˚W.

**The Line Islands and the Line Group.—**The Line Islands consists of the Line Group; each group of the three runs E to W almost parallel to one another as a scattered chain of low and flat coral islands or atolls, from Flint Island to Palmyra Atoll, which lies about 1,200 miles NW. The three groups are the Southern Line Group, the Central Line Group, and the Northern Line Group.

The Southern Line Group is formed by **Flint Island** (11˚26'S., 151˚48'W.), **Vostok Island** (10˚06'S., 152˚25'W.), and **Caroline Island** (9˚57'S., 150˚13'W.). Three other islands that geographically mold into this line group are Phoenix Island, Enderbury Island, and Canton Island.

The Central Line Group consists of the islands of Starbuck and Malden; both islands lie in the South Equatorial Current belt where there is a dominant W set in their vicinity. Between the islands, the rate is generally 1 knot with an E set; however, it increases at times to 2.5 knots near the coast.

Since currents along these islands are not reliable, approaches from the E require extreme caution to the nature and extent of fringing offshore reefs and the strong tide rips in the vicinity.

The Northern Line Group consists of Christmas Island, Teraina Island, and the island of Tabuaeran, including the adjacent Jarvis Island and Palmyra Atoll.

The Line Islands are described beginning in paragraph 2.2.

**The Cook Islands.—**The Cook Islands are a self-governing state in association with New Zealand under the British Crown. These islands lie scattered between 8˚S and 23˚S, and 156˚W and 167˚W in two groups, known as the Northern Cook Islands and Southern Cook Islands (Lower Cook Islands). The islands have a total land area of 93 square miles.

The Northern Cook Islands are described beginning in paragraph 2.13. The Southern Cook Islands (Lower Cook Islands) are described beginning in paragraph 2.33.

**The Samoa Islands.—**Western Samoa or the Independent State of Western Samoa consists of large islands of Savaii and Upolu, between 13˚20'S and 14˚05'S, and 171˚20'W and 172˚50'W. The two islands cover a land area of 1,104 square miles.

American Samoa or the incorporated Territory of American Samoa includes the six islands of the Samoa group lying E of 171˚W. **Swain Island** (11˚04'S., 171˚05'W.), a dependency of American Samoa, lies about 200 miles N of Tutuila, the principal island. The total land area of American Samoa is about 77 square miles.

A ferry runs between Western Samoa and American Samoa.

The Samoa Islands are described beginning in paragraph 2.18.

**The Tonga Islands.—**The Tonga Islands (Friendly Islands), with a total land area of 277 square miles lie between 18˚01'S and 21˚28'S, and 173˚54'W and 175˚25'W. The islands are widely scattered and occur mostly in groups. The groups consist of 170 islands (36 inhabited) and islets, all separated under three major classifications known as the **Tongatapee Group** (21˚12'S., 175˚10'W.), the **Ha'apai Group** (19˚45'S., 174˚30'W.), and the **Vava'u Group** (18˚40'S., 174˚00'W.); they extend about 200 miles in a NNE-SSW direction.

The off-lying islands of **Niuatoputapu** (15˚57'S., 173˚45'W.) and **Niua Fo'ou** (15˚36'S., 175˚38'W.) are included in the Kingdom of Tonga. Tonga is an independent state and a member state of the British Commonwealth.

The Tonga Islands are described beginning in paragraph 2.39.

## The Line Islands

**2.2** The **Line Islands** (1˚52'N., 157˚22'W.) consists of the scattered islands and atolls lying near the Equator and the meridian of 160˚W. Two members of the group, Jarvis Island and Palmyra Atoll, are private property; they are unincorporated territory of the United States. The remainder belong to Kiribati.

This group should be considered dangerous to navigation as the islands are low, flat, and surrounded by strong, variable currents. These currents are described below.

The N section of this group lies in, or near the boundary of the Equatorial Countercurrent. Correspondingly, Kingman Reef experiences an E set, while the sets around Palmyra Atoll are strong and variable. The rest of the group lies within the W setting South Equatorial Current.

When within 200 miles of Kiritimati, the current was reported to have rates of 2.5 to 3 knots.

In the vicinity of Malden Island and Starbuck Islans, the general set is W; however, E sets have also been experienced. Some of these E sets have exceeded rates of 1 knot.

**Palmyra Atoll** (Palmyra Island) (5˚53'N., 162˚05'W.) is an atoll which consists of many small islets lying on a barrier reef which encloses three distinct lagoons. The reef surrounding Palmyra Atoll is 5 miles long E-W, and 2 miles at its widest part. Shoal water extends 1.8 miles E from the SE extremity of the reef and the same distance from the NW and SW extremities.

The islets are low, about 1.8m high, and covered with coconut and other trees reaching heights of 30m and visible 12 to 15 miles.

**Winds—Weather.—**Palmyra Atoll has unfavorable weather, and is the only island in its latitude where fresh W winds occur. A tropical front hovers in the vicinity of the island and is caused by the meeting of the Northeast Trades and the Southeast Trades.

Northeast Trades prevail, with an average velocity of 10 to 12 knots. There are frequent squalls of short duration and occasional winds up to 22 knots, but typhoons are infrequent.

Rainfall is heavy and humidity high, ranging from 2,540 to 4,572mm annually. Rain occurs almost daily; heavy squalls come up suddenly from the SW, but there are no severe storms.

**Tides—Currents.—**The tidal rise at Palmyra Atoll is about 0.6m at MHHW and 0.0m at MLW.

Strong and variable currents may be expected in the vicinity of the atoll. Caution is advised if approaching the atoll from the SW as dangerous tide rips have been reported to lie 5 miles SW from the atoll.

A current sets NW across the entrance channel and is particularly strong SW of Sand Island.

**Depths—Limitations.—**A dredged channel, which leads through the SW side of the island, is the only entrance. It was reported that the channel had a depth of 7.9m its entire length. The depths within the lagoon vary from 3 to 53m. A pier was reported in poor condition, with depths of 6.4 to 9.1m alongside, is situated in the W lagoon. The reefs and shoals within the lagoon are shown on the chart.

**Aspect.—**A group of four radio towers stand as a good landmark on the SW part of the atoll.

**Regulations.—**See U.S. Coast Pilots for regulations pertaining to navigation in U.S. waters. Palmyra Atoll is privately owned. Permission to enter the atoll must be secured from the owner in advance.

**Anchorage.—**The island should be approached from the W and anchor on the bank, in 22m, sand and coral, with the NW extremity of the island bearing 071˚, 2.5 miles distant, or farther in, in 14.6m, sand and coral, with the point on the same bearing 2 miles distant. It is not advisable to attempt to anchor between sunset and sunrise. In 1988, a 2 knot current setting S was observed during a NW fresh at the anchorage.

**Caution.—**An explosive dumping area is situated with its center about 15 miles WSW of Palmyra.

**2.3** **Kingman Reef** (6˚25'N., 162˚26'W.) is located about 33 miles NNW of Palmyra Atoll. The reef, a U.S. possession, is a Defensive Sea Area and Airspace Reservation, and is closed to the public. The airspace entry control has been suspended, but is subject to immediate reinstatement without notice.

The reef is triangular in shape with its apex to the N. The reef is about 9 miles long E-W and 5 miles N-S. A small islet, 0.9m high, lies on the E side of the reef. The reef dries on its NE, E, and SE edges; the remainder of the atoll is contained within a ridge with depths of 18.3m. However, there are breaks in the reef, one on the N side and one on the S side, with more water. Outside the ridge the bottom slopes steeply to over 183m.

The reef has been reported to be difficult to identify, both visually and by radar. The reef has been sighted at 7 miles.

Kingman Reef is within the belt traversed by the Equatorial Countercurrent, which in this vicinity sets E at a rate of 1.3 to 1.8knots.

**Caution.—**A shoal, the existence of which is doubtful, is charted at 6˚50'N, 169˚36'W.

**2.4** **Teraina Island** (Washington) (4˚43'N., 160˚24'W.) lies about 120 miles SE of Palmyra Atoll. It is administered as part of the Republic of Kiribati.

The island is about 3m high and is covered with a luxuriant growth of coconut and other trees. It is reported to be visible at 14 miles.

The fringing reef extends about 0.5 mile off the E part of the island and for some distance off the N side. At the W end, two tongues of reef extend from 0.3 to 0.4 mile offshore. In all other parts the shore reef is narrow.

Off the W side of the island, a bank, deepening gradually, has depths of 18.3 to 26m, 2.3 miles offshore.

**Tides—Currents.—**As Teraina Island lies near the S edge the Equatorial Countercurrent, great variations in the strength and direction of the offshore currents may be expected. For this reason, every opportunity should be taken to fix the position of the ship when in this vicinity.

**Anchorage.—**Anchorage is available on the bank off the island's W sides, in general depths of 13 to 31m. Caution is advised, however, as this area is often affected by heavy swell; working cargo here has been described as the most difficult and dangerous in the Pacific. Care must be taken to find a sandy bottom before letting go, as there are many deep holes in which anchors have been lost.

Anchorage is good when the Northeast Trades are light, but has been found very uncomfortable on occasions when they are

strong enough to raise a sea and the countercurrent is setting strongly E, swinging a vessel across the sea. Such conditions are reported to be frequent from September to December.

A recommended berth is 0.5 mile offshore, in depths from 9 to 11m, with the N and S tangents of the island's W end bearing 075˚ and 121˚, respectively.

**2.5 Tabuaeran** (Fanning Atoll) (3˚52'N., 159˚20'W.) is administered as a part of the Republic of Kiribati. The District Commissioner for Tabuaeran is resident at Kiritimati Atoll.

The islands of the atoll are thickly covered with coconut trees, 18.3 to 27m high, visible at a distance of about 15 miles.

The barrier reef is not more than 0.6 to 1.2m high, except on the N and E sides, which are about 3m high. The reef is steep-to; on the N and NW side of the atoll the 200m line lies about 0.5 mile offshore.

**Winds—Weather.—**The prevailing winds are from E to the ENE. Average velocities are about 10 knots, with occasional gusts up to 40 knots. Gale force winds average less than 1 day per year. Rainfall averages 190mm. The dry season extends from August to November. There is no fog.

**Tides—Currents.—**The currents in the vicinity of Teraina are strong and variable; when in the vicinity every opportunity should be taken to fix the vessel's position.

**2.6 English Harbor** (3˚51'N., 159˚22'W.) (World Port Index No. 56039) is located within the barrier reef near the center of the SW side of the island; it is a natural harbor. A settlement is situated on the S side of the entrance.

**Tides—Currents.—**There is little tide in English Harbor, but normally the flood current runs until 10 minutes after HW and the ebb current runs until 20 minutes after LW. Slack water lasts only about 10 to 15 minutes. The flood current runs at a rate of 4.5 to 5 knots, and the ebb at a rate of 7 knots. Both currents are affected by the force and direction of the wind. On the ebb tide, rips and overfalls extending from the spit on the N side to near the middle of the channel might be dangerous to small craft.

**Depths—Limitations.—**The navigable channel, with a least depth of 5.8m, is reduced to a width of less than 46m by the reef extending a short distance off Weston Point, the S entrance point, and the drying patches extending halfway across the pass from Danger Point, the N entrance point.

**Aspect.—**A conspicuous flagstaff stands on Weston Point. A light is shown on request from a stone monument standing about 45m ENE of the point. Take care not to confuse the light with an uncharted chimney close SW of it. The monument was reported obscured from seaward. A radar-conspicuous wreck stands about 1.3 miles NW of the harbor entrance.

**Pilotage.—**Pilotage for the harbor is necessary and is available from the settlement on the E side of Weston Point.

**Anchorage.—**Anchorage may be taken with the crane on Cartwright Point bearing 085˚, and a white pier in alignment with a palm tree painted white, both of which are situated 0.3 mile S of Weston Point, bearing 138˚. Small vessels usually anchor E of Terania Light, but shoaling and a tug moored in the vicinity make for uncertain depths and swinging room. Both bow anchors, and a stream anchor should be used here as English Harbor is exposed to squally NE and E winds.

Vessels may anchor in Whaler Anchorage, 3.8 miles NNW of English Harbor, in 27m, with the beacons in line 121˚, about 0.3 mile offshore. Vessels are cautioned not to anchor S of the alignment, as it marks the N limit of a cable area best seen on the chart. It was reported that the beacons may have disappeared or become overgrown.

**Caution.—**Shoaling has been reported in English Harbor.

**2.7 Kiritimati Atoll** (Christmas Island) (1˚52'N., 157˚22'W.) is about 27 miles long SE-NW and is 16 miles wide in the N part. A neck extending from near the center of the atoll toward the SE is about 4 miles wide; this part is low-lying scrub land, with trees adjacent to the coast. The island is about 12m high in the NW part, where there are growths of scrubby trees and coconut palms visible for a distance of 12 miles.

There are several indentations in the coast. The Bay of Wrecks, the largest, is on the E coast and Vaskess Bay is located on the SW coast.

Bridges Point Light is a good landmark, as are radio masts situated 0.2 mile N and 4 miles NNE of it. A tank farm lies N of the light, while a large sled lies 7 miles E of the light.

Kiritimati Atoll has been declared a nature reserve. Permission to land on the small islands S of London must be obtained from the warden.

**Winds—Weather.—**The general tendency of the winds from November to May is NE and from June to October, SE, with an occasional squall from the N or S. North, NW, and W winds occur occasionally between March and June.

Rainfall at Kiritimati Atoll varies greatly from year to year. The weather is generally excellent for navigation.

**Tides—Currents.—**The spring range here is about 7m.

Offshore, the majority of the sets reported are between the NW and SW, with a large portion of the rates exceeding 1 knot. A rate of 2.5 knots has also been reported. E sets appear to be infrequent from June to November, but may occur at other times, particularly from March to May.

A strong NW current along the atoll's N coast forms tide rips N of the atoll's NW extremity. A very strong W current sets onto the island's SE end.

During passages between Kiritimati Atoll and Tabuaeran Atoll, a vessel reported currents to be variable, but not exceeding 1 knot.

**Anchorage.—**There is good anchorage, in 33m, coarse sand, with Bridges Point Light structure bearing 110˚, 0.5 mile dis-tant. Anchorage can be found anywhere W or NW of Bridges Point; however, anchorage SW of the light should be avoided as abandoned moorings lie about 0.5 mile SW of it.

**Caution.—**Fish Aggregating Devices (FADS) have been moored about 2.8 miles W and 3 miles NW of North West Point.

The fringing reef in the vicinity of South West Point was reported to be extending W.

**2.8 London** (1˚59'N., 157˚28'W.) (World Port Index No. 56035) is situated on the N side of the lagoon entrance, 3.8 miles SSE of the NW extremity of the atoll. The atoll is administered as a commercial plantation by the Government of Kiribati, through a District Commissioner, who is normally in residence here.

**Tides—Currents.—**The current sets strongly into and out of the lagoon, and may reach velocities of 4 to 5 knots, but does not affect the use of the port facilities. From November to March, NW swells are frequent and at times cause lines of breakers across the lagoon entrance making passage by small boats hazardous and sometimes impossible. W swells and fresh E winds cause the most dangerous conditions. During flood tides with strong E winds, waves up to 1.2m high are produced.

**Depths—Limitations.—**Vessels proceeding to London Wharf should use Cook Island Passage, which has a least charted depth of 5.8m.

London Wharf, has depths of 1 to 2.5m alongside. The approach channel has a limiting depth of 2.1m. A T-shaped jetty is situated 1.75 miles NNW of Port London. The jetty is 220m in length, terminating in a fendered berthing face 80m in length, with dolphins at each end.

**Caution.—**Caution is advised as depths less than charted have been reported in Cook Island Passage and London Passage. A sand spit E of the wharf is constantly changing.

The lagoon is shallow and studded with coral patches which makes navigation difficult even for boats.

**2.9 Jarvis Island** (0˚23'S., 160˚01'W.), an island of sand and coral formation, is located about 202 miles SW of Kiritimati Atoll. The island is 1.8 miles long in a E and W direction and about 1 mile wide; it rises to a height of 6.1m.

A narrow fringing reef, which dries in places and has breakers along the S shore, encircles the island. There are two breaks in the reef on the W side. A shoal, with a least known depth of 4.6m, extends about 0.6 mile from the E side of the island. The depths drop rapidly outside the shoal area.

Jarvis Island is a U.S. possession and a National Wildlife Refuge. It is under the jurisdiction of the U.S. Fish and Wildlife Service.

The higher ground surface lies on the W end of the island. Although low lying shrubs cover on most part of the island, it was observed without appreciable size of vegetation.

**Caution.—**Jarvis Island has been reported to lie 1 mile NE (1991), 1.6 miles E (1992), and 1.3 miles ENE (1996) of its charted position.

**2.10 Malden Island** (4˚03'S., 155˚00'W.) is triangular-shaped, of coral formation, and located 375 miles SE of Jarvis Island. The island is a wildlife sanctuary under the control of the Government of Kiribati.

The island is about 5 miles long and 4 miles wide at its E end, with the apex to the W. It is about 9m high, and visible for about 15 miles.

Malden Island is steep-to, with reefs extending from all its extremities for distances of 0.2 to 0.3 mile.

The settlement was situated on the N side of SW point and the ruins still remain.

**Tides—Currents.—**Between Malden Island and Starbuck Island, currents with rates of 1 knot are usual, but may reach 2 to 2.5 knots. Between September and November, the highest rates occur, sometimes exceeding 3 knots. The usual direction of the set is W, but E sets have been experienced rarely exceeding 1 knot.

**Anchorage.—**Anchorage is available, in a depth of 28m, off the W side, about 0.2 mile WNW of a tripod beacon, which is close SE of the landing place.

**Caution.—**Caution is advised as no implicit reliance can be placed on current rates and direction. Great care should be taken when navigating in this area.

**2.11 Starbuck Island** (5˚37'S., 155˚54'W.) lies about 105 miles SSW of Malden Island. It is about 4.6m high and has a few shrubs on its NW part, making it visible from aloft at a distance of 11 miles.

A fringing reef, a large part of it awash, surrounds the island; it extends about 0.2 to 0.3 mile offshore, except off the E end, where it extends for 0.7 mile. A wreck is reported stranded near the NW extremity of the island.

The approach to Starbuck Island, especially from the E, should be made with great caution due to the currents in the vicinity of the island. The fact that the reef extending E is awash, makes the strong W current dangerous.

**Filippo Reef** (5˚31'S., 151˚47'W.) has been reported to be about 1 mile long in a NW-SE direction, and less in width. From the appearance of the breakers on the reef, it has about 0.6 to 0.9m of water.

Breakers were reported (1926) to have been seen about 30 miles SW of Filippo Reef; a line of breakers about 68m in length were reported (1944) about 80 miles SE of Filippo Reef. This area lies outside of US chart coverage (2002).

**Caution.—**Vessels are advised to make due allowances for the strength, velocity, and erratic directions of the current in the vicinity of Filippo Reef; it may set vessels up to 50 miles off course in a 24-hour period.

**2.12 Caroline Island** (9˚57'S., 150˚13'W.) is an atoll consisting of a number of small, low, islets 4.6 to 6.1m high. The barrier reef is about 5.5 miles long in a N-S direction and about 1.4 miles wide at its S or widest end. The S end of the S island is reported to extend 1 mile S and then extends further SW and SE; it should not be approached at night. Broken water is reported to extend nearly 2 miles S of the island.

There is a boat passage through the reef near the SW point of the atoll that is narrow and tortuous.

**Vostok Island** (10˚06'S., 152˚25'W.), a densely-wooded island with trees, which rise to a height of 24m is roughly triangular in shape, and is about 0.4 mile long in a N-S direction. A sunken reef extends about 0.3 mile N from the N extremity of the island, and about 0.2 mile from the SW extremity, and 0.3 mile from the SE extremity.

The offshore current sets W at a rate not exceeding 3 knots. Close inshore, on the E side of the island, the current sets N. The eddies on the lee side of the island are changeable, depending on the velocity of the main current.

A sounding of 55m was obtained (1927) about 0.5 mile NW of the N extremity of the island.

In 1985, it was reported that the island lies 4.8 miles ENE of its charted position.

**Flint Island** (11˚26'S., 151˚48'W.) lies about 90 miles S of Vostok Island. It is about 2.5 miles long in a NNW-SSE direction and about 0.5 mile wide. The island is densely wooded with trees which rise to a height of 15.2m.

Flint Island is surrounded by a steep, fringing coral reef which dries at LW and extends about 0.6 mile from the N end of the island, breaking for about 0.2 mile from the shore and terminating in a strong tide rip. The reef extends about 0.4 mile

from the S end of the island, breaking for 0.1 from the shore. Both reefs have heavy breakers in a low swell and the reef extent is easily identified by lighter colored water.

A current sets W past the N and S reefs at up to 0.5 knot.

There is a boat channel through the reef with a least depth of 0.8m near the settlement on the NW side of the island.

## The Northern Cook Islands

**2.13** The Cook Islands consist of two groups, known as the Northern Cook Islands and the Southern Cook Islands (Lower Cook Islands).

The Norhtern Cook Islands consist of Penrhyn Atoll, Rakahanga Atoll, Manihiki Atoll, Suwarrow Atoll, Nassau Island, and Danger Island. They are described in this order from E to W.

**Winds—Weather.—**Typhoons may be experienced from November to March. Generally, these storms come from W, but have been said to develop near Penrhyn Atoll.

**Tides—Currents.—**Generally, currents set W, with the predominance of W sets increasing toward the Equator. Current rates usually do not exceed 1 knot.

**Regulations.—**Vessels arriving in the Cook Islands are required to call at Avaitu, Aratunga, or Penrhyn Atoll before proceeding to any other possession of that nation, unless in distress or given the specific approval of the Cook Islands Government.

Vessels arriving from an area infected with Rhinoceros Beetles must remain at least 1 mile offshore from 15 minutes before sunset until 15 minutes after sunrise. When an island is encircled by a reef, the 1 mile measurement will be taken from the seaward edge of the reef.

**2.14** **Penrhyn Atoll** (9˚00'S., 158˚00'W.) lies about 330 miles WNW of Vostok Island and is the largest and northernmost of the Northern Cook Islands.

Numerous low islets, some of them several miles in length, stand on the reef surrounding the lagoon; they are covered with coconut palms which reach an elevation of about 15.2m.

The atoll is about 12.5 miles long in a SE-NW direction and is about 8 miles wide. North-West Bank, with a charted depth of 6.7m, extends about 1.5 miles NW from the NW extremity of the atoll.

**Winds—Weather.—**The winds at Penrhyn Atoll are usually E, with occasional N and NW winds between December and March. Typhoons are said to form in the vicinity of the atoll, but winds of typhoon force are unknown here.

**Tides—Currents.—**The three passes through the barrier reef into the lagoon are Northeast Pass, Northwest Pass, and West Pass (Taruia Pass); West Pass is the recommended pass. However, the tidal current can be strong running either direction, in or out of the pass.

The currents in the pass ordinarily run at a rate of about 3 to 4 knots, but at times have run at a rate of 8 knots. Both flood and ebb currents run for about 5 hours 30 minutes, except in cases of a heavy sea on the reef, when the current always sets out. The period of slack water is about 40 minutes at LW, shorter at HW. Heavy tide rips may be encountered at the entrance to the pass.

**Aspect.—**West Pass is easily identified from the SW by the conspicuous islets on either side. The islet on the S side of the pass on which the observation spot is situated is conspicuous when within a distance of 5 miles. The pass is located about 2.5 miles S of the NW extremity of the atoll.

**Pilotage.—**Pilotage has been reported to be compulsory for West Pass, and that a powered vessel with the proper draft may be handled at any stage of the tide. The pilot reportedly boards off the entrance to the pass.

**Anchorage.—**Outer anchorage is available on a bank SW of Taruia Pass, where the depths increase gradually to 18.3m then drop steep abruptly from the continental shelf. This anchorage is suitable with an E wind to allow a vessel to swing away from the reef.

Anchorage may also be obtained on **NW Bank** (8˚57'S., 158˚04'W.), in depths between 13m and 17m; however, it is exposed and lesser depths may exist than charted.

Good anchorage allowing swinging room is available off Omoka, in a depth of about 18m.

**Caution.—**The depths listed for the passes and lagoons of this atoll are derived from old sketch surveys. The passes should be entered only at slack water, under favorable light conditions, and with local knowledge. A vessel 93m in length, with a draft of 4.6m possessing local knowledge, has been reported to have negotiated West Pass and the channel to Omoka.

Flying Venus Reef lies about 3 miles NE of the NE extremity of Penrhyn Atoll. The reef has a least charted depth of 3.7m, but there is probably less water.

**2.15** **Omoka** (9˚01'S., 158˚04'W.) (World Port Index No. 55720) is situated on the S side of West Pass within the lagoon. The Resident Agent lives here. A channel leads from the fairway of West Pass to Omoka; it will accommodate a vessel with a draft up to 4.3m. There is a stone wharf here suitable for vessels up to 46m in length with a depth of 4.3m alongside.

A tower, 9m high, stands 0.3 mile S of Omoka, while a satellite dish stands 1.3 miles SE of Omoka.

**2.16** **Rakahanga Atoll** (10˚00'S., 161˚06'W.) (World Port Index No. 55710) lies 186 miles WSW of Penrhyn Atoll. It is roughly quadrilateral in shape, about 2.5 miles long in a N-S direction and about 1.5 miles wide at its N end. The atoll is about 18m high to the top of the trees. A light is shown on request from the island's SW end.

The fringing coastal reef extends from the SW extremity of the atoll to a distance of 0.2 to 0.3 mile offshore.

There is a settlement in the SW part of the atoll. Landing may usually be affected through a passage in the reef, W of the settlement. A strong tidal current runs and landing conditions are much effected by the surf.

There is anchorage off the NW extremity of the atoll, in 14m, about 0.1 mile from the fringing reef.

**Wairuna Shoal** (5˚12'S., 162˚18'W.), which may not exist, was reported (1915) as a dangerous breaking reef. This position is about 300 miles NNW of Rakahanga Atoll.

**Manihiki Atoll** (10˚23'S., 161˚01'W.) is located 21 miles SSE of Rakahanga Atoll. It is roughly triangular in shape, with its apex to the N. It is 6 miles in length NW and SE by 5 miles wide. There are several low islets on the continuous reef, densely covered with coconut trees. The tops of the trees reach

a height of 21m. An aviation runway lies close to the town at the N extremity of the island.

The principal village is on the W side of the atoll. Landing can usually be affected at this village.

A depth of 27m lies about 5 miles W of the N extremity of the atoll.

**Suwarrow Atoll** (13˚16'S., 163˚06'W.) consists of several wooded islets lying on a barrier reef which encloses a lagoon. Anchorage Island on the NE side and High Island on the W side of the island are covered with coconut trees from 18 to 25m high; they are easily recognized.

The barrier reef shows a little above HW. It is dangerous to approach the reef on its S or SE side unless the weather is clear. The N side projects to a sharp point; on the E side of it, there are some islets covered with brush.

Northeast Reef lies about 0.5 mile E of Anchorage Island and forms the E side of the entrance. East Reef lies 0.3 mile E of the S extremity of Anchorage Island, and South Reef lies about 0.2 mile SSW of East Reef. South and East Reefs can be distinctly seen from 3 miles.

The coast in the vicinity of the passage is said to be dangerous to approach at night due to irregularities in the line of the barrier reef.

The lagoon entrance is just E of Anchorage Island. A vessel, with a draft of 4.6m, can use the channel between Anchorage Island and South Reef, but caution and local knowledge is necessary. Currents in the lagoon entrance are irregular. Rates on the flood reach 0.5 to 1 knot, while the ebb flows at rates of 2 to 3 knots. At the anchorage within the lagoon, the ebb current starts about 1 hour 30 minutes before HW.

**Anchorage.—**Anchorage, unsafe in N weather, may be taken inside the lagoon, 0.2 mile off the W side of Anchorage Island, in a depth of 33m.

**2.17** **Nassau Island** (11˚31'S., 165˚25'W.) lies about 165 miles NW of Suwarrow Atoll; it is 21m high to the top of the coconut palms. The island is surrounded by a steep-to fringing reef, which is about 90 to 130m wide on the E, S, and W sides, but comes in close to the beach on the N side.

The prevailing winds from April to September are the SE trades. At other times, winds may vary from the NE to W.

The **Danger Islands** (10˚55'S., 165˚50'W.) lie about 42 miles NNW of Nassau Island. They consist of Pukapuka, the farthest N; Motu Ko, 3 miles S of Pukapuka; Motu Katava, 1.5 miles NW of Motu Ko; and several smaller islets and sand cays. A sand cay lies at the W end of a reef, 3 miles W of Motu Katava. The islands, islets, and sand cays lie on or within the barrier reef, which surrounds a shallow lagoon.

The barrier reef is unbroken and there is no access to the lagoon for other than small boats. On its W side the barrier reef is always awash; its S side is awash at LW, and its E side is partly awash and partly dry sand. The sea breaks over the sunken reef which extends W from Motu Katava.

Pukapuka is densely wooded with coconut and other trees; some reach a height of 24m. The island is bordered on its N and W sides by wide, flat reefs, and the surf beats heavily on the narrower reef on the weather side. Three villages are situated on the S side of the island near the lagoon; a large church and a school are situated in one of the villages. The Resident Agent lives on Pukapuka.

Motu Ko, at the SE end of barrier reef, is flat and sparsely wooded; the tops of the trees rise to a height of 30m. An aviation runway is situated on the S side of Motu Ko.

Motu Katava is densely wooded in its W part. The trees on the W side rise to a height of 38m, and the coconut palms on the E side rise to 24m.

The current sets strongly onto the E side of the Danger Islands.

The current across the reef extending W from the islands is dangerous. It runs S during the ebb and N during the flood, attaining a rate of 3 to 5 knots. This reef is said to break in deep water even on a calm day.

**Tema Reef** (11˚05'S., 165˚38'W.) lies about 14 miles SE of Danger Islands. The reef was reported to lie 2 miles S of its charted position. The reef is about 0.3 mile in diameter and breaks heavily, but no rocks show above water. On a good day, with the wind less than force 4, the reef has been sighted at 8 or 9 miles.

Breakers have been reported (1986) to lie about 140 miles SSW of Tema Reef, and may best be seen on the chart.

## The Samoa Islands

**2.18** The **Samoa Islands** (Navigator Islands) (13˚25’S. to 14˚30’S.; 168˚00’W. to 173˚00’W.) consists of two groups, which are commonly referred to as American Samoa and Western Samoa.

The islands comprising American Samoa are Tutuila Island, Aunuu Island, Ofu Island, Olosega Island, Tau Island, and Rose Atoll. Western Samoa comprises the islands of Upolu Island and Savai'i Island.

**Winds—Weather.—**The prevailing winds, or so-called trade winds, come from a direction more nearly E, blowing between ESE and NNE. They are fairly constant through the dry season, but during the wet season they are fitful, and are frequently broken by periods of calm.

The islands lie within the typhoon area of the W Pacific. Typhoons occur from January to March, and occasionally up to the middle of April.

The year divides itself distinctly, but not sharply into a dry season, May to November, and a wet season, November to April. The wettest month, January, has a range of 127 to 1,651mm. The annual rainfall has also varied this much.

The climate varies little from year to year, because of the great area of water surrounding the group. December is the hottest month, with an average excess of only about 2˚ over the mean temperature for July, the coldest month.

**Regulations.—**See U.S. Coast Pilots for general regulations concerning navigation in United States waters. Specific regulations will be given with the description of the area they affect.

**Caution.—**Caution should be exercised in the vicinity of American Samoa, as several Fish Aggregating Devices have been moored at off-lying, deep-water locations around Tutuila, and other positions around the group. These devices may drift off position, and/or concentrations of fishing vessels may be found in their vicinity.

The devices are comprised of aluminum catamaran floats painted orange and white. Each device carries white daymark,

fitted with the letter designation of the device, and a flashing white light. The devices offer good radar returns.

**2.19 Rose Atoll** (14˚33'S., 168˚09'W.), the farthest E of the Samoa Islands, is nearly square in shape; its sides are about 1.5 miles in length. Sand Island, inside the reef on the N extremity, is merely a sand spot.

A large clump of trees, 20m high, stands on Rose Atoll.

There is a boat channel into the lagoon, close W of the N extremity of the reef.

**Tides—Currents.—**Tidal currents off Rose Atoll are reported to set NE and SW, with the SW or ebb current being the stronger.

**Regulations.—**Rose Atoll is a National Wildlife Refuge managed by the Department of Interior. Entry is strictly prohibited without prior approval.

The **Manua Islands** (14˚13'S., 169˚33'W.) consists of three islands which extend over an area of about 17 miles in an ESE-WNW direction. The group is clear of dangers as far as known.

**Tau Island** (14˚15'S., 169˚28'W.) is the farthest E of the three islands which comprise the Manua Islands. The island is about 5.8 miles long E-W, is dome-shaped, and rises to a height of 966m. It is covered with vegetation.

Maafee Islet is located close offshore, about 0.3 mile S of the W extremity of the island.

**Tides—Currents.—**The tidal currents at the Faleasau anchorage flows SW on the ebb at 1 to 2 knots, and the flood flows NW at 1 to 2 knots. At the Luma anchorage, the ebb flows S and the flood N at a similar rate.

**Anchorage.—**Faleasau (Faleasao), on the NW side of the island, affords sheltered anchorage, in 27m, during the trade winds, but a vessel should be prepared to weigh anchor with any change. Anchorage may be obtained, in 24m, coral, with Fitiuta Point, the NE extremity of the island, bearing 080˚, distant 0.4 mile. Fair anchorage can also be obtained at Luma village on the W side of the island opposite a conspicuous white church.

**Caution.—**A shoal, with a depth of 40m, lies about 1.3 miles, bearing 279˚, from the W extremity of Tau Island. It lies in an area that has experienced submarine volcanic action.

**2.20 Olosega Island** (14˚11'S., 169˚37'W.), 6 miles NW of Tau Island, rises nearly perpendicularly on its W side to a height of 639m. The coral reef surrounding the island consists of two regular shelves, one beyond the other.

There is fair anchorage, except during the trade winds, in 33m, coral, S of the W extremity of Olosega, and in 27m, sand, NE of the same extremity.

**Ofu Island** (14˚11'S., 169˚39'W.) is separated from Olosega Island by Asaga Strait, which is about 0.2 mile wide. Ofu is nearly 3 miles long in an E-W direction, and about 1.5 miles at its widest point. The island rises to 494m in its SE part. Two islets lie off the W side of the island. The coastal reef extends about 0.2 mile from Ofu Island to these islets.

A light is shown from the island's W end. A stranded wreck lies on the reef close NW of the light.

**Depths—Limitations.—**Significant improvements have been made to Ofu Harbor. The newly-built harbor is protected by a breakwater and has an excellent pier fac, approximately 30m in length, for small craft. The alongside depth and turning basin has a reported controlling depth of 4.9m. A boat ramp exists for launching and recovering small craft.

A 47m bank lies about 23 miles WNW of Ofu Island; a 62m bank lies about 28 miles SW of the island.

## Tutuila Island

**2.21 Tutuila Island** (14˚19'S., 170˚42'W.) is about 17 miles long in an ENE-WSW direction, 5 miles wide, and rises to a height of 653m. A wooded mountain ridge extends nearly the entire length of the island and is of extremely rugged aspect, especially in the E. The N coast is bold and precipitous.

The 180m curve lies from 0.1 to 2.3 miles off the S coast of Tutuila, about 4.3 miles off the W extremity, and from 1.3 to 2.5 miles off the N coast. There are several shoal areas, especially off the S coast, which may best be seen on the chart.

**Tides—Currents.—**Currents near the coast set SSW, particularly with NE winds. Rates of 4 knots have been observed. Between Tutuila and Upolo, a NW current with a rate of less than 0.5 knot has been found to exist. A current setting SW from Cape Taputapu is said to produce overfalls.

The S coast of the island extends from Cape Matatula, the E extremity of the island, in a WSW direction about 14 miles to Steps Point, the S extremity, and then about 5.8 miles NW to Cape Taputapu, the islands W extremity.

From **Cape Matatula** (14˚15'S., 170˚34'W.) to Matuli Point, 1.5 miles S, the coast is fronted by a reef which extends about 0.1 mile offshore.

**Aunuu Island** (14˚17'S., 170˚33'W.) lies 0.7 mile SSE of Matuli Point. The island has two peaks, and there is a village at its W end. A light is shown from the island's NE shore.

**Caution.—**A cable area extends across the channel between Aunuu and Tutuila Islands, and is best seen on the chart. Vessels should avoid anchoring in the vicinity.

Nafanua Bank, with a least charted depth of 6.4m, extends 1.5 miles in a SW direction from Aunuu Island.

When making Pago Pago Harbor from the N, vessels usually pass N of Aunuu Island.

From Matuli Point, the coast trends 2.3 miles SW to Cape Fogausa. A rock, with a depth of 3.1m, lies about 0.4 mile SSE of the cape.

Fagaitua Bay lies between Cape Fogausa and Lions Head, 1.7 miles W. There is a 3.7m patch near the middle of the bay. The chart should be consulted for other depths.

**Breakers Point** (14˚18'S., 170˚40'W.), 2 miles W of Lions Head, is the E entrance point to Pago Pago Harbor.

Discolored water has been reported (1989) to exist within 1 mile of 14˚22.2'S, 170˚40.7'W.

Taema Bank, with charted depths of 7.3m, lies across the entrance to Pago Pago Harbor, about 1.5 miles S of Breakers Point. The bank is about 2.3 miles long in an ENE-WSW direction.

Narragansett Passage lies between Taema Bank and Nafanua Bank to the E. There are several banks in the vicinity of the passage whose positions may best be seen on the chart. The pass is not recommended due to the age of survey.

## Pago Pago Harbor (14˚17'S., 170˚40'W.)

World Port Index No. 55680

**2.22** Pago Pago, a natural harbor located on the S shore of Tutuila, is entered between Breakers Point and Niuloa Point, about 0.8 mile WSW.

Pago Pago, on the NW side of the harbor is the largest village on the island and is the seat of the government. It is the only port of entry for American Samoa. The village of Utulei is situated close SE of the government administration buildings, and the village of Fagatogo is situated close W of the same buildings.

**Winds—Weather.—**The climate of the Samoa Group is mild. Although not far from the Equator, it is pleasant, even at sea level. The year divides itself into a dry season, May to October, and a wet season, November to April, with a wide variation in rainfall from year to year.

The prevailing winds, or so-called trade winds, come from an E direction, blowing between the ESE and NNE. These winds are fairly constant through the dry season, but during the wet season, are weaker, being broken by frequent calms.

**Tides—Currents.—**The mean tidal range is 0.7m, while the spring range is 0.9m.

**Depths—Limitations.—**The shores of the harbor are fringed by reefs, which on the W side of the entrance extend up to 0.3 mile offshore and the same distance inside the E entrance. In most parts the reefs are steep-to and their edges are marked by surf.

The depths in the harbor are from 31 to 69m. An 18.3m depth is charted outside the 37m curve, about 0.2 mile SW of Breakers Point. A dangerous submerged wreck is situated about 0.1 mile E of the patch.

Station Wharf (Main Wharf), on the S side of the inner harbor, has depths of 9.8 to 11m alongside, but in 1987, a vessel reported a least depth of 9.1m alongside.

A deep draft container wharf, 240m long, is situated between Station Wharf and Fuel Pier.

Fuel Pier has depths of 10.3m alongside.

Station Wharf and Fuel Pier have been reported (1992) to be in poor condition.

Customs Pier has a depth off 3.1m at the SW end and 6.1m at the NE end.

The facilities on the N shore of the inner harbor are reserved for the fishing fleet serving the canneries.

An aerial cable, with a clearance of 46m, spans the inner harbor.

**Aspect.—**When making the port, easily-identified landmarks include Aunuu Island; Steps Point, the S extremity of the island; the sharp peak of Matafao, 653m high, 1.3 miles S of Pago Pago; the flat, dome shape of North Pioa Mountain, 524m high, on the E side of the harbor; and Fatu Rock, 31m high, located 0.2 mile S of Niuloa Point. Tauga Rock, about 1 mile E of Breakers Point, is 27m high and prominent.

**Pilotage.—**Pilotage is not compulsory, but is advisable; a pilot is available day or night. Pilotage fees are charged whether or not a pilot is used. It is recommended that large vessels request a pilot if docking in inclement weather. A radio request for a pilot should be made 24 hours prior to the ETA. The pilot prefers to embark close to the dock, but in good weather will embark off Fatu Rock.

Entrance at night is not encouraged; however, if previous arrangements are made and weather permits, a pilot will embark during hours of darkness.

Port officials board incoming ships alongside the dock.

**Regulations.—**See the U.S. Coast Pilots for regulations pertaining to navigation in U.S. waters.

Required notifications to the Officer in Charge, Marine Inspection and/or the Captain of the Port, Honolulu, may be made in American Samoa to:

U. S. Coast Guard Liaison Office, American Samoa
P.O. Box 249
Pago Pago, American Samoa

**Signals.—**Pago Pago Harbor Control and the harbormaster may be contacted on VHF channel 16. Pago Pago Harbor Control also monitors 2182 kHz.

**Anchorage.—**There is good anchorage in the inner harbor, in 11 to 46m, mud and sand. The best anchorage for large vessels is in midstream off the main dock. Vessels of 1,000 grt and up should not anchor in less than 29m, as the harbor becomes narrow and there is no room to swing.

**Directions.—**Vessels approaching from the E should pass about 1.5 miles E and 1 mile SE of Aunuu Island. Then a course of 256˚ should be steered until Breakers Point Light bears about 025˚. Then alter course to the N to pass W of Taema Bank. When clear of the bank, steer a NE course to intersect the entrance range. Then steer 342˚ and enter the harbor on the range. This range line passes E of Whale Rock, which has a depth of 3.7m.

**Caution.—**Vessels from the W or S, and deep-draft vessels, should keep outside the 200m curve until reaching 14˚21'S, 170˚41.5'W. From this position steer 026˚ to clear the W end of Taema Bank, then proceed as directed above.

From Pago Pago Harbor, the shore trends SW 6.8 miles to **Steps Point** (14˚23'S., 170˚46'W.); about midway on this stretch of shore, near the airport, the reef extends about 0.3 mile offshore. The sea breaks continuously on this reef.

An area W of Stepps Point, including Fagatele Bay, has been declared a National Marine Sanctuary. See the Code of Federal Regulations, Title 15, Part 941, as well as U.S. Coast Pilot 7 for further detais.

The shore from Steps Point to Papualoa Point, about 2 miles NW, is formed partly by perpendicular rocks and partly by blocks of lava, which extend some distance seaward and upon which the sea breaks.

Leone Bay is entered between Papualoa Point and Fagaone Point, about 2.5 miles NW, and is open to the SSW. There is anchorage W of the village of Leone, in 29 to 37m, but it is dangerous when winds are from the S or SSW.

**2.23 Cape Taputapu** (14˚19'S., 170˚51'W.), the W extremity of Tutuila, lies 1.5 miles WNW of Fagaone Point. It is a mass of high, steep rocks, fronted by some rocky islets. Taputapu Island lies on the reef close SW of Cape Taputapu. The following banks, with the indicated least depths, lie in the approach to Cape Taputapu:

a. 26m—3.3 miles SE.
b. 20m—2.3 miles SSE.

c. 27m—3.8 miles SW.
d. 33m—3.5 miles W.

The N coast of Tutuila is described from the E to W.

From Cape Matatula to Pola Island, 6.5 miles W, the coast is indented by numerous bays. The coast then trends WSW 11 miles to Cape Taputapu. This coast is also indented with bays.

**Aoa Bay** (14˚15'S., 170˚35'W.), entered about 1.5 miles WSW of Cape Matatula, affords anchorage, in 31m, midway between the entrance points.

Masefau Bay, entered W of Tiapea Point, 1.5 miles W of Aoa Bay, affords anchorage, in 31m. The surrounding reefs and Nuusetoga Island, off the W entrance point, narrow the anchorage.

Afono Bay, 1.5 miles W of Nuusetoga Island, is said to provide good anchorage, in 26m, coral, except in N winds.

**Pola Island** (14˚14'S., 170˚40'W.), 1.5 miles NW of Afono Bay, is located off the N extremity of Tutuila. Cockscomb Point, the N extremity of Pola Island is formed by a ridge of rocks, which are high, indented, and steep.

A depth of 24m is charted just over 1 mile ENE of Cockscomb Point; a 27m depth is charted about 1.5 miles W of the same point.

Fagasa Bay lies about 4 miles SW from the N extremity of Tutuila. Anchorage, protected from the trades, may be taken, in 24m, between the E and W points of the bay.

Between Fagasa Bay and Aoloau Bay, 3 miles WSW, there are two small bays backed by mountains.

Aoloau Bay affords good anchorage, in 27m, midway between the heads, but vessels should be prepared to leave on short notice when the winds shift to the N. Aoloau Bay is small and surrounded by high mountains.

A 22m depth is charted 1.5 miles NNW of Aoloau Bay. Similar depths are charted to a distance of 4.8 miles W of the 22m depth above.

**Poloa Bay** (14˚19'S., 170˚50'W.), 4 miles SW of Aoloau Bay, affords good anchorage during E winds, in 31m, midway between the entrance points. Vessels should be prepared to leave on short notice when the wind shifts to the W.

In this bay there is a 1 to 4 knot current that runs in a SW direction. Cape Taputapu is located close SW of Poloa Bay.

## Upolu Island

**2.24 Upolu Island** (13˚54'S., 171˚44'W.), in Western Samoa, lies about 38 miles WNW of Tutuila Island. The island is about 39 miles long in an E-W direction and 13 miles wide. A range of mountains consisting of a series of extinct volcanoes traverse the length of the island, lying nearer the S coast and sloping more steeply on the S side than on the N. The E part is more mountainous. The island rises to a height of 1,100m in Mount Fito, near the center of the island.

The shores of the island are fringed with a coral reef, which in places is intersected by channels, forming convenient harbors.

Apia, on the N coast, is the principal town on the island, and the official port of entry for Western Samoa.

**Cape Tapaga** (Point) (14˚01'S., 171˚23'W.), the SE extremity of the island, is reef-fringed. This reef curves N around the small islands of Namua and Fanuatapu, located 1.5 miles and 2.8 miles NE, respectively, from Cape Tapaga. The reef extends offshore to the W side of Fanuatapu, 1.5 miles distant.

Depths of 4.9m are charted 1.5 miles and 1.6 miles NE of Cape Tapaga, and a depth of 1.2m is charted 1.8 miles NE of the cape.

**Samusu Point** (13˚59'S., 171˚26'W.), 3.8 miles N of Cape Tapaga, is precipitous. A patch, with a depth of 11.9m, lies 1.5 miles E of the point.

Uafato Bay, about 5 miles NW of Samusu Point, affords anchorage to vessels with local knowledge on its W side, in a depth of about 29m. Care should be taken to avoid a coral spur extending NE from the head of the bay.

A bank, with a depth of 14.6m, lies 2.5 miles NNE of the W entrance point of Uafato Bay.

**Fagaloa Bay** (13˚55'S., 171˚32'W.), 2.5 miles NW of Uafato Bay, is 1 mile wide at its entrance and recedes 2.5 miles in a SW direction. The bay is fringed with reefs; those on the S side extend up to 0.3 offshore, and have shoals which lie off the reefs. The reefs on the N shore extend up to 0.2 mile offshore.

The SE trade winds prevailing in Fagaloa Bay from April to October draws into the bay as a NE wind. The W winds generally felt at the anchorage as coming from WSW to SSW.

There are general depths in the bay from 18 to 70m. The 20m curve lies about 0.5 mile from the head of the bay.

**Anchorage.—**Anchorage may be taken, in 27m, 0.7 mile from the head of the bay. A 14.6m patch lies close S of the anchorage.

Fagaloa Bay may be approached from the N and when Spitzer Mountain, about 12 miles from the E end of the island, bears 244˚, stand in on that bearing.

A waterfall on the S side of the bay is conspicuous and Fao Peak on the N side is unmistakable.

From Fagaloa Bay the coast continues NW 3.5 miles to Mantantu Point, then W 2 miles to Saluafata Harbor.

A reef extends up to 0.8 mile seaward between Mantantu Point and Saluafata Harbor.

**2.25 Saluafata Harbor** (13˚52'S., 171˚37'W.), a natural harbor, is protected from the swell by coral reefs. The W side of the bay is encumbered by reefs which partly dry and extend 0.7 mile offshore. Casino Islet lies on this reef, 0.4 mile offshore; this islet is sometimes covered, even 2 hours before HW, and frequently shifts its position. Saluafata Bank, with a least depth of 3.7m, lies about 0.8 mile N of the E entrance point. With a NE swell the sea breaks on this bank.

Ariadne Point is located on the SE side of Saluafata Harbor; a conspicuous beacon marks the point.

**Anchorage.—**Anchorage, in a depth of 14m, sand, can be taken with Ariadne Point bearing 170˚ at 0.4 mile distant. The anchorage may be approached with the beacon on Ariadne Point in line with a rear beacon, and the summit of Leading Peak bearing 175˚. This range leads close to the reef on the W side of the harbor.

**Vailele Bay** (13˚50'S., 171˚43'W.), about 5 miles W of Saluafata Harbor, is divided into two parts by a detached reef which dries in places. In the W part of the bay is the settlement of Letogo.

A shoal, with a least depth of 2.7m, lies 0.2 mile NW of the N end of the detached reef above. The anchorage NE of Letogo

is approached between the reef and the shoal on a course of 239˚. Vessels anchor, in 11 to 12m, about 0.3 mile offshore.

**Nuu** (13˚48'S., 171˚39'W.), with a depth of 18m, lies 5 miles NE of Letogo. Depths of 20 and 22m are charted 1.3 and 2.5 miles NW and WNW, respectively, from Nuu.

**Matautu Point** (13˚49'S., 171˚45'W.), 3 miles NW of Letogo, is the E entrance point to Apia Harbor.

Muaavasa, a bank with a depth of 13m, lies 2 miles NE of Matautu Point; the bank breaks occasionally. Toatuga, with a least depth of 12m, lies on the entrance range line 3.5 miles NNE of Matautu Point.

East Reef extends 0.4 mile N from Matautu Point, and West Reef lies on the W side of Apia Harbor and extends 0.6 mile E, and nearly 1 mile N from Mulinuu Peninsula. The peninsula projects 1 mile NW from Apia.

## Apia Harbor (13˚39'S., 171˚46'W.)

World Port Index No. 55670

**2.26** Apia Harbor is an inlet in the coastal reef entered between East Reef and West Reef; it is open to the North. Apia is the capital and principal town in Western Samoa; it is a port of entry.

**Winds—Weather.—**During the months of May to October, at irregular intervals, there is a day of short squalls and rain instead of the steady trade winds. The squalls may be of force 6 or 7 for a short period, but are not dangerous. The typhoon season is November to March.

**Tides—Currents.—**The mean tidal rise here is 0.8m, while the spring rise is 1m.

The current across the harbor entrance, about 0.3 mile off the reef, is variable and frequently sets against the wind and tide. It is predominantly W and attains rates of 4 to 5 knots during the rainy season. In this season, November to February, the rivers which discharge into the harbor frequently cause 2 knots W set at the anchorage.

A vessel entering the harbor in February reported that a 1m swell in the harbor entrance was the dominating concern.

**Depths—Limitations.—**Depths on the range line vary from 49m at the seaward end, to 16m just NE of the tanker berth. Within the harbor, depths range from 4.8 to 12.8m, but a reef fringes the entire harbor and may best be seen on the appropriate chart.

Main Wharf is 184m long, with a depth of 9m alongside; the inner berth, on the inside face of the wharf, is 80m long, with a depth of 4.5m alongside. Caution is advised when using this inner berth, as a coral rock with a depth of 1.2m lies about 68m SE of the wharf's SE end. The maximum allowable draft at the main wharf at Apia is 9m.

An inter-island ferry terminal, with alongside depths of 3 to 4m, is situated close E of main wharf. Wooden dolphins have been set out at this berth to keep vessels off the harbor bulkhead.

An offshore oil berth, connected to a submarine pipeline and centered within a Prohibited Anchorage Area, lies in a charted depth of 12.1m on the W side of the harbor. This multi-point mooring will accommodate tankers up to 30,000 dwt, with a maximum draft of 12.8m.

**Aspect.—**A conspicuous object when approaching Apia is the small tide gauge on West Reef. The twin towers of the catholic cathedral, and the single tower of the church are conspicuous. A conspicuous radio mast stands 0.5 mile SSE of the front range light. Two groups of oil tanks stand on Mulinuu Peninsula. Caution should be exercised when using these marks as a vessel has reported that the tide gauge is missing and the radio mast could not be located.

**Apia Clock Tower**

**Pilotage.—**Pilotage is compulsory; the pilot boards about 2 miles outside the harbor on the range line. The port is open at night for arrivals or departures, but arrivals are preferred in either early morning or late afternoon, as the trade wind is less fresh then.

**Regulations.—**Vessels should send their ETA to the local authorities at least 48 hours in advance, confirming 24 hours prior to arrival. Pratique should be requested at least 12 hours before arrival.

Between November and April, vessels may not immobilize their main engines without the harbormaster's permission, and should be ready to sail with 2 hour’s notice.

**Signals.—**Apia Harbor Control and the pilot may be contacted on VHF.

**Anchorage.—**Ships awaiting a berth can anchor about 1 mile N of East Reef, in 46 to 49m, coral, poor holding ground. Vessels may also anchor, in 37m, N of the harbor entrance, on or near the range lines.

Anchoring is prohibited in the vicinity of the tanker terminal.

**Directions.—**Entry to the harbor may be made with the approach range in line bearing 194˚. A set of range beacons, in alignment bearing 133˚, leads from the entrance range to the inner harbor.

**Caution.—**A dense, white smoke from local cooking fires may obscure the marks in the approaches to the port. This smoke may be encountered particularly on Sunday.

Between November and April, especially with a N or NW swell, a heavy surge may be felt at Main Wharf, strong enough to force a vessel to leave her berth.

**2.27** From Apia to **Cape Faleula** (13˚47'S., 171˚50'W.), 4.3 miles NW, the coast is low and fronted by reefs. The reef extends 1.5 miles seaward from Cape Faleula, the N extremity of the island. A bank, with a depth of 5.8m, is located 2 miles NW of the light which stands NNW of Cape Faleula.

From Cape Faleula to Cape Fatuosofia, 15 miles WSW, the coast is low and covered with vegetation. The coastal barrier reef extends from 0.5 to 1.5 miles offshore.

There is anchorage in an exposed position off the village of Mulifanua, 3 miles NE of Cape Fatuosofia.

An incoming vessel should fix its position offshore and head for Mulifanua on course 148˚. When the range lights become visible, continue on the range, bearing 148˚, and anchor, in 29m, about 0.8 mile from the front beacon. A depth of 11.6m is charted on the range line NW of the anchorage.

**Manono** (13˚51'S., 172˚06'W.) is an island lying nearly 2 miles WNW of Cape Fatuosofia. The reef which surrounds Manono is connected to Upolu; the reef extends 0.6 mile W of Manono, and an islet, 37m high, is located near the W edge of this reef.

From Cape Tapaga, the S coast of Upolu extends W 19.5 miles to Cape Nuutoi, then continues about 21 miles WNW to Cape Fatuosofia.

**Tides—Currents.—**The currents off the S coast of Upolu set E.

**Hertha** (13˚53'S., 171˚16'W.), a bank with a depth of 27m, lies about 14 miles NE of Cape Tapaga.

**Nuutele** (14˚02'S., 171˚22'W.) and Nu'ulua, two islets joined by a reef, lie 1.3miles and 2 miles SE, respectively, of Cape Tapaga.

A rock, with a depth of 4.9m, lies 0.4 mile W of the NW extremity of Nuutele, but its position is doubtful. Large vessels should avoid the passage between Nuutele and Upolu.

Lepa, a village about 3.8 miles W of Cape Tapaga, is marked by a long, low, white church with a bright red roof.

**2.28 Falealili Harbor** (14˚01'S., 171˚41'W.), entered about 12 miles W of Lepa, is sheltered from N winds only. Nuusafee, an islet, lies on the reef 1 mile WSW of the E entrance point. The reef extends 0.8 mile offshore, with indentations in it.

This harbor is too small and deep to allow sufficient chain to be veered in a heavy gale.

Safata Harbor, about 9 miles WNW of Falealili Harbor, is a reef harbor with depths of about 11 to 26m. The entrance is difficult to make out from a distance.

In the entrance and in the central part of the bay are four reefs, three of them on the center line of the bay. The outermost of the detached reefs has a depth of 4.9m, and the sea breaks on it in heavy weather; there is a depth of 0.9m on the middle reef which also breaks, and the inner reef dries. The channel on either side of the reef is about 0.2 mile wide. The E part of the harbor offers better shelter.

From Safata Harbor, the coast trends 3.5 miles W to **Round Point** (14˚00'S., 171˚55'W.), and then 4.5 miles NW to Lefaga Bay. The coast along this area is fringed by a reef.

**Cape Mulitapu'ili** (13˚57'S., 171˚59'W.), the W entrance point of Lefaga Bay, is a high bluff.

From Cape Mulitapu'ili to Samatau, a large village 5 miles NW, the coast is fringed by a reef which extends 0.5 mile offshore, then to the S side of Manono where the fringing reef extends about 1.5 miles offshore.

**2.29 Apolima** (13˚49'S., 172˚09'W.), an islet, 165m high, lies about 1.8 miles NW of Manono Island. A rock, 12.2m high, lies 0.4 mile N of the islet.

Apolima Strait separates Apolima from the SE extremity of Savai'i Island, about 4 miles WNW. Depths of 14.9m and 16.1m are charted 2.3 miles WNW and 3.5 miles NNW, respectively, from Apolima.

The strait is easy to navigate, but vessels which have passed through from the S have reported a strong current setting E towards Apolima, and N of the islet a strong countercurrent setting W.

**Caution.—**Caution should be exercised when approaching the strait from the S, as depths of 34 to 62m are charted in an area 9 miles SW, 11 miles S, and 12 miles SE of Apolima.

Ferry traffic may be encountered in the strait at any time. These vessels are reported to be poorly lit and not readily discernible by radar.

## Savai'i Island

**2.30 Savai'i Island** (13˚37'S., 172˚29'W.), the largest and farthest W of the Samoa Group, is about 40 miles long and 20 miles wide. It differs from the other islands in appearance; the shores are low and the ascent to the center is gradual. The island rises to a height of 1,858m near the center which is constantly enveloped in clouds.

**Tafua Savai'i** (13˚47'S., 172˚15'W.), 1.5 miles NW of the SE extremity of the island, is 171m high. It makes a good mark for making Apolima Strait. It begins to show above the horizon about the same time as Apolima Islet, and appears as an island. From the NE, Tafua Savai'i may be mistaken for Apolima and the latter for Manono, which does not appear until much closer.

Palauli Bay, 3.5 miles WNW of Tafua Savai'i is a semicircular bay almost entirely barred by a reef. Vessels may anchor in the bay during NE winds, in 44m, sand, with Tafua Savai'i bearing 099˚, about 0.4 mile off the reef fronting the E shore. A rock lying W of the anchorage is marked by breakers.

The S side of the island is rocky; as there are no fringing reefs, a heavy surf beats directly upon it. There are few places where landing can be affected.

**Cape Asuisui** (13˚47'S., 172˚32'W.), the SW extremity of the island, lies 15 miles W of Palauli Bay.

From Cape Asuisui the coast trends NW about 6 miles to Salailua Bay, which may be identified by the fringing reef which is the first fringing reef seen after passing Palauli Bay.

There is anchorage in the middle of Salailua Bay, in a depth of 44m. The anchorage is protected from SSE winds; the holding ground is good.

A depth of 6.4m is charted 0.5 mile offshore, about 2 miles NW of Salailua Bay.

At Falelima, a village standing 10 miles NW of Salailua Bay, there is a white house in the middle and another at its S end. Landing can be affected in favorable weather, at HW, between the rocks which project off the coast.

**Cape Mulinuu** (13˚30'S., 172˚48'W.), the W extremity of Savai'i Island, terminates in a low, rocky spit. A white church near this point is a conspicuous landmark.

Table of Contents

From a position about 3.8 miles N of the SE extremity of Savai'i to **Cape Tuasivi** (13˚40'S., 172˚10'W.), the E extremity, about 5 miles farther N, there is a barrier reef which extends up to 1.8 miles offshore.

South of the reef is the village of Salelologa, where shelter may be obtained by small vessels with local knowledge in fair weather. Lights, in line bearing 312˚, lead into the entrance.

The barrier reef continues for a distance of about 6 miles NNW of Cape Tuasivi. There are several boat passages through the reef. Between the reef and the coast there are numerous mangroves and large trees, which at HW give the appearance of a flooded island.

From the above reef for a distance of about 10 miles the coast is steep-to, apparently without any reef fronting it.

**Tides—Currents.—**See the Apolima Strait description in paragraph 2.29 for information on currents off the E side of Savai'i Island. Off the island's N coast, a W set is felt, but it is basically confined to deep water.

**2.31 Matautu Bay** (13˚26'S., 172˚22'W.), 17.5 miles NNW of Cape Tuasivi, lies close W of the N extremity of Savai'i Island. The bay is a slight indentation in the coast whose W entrance point consists of a perpendicular cliff, 50m high.

**Anchorage.—**An anchorage with good shelter in the trade wind season, but exposed at all seasons, may be taken by vessels with local knowledge, in 14 to 26m, sand, between the reefs.

Safune Bay, 3.5 miles W of Matautu Bay, is nearly filled with reefs, but it provides anchorage, in 24m, during SE winds. There is usually a swell at the anchorage.

**Asau Bay** (13˚30'S., 172˚38'W.), entered about 13 miles W of Safune Bay, is completely fronted by a reef of sand and mud.

**Tides—Currents.—**Off the entrance, the tidal current sets in an E direction from 4 hours before to 1 hour after HW at Asua, and in a W direction from 3 hours after to 6 hours before HW reaches a maximum rate of almost 0.8 knot at springs.

In the dredged channel, there is a continuous NW flow, reaching a maximum rate of 1.5 knots during a falling tide, with a minimum rate on the rising tide.

There are heavy tide rips in the channel 0.2 mile NW of the seaward end of the airstrip.

**Depths—Limitations.—**The approach channel through the reef to Asau Bay is 54m wide, while the center 37m has been dredged to 6.7m. Due to sea and swell conditions, an under-keel clearance of 1.5m is recommended. The best conditions for entering are at first light and LW. There is a wharf with a least depth of 8.5m close S of Utuloa on the E shore of the bay.

Three sets of range beacons mark the channel edges and center; all three sets stand in line bearing 139˚.

**Anchorage.—**Anchorage may be obtained, in 31m, 0.2 mile N of the entrance, but may be untenable when the wind backs to the NE.

Close W of Asau Bay, separated from it by Cape Mauga, lies Sataua Bay, which has a sandy shore and a reef. Anchorage may be obtained by vessels with local knowledge, in 27 to 37m, in the middle of the bay where there is good shelter from the trade winds.

**Caution.—**Caution is advised as silting has been reported on the W side of the approach channel off the airstrip.

**2.32 Cape Vailaoa** (13˚29'S., 172˚47'W.), fronted by a coastal reef, is located 6 miles WNW of Sataua Bay.

Falealupo Road, entered SW of Cape Vailaoa, affords good protection against E winds in an anchorage, with depths of 20 to 49m, coral and sand.

Cape Mulinuu, the W extremity of Savai'i Island, lies at the S end of Falealupo Road.

**Swains Island** (11˚03'S., 171˚05'W.), lying about 160 miles NNE of Savai'i, is somewhat circular in shape and has a diameter of about 1.5 miles. The land is from 3 to 4.6m high, and the trees are from 21 to 30m high.

A platform reef about 183m wide, which surrounds the island, uncovers at LW; the reef is steep.

The island is administered by the Government of American Samoa.

There is anchorage for small vessels N of the village of Taulaga, which is situated on the W coast of the island. Deep-draft vessels are advised to remain at least 0.4 mile offshore as depths shoal rapidly; a vessel anchoring 0.2 mile off the village reported anchoring in 55m.

## The Southern Cook Islands (Lower Cook Islands)

**2.33** The Southern Cook Islands (Lower Cook Islands) lie between 19˚ to 22˚S and 157˚ to 160˚W. They consist of Mangaia, Rarotonga, Mauke, Mitiaro, Atiu, Takutea, Manuae, Te-Au-o-Tu, and Aitutaki.

The Southern Cook Islands are administered for the New Zealand government by a Resident Commissioner at Avarua in Rarotonga. Each island has a Resident Agent, who is assisted by the island council.

**Winds—Weather.—**The climate of the Southern Cook Islands is generally warm and humid. The trades usually blow from the ESE. Typhoons may be experienced from November to April, and usually come from the direction of the Samoa Islands.

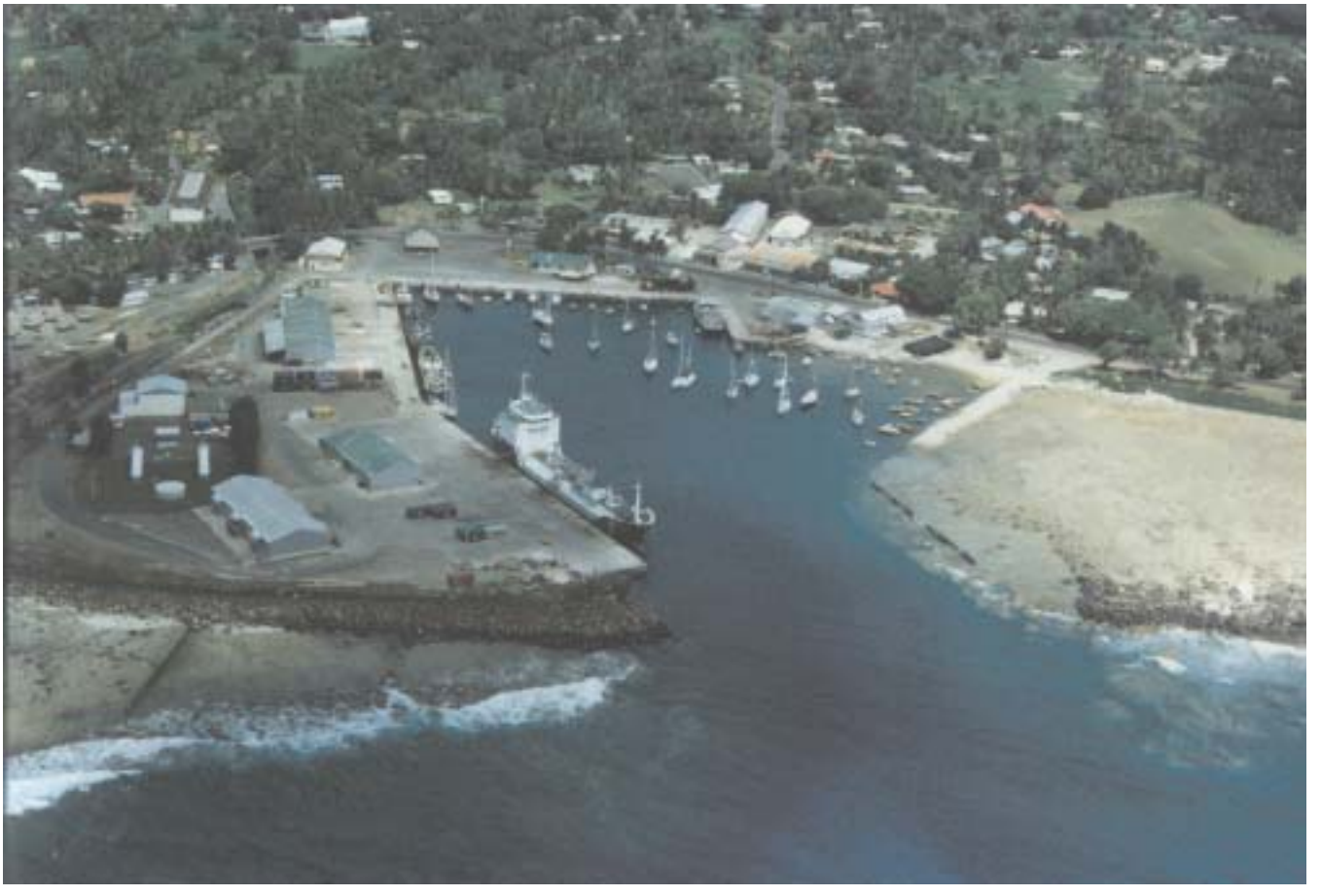
**Tides—Currents.—**In the vicinity of this group, the current will generally be found setting to the W with a velocity of about 0.5 knot, but it is influenced by the force and direction of the wind.

**Mangaia** (21˚55'S., 157˚55'W.), the farthest S of the Southern Cook Islands, lies about 730 miles SE of Rose Island in the Samoa Islands. The island rises to a height of 169m near the center. A fringing reef, about 0.6m high, surrounds the island and extends about 46 to 366m offshore. A huge barrier cliff, formed of coral and covered with vegetation, makes a complete circuit of the shore.

Oneroa, a village on the W side of the island, is conspicuous. The Resident Agent lives on the island. A white church and radio masts are situated within the settlement. A light, shown occasionally, is exhibited near the town. In good weather, anchorage for small vessels is available off a village 0.8 mile N of the main village, but the vessel's engines must be kept ready for immediate departure. A small wharf used by lighters lies adjacent to the anchorage; however, the channel to the wharf requires local knowledge.



Return to paragraph: 2.1



*Courtesy of Don Silk, Harbormaster.*

**Avatiu Harbor**

## Rarotonga

**2.34** **Rarotonga** (21˚14'S., 159˚46'W.) lies about 110 miles WNW of Mangaia and is the seat of government for the Cook Islands. The New Zealand High Commissioner resides at Avarua, where the offices of the administration are situated.

The island is about 6 miles long E-W, and about 4 miles wide. The island is volcanic in nature, the mountains rising to sharp peaks covered with vegetation. The highest peak is Mount Te Atu Kura, 643m high.

The fringing reef surrounding the island is steep-to, extending for 0.3 mile on the S side and 0.5 mile on the SE side.

Avarua Harbo**r**, on the N side of Rarotonga, is N of the passage which leads through the barrier reef to the town of Avarua.

Avatiu Harbor, located 0.5 mile W of Avarua Harbor, lies outside the barrier reef.

**Winds—Weather.—**The Southeast Trades dominate the area. At Rarotong,a 25 per cent of the winds are E and SE. Next in frequency, at 9 per cent, are S winds. These S winds are most frequent from May to September. North and NE winds blow most often from December to February. Calms in the Rarotonga area occur about 13 per cent of the time.

**Tides—Currents.—**The spring range of tide is 0.6m. The tidal currents in the approach to Avatiu harbor normally sets to the W. Reports have stated that a W set, with rates of 1 to 3 knots, may be encountered in the harbor entrance. It has also been observed that N winds send a swell into the harbor causing rips and cross channel sets in the entrance.

**Aspect.—**When approaching Rarotonga from the W, red obstruction lights mark antennas and other obstructions within the vicinity of an airstrip situated on the island's NW side, as well as an aeronautical beacon shown from the same general location. These lights should not be confused with the lights of Avarua and Avatiu. The obstruction lights and aeronautical beacon are shown only when an aircraft is expected.

The large fuel tanks W of the harbor, and white cylindrical tanks on the E side, are the most conspicuous marks seen when approaching Avatiu.

**Caution.—**A local magnetic anomaly has been reported to lie at the position 21˚11'S, 159˚45'W.

The local authorities should be contacted for the latest information on depths and aids to navigation before anchoring or attempting to berth here.

Avarua Harbor is no longer used by commercial vessels.

**2.35 Avatiu** (21˚12'S., 159˚47'W.) (World Port Index No. 55740) is open to shipping with a draft of 6m or less, but vessels should keep in mind the cautions listed below. Range lights, in line bearing 193˚, lead from seaward to the harbor basin which will accept a vessel up to 90m in length. Two wharves are available; the outer berth has a length of 135m with depths of 6m alongside and the inner berth has a length of 125m with depths of 5.5m alongside.

Conspicuous tanks are charted on the NE side of the harbor.

**Pilotage.—**Pilotage is available and recommended for Avatiu Harbor. Vessels should send requests for pilotage through Rarotonga Radio 24 hours in advance to the Harbormaster, Rarotonga. Vessels are requested to call the Harbormaster on VHF channel 16 when in range. The pilot boards 0.8 mile N of Avatiu Harbor entrance.

**Signals.—**Rarotonga Radio maintains a 24-hour watch on 2182 kHz. The Harbormaster can be contacted on VHF channel 16 during normal hours, or can be contacted through Rarotonga Radio outside normal hours.

**Anchorage.—**Vessels unable to enter either harbor usually anchor, in depths of 65m, at the intersection of two sets of range lights, best seen on the chart. The holding ground is soft coral, and reported to be bad, although safe in winds between the E and SW. The anchorage is unsuitable with N winds or swell. Caution is advised, as the ranges have been reported to be difficult to distinguish. In calm weather, the ship's chain may snag on the coral.

**Caution.—**Avatiu is exposed to N winds. When such a wind generates a sea, a confused sea rolls over the reefs making them unsafe, and entry difficult.

A pinnacle rock, with an estimated depth of 5.9m, was reported to lie at approximately 20˚38'S, 161˚02'W.

**2.36 Mauke** (20˚09'S., 157˚23'W.), 148 miles ENE of Rarotonga, is the farthest E of the Lower Cook Islands. It is low and wooded, somewhat circular in shape, and has a diameter of 2.3 miles. A reef fringes the island, but does not extend more than 0.3 mile.

There is no anchorage, but local boats will come out in good weather. The principal landing place is at Taunganui, on the NW side of the island. The island has an airstrip.

**Mitiaro** (19˚50'S., 157˚41'W.) lies about 24 miles NW of Mauke. It is a small island surrounded by a barrier reef; there are apparently no dangers outside the reef, and there is no anchorage.

**Atiu** (20˚02'S., 158˚07'W.) lies about 21 miles WSW of Mitiaro. The island is thickly wooded and rises to a height of 120m near the center. The coast is encircled with a coral cliff. A bold, rocky cliff about 91m high, intersected by sandy bays, forms the N side of the island.

The fringing reef surrounding the island extends no more than 0.5 mile from the coast; depths of 220m are found 0.2 mile seaward of the reef, and there are no apparent off-lying dangers. With an E wind, a current sets strongly onto the island's N side.

There are a number of landings on the island, but local knowledge is necessary for all.

The island's center is so thickly settled that the separate villages can be regarded as one. Taunganui, on the W coast, is the residence of the Resident Agent. The landing here cannot be used in NW winds and a S swell.

A lighter harbor contained within a concrete jetty lies on the island's W side. This harbor requires local knowledge and is available to small craft less than 9m in length. The harbor is reportedly hazardous to enter.

There is an aviation runway at the N extremity of the island.

**2.37 Takutea** (19˚49'S., 158˚18'W.), located 12 miles NW of Atiu, is a small island with a white, coral sand beach protected by a fringing reef. The tops of the trees are about 24m high and are visible from Atiu.

A reef, occasionally marked by heavy breakers, extends 1.8 miles SE from the island. A shoal, with depths of 7.3 to 12.8m, extends about 0.3 mile W from the W extremity. Tide rips exist N of this shoal.

**Manuae Atoll** (Hervey Islands) (19˚21'S., 158˚56'W.) consists of Te-Au-o-Tu, a small island on the E side of a lagoon, and Manuae, a small island on the W side of a lagoon.

A coral reef surrounds the atoll and there is no passage through the reef. There is no safe anchorage, but with offshore or light winds, temporary anchorage can be found off the NW side of Manuae, in 16 to 22m, about 0.1 mile off the reef.

**Aitutaki** (18˚54'S., 159˚46'W.), the farthest NW of the Lower Cook Islands, lies about 51 miles WNW of Manuae Atoll. The island, about 4 miles long in a N-S direction, is located at the N end of a reef which is a fringing reef on its N extremity, but becomes a barrier reef farther S. A number of small islets, from 6 to 18m high and covered with trees, stand on the barrier reef; also, some low cays on the E side of the reef break heavily.

Aitutaki rises to a height of 119m in the N part. A light is situated on this peak.

There are some conspicuous rocks, 11.6m high, off a point on the W coast about 2 miles SSW of the N extremity of the island. A house with a conspicuous silver-grey roof stands near the coast, about 0.4 mile SSE of the conspicuous rocks, and 0.6 mile SSW of the house there is a church with a conspicuous red roof.

Motikitiu, a small islet, is located near the SE extremity of the barrier reef 4 miles SE of Aitutaki; Maina, a small islet, is located near the W extremity of the reef, 5.5 miles WNW of Motikitiu.

**2.38 Arutunga** (18˚53'S., 159˚47'W.) (World Port Index No. 55730) is a reef port with a boat passage through the reef which has a depth of 1.8m at HW. In 1972, a depth of 1.5m could be carried to the pier. Strong currents occur in the boat passage, for which pilotage is recommended. Range lights, in line bearing 145.5˚, are shown from the port.

The Resident Agent is stationed at Aratunga.

A vessel can anchor off the boat passage, in 33m, coral sand, about 0.8 mile NW of the root of the pier.

In 1988, it was reported that the anchorage area was small, difficult to locate, and very close to shoal water. Also, the anchorage appeared to be unsafe with a W wind.

**Palmerston Atoll** (18˚04'S., 163˚10'W.) lies about 200 miles WNW of Aitutaki. They belong to the Northern Cook Islands and are administered from Rarotonga.

The atoll consists of six sandy islets on a coral reef and encloses a lagoon. The islets are covered with coconut palms, with the exception of some low cays on the NE part of the reef.

The inhabitants state that heavy gales occur every year, usually in January and February, blowing from the NE and E, and lasting 24 to 36 hours, the wind remaining in that quarter.

During good weather, anchorage can be obtained, in 10 to 30m, coral, about 0.2 mile from the reef, on a prolongation of the W point of the reef extending from the W islet. It is impractical for large vessels to anchor. The atoll is dangerous to approach at night.

*Courtesy of Ewan Smith*

**Palmerston Atoll**

## The Tonga Islands

**2.39** The Tonga Islands are a widely scattered group of islands lying between 18˚01'S and 21˚28'S, and 173˚54'W and 175˚25'W. They consist of over 100 islands and islets, which are divided into three main groups, namely Tongatapu, Ha'apai, and Vava'u. Between Tongatapu and Ha'apai are the subsidiary groups of Nomuka, Otu Tolu, and Lulunga (Kotu).

Volcanic activity occurs occasionally in areas N and S of the Tonga Islands, which may best be seen on the appropriate chart.

**Winds—Weather.—**In early winter the trade wind blows mainly from the ESE becoming SE in July. In the N at Vava'u, strong winds blow mainly from between the ESE and SSE, and are said to last about 3 days; they are generally accompanied by rain squalls. In summer, strong winds occasionally blow from the NW with thick rainy weather, but the wind does not usually remain in this quarter longer than 12 hours. It is reported that a swell from the SW, raised by gales in high S latitudes, cause a heavy surf on the S coasts of the islands.

**Tides—Currents.—**The currents in the shallower waters of this area and near the island coasts are greatly influenced by the winds and tend to follow the line of the coasts.

**Caution.—**A local magnetic anomaly has been reported to exist at 20˚42'S, 175˚01'W.

Generally, a line of shallow and shoal depths extends SSW from the Tonga Islands for about 500 miles to the Kermadec Group, continuing SSW towards New Zealand. The Kermadec Group and the dangers SW of them are described in Pub. 127, Sailing Directions (Enroute) East Coast of Australia and New Zealand and may be seen on the appropriate chart.

Volcanic activity (1979) has been reported at the position 25˚52'S, 176˚14'W; activity has also been reported (1986) at the position 24˚58'S, 175˚52'W.

**2.40** The **Minerva Reefs** (23˚46'S., 179˚02'W.), lying from 250 to 275 miles SW of Tongatapu Group, appear to stand on a submarine plateau from 549 to 1,097m below the surface of the sea, which extends about 28 miles in a NNE and SSW direction. The two reefs are 18 miles apart and are located toward the extremities of the plateau.

**South Minerva Reef** (23˚56'S., 179˚08'W.), consisting of two united atolls about 4.8 miles long in an ENE and opposite direction, has large detached blocks of coral lying on the W reef, which dries 0.9m.

A bight on the N side of the junction of the two atolls is about 0.8 mile wide. Here, about 0.3 mile N of the reef, there are depths of 18 to 37m, where vessels can find protected anchorage during the SE trades. A tower stands close to the junction of the two reefs.

**North Minerva Reef** (23˚38'S., 178˚55'W.), nearly circular in shape, has a diameter of about 3 miles. The reef, which dries about 0.6m or 0.9m, was reported to give a good radar echo. An opening about 0.2 mile wide, and which has tidal currents running through it at rates of 3 knots, leads into the coral-free lagoon. Anchorage may be had, in a depth of 27m, sand, near the center of the lagoon.

**Pelorus Reef** (22˚51'S., 176˚26'W.), about 144 miles NE of North Minerva Reef, has a charted depth of 26m. It would be prudent to avoid the vicinity of this reef.

For the many shoal areas and reported discolored water areas S of the Tonga Islands, refer to the chart.

**Ata** (22˚20'S., 176˚12'W.), 32 miles NNE of Pelorus Reef, is distinguished by two lofty peaks of about equal height, the N of which is about 290m high. The island, about 1.5 miles long, is wooded. A rock, about 91m high, lies close off the S point of the island, and some white rocks, 122m high, lie close off the NW point.

**Gleaner Reef** (22˚43'S., 173˚54'W.), which was struck by a vessel drawing about 5m, lies about 128 miles ESE of Ata, but the position is doubtful.

An obstruction was reported (1946) in position 21˚54'S, 174˚01'W, about 49 miles NNW of Gleaner Reef.

Depths of 168m and less have been reported to lie between Ata and Tongatapu, and may best be seen on the chart. Vessels are urged to use the appropriate caution in this area.

**Eua Island** (21˚22'S., 174˚56'W.), the farthest S of the Tonga Islands, lies about 10 miles SE of Tongatapu. The island is 10.5 miles long in a N-S direction and nearly 4 miles wide; it rises to a height of 329m near its S end.

Kalau, an islet 37m high, lies 2.5 miles WSW of the of the S extremity of Eua.

When approaching Tongatapu from the S, Eua provides a good landfall; however, caution should be exercised if approaching from this direction.

English Road, on the NW side of Eua Island, affords anchorage, in 46m, about 0.3 mile offshore, off the village of Ohonua. This anchorage is unsafe in W winds.

**2.41** **Tongatapu** (21˚10'S., 175˚12'W.), the principal island of the Tonga group, is triangular in shape and is about 18 miles long, 9 miles wide, and mostly level. The ground is undulating in places and rises from sea level on the N coast to an elevation of about 61m in the SE part of the island.

**Caution.—**Uncharted reefs have been reported to lie up to 4 miles off the island's S side.

Attention is drawn to the presence of old mine zones around Tongatapu.

**Niu Aunofo** (21˚04'S., 175˚20'W.), the NW extremity of Tongatapu, is a low, wooded rocky cliff.

Duff Reef, 2.5 miles W of the light on Niu Aunofo, is a small steep-to reef on which the sea always breaks heavily.

The coast for 2.5 miles SW of Niu Aunofo is rocky, with long white patches of sand, and is fringed by a narrow reef which is steep-to.

For 12 miles SE, there is a considerable number of blowholes which extend between the higher ground and the coastline. The coast is mostly low, rocky cliffs with patches of white sand in places.

From this point to Houma (Homa) Toloa, the S extremity of the island, the coast changes and rises until at that point the cliffs of coral rock are more than 61m high. A barrier reef, or series of reefs, extend along the entire S side of the island, 3 to 4 miles S from it.

From Houma Toloa to **Mui Hopohoponga** (21˚09'S., 175˚02'W.), the E extremity of the island, about 9 miles NNE, the coast consists of low, broken rocky cliffs and sand patches.

The fringing reef which surrounds Houma Toloa continues for some distance to the N. A similar reef extends around Mui Hopohoponga.

From Mui Hopohoponga the coast trends 16.5 miles WNW to Niu Aunofo. It is broken and low, the highest point being Popua, a hill with an elevation of 33m to the tops of the trees, located on the coast 7.5 miles W of Mui Hopohoponga.

Coral reefs extend 9 miles offshore, and other dangers lie within 13 miles of the coast; there are some islets on these reefs in the approaches to Nuku'alofa.

Eua Iki lies about 3 miles ENE of Mui Hopohoponga. Reefs, which break, extend about 0.8 mile in a SSE direction from the island; no vessel should attempt to pass the E or S sides nearer than 1.5 miles.

The extensive reef 3 miles NNE of Mui Hopohoponga always breaks.

There are three channels leading to Nuku'alofa, from E to W, are Piha Passage, Ava Lahi, and Egeria Channel. Piha Passage can ordinarily be used in an emergency, but is not recommended. Egeria Channel is not recommended.

**Hakau Mama'o** (21˚00'S., 175˚13'W.) is a coral reef lying about 7 miles NE of Niu Aunofo. It seldom dries, but the breakers on it are always visible.

Monro Rock is a small, coral head, with a depth of 7.3m, located about 1.5 miles NE of the light structure on Hakau Mama'o. A shoal, with a least depth of 8.5m, lies 1 mile NNW of Monro Rock.

Atata is a wooded island, 36m high to the tops of the trees, about 4 miles ENE of Niu Aunofo; it lies at the NE end of an extensive reef.

Malinoa, a low sandy islet 15.5m high, lies 7 miles E of Atata. Telemachus Reef, with a least depth of 3.7m, lies 2 miles NW of Malinoa; the sea breaks on the reef.

## Nuku'alofa (21˚08'S., 175˚12'W.)

World Port Index No. 55590

**2.42** Nuku'alofa, the principal town of the Tonga Islands, is the residence of the Ruler and the Government; it is a port of entry. This is a natural coastal harbor protected by reefs, but open to N winds. The alongside berths may become untenable for small vessels, forcing them to anchor out.

**Winds—Weather.—**Nearly 60 per cent of the winds are from the SE to E. During May to August, when SE winds are in their ascendancy, the E wind components are in considerable part replaced by S, SW, and NW winds. About 24 per cent of the annual winds are from the NE and S, about equally divided between the two directions. The December wind speed is 10 knots; from May to July the wind speed is about 7 knots.

From May to November, the strongest winds are generally experienced from the SSE to ESE, usually accompanied by rain from these quarters, lasting up to 3 days. When the wind shifts to the NE, good weather may be expected for a time.

After September, strong NW winds with thick dirty weather and heavy rains may occasionally be expected, but the wind does not appear to remain longer than 12 hours in that quarter, and will probably shift to the S and clear up.

From December to April, the winds are generally E, but sudden and violent W and NW squalls are common. An average year brings about 3 days of gales.

Typhoons may be experienced from December to March.

**Tides—Currents.—**The spring range at Nuku'alofa is 1.2m. In Ava Lahi, the principal approach, a W set will usually be encountered, the force and direction varying with the prevailing E winds. The strength of this current is greater N of Malinoa, and decreases farther S.

In Piha Passage, the tidal currents set E and W, with slack water occurring about 2 hours 30 minutes after HW or LW at Nuku'alofa. Within the narrows slack water usually occurs about 3 hours after HW or LW, but the wind has a considerable affect on this. Currents through this area have been reported as irregular, with maximum rates of about 4 knots.

At Queen Salote Wharf, the surface current flows to the W; however, at a depth of 5.5m a countercurrent tends to the E.

**Depths—Limitations.—**Nuku'alofa is approached through Ava Lahi, which was swept (1942) to a depth of 12m, and is indicated in green on the chart; a maximum draft of 10.3m can be accommodated in the harbor.

Vuna Wharf consist of a T-shaped jetty and extends to the edge of the fringing reef in front of the Government buildings. The berth is 60m in length, and will accept a vessel with a draft of 6.7m. Two wrecks covered by 5.7m and 13.2m of water lie, respectively, 92m and 185m to the SE of the extremity of Vuna Wharf.

Queen Salote Wharf, 1 mile E of the Vuna Wharf, consists of four numbered berths. Berth No. 1 is about 90m in length, with

a depth of 12.2m alongside; this berth works containers and general cargoes. Berth No. 2 is 110m long, with a depth of 10m alongside, and can handle container, tanker, ro-ro, and general cargoes. Berth No. 3 is 100m long, with a depth of 7m alongside and handles local trade. Berth No. 4 is 60m in length.

Dredged boat harbors lie on either side of Queen Salote Wharf and are best seen on the chart.

**Aspect.—**The flagstaff at the root of the pier is reported to be prominent from the entrance of Ava Lahi. The palace and royal chapel are wooden structures situated near the foreshore. Conspicuous radio masts and tanks are situated 0.5 mile and 1.4 miles ESE, respectively, of the root of the town jetty. A radio mast high is situated 0.8 mile ESE of the tanks.

**Pilotage.—**Pilotage is compulsory for merchant vessels and should be ordered at least 24 hours in advance. Vessels may also request advice on the best time to transit the entrance channels. Pilots will board vessels using Ava Lahi, about 2.5 miles NE of Hakau Mama'o (outer boarding location) or in position 21˚03.5'S, 175˚12.9'W (inner boarding location). Vessels less than 137m in length drawing less than 5.5m board the pilot for Piha Passage 2.8 miles E of the Narrows.

**Signals.—**The pilot station may be contacted on 2182 kHz or VHF channels 12 or 16. The pilot vessel may be contacted 1 hour before arrival.

**Anchorage.—**The anchorage is clear of dangers, except for three reefs, which dry from 0.3 to 0.6m. They lie 0.5 mile NE, 0.9 mile NNW, and 1.8 miles N of the root of the pier. Large vessels may anchor, in 27m, SE of the reef Ualanga Uta, about 0.6 mile N of the pier head.

During the typhoon season, more shelter and better holding ground will be found in the bight E of Queen Salote Wharf pier head.

**Caution.—**A wreck, with a depth of 11.6m, lies about 0.5 mile SW of Paugaimotu Islet; a special spherical buoy is moored close to it. A wreck covered by 10.4m of water is situated at 0.3 mile to the SW of the same islet.

Shoals exist over a considerable area to the NE of Tongatapu.

A 9.1m shoal, and a shoal with a depth of 12.8m, lie about 17.5 miles and 3.5 miles NNE, respectively, of Malinoa Light.

**Dido Shoal** (20˚55'S., 175˚00'W.), about 13 miles N of Mui Hopohoponga, has a least charted depth of 7.3m; it breaks in moderate weather.

Hyane Shoal, a small coral patch with a least depth of 7.3m, lies about 5 miles WSW of Dido Shoal. A similar shoal lies 1.5 miles W of Hyane Shoal.

Caution should be exercised when navigating in this area.

A submarine volcano, which is occasionally active, is located 17 miles NW of Niu Aunofo. A depth of 13.7m was obtained over the volcano in 1943, but due to volcanic activity that resumed in 1999, less water may now exist.

**2.43 Hunga Ha'apai** (20˚33'S., 175˚25'W.) and Hunga Tonga are two islands which lie about 31 miles N of the W extremity of Tongatapu.

Hunga Ha'apai rises to a height of 122m in its N part and 104m in the S. A ridge runs the entire length of the island, falling in high cliffs to the sea on the E side.

Hunga Tonga, about 1 mile NE of Hunga Ha'apai, has steep cliffs; above the cliffs the ground rises to a wooded ridge that runs the length of the island.

A reef that breaks lies 2 miles SE of Hunga Ha'apai. In this vicinity a submarine volcano was reported.

**Tides—Currents.—**When navigating in this part of the group, vessels should make allowance for the strong W current.

**Fonua'ou** (20˚19'S., 175˚25'W.) is of volcanic origin and at times smoke has been seen rising from it. The island has changed shape many times and has at times disappeared. Volcanic activity has been reported in 1993.

Shoals are reported to lie 33 miles W of Fonua'ou.

The islands in the S part of the Nomuka Group lie 38 miles NNE of the light on Malinoa. The group lies on an extensive bank, which has charted depths of 3.7 to 174m and many drying rocks.

**Kelefesia** (20˚31'S., 174˚44'W.), the farthest S of the group, is 37m high and wooded. Foul ground extends 4 miles SE of the island, and the rock 5 miles farther SE is marked by heavy breakers. There are other dangers E and NE which may best be seen on the chart.

Kefikana Rock, 4m high, white and conspicuous when the sun is shining on it, lies 3 miles WNW of Kelefesia.

Tonumea, an island 42m high and densely wooded, lies on a reef 2.5 miles NNW of Kelefesia. The sea breaks on some foul ground which lies 0.8 mile NNW of the island.

**2.44 Nomuka Island** (20˚15'S., 174˚48'W.), about 11 miles NNW of Tonumea, is the principal island of the group. It is triangular in shape, with each side about 2 miles in extent; it encloses a saltwater lagoon. West of the lagoon there is an elevated ridge with a peak, 51m high, at the N end and a peak, 49m high, at the S end.

A fringing reef encircles the island and extends 0.3 mile offshore in places, but there are breaks in it where boats can approach.

Nomuka Iki, about 1 mile S of Nomuka, is separated from it by a channel that has a least navigable width of 0.3 mile. The island rises to a height of 45m in the S part. The island is surrounded by a coral reef which extends 1.3 miles ESE from the S extremity, forming a dangerous point. There are reefs and shallows off the S and W sides of the island which break, but they have not been completely examined.

Muifuiva, a small islet, lies 0.5 mile NW of the N extremity of Nomuka Iki. Lua Vaila, with a depth of 3.7m, lies in the middle of the channel 0.8 mile E of Muifuiva. A light is shown from the islet.

Nomuka Harbor lies between Nomuka on the N and Nomuka Iki on the S; it is open NW, but is protected in other directions by these two islands and adjoining reefs.

**Anchorage.—**Anchorage may be taken, in 24m, coral sand, with the NW extremity of Nomuka Iki bearing 244˚, 0.4 mile distant.

In the NW approach to the anchorage there are depths of 7.3m, 9.1m, and 8.2m, located 0.6 mile NE, 0.4 mile NNW, and 0.5 mile NNW, respectively, from the light on Muifuiva.

**2.45 Mango Island** (20˚20'S., 174˚43'W.), an island 5 miles SE of Nomuka, is fringed by a reef which extends 0.8 mile SE. There is a wooded hill at its NW and SE ends, each about 43m high. A village with a church is situated on the N coast of the island. Anchorage for small vessels may be taken,

Table of Contents

in 22m, sand and coral, with the tangents of Mango bearing 126˚ and 196˚.

Mango Iki, about 1 mile W of Mango, is 21m high to the tops of the trees, and is fringed by a reef which breaks.

The passage between Mango Iki and Mango is bad, especially during S winds.

**Nukufaiau** (20˚18'S., 174˚42'W.), about 2 miles NNE of Mango, is encompassed by a reef which extends 0.2 mile offshore. A coral patch, with a depth of 6.4m, lies 2 miles WNW of the islet, and a patch, with a depth of 5.5m, lies 0.8 mile NNE of the islet.

**Luafitu** (20˚20'S., 174˚38'W.), a reef that covers 3.7m, is located 4.5 miles ESE of Mango. Rocks and shoal water are charted ENE and ESE of this danger.

**Nukutula** (20˚15'S., 174˚41'W.) is a wooded sand cay, 5.5m high, standing on a reef 2.5 miles N of Nukufaiau.

Fonoifua, an island about 3.5 miles ESE of Nukutula, is 28m high to the top of the trees on the S side, and rises to a cliff 20m high on the N side.

Tano'a, an islet about 0.8 mile S of Fonoifua, has a good boat harbor in the reef N of it.

**2.46** The Otu Tolu Group is composed of four islands which stand on the same sunken reef about 15 miles ESE of Nomuka. They are low, wooded, and even-topped islands.

**Fetokopunga** (20˚18'S., 174˚32'W.), the farthest N of the group, lies 5 miles ESE of Fonoifua; it is 17m high and has no distinguishing feature. **Telekivavau** (20˚19'S., 174˚31'W.), 0.8 mile farther SSE, is 22m high. **Telekiha'apai** (20˚21'S., 174˚31'W.)(Lalona), the next islet, about 1.5 miles farther S, is 20m high, and **Telekitinga** (20˚24'S., 174˚32'W.), 2.3 miles farther S, is 16m high.

**Tides—Currents.—**The currents, especially in the vicinity of the reefs, are uncertain in strength and are variable in direction. After strong E winds they set strongly to the W causing rips and blind rollers in places.

**Caution.—**The area enclosed between the reefs S of Otu Tolu, Nomuka, and the islands to the S, is thickly studded with reefs and shoals, and it is unsuitable for navigation except under favorable conditions of light. The reefs are steep-to and not easily seen, even from the masthead. There are passages that can be used, but great caution should be exercised.

A shoal has been reported to lie about 27 miles E of Telekitinga in about 20˚22'S, 174˚03'W.

**Hakaufisi** (20˚09'S., 174˚55'W.) is a reef lying about 7.5 miles NW of Nomuka; it is steep-to, dries in places, and the sea always breaks on it. A stranded wreck is charted on the reef.

The Ha'apai Group is composed of numerous coral islands lying NNE of the Nomuka Group, and separated from that group by a deep channel about 3 miles wide. The islands are scattered over an area 40 miles in length in a NNE-SSW direction, and 22 miles in width; for the most part they lie on an irregularly shaped bank with depths less than 183m. Many of the islands and reefs rise abruptly from deep water, with depths of more than 366m around them.

Most of the islands of the group present similar features; from a distance they appear low and flat-topped, and on a nearer approach a white, sandy beach is seen encircling a densely wooded island entirely surrounded by a reef.

The SE part of the group is faced on the E side by a barrier reef.

**Anchorage.—**The best anchorages of this group are off the W side of Lifuka. Elsewhere, anchorages are few, especially in the N part of the group.

The Lulunga Group (Kotu Group), a subsidiary of the main Ha'apai Group, comprises a cluster of small, low islands in the SW part of it.

On the S side of the Lulunga Group, the W extension of the barrier reef is broken up in patches. Some of the patches break heavily and others have blind rollers which break occasionally. The only pass through this part of the reef that a vessel should attempt is Ava Fonuaika, lying immediately W of Fonuaika Islet. Large vessels should use the passage between Tungua and Doyland Reef, as it is wider and the tidal current is not as strong.

**Fonuaika Islet** (20˚07'S., 174˚42'W.), the farthest S of the Lulunga Group, lies about 9 miles NNE of Nomuka. It is a small, wooded islet 20m high to the tops of the trees. It is fringed by a steep-to reef which breaks heavily. A line of detached reefs extend E from the islet to the S extremity of the barrier about 15 miles distant.

A detached reef, on which the sea breaks, lies 1.5 miles W of Fonuaika. Murray Patches consist of three detached shoals 3.3 miles WSW of the islet; the NW patch has depths of less than 1.8m.

Tokulu, a sand cay 1.5m high, about 5 miles W of Fonuaika, lies on a detached reef whose S side is steep-to. It is the farthest SW of the Lulunga Group. A light is shown from the cay.

Wickam Reef lies 1.5 miles WNW of Fonuaika. A shoal, with a depth of less than 1.8m, lies close SE of the reef. Ava Fonuaika passes to the E of this shoal.

Ward Rock is a coral patch, with a depth of less than 1.8m, lying nearly 2 miles N of Fonuaika; it is steep-to.

**2.47 O'ua Island** (20˚02'S., 174˚41'W.), 4.3 miles N of Fonuaika, is densely wooded and about 43m high to the tops of the trees. It is surrounded by an extensive reef. A reef, which dries 1.5m, extends about 1 mile WSW from the island; a sand cay and two islets are located on this extension. Detached reefs lie about 1 mile W of these islets, and Nukulai Island is separated from these reefs by a deep channel 0.4 mile wide. A light is situated on Nukulai Island.

**Lekeleka Islet** (20˚04'S., 174˚37'W.) lies close within the E extremity of an extensive reef, 4 miles ESE of O'ua Island. Between Lekeleka Islet and the barrier reef E and SE there are a number of reefs, the positions of which may best be seen on the chart. A reef 3 miles N of Lekeleka Islet is awash. There are several reefs charted in this area.

A reef, which breaks, is located 3.3 miles NNE of O'ua Island; it can always be distinguished.

**Tungua Islet** (20˚01'S., 175˚46'W.), 4 miles WNW of O'ua Island, lies on the N end of a reef which extends 1.3 miles SE from it. A small, rocky islet, marked by a light, lies about 1 mile NE of Tungua Islet.

Doyland Reef, awash, lies about midway between the NW end of Wickham Reef and the SE extremity of the reef projecting SE from Tungua Islet. The channel N of Doyland Reef is about 0.5 mile wide. There is a reef, awash, about 0.6 mile E of Doyland Reef.

Kito is a small, wooded islet lying 1.3 miles NW of Tungua Islet. A small reef, awash, lies 1.5 miles E of Kito. Other dangers are charted ENE and SE of Kito, and a depth of 9.1m is charted 1.8 miles WSW of the islet.

**Foua** (20˚00'S., 174˚44'W.) is a small, rocky islet 9m high located just over 1 mile NE of Tungua Islet; a light is shown on the islet.

**2.48 Kotu Island** (19˚57'S., 174˚48'W.), the farthest W of Lulunga Group, lies 4 miles NNW of Tungua Islet. The island is densely wooded and is 37m high to the tops of the trees. The S end of the island is faced by reddish cliffs, 15m high, but the N end is low with a sandy shore.

Kotu Island is located on a reef which extends 2 miles SE of the island. An extensive reef and foul ground extends nearly 3.3 miles ENE from the island; between the E end of this reef and the W side of the reef fronting Ha'afeva Island, there is a deep channel about 0.6 mile wide.

A reef, the W danger in the group, lies 1 mile W of KotuIsland; it is about 3 miles long in a N-S direction.

Putuputua, the farthest N of the Lulunga Group, a sand cay about 3.7m high, stands on a reef 3 miles NE of Kotu Island.

**Ha'afeva Island** (19˚57'S., 174˚43'W.), 4.5 miles E of Kotu Island, is the principal island of the group. It is fringed by a narrow reef, but on the E side where the village is, a boat channel leads to the beach. A barrier reef fronts the NW, N, and NE sides. The SE portion of this reef is from 0.5 to 1.5 miles from the island, the intervening space forming a small bay in which there are depths of 38 to 51m. An islet is located on the reef, 0.8 mile ESE of the E extremity of Ha'afeva Island, and a wooded islet lies 0.8 mile SE of the S extremity. A rock, 3.7m high, lies in the approach to the anchorage, 0.3 mile NE of the wooded islet.

Vessels with local knowledge may anchor off the village, in 49m, sand and coral, with the S tangent of Ha'afeva Island bearing 269˚ and the NE tangent bearing 356˚.

**Limu Islet** (20˚01'S., 174˚27'W.), a small, wooded cay with trees 12m high, lies on the barrier reef in the SE part of the Ha'apai Group, 9 miles ENE of Lekeleka Islet.

Ava Matamatavika is a channel through the barrier reef, 3 miles NW of Limu Islet. It is about 0.6 mile wide and has depths of 48 to 60m in the center.

There are three narrow, wooded islets from 12 to 15m high on the barrier reef on the N side of Ava Matamatavika. **Uanukuhihifu** (19˚58'S., 174˚30'W.) is the farthest SW of these three, and **Tofonga** (19˚57'S., 174˚28'W.) is the farthest NE.

A shoal, which consists of a narrow ridge with a least depth of 1.8m, lies about 2 miles SW of Uanukuhihifu. This shoal is formed by a bank 2.5 miles long, extending in a WNW and opposite direction. A small reef, awash, lies about midway between this shoal and the barrier reef.

Ladd Reef, a small coral patch with depths of 0.6 to 0.9m, lies 2 miles NNW of Uanukuhihifu; a similar patch exists 0.5 mile SE of Ladd Reef.

A bank of irregular soundings, all over 37m, lies NW of Ladd Reef. The bank is marked by tide rips and overfalls during the strength of the tide, giving the appearance of shoal water.

There is an anchorage, in 33m, sand and coral, with the W extremity of Uanukuhihifu bearing 212˚, distant 1.1 miles, and the N extremity of Tofonga bearing 094˚.

**Tides—Currents.—**The tidal currents set through with a velocity of 4 to 5 knots flood to the E, and about 3 knots ebb to the W. During the E current with an E wind, there are heavy tide rips and overfalls dangerous to boats, but by keeping close to the reef on the S side they may be avoided. It is not advisable for vessels to use the passage except at the time of slack water.

**2.49 Uiha Island** (19˚54'S., 174˚24'W.), 3.5 miles NE of Tofonga, is 2.5 miles long N-S.

Tatafa Islet, 27m high, lies off the NW extremity of Uiha Island.

Ava Auhangamea, the channel separating Tatafa Islet on the S from Uoleva on the N, is 0.4 mile wide between the reefs on either side. Two shoals, with depths of 5.5 to 8.2m, lie nearly in the middle of the channel.

**Tides—Currents.—**The tidal currents in Ava Auhangamea run at the rate of 3 to 4 knots on the E current, which does not begin to make until 2 or 3 hours before HW. When there is an E wind, heavy tide rips and overfalls extend across the passage, making it dangerous for boats.

**Uoleva** (19˚51'S., 174˚24'W.) is covered with trees which attain a height of 30m. It is the S island of a chain of islands, connected by reef, extending in a NNE direction for 14.5 miles. Off the NW coast of the island there are patches of reef, with foul ground between them and the shore, at a distance of 0.8 mile.

Hakau Faha, 2 miles NW of Uoleva, is a reef awash, which always breaks. Nearly 1 mile WNW of Hakau Faha there are two patches having depths of 4.6 and 5.5m. Many coral heads have been reported to lie E of Hakau Faha.

**2.50 Lifuka Island** (19˚48'S., 174˚21'W.), 0.7 mile NE of Uoleva, is the principal and farthest SW of the three largest islands of the group.

The seaward coast toward the N and S ends of the island is cliffy, but the remainder is low and covered with trees.

On the W side of Lifuka Island, there are numerous reefs and shoals within the 37m line. Beacons, which may have been destroyed, have been erected on some of the reefs.

**Depths—Limitations.—**The reefs in the vicinity of the anchorages and in the approaches are so numerous that only those bordering the entrance channels are described.

A reef, which has a sandbar that dries 1.2m, lies just over 2 miles NW of the N end of Lifuka Island. Shoal water extends nearly 0.1 mile E of the reef, and shoal patches extend 0.5 mile W of the reef.

The shore reef extends 1.3 miles SW from the N extremity of Lifuka Island; the edge is usually indicated by breakers.

Mariner Patch, a detached coral head with a depth of 4.6m, lies 0.1 mile off the W part of the above reef and is marked by a buoy.

Lua Sii, marked by a buoy, is a coral patch with a depth of 2.1m WNW of Mariner Patch. It is not always seen in passing. There are two rocky patches W of Lua Sii which sometimes break.

Lua Matavai, with a depth of 2.7m, lies about 0.4 mile SSW of Mariner Patch and is marked by a buoy.

Hakau Mateialona, which dries, lies 0.6 mile WNW of Lua Matavai. Sunken reefs extend 0.1 mile SE from it and a patch, with a depth of 5m, lies 0.3 mile NW of it.

Navigators should be aware that the buoys referred to above may not be in place. Therefore, be prepared to navigate visually, bearing in mind that the reefs in this area are difficult to make out at high water.

**2.51 Hakau Tuaniu** (19˚47'S., 174˚23'W.), which dries 0.3m, lies 0.5 mile SW of Hakau Mateialona. A coral head, with a depth of 4.1m, lies 0.1 mile S of the reef. Lua Tula, with a depth of less than 1.8m, lies 0.4 mile S of Hakau Tuaniu. Lee Patch, with a charted depth of 3.7m, lies 1 mile SW of Lua Tula.

Lua Vika, with a depth of less than 1.8m, lies about 0.6 mile ESE of Hakau Tuaniu.

Hakau Fusipala, which dries, lies about 0.3 mile SSW of Lua Matavai.

**Buchanan Reef** (19˚47'S., 174˚22'W.) is a small reef, awash, about 0.4 mile S of Hakau Fusipala. To the N and E of it, foul ground and reefs too numerous to mention form part of the inner line of reefs fronting the anchorage off Pangai. This line of reefs is prolonged to the S by two large reefs, with a pass between them, for a distance of 1.3 miles.

Hakau Sela, a small drying reef, lies 0.5 mile SE of Buchanan Reef. In 1991, it was reported that a dangerous wreck, with a depth of 0.6m, lies 0.1 mile N of Hakau Sela. Rachel Patch, with a depth of 3.2m, lies 0.15 mile E of Hakau Sela. Hakau Vonu, about 0.5 mile S of Rachel Patch and about 0.3 mile offshore, is awash.

David Patch, with a charted depth of 3.2m, lies 0.15 mile N of Hakau Sela; a patch, with a depth of 4.6m, lies 0.2 mile SW of David Patch.

**Pilotage.—**Local pilots are not available, but may be obtained at Nuku'alofa by prior arrangement.

**Anchorage.—**Anchorages are available off the W side of Lifuka, and are described below, along with the channels leading to them. The reefs and channels are marked by lights, beacons, and buoys, but such aids should not be relied upon. Additionally, there is a lack of landmarks in the area to assist in fixing a vessel's position. It may be necessary to navigate strictly by eye from aloft. On a calm day at HW the reefs are frequently impossible to see. Vessels are urged to exercise the appropriate caution.

Faka'amunei Anchorage offers a convenient anchorage outside the reefs lying off Pangai, and is used by vessels arriving too late to transit the channel S of the anchorage in safety. Deep-draft anchorage is available among the reefs, but only vessels with a draft of 5m or less may reach the inner anchorages.

Faka'amunei Anchorage lies off the NW side of Lifuka Island, but is not safe in W winds. Anchor, in depths of 29m, sand, with the N end of the island bearing 090˚ and about 1.1 miles distant. A W set has been experienced in the vicinity of Faka'amumei Anchorage.

Within the reefs, the only safe anchorage for deep-draft vessels is available in the vicinity of Lua Vika. Vessels are afforded anchorage, in a depth of 25m, sand and coral, about 0.4 mile S of the reef, or in a depth of 20m, 0.3 mile WSW of the reef.

Anchorage for vessels off Pangai is available, in depths of 8m, with a conspicuous flagstaff bearing 124˚, 0.5 mile distant. Caution is advised as this anchorage affords little shelter from winds or bad weather from the W.

**Directions.—**To approach the anchorages near Lua Vika from the N, sail as safely as navigation permits to the general vicinity of Faka'amunei Anchorage. After fixing the vessel's position, steer to pass about 90m W of the buoy marking Mariner Patch. After passing between Mariner Patch and Lua Sii, steer to pass W of Lua Matavai, then steer a mid-channel course between Hakau Fusipala and Lua Vika, then anchor as desired.

To reach the deep-draft anchorages from the W, steer an E course towards Lua Vika, passing N of Lua Tula and S of the dangers lying about 0.3 mile NNE of it.

The channels from the deep-draft anchorage to the inner anchorage require local knowledge.

**2.52 Pangai** (19˚48'S., 174˚21'W.) (World Port Index No. 55600), the principal town on Lifuka Island, is situated near the middle of the W shore of the island. The Governor resides here. Several public buildings, churches, and missions are situated in the town. A pier, 15m long with a least depth of 2.1m at its head, extends NW from the town.

**Foa Island** (19˚45'S., 174˚18'W.) lies on the barrier reef with its SW extremity 0.4 mile NE of Lifuka Island. It is a low, densely wooded island about 4 miles long. The SE side is bordered by low cliffs, and the NW coast consists of sandy beaches and rocky points. The coastal reef on the latter side is broken and there are several off-lying patches.

Nukunamu is a low, wooded islet, 15.2m high, lying close NE of the N extremity of Foa Island.

**Ha'ano Island** (19˚40'S., 174˚17'W.), the farthest N of the group, lies 0.8 mile N of Nukunamu. It is covered with trees which have an elevation of 30m.

A barrier reef, which breaks heavily, follows the trend of the E coastline of the chain of islands N from Uoleva, separated from them by a narrow channel; from the N end of Ha'ano Island, it extends 0.6 mile farther N. On the W side of the islands it becomes a fringing reef with a broken and irregular edge for the greater part of its length.

On approaching from the NW, Ha'ano Island, Foa Island, and Lifuka Island appear as one low line of land broken by gaps. If making for the anchorages off Lifuka Island, steer for the second gap from the N.

**Fotuha'a Island** (19˚48'S., 174˚44'W.), 9 miles NNE of Kotu, on the W side of the group, is about 61m high to the tops of the trees. Cliffs, 24 to 27m high, form the coastline throughout; landing is only possible in good weather.

Fatumanongi, a small, flat rock 3m high, lies 2.3 miles N of Fotuha'a. A spit, with a depth of 5.5m, extends 0.2 mile N from the rock.

**Tofua** (19˚45'S., 175˚04'W.), 16.5 miles NW of Kotu, is an active volcano. The island appears flat-topped and rises to a height of 506m, rising steeply from the coast except on the NW side, where the slope is more gradual.

**Kao** (19˚40'S., 175˚02'W.), an active island volcano, lies 2 miles NNE of Tofua and is separated from it by a deep, clear channel. It rises in the center to a peak, 1,030m high, which appears as an almost perfect cone from every direction.

The coast of the island is rocky and cliffy in many places and is steep-to all around.

**Caution.—**Volcanic activity has been reported (1993) on the island.

A rock, 0.9m high, lies 1.3 miles N of Kao. Depths of 26 to 27m lie 0.3 mile NW of the rock.

**2.53 Niniva** (19˚46'S., 174˚38'W.), an islet, 26m high, lies close within the SW extremity of an extensive coral reef enclosing a lagoon, about 5.5 miles NE of Fotuha'a Island.

Hakau Iki, a detached coral reef, awash, lies 0.6 mile WNW of the W extremity of Hakau Homaulu, the reef on which Niniva is located.

Hakau Lahi is an extensive reef enclosing a lagoon, separated from the NE side of Hakau Homaulu by a deep channel about 1 mile wide. Meama, an islet 32m high, is located close within the NW extremity of the island, and a wooded islet, 18.3m high, lies close within the SE extremity. Detached shoals, with depths of 2.7 to 5.5m, lie 0.5 to 1 mile S of the S extremity of Hakau Lahi.

**Balfour Patch** (19˚42'S., 174˚34'W.), with a least depth of 10.1m, coral, and steep-to, lies 3.3 miles N of Meama.

Smith Shoal, with a least depth of 3.7m, and steep-to, lies 6 miles ESE of Meama.

Hakau Eihiho is a small reef lying 2 miles SSE of Niniva. Two detached reefs, with depths of 5.5m and 4.6m, lie 0.4 mile and 0.7 mile S, respectively, of the reef.

**2.54 Lofanga Island** (19˚50'S., 174˚33'W.), a low, flat-topped, wooded island bordered by cliffs, lies 2.5 miles SE of Hakau Eihiho. The principal village is on its S side. A reef projects 0.3 mile to the W of the island, and a small detached coral head, with a depth of 3.7m, lies 0.5 mile off the W end of the island. Another small, coral patch, with a depth of 2.7m, lies 0.4 mile N of the island.

The channel between Lofanga Island and Hakau'ata, which lies in the middle of a reef 1.5 miles SE, is obstructed by a cluster of rocks, awash, nearly in the center of the passage.

**Anchorage.—**Anchorage can be taken by small vessels, in 20m, sand and coral, with the right tangent of the island bearing 062˚ and the left tangent bearing 277˚.

Hakau Fakaosi Toume is a reef on a detached bank which dries 1.2m, 4.8 miles ENE of Smith Shoal and about 2.3 miles WNW of the W extremity of Foa.

Esk Shoals, 3.5 miles NE of Smith Shoals, consists of several coral patches with depths of 3 to 5.5m. Crawshaw Shoals, with depths of 4.6m and 5.5m, lie on a coral bank which is steep-to, 4 miles E of Esk Shoals. Lualafalafa, with depths of 7.3m and 9.1m, coral and steep-to, lies 2.5 miles N of Crawshaw Shoals.

Luahoko, 3.5 miles W of Lualafalafa, is a small islet covered with trees 14m high. It is surrounded by a reef which extends 0.3 mile from the N side.

**Ofolanga Island** (19˚36'S., 174˚27'W.), the N island of the Ha'apai Group, lies 9 miles NW of Ha'ano Island. It is low and covered with trees which are 24 to 27m above the sea. The island is surrounded by a barrier reef which is 0.8 to 1 mile off all sides except the S, where it nearly joins the fringing reef. The edge of the barrier reef is steep-to and free of off-lying dangers, except off the SE corner where a shoal patch, with a depth of 7.3m, lies 0.12 mile from the reef.

**Anchorage.—**Anchorage may be taken near an indentation in the barrier reef, in 24m, sand, with SW extremity of the island bearing 001˚ and the SE extremity bearing 070˚; the reef will be 0.2 mile distant.

**2.55** Mo'unga'one Island lies 2.3 miles SW of Ofolanga Island, with a deep channel between them. The island is flat-topped, the trees reaching a height of 30m; it has a rocky, cliffy coastline with no fringing reef except on its SE, where there is a sandy beach fringed by a reef which extends about 0.1 mile from the shore.

Bethune Bank, with a least charted depth of 12.8m, lies 5 miles NE of Ha'ano Island. There are three extensive banks within 5 miles N of Bethune Bank, which may best be seen on the chart.

**Falcon Bank** (19˚19'S., 174˚07'W.), 22 miles NNE of Ha'ano Island, has a depth of 12.8m; less water may exist on it.

Disney Reef, 2 miles NE of Falcon Bank, has a depth of 4.6m; it breaks when there is a swell. Both Falcon Bank and Disney Reef are steep-to.

**Akkumanes Bank** (19˚14'S., 174˚06'W.) is separated from the bank upon which Disney Reef stands by a deep channel 1.5 miles wide. It extends 14 miles in a N direction. The depths along the SE edge of the reef are 22 to 26m. On the E, at flood current, there are tide rips and overfalls on the shallower part of the bank.

**Hakaufusi** (19˚01'S., 174˚01'W.) is a sand cay, 1.5m high, encircled by a reef located 17 miles N of Disney Reef. There is foul ground, on which the sea usually breaks, at a distance of over 0.5 mile off the N and E sides.

Campion Breakers, 3 miles SW of Hakaufusi, always breaks; shoal water extends 2 miles W of the breakers.

**Tides—Currents.—**Between Ha'apai and Vava'u, observations show during Southeast Trades that at springs the E current begins to make about 1 hours 30 minutes before HW by the shore, and runs until about 4 hours after HW. The direction varies from ESE to NNE attaining its maximum velocity of 1.3 to 1.8 knots when setting NE, gradually changing its direction N. The W current begins to make 4 to 5 hours after HW, its direction ranging from NW to SW with a rate of 1.5 to 2 knots.

The tidal currents are liable to considerable variation both in velocity and direction, and also in the time for turning, and the foregoing can only be taken as a general guide. Sometimes the E current does not begin until nearly HW, but it seldom runs for a period longer than 4 hours after HW.

**2.56 Metis Shoal** (19˚11'S., 174˚52'W.), about 42 miles WNW of Falcon Bank, is a small shoal with a depth of about 3.6m, which occasionally breaks. Numerous reports of volcanic activity has been reported in the vicinity of this shoal. An islet, formed by volcanic activity, has been reported (1995) in the vicinity of the shoal.

Home Reef, which breaks, lies about 13 miles NNE of Metis Shoal; it has a depth of about 1.8m. Volcanic activity has been reported about 3.3 miles SE of Home Reef.

**Late Island** (18˚48'S., 174˚39'W.), located about 12 miles NNE of Home Reef, is about 518m high and about 3 miles in diameter. The hills slope gradually from the sea to the sy-

mmetrically shaped peak. It has been reported to be visible 50 miles in clear weather.

There are no off-lying dangers, and the coast, which is cliffy, appears to be steep-to within a very short distance.

There is a shelf running off the N side of the island, where a vessel may anchor, in 27m, sand and stone, with the peak bearing 173˚ about 0.4 mile from the shore.

A reef was reported about 42 miles W of Late Island in 18˚46'S, 175˚24'W; it has shoal water on its N and NE sides.

Vava'u, the largest island of the Vava'u Group, is located 60 miles NNE of Ha'ano. The group consists of the large island and several smaller islets encompassing an area about 18 miles long in a NNE-SSW direction. The N side of Vava'u is high and steep-to, but S of the island there are many reefs and low islets. The depths are considerable throughout the group; the anchorages are few and indifferent.

When approaching the group from the SW, Fatumanga, about 10 miles SW of Vava'u, will be seen in the foreground and about 5 miles farther NNE, Fofoa, Kalau and Hunga, appearing as one island will be seen, terminating to the W in a bluff headland with a second bluff showing a short distance E. Vava'u will be seen, also terminating to the W in a bluff headland. In the SW part of Vava'u, the defined table-topped hill Mo'ungalafa shows higher than the more distant land behind. Farther to the E the land becomes fainter and lower as it recedes in the distance.

Lalalolomei Bank, with a least charted depth of 12.8m, lies 5 miles NNW of Hakaufusi.

**Maninita** (18˚51'S., 174˚00'W.), the farthest SE of the islands, is 16.7m high and lies 6 miles NNE of Lalalolomei Bank. Taula, a similar islet, lies 1 mile NW of it. Lua Loli, a coral reef, lies about 0.3 mile N of Taula, and extends about 0.5 mile in a NW direction.

**2.57 Fua'amotu Island** (18˚48'S., 174˚01'W.), a wooded island, 41m high, surrounded by a reef, lies 3.8 miles NNW of Maninita. Lua Ui Vaha is a small, wooded islet surrounded by a reef located 1.8 miles WSW of Fua'amotu. Kaihifahifa, a small islet 15m high, is located in the center of a reef 1 mile SSE of Fua'amotu.

Foul ground with reefs which break and two small islets, Luatafito and Fonuafuu, located on it, extends 5 miles NNE from Maninita.

Lua Hiapo and Lua a Fulehu are two small wooded islets lying 4.3 miles and 5.3 miles WNW, respectively, of Maninita. Each is encircled by a reef. Unmarked shoals and reefs lie in the vicinity of these two islets.

Richards Patches lie about 2.3 miles SSW of Lua a Fulehu; they have a least charted depth of 9.1m. Finau Patches are two coral shoals, with a depth of 9.1m, lying about 2 miles NNW of Richards Patches.

**Fatumanga** (18˚47'S., 174˚10'W.), a barren flat-topped island, 26m high, is located 3.3 miles NW of Finau Patches. A shoal extends 0.5 mile S of the islet; a rock on the shoal breaks. This islet may be passed on either side, with due consideration to the shoal.

Luo Atofuaa, a coral patch with a depth of 3.7m, which nearly always breaks, lies 2.3 miles E of Fatumanga.

Fonua'one'one, 23m high, lies 0.8 mile ESE of Luo Atofuaa.

Fotuaikamoana, a coral patch with a depth of 12.8m, and Fotuaikamamaha, a similar patch with a depth of 9.1m, lie 1.3 miles and 2 miles NNE, respectively, of Fatumanga.

Mu'omu'a, an islet 41m high, is located 1.5 miles E of Fotuaikamamaha. An islet, 18m high, is located 0.4 mile S of Mu'omu'a.

**Ovaka** (18˚45'S., 174˚06'W.), an island that rises to a height of 58m in its W extremity, lies about 0.7 mile NNE of Mu'omu'a. A reef, which is not passable, extends 3.5 miles E. Two small islets lie on this reef, and Euakafa, 82m high, is the highest and most conspicuous islet of the S group. It lies on the E extremity of the reef.

Lua Ui, a small islet surrounded by a fringing reef, lies 1.3 miles SSE of Euakafa. An isolated coral reef lies about 1 mile WSW of Lua Ui.

**Vaka'eitu** (18˚43'S., 174˚06'W.) is an L-shaped island lying 0.8 mile N of Ovaka. The island extends 0.8 mile N from its S extremity and about 1 mile E. Langitau, a small islet, lies on a reef that joins the SE extremity of Vaka'eitu.

**Anchorage.—**Anchorage may be taken N of Ovaka, in 53m, sand and coral, with the E extremity of Ovaka bearing 156˚ and the NW extremity bearing 249˚, 0.3 mile offshore.

Nuapapu, lying close N of Vaka'eitu, is connected to it by a reef. The island extends 2.5 miles NE and then 1.8 miles SSE; at no place is it more than 0.3 mile wide.

Nuapapu, with Vaka'eitu, forms the E shore of Ava Pulepulekai.

Kitu, a narrow, flat-topped wooded islet, with precipitous sides, lies 90m N of Nuapapu.

Kapa, a wooded islet which rises to a height of 105m, lies 1.5 miles E of Nuapapu. There are several high flat-topped islands with precipitous sides lying between these two islands.

**2.58 Foelifuka** (18˚43'S., 174˚09'W.) is an islet, 38m high, lying 1.8 miles W of the W extremity of Vaka'eitu. Close E of Foelifuka is a wooded islet, with a light shown on it. North of these islets to Fofoa and Hunga, 0.5 mile distant, there is an area encumbered with reefs and foul ground.

Tefitomaka, a rock 1.2m high, stands on a shoal area 0.8 mile SSW of Foelifuka. The soundings between the rock and islet are irregular, and vessels should not pass between them.

Fofoa, 0.5 mile N of Foelifuka, terminates at its W extremity in a prominent bluff, 63m high. Kalau, which also terminates at its S end in a high bluff, almost joins the N extremity of Fofoa.

Hunga, separated from Kalau on its SW extremity by a narrow reef-filled pass and the island's S extremity, lies about 90m E of the E extremity of Fofoa.

Fofoa, Hunga, and the islets S form the W shore of Ava Pulepulekai.

The E extremity of Hunga is separated from the SW extremity of Vava'u by Faihava, a deep channel about 1.5 miles wide.

**2.59 Vava'u** (18˚37'S., 174˚00'W.) is nearly 9.5 miles long E and W, about 6 miles wide; its S shoreline is irregular in shape. The NW, N, and NE coasts of the island are bordered by high cliffs covered with vegetation; in some places there are white streaks. There are numerous islands and shoals off the S side of the island.

From **Nukumalolo** (18˚38'S., 173˚55'W.), the SE extremity of the island, a chain of islands extends 4 miles S. They are connected to the main island and to each other by reef; their E sides are cliffy and steep-to. Another chain of islands parallels this group 1.5 miles W.

From Nukumalolo to Maninita Islet, about 14 miles, the E side of the group is bound by a succession of reefs. Shallow depths, which break heavily if there is any swell, exist between the patches of reef along the whole of this distance. There is no channel for a vessel to navigate.

The whole area E of Kapa is unapproachable, the area being surrounded by reefs with no navigable channel.

Ava Pulepulekai, the channel between Hunga and Nuapapu, is deep and clear of dangers. The shore on both sides of the channel is deep and steep-to. This channel is the approach to Neiafu from the S and W.

Faihava is the NW channel of approach to Neiafu; it is deep and clear of dangers.

Luafatu, 34m high, lies about 1 mile W of Fata, the SW extremity of Vava'u.

**Utungake** (18˚40'S., 174˚01'W.), 1.8 miles E of Fata, is an island that rises to 88m in its S part. This island lies on the SE side of the approach channel to Neiafu. It is connected to Kapa by a reef, which extends in a SW direction from its S extremity. Mala, a small islet 41m high, lies on the reef about midway between the two islands.

**Anchorage.—**Anchorage may be taken in the bight formed between Utungake, Kapa, and the reef in 54m, coral, with the SW extremity of Mala bearing 141˚ and the W extremity of Utungake bearing 016˚.

Teleki, a point on the N side of the channel 0.5 mile N of Utungake, rises to a height of 55m.

Talau, a promontory 1 mile ENE of Teleki, rises to a conspicuous flat-topped summit, 131m high.

Pangaimotu lies with its N extremity 0.4 mile SE of Talau. A shoal spit, with a depth of 5.5m at its extremity, extends 0.15 mile NE from the N extremity of the island. Galloway Rock, about 0.2 mile NW of the N extremity of Pangaimotu, with a depth of 4.6m, lies on a rocky ridge which stretches across the channel.

**2.60** **Neiafu** (18˚39'S., 173˚59'W.) (World Port Index No. 55610) is situated about 0.8 mile E of Talau on Vava'u. The Governor of the group resides here; the Government offices are close to the wharf.

**Depths—Limitations.—**The Halaevalu Wharf, which is 60m long, has a depth of 7m on its W side and 9.1m on its E side; an extension has been completed which can accommodate vessels with a maximum draft of 7.9m.

A small boat jetty lies just SE of the wharf with the Bounty Bar at its root and a ferry ramp lies just NW of the wharf.

**Pilotage.—**Pilotage is compulsory; the pilots do not permit vessels to enter at night. The pilot will board inbound vessels in Faiahiva Channel.

**Anchorage.—**Anchorage may be taken in Neiafu Harbor, in 33m, sand and coral, with the Church bearing 100˚ and the W end of the wharf bearing 021˚.

A vessel has reported anchoring 0.4 mile N of Lotuma, in a depth of 49m, over a bottom of sand and coral.

**2.61** Kilikili, a point on Vava'u about 0.2 mile NNW of Pangaimotu, shows two beacons in range 065.5˚, which lead to the harbor entrance S of Galloway Rock. There is a least depth of 9.6m on the range line. Another set of range beacons, in alignment astern bearing 291˚, leads through a segment of the harbor channel only 90m wide. A third set of range beacons, in alignment bearing 104˚, leads to the wharf. The rear beacon of this last pier has been reported to be hard to distinguish from a church standing about 0.2 mile SE of the wharf. A light is shown from the end of the wharf.

Vessels departing the harbor should do so early in the morning, as the beacons shown from Kilikili, which mark the critical part of the channel, would be astern and obscured by the sun at other times.

**Toku Island** (18˚09'S., 174˚11'W.), 27 miles NNW of Vava'u, is flat-topped and wooded. It is encircled by a fringing reef which projects 0.3 mile from it in a N direction. A rock, awash, which breaks heavily, lies 11.4 miles WSW of the island. The Tongan Government has prohibited the settlement of the island, as the volcano is liable to eruption.

**Fonualei** (18˚01'S., 174˚19'W.), 11 miles NW of Toku, rises to a sharp defined summit 183m high which falls abruptly to the sea on the S side.

There is a narrow fringing reef on the NE, S, and W sides. Off the NW side of the island it has been reported that a shelf with depths of 37m extends about 0.3 mile from shore. There are no dangers charted outside the fringing reef.

**Caution.—**Volcanic actively was reported (2001) NW of the Vava’u Group, centered on position 18˚19.1'S., 174˚21.1'W.

**2.62** **Niua Fo'ou** (15˚36'S., 175˚38'W.), about 200 miles NNW of Vava'u, is a Tongan possession. This volcanic island is 260m high at its E end. There appears to be no safe anchorage for large vessels here; however, small vessels may anchor, in 12 to 18m, off the village on the W side, 0.1 mile from shore, with the remains of the church bearing 124˚.

**Niuatoputapu** (16˚00'S., 173˚47'W.), 107 miles ESE of Niuafo'ou, is part of the Kingdom of Tonga. There is a ridge of hills near the center of the island, 107m high. The principal village, Hihifo, is situated on the NW side of the island. The Government Agent or Chief Magistrate lives here.

A barrier reef enclosing a lagoon full of shallow patches lies 0.7 mile off the NW side of Niuatoputapu. The other sides of the island are fringed by a narrow steep-to reef. A dangerous reef which breaks heavily, and with depths of less than 1.8m, lies about 2 miles NW of the island, and a dangerous coral reef extends about 1 mile from the SW extremity of the island.

An islet, 6m high, stands on the seaward edge of the barrier reef off the NW side of Niuatoputapu, and a wooded islet, 21m high, lies close to the W side of the island off Hihifo.

When approaching from the SE, vessels should give the island a berth of at least 1 mile to avoid the shoals extending from it.

**Anchorage.—**Anchorage may be taken, in 18m, 0.5 mile NW of the islet, 6m high, off the NW side of Niuatoputapu.

**Caution.—**A 15m shoal lies about 9 miles SSW of Niuatoputapu.

It has been reported (1994) that Niuatoputapu lies 2 miles W of its charted position.

Table of Contents

**Tafahi** (15˚51'S., 173˚44'W.), 7 miles NNE of Niuatoputapu, a possession of Tonga, is a conical-shaped, wooded islet, rising to a height of 610m. The island is reported to give a good radar return up to 24 miles.

**Caution.—**It has been reported (1991) that Tafahi lies 2 miles W of its charted position.

**Curacoa Reef** (15˚30'S., 173˚37'W.), 24 miles NNE of Tafahi, has been reported to consist of two parts about 90m apart lying in a NW-SE direction. The sea breaks heavily in the vicinity of the reef.

Curacoa Shoal, with a depth of 18.3m, lies 11 miles SSE of Curacoa Reef.

**Caution.—**Volcanic activity was reported in an area 5 miles SSW of Curacoa Reef.

**2.63 Niue Island** (19˚02'S., 169˚52'W.), about 230 miles E of Vava'u of the Tonga Islands, is about 12 miles long N-S and 10 miles wide. Its thickly-wooded hills rise to a height of 73m. The island is self governed.

A steep fringing reef surrounds the island, and there are no charted off-lying dangers.

**Winds—Weather.—**The prevailing wind is from the ESE. Winds of high velocity occur during the summer months, but seldom result in severe typhoons.

December to March is the wettest season and the hottest, although the rainfall is generally distributed throughout the year.

**Regulations.—**Vessels coming to Niue from any area infected with Rhinoceros Beetles must remain at least 1 mile offshore from 15 minutes before sunset until 15 minutes after sunrise.

**2.64 Alofi** (19˚02'S., 169˚56'W.) (World Port Index No. 55695) is situated at the head of Alofi Bay, on the W coast of Niue. It is one of the five principal villages on the island. There are lights, in line bearing 123˚, which lead to the anchorage in Alofi Bay; the cargo is worked here.

**Anchorage.—**There is good anchorage in the bay, in depths of 55m, coral, about 0.2 mile from the fringing reef, with a lighted beacon bearing 123˚, and Alo-fi North beacon on the N side bearing 046˚. It has been reported that local vessels up to 1,700 grt moor on the range line, bow to seaward, and stern lines to the shore. This anchorage is not tenable in strong W winds.

**Antiope Reef** (18˚15'S., 168˚24'W.) is a circular plateau approximately 400m in diameter. A depth of 9.5m lies over the reef. It has been reported that the reef breaks.

**Harans Reef** (21˚33'S., 168˚55'W.), whose charted position is doubtful when reported, the reef was breaking furiously.

Another report of a reef, the position of which is doubtful, lies in 21˚43'S, 167˚45'W.

**Beveridge Reef** (20˚00'S., 167˚48'W.) encloses a lagoon; the reef is awash at LW and breaks continually.

**Tides—Currents.—**The tidal current in the pass has been reported to reach rates of 4 to 6 knots on the ebb.

**Depths—Limitations.—**A pass into the lagoon, from the SW side, is about 0.2 mile wide; over a width of 90m it carries a depth of 5m. There are several coral heads in the passage, and it was reported that it would be unwise for vessels with a draft of over 3.7m to use it.

**Anchorage.—**A vessel has reported anchoring, in a depth of 3m, on the E and S sides of the outer lagoon, where the water was light green in color. The bottom was sand, holding ground reported as excellent. The anchorage was uncomfortable near HW with strong winds.

**Caution.—**A stranded wreck lies at the SE end of the barrier reef.

The reef has been reported to lie 4 miles SW and 5 miles E of its charted position. The reef has also been reported (1993) to lie 3 miles NE of its charted position.

Table of Contents