

H. O. Pub. 72
(Formerly No. 163)

**SAILING DIRECTIONS
for
JAVA
LESSER SUNDAS; SOUTH,
SOUTHEAST, AND EAST
COASTS OF BORNEO;
AND CELEBES**

**Excludes western end of Java between Tandjung
Tjankuang and Udjung Krawang**

**Fifth Edition
1962**

Published by the U. S. Naval Oceanographic Office
under the authority of the Secretary of the Navy



United States
Government Printing Office
Washington : 1962

For Sale by authorized Sales Agents of the U. S. Naval Oceanographic Office
Price, including ring binder.....\$4.50
Contents only (without binder).....\$3.00

CHANGE
1

HOW TO KEEP THIS BOOK CORRECTED

As initially published, this book contains material based upon information available in the U.S. Naval Oceanographic Office through the date given in the preface. Subsequently it should be brought up to date by replacing obsolete pages with loose-leaf change pages, which are published at appropriate intervals in consecutively numbered sets called Changes. A later Change does not automatically cancel an earlier Change, therefore each Change must be inserted in sequence as published; eventually the book will contain change pages from several different Changes. A revised List of Effective Pages included in each Change lists the correct pages comprising the complete book. The publication of new Changes, which normally occurs every twelve to eighteen months, is announced in Notice to Mariners. Instructions for ordering Changes will be found in the front part of the book.

In the interval between Changes, information that may amend material in this book is published in the weekly Notice to Mariners. For easy reference, notices should be pasted to pages affected. Book owners will be placed on the Notice to Mariner mailing list on request to the U.S. Naval Oceanographic Office, Washington, D.C. 20390.

SPECIAL NOTICE

Pursuant to Public Law 87-533, which became effective on 10 July 1962, the U.S. Navy Hydrographic Office has been redesignated the U.S. Naval Oceanographic Office.

References to the Hydrographic Office and its abbreviation "H.O." may appear throughout this publication. Corrections will be made as opportunity permits. In the meantime, the new name is intended wherever the old name appears.

[illegible]

CHANGE IX
1

(Formerly page VII) H. O. 72

1964
 TAC #40 TR
 TAC #42 TR
 #48 FA
 52 TR
1965
 1 TR
 10 WBG
 18 TR

41-46
 47 — JHS

1966
 1 TAC 6 TR
 18 TR
 33
 ↓
 44
 ↓
 51
 CB2
 CB2

1967

1-
 2-GB
 3-GB
 4-
 5-

6 NONE

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

~~Not~~
 1967

33

34

35

36

37

38

39

40

41

42

43

44

PREFACE

This publication, *Sailings Directions for Java*, except the west coast from Tandjung Tjankuang to Udjung Krawang, Lesser Sundas, South and Southeast Coasts of Borneo, and Celebes, is the Fifth Edition of Oceanographic Office Publication No. 72; as originally published it is corrected to September 29, 1962 (including Notice to Mariners No. 39).

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

Zeemansgids Voor Indonesie, Deel II (Middengedeelte), 1956, with *Aanvullingsblad (Supplement)* No. 2—1959.

Zeemansgids Voor Indonesie, Deel III (Oostelisk Gedeelte), 1951, with *Aanvullingsblad (Supplement)* No. 5—1959.

Eastern Archipelago Pilot, Vol. II, Sixth Edition, Admiralty London, 1949, with Supplement No. 5—corrected to Oct. 3, 1959.

Allied Geographic Section—*Terrain Studies*—*Statesman's Yearbook* (1962).

Merchant vessel reports and reports of various shipping companies.

Reports from U.S. naval vessels.

Indonesian, Dutch, and B.A. Charts.

EXPLANATORY REMARKS

COASTAL DESCRIPTIONS.—Beginning with Chapter 2, chapters in this publication are divided into major divisions, or parts, consisting of relatively short sections of coast or of bays or gulfs, islands or island groups, sounds and channels, etc. Major divisions are normally arranged in geographic sequence according to the general plan of the book, and are subdivided, according to subject, into subordinate divisions, which are arranged in the order the various subjects would normally be considered by vessels operating in the area. For example, information normally required for navigating in the offing is given before that required for navigating close inshore, and outer dangers are described before those that fringe the coast. This arrangement makes reference to only the first few paragraphs of each major division covering a particular coast necessary for normal offshore navigation, but progressively more study of the text is required as concern for coastal details increases, as when approaching close-to, entering port, or anchoring. The subordinate divisions are appropriately titled to aid in locating specifically required information, and their arrangement is designed to eliminate comprehensive reading if the various inshore details of a coast are of no concern.

GRAPHIC INDEXES.—A general index diagram showing the area described in this publication and the general limits of the various chapters is located in the front part of the book. An

CHANGE 1	III
-------------	-----

(Formerly page XV) H. O. 72

PREFACE

individual chapter index diagram showing an enlargement of the specific area described is located at the beginning of each chapter. These chapter indexes also show the limits of the best-scale charts issued to U.S. naval vessels by the **Oceanographic Office** and indicate the place in the text where a description of various designated localities begins. To find the description of a particular locality, simply refer to the general index to determine the appropriate chapter, and then refer to the particular chapter index, which will indicate by means of section numbers the place in the text where a description of the area that includes the particular locality begins.

BEARINGS are true, and are expressed in degrees from 000° (North) to 360°, measured clockwise. Bearings limiting light sectors are toward the light.

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

DISTANCES are expressed in nautical miles of 1 minute of latitude, or approximately 2,000 yards. Distances of less than 1 mile are expressed in yards or fractions of a mile. Decimals are occasionally used.

WIND DIRECTIONS are the true directions from which winds blow.

CURRENT DIRECTIONS are the true directions toward which currents set.

CHARTS shown on the graphic indexes at the beginning of each chapter are the largest-scale charts of the locality on issue to the U.S. naval vessels by the **Oceanographic Office**. The H.O. Catalog of Nautical Charts and Publications (Region 7, Australia and Indonesia) shows complete **Oceanographic Office chart coverage**.

GEOGRAPHIC POSITIONS given at intervals throughout the text are approximate only and are intended to facilitate reference to the charts.

DEPTHS are referred to chart datum and are expressed in fathoms or feet.

HEIGHTS are referred to the plane of reference used for that purpose on the charts and are expressed in feet.

LIGHT AND FOG SIGNAL CHARACTERISTICS are not described, and light sectors are not usually defined. The Light Lists should be consulted for complete information.

RADIO NAVIGATIONAL AIDS and radio weather services are not described in detail. H.O. Publications Nos. 117B and 118B should be consulted.

GEOGRAPHIC NAMES are generally those used by the nation having sovereignty. Names in parentheses following another name are alternate or obsolete names that may appear on some charts. In general, alternate, or obsolete names are quoted only in the principal description of the place.

CORRECTIVE INFORMATION.—It is requested that the U.S. Naval Oceanographic Office, Washington, D.C. 20390, or any of its branch offices, be advised of any inaccuracy found in this publication or of additional navigational information considered appropriate for insertion. Various Oceanographic Office forms are available for this purpose.

CONTENTS

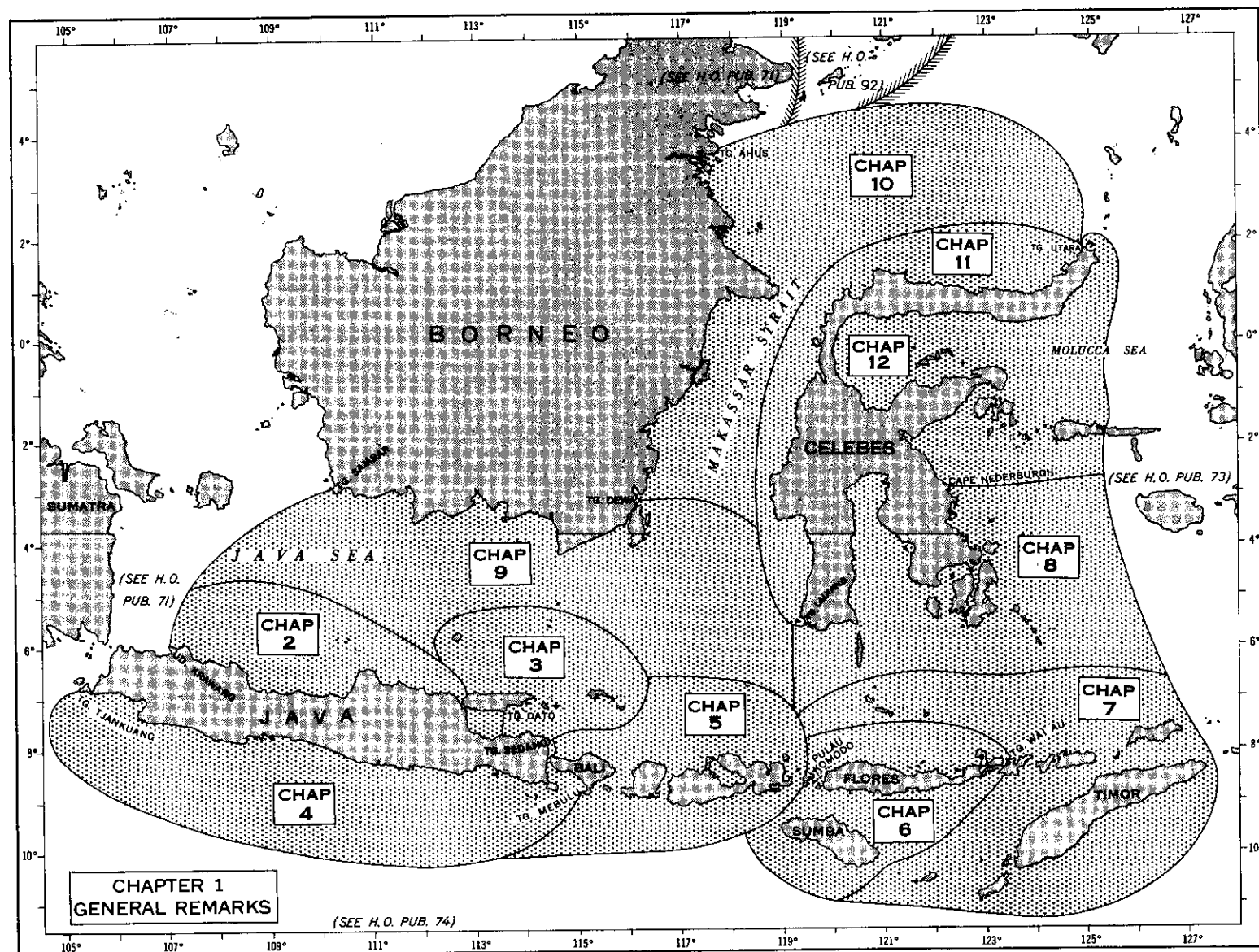
	Page
How to keep this book corrected - - - - -	II
Preface - - - - -	III
Chartlet—Chapter Limits- - - - -	VII
Record of Changes- - - - -	IX
How to obtain Changes - - - - -	XI
List of Effective Pages- - - - -	XIII
The Short Correction System- - - - -	XVII
Appendix—Climatological tables - - - - -	475
Glossary - - - - -	483
Index- - - - -	485
Conversion table - - - - -	533
U.S. Naval Oceanographic Office Sailing Directions - - - - -	535
Route Chart - - - - -	envelope at back of book
Index Chart—Limits of Sailing Directions- - - - -	envelope at back of book
Chapter 1	
General Remarks on Indonesia—Buoyage—Signals—Regulations—Cautions—Pilotage— Climatology—Oceanography—Routes- - - - -	1
Chapter 2	
North Coast of Java—Udjung Krawang to Surabaya, Including Kepulauan Karimundjawa - - - - -	63
Chapter 3	
North and Southeast Coasts of Madura—Off-Lying Islands—Selat Sapudi and East Part of Selat Madura - - - - -	105
Chapter 4	
South Coast of Java—Selat Bali- - - - -	131
Chapter 5	
Bali, Lombok, and Sumbawa, with Straits and Off-Lying Islands- - - - -	155
Chapter 6	
Sumba; Flores, with Adjacent Islands and Straits- - - - -	205
Chapter 7	
Pulau Lomblen and Kepulauan Alor, with Straits—Timor and Wetar, with adjacent Islands and Straits—Pulau Tanahdjampea, Kepulauan Matjan and Adjacent Islands- - - - -	257

CONTENTS

Chapter 8	
Southeast and South Coasts of Celebes.....	Page 287
Chapter 9	
South Coast of Borneo—Selat Laut—South entrance of Makasar Strait.....	325
Chapter 10	
Makasar Strait—East Coast of Borneo.....	349
Chapter 11	
West and North Coasts of Celebes.....	395
Chapter 12	
East Coast of Celebes.....	433

(Formerly page III) H.O. 72

CHANGE
1
VII



SEE SHORT CORRECTIONS

CHAPTER LIMITS

CHAPTER LIMITS—H.O. PUB. NO. 72

1

2

3

4

5

6

7

8

9

10

11

12

HOW TO OBTAIN CHANGES

Sales to General Public.—When this book is sold, all Changes in effect at the time are furnished at no extra cost. Subsequent Changes have a standard selling price of 35 cents each. Whenever possible, Changes should be bought from one of the local sales agents listed in Part I of the Catalog of Nautical Charts and Publications. If there is no sales agent available, Changes may be ordered by mail from the U.S. Naval Oceanographic Office, Washington, D.C., 20390 or from either of the Distribution Offices listed below. Such orders must be accompanied by check or money order made payable to the U.S. Naval Oceanographic Office. Postage stamps or Government Printing Office coupons cannot be accepted as payment. Changes will be mailed, postage paid, by regular mail. Special handling costs, such as air mail, special delivery, etc. must be borne by the purchaser.

In emergencies, Changes may be bought from one of the Branch Oceanographic Offices also listed in the catalog. Branch Offices do not handle mail orders.

Official U.S. Government Issues.—U.S. naval vessels and government activities on official distribution lists will receive Changes automatically upon publication. Government

activities not on the distribution lists should submit requests to the U.S. Naval Oceanographic Office, Washington, D.C., 20390 or to one of the Distribution Offices.

Mail orders from the Pacific Ocean area or west of the Mississippi River, except the Gulf of Mexico and the Canal Zone, should be sent to:

U.S. Naval Oceanographic Distribution
Office
Clearfield Annex
Ogden, Utah, 84016

Orders from all other areas should be sent to:

U.S. Naval Oceanographic Distribution
Office
U.S. Naval Supply Depot
5801 Tabor Ave., Philadelphia, Pa., 19120

Order Blank.—To insure prompt handling, the order blank at the bottom of the page should be used when ordering by mail from the U.S. Naval Oceanographic Office or Distribution Offices.

H.O. 72

Change 2 XI

Detach along this line

ORDER BLANK
for
Change No. 3 to H.O. Pub. 72

Please send above Sailing Directions Change to address below.
Payment of 35 cents (check or money order) is enclosed.

Mailing Label—Please Type or Print Carefully

Chg. No. 3 H.O. Pub. 72

Name _____
Address _____
City _____ Zip Code _____
Country _____

LIST OF EFFECTIVE PAGES

H.O. Pub. No. 72 — Fifth Edition, 1962
Change No. 2

This list supersedes any previous list. If two or more Changes are to be applied at one time, only the latest list should be used.

EXPLANATION

- 19 Original book page. Only odd-numbered pages are listed; their reverse sides are taken for granted unless otherwise noted.
- 19-3 Change page from Change No. 3. It replaces previously effective page 19.
- 20a-3 Additional book page included in Change No. 3. Pages 20b, 20c, etc., if included, are inserted in alphabetical order.

PAGES REQUIRED IN COMPLETE BOOK

Title Page—1	IX—1 (Rev. Blank)	XVII—2
III—1	XI—2 (Rev. Blank)	XIX—2
V—1	XIII—2	XXI—2
VII—1 (Rev. Blank)	XV—2 (Rev. Blank)	XXIII—2
		XXV—2 (Rev. Blank)

Continued on reverse side

LIST OF EFFECTIVE CHANGES

This list supersedes any previous list. The effective pages of each listed Change must be applied to bring this publication up to date. Previous Changes not listed are no longer effective.

Change No. 1, corrected through Notice to Mariners 30 of 25 July 1964
Change No. 2, corrected through Notice to Mariners 7 of 12 Feb. 1966

LIST OF EFFECTIVE PAGES

1 (Rev. Blank)	111	219	329-1
3-1	113-1	221	331-1
5	115-1	223	333
7-1	117-1	225	335
9-1	119-1	227	337
11-1	121	229	339-1
13-1	123-1	231	341
15-1	125-1	233	343
17	127	235	345
19-1	129 (Rev. Blank)	237	347-2
21-1	131 (Rev. Blank)	239	349-1 (Rev. Blank)
23-2	133	241	351
25	135-1	243	353
27	137	245	355-1
29	139-1	247	357
31	140a (Rev. Blank)	249	359
33	141-1	251	361-1
35	143	253	363-1
37	145-1	255	365-1
39	147	257 (Rev. Blank)	367
41	149	259	369-1
43	151	261	371
45	153	263	373
47	155-1 (Rev. Blank)	265	375-1
49	157	267	377-1
51	159	269	379
53	161	271-1	381
55	163-1	273-1	383
57	165-1	275-1	385-2
59	167-2	277-1	387
61	169-1	279	389-1
63 (Rev. Blank)	171-1	281	391-1
65	173-1	283	393
67	175-1	285 (Rev. Blank)	395 (Rev. Blank)
69-2	177	287 (Rev. Blank)	397
71-2	179	289	399
73	181	291	401
75	183	293	403
77-1	185-1	295	405-1
79	187	297	407-1
81-2	189-1	299	409-1
83	191	301	411
85-1	193-1	303	413
87-1	195	305	415
89-1	197-1	307	417
91	199	309	419
93	201	311-1	421
95-2	203	313	423
97-2	205 (Rev. Blank)	315	425
99-2	207	317	427-1
101-1	209	319	429-1
103 (Rev. Blank)	211	321	431 (Rev. Blank)
105 (Rev. Blank)	213	323	433 (Rev. Blank)
107	215	325 (Rev. Blank)	435
109-1	217	327	437

LIST OF EFFECTIVE PAGES

439-1	491
441-1	493
443	495
445	497
447	499
449-1	501
451-1	503-1
453	505
455	507
457	509
459	511
461	513
463	515-1
465	517-1
467	519
469	521
471-1	523
473 (Rev. Blank)	525
475	527
477	529
479	531
481	533-2 (Rev. Blank)
483	535-2
485	537-2 (Rev. Blank)
487	Envelope containing
489	route and index chart

NEW FORMAT AND TYPE STYLE

In the interest of economy and efficiency, automatic punched tape typesetting machinery is being used to produce Sailing Directions and Sailing Directions Changes. This new machinery has necessitated a slight change in format and a different printing style.

New editions will be printed entirely in the new format and type style. Existing editions will be converted gradually by the Change page system, therefore both old and new styles may be present in any single volume. Differences, which will be eliminated as soon as possible, may also appear in a single set of Change pages. These typographical differences do not affect the content of the Sailing Directions.

.

.

.

.

.

.

.

.

.

—

—

—

—

THE SHORT CORRECTION SYSTEM

Although Change pages replacing obsolete pages represent the ideal correction system for loose-leaf books, the Short Correction system is used as a reasonable alternative when corrections are too small to justify replacing an entire page.

Short Corrections are intended to be kept intact in the front of the book for ready reference as needed. The previous option of cutting apart and pasting Short Corrections to affected pages has been discontinued in the interest of simplicity. Previous Short Corrections that remain effective are repeated in subsequent Changes, and both old and new corrections for any given page are grouped together for easy reference. Pages affected by Short Corrections that are new with this Change are listed below. It is recommended that the top of each affected book page be marked "See Short Corrections" as a reminder that a Short Correction applies.

Short Corrections are preceded by a code group which shows the applicable page number, column, line number, and first word of line affected. Unless otherwise indicated each Short Correction replaces the entire line or lines designated. Exceptions are self-explanatory.

Example: 429-L-10 (Island). The Short Correction applies to Page 429, left column, line 10. "Island", the first word of line 10, serves as a check on the line count.

NEW SHORT CORRECTIONS IN THIS CHANGE

Short Corrections that are new with this Change apply to the following pages, which should be marked as suggested above.

Pages VII, 15, 73, 74, 77, 87, 89, 110, 119, 124, 125, 126, 159, 164, 170, 194, 307, 338, 362, 367, 368, 370, 375, 389, 397, 406, 407, 409, 410, 413, 417, 439, 440, 441, 446, 452, 460, 513, 514, 516, 532.

CUMULATIVE SET OF SHORT CORRECTIONS

VII—Chapter Limits: For MAKASSAR read MAKASAR (Chg. 2)

6-L-50 (Maluka) After line 50 add:

West Irian-----Kotaburu (Hollendia) (Chg. 1)

6-R-12 (papan): papan, Tandjunguban, Sungai Pakning, Pelambang, and Dumai. (Chg. 1)

15-R-21 (a):

(a) Green or Black.—Indicates torpedo has been (Chg. 2)

18-L-36 (1):

1. Establish a radiotelephone watch on 2182 (Chg. 1)

67-L-39 (beacon) After line 39 add:

It was reported (1963) that the light structure was a good radar target at a distance of 10 miles. (Chg. 1)

73-L-1 thru 4 (of Harbor): Delete. (Chg. 2)

73-R-29 (NAVIGATIONAL):

NAVIGATIONAL AIDS.—A light buoy, painted in red and white horizontal bands, is moored close off the west extremity of Karang Djeruk (sec. 2B-3). (Chg. 2)

74-L-23 (available) After line 23 add:

It was reported (1964) that there was a shortage of lighters. (Chg. 2)

75-L-14 and 15 (cone): cone, with a flat upper surface 10,336 feet high. The latter, 11,057 feet high, has a broken upper (Chg. 1)

77-R-35 (often) After line 35 add:

In 1962 it was reported that the depth in the entrance channel was 10 feet. (Chg. 2)

79-L-37 (and) After line 37 add:

It was reported (1963) that the coast between a position about 15 miles north-northeastward of Semarang and a position 2 miles farther northeastward lay about 3 1/2 miles farther westward than charted. (Chg. 1)

80-R-6 (coast) After line 6 add:

It was reported (1963) that Pulau Mondoliko was a good radar target at a distance of 16 miles. (Chg. 1)

83-Title of view: for "15 miles 209°" read "8 miles 151°." (Chg. 1)

87-R-11 thru 13 (An): Delete (Chg. 2)

89-R-13 (the): the pierhead was 29 1/2 feet (MLWS). In 1964 a 10,000-ton vessel was berthed and there was sufficient space available for another vessel of similar size. Bagged (Chg. 2)

91-L-24 (sunken): sunken wrecks. The greater part of these areas had a LWS swept depth of 26 feet in 1962. The limits of these areas are (Chg. 1)

93-L-1 (peak): peak of a bare ridge. Gunung Sleret (Seleret), 804 feet (Chg. 1)

103-L-20 thru 21 (There):

There are two floating cranes with a lifting power of 200 and 75 tons. Three smaller floating cranes are available. Several railroad cranes are available. The before- (Chg. 1)

110-R-4 (good): good landmark. The island serves as a good radar target for vessels approaching Selat Sapudi or Selat Raas. (Chg. 2)

111-L-12 (much) After line 12 add:

It was reported (1963) that Pulau Bawean was a good radar target at a distance of 29 miles. (Chg. 1)

119-L-24 (fathoms): fathoms. Two obstructions lie about 7 3/4 miles southwest by south of the southwest extremity of Gila Dua. (Chg. 2)

121-R-13 thru 14 (TANDUNG DJANKAR):

TANDJUNG DJANKAR is a low point covered with high trees. The (Chg. 1)

122-R-6 thru 8 (depth): depth of 2 1/2 fathoms. Two shoals, with depths of 7 feet and 11 feet, lie within 700 yards westward of Djamungan Reef. (Chg. 1)

124-R-27 (ally): ally navigate this strait, which is prominent by radar. (Chg. 2)

125-L-38 thru 40 (A growing): Delete (Chg. 2)

125-R-7 (dries) After line 7 add:

A growing reef was reported (1963) about 1 1/2 miles east-northeastward of the northeast extremity of Pulo Raas. (Chg. 2)

126-L-20 (Selat): Selat Sapudi. Selat Raas is prominent by radar. (Chg. 2)

134-R-14 thru 22 (4A-3):

4A-3 The 100-fathom curve lies up to 13 1/2 miles offshore southward of Djungkulon Peninsula gradually closing to 2 miles off Ujung Sinini and 4 miles off Ujung Genteng. It incloses all known dangers. (Chg. 1)

137-L-28 (in range): in range with a rock on the fringing sandbank, about (Chg. 1)

138-L-16 thru 17 (A large): Delete (Chg. 1)

140a (TJILATJAP, port plan) under column "DEPTH, Feet" correct first three depths as follows: 22 to read 17, 15 to read 23, 18 to read 23 (Chg. 1)

143-L-31 (4C-6):

4C-6 Dangers, other than those charted, (Chg. 1)

143-R-3 (indents): indents the east shore of the lay. A beacon stands on the shore at its south entrance point. (Chg. 1)

150-R-36 (the main): the main light structure. It is marked by a BEACON with a cylindrical topmark. (Chg. 1)

158-R-24 thru 25 (northward): northward to a position 7°33'30" S., 115°10' E. thence to a position 7°33'30" S., 114°30' E. is (Chg. 1)

159-L-11 (peak) After line 11 add:

There are few navigational aids on Bali, but the radar presentation is very good. (Chg. 2)

162-L-29 (coast): insular shelf between Tandjung Gondol and Tjelukan (Chg. 1)

164-R-43 (mark): mark. The hill was reported (1964) to be conspicuous from the north, but not conspicuous when approaching from the south. The 1,230 foot peak, about 2 1/2 miles (Chg. 2)

170-L-28 (20 miles) After line 28 add:

It was reported (1964) that of the physical features of the three islands only the peak on Pulau Trewangan was a good navigational mark, both visually and by radar. (Chg. 2)

170-View: For "Maredje" read Gunung Maredje, 13 miles, 159°. (Chg. 2)

178-L-37 thru 39 (lies between): lies between Lombok and Sumbawa. It is often used instead of Selat Lombok. There are few dangers; islands in it may be closely approached, and physical features are convenient for fixing position. (Chg. 1)

179-L-11 thru 16 (DIRECTIONS): Delete (Chg. 1)

182-L-35 thru 36 (Tandjung): Tandjung Labu Beru is a wide bay, fronted by Pulau Paserang and Pulau Belang, (Chg. 1)

187-L-9 (Langudu): Langudu, is marked by a 155-foot-high hill, a (Chg. 1)

188-R-38 (4,636-foot): 4,636-foot Sasah (Lambuwi) and the 3,822-foot Soromandi; (Chg. 1)

191-L-4 (Saleh): Saleh, is hilly and rises 1,785 feet; it has no (Chg. 1)

191-L-10 (and Tandjung): and Tandjung Sarah Tor (Boko), a point 4 1/4 miles (Chg. 1)

194-R-33 (least) After line 33 add:

An OBSTRUCTION lies about 50 feet westward of the T-head. (Chg. 2)

196-R-21 thru 22 (The only): The only recognizable peak is the blunt, 4,930-foot Doro Maria (Kuta), 8 miles westward of Tandjung (Chg. 1)

202-L-4 (islet) After line 4 add:

A ruined lighthouse stands near the west extremity of the westernmost islet. (Chg. 1)

219-Page Heading: for "Palau" read "Pulau" (Chg. 1)

221-Page Heading: for "Palau" read "Pulau" (Chg. 1)

244-L-34 (Tandjung) After line 34 add:

A dangerous sunken rock, the existence of which has not been confirmed, is reported to be located about 3 miles east-northeast of Unjuran Reef. (Chg. 1)

245-L-36 (call): call at Maumese. A pier about 150 feet long extends from the north end of the village. (Chg. 1)

245-R-38 and 39 (to Selat): to Selat Pangabatang, is 1,150 feet high, wooded and steep, and reef fringed. (Chg. 1)

255-L-12 and 13 (isolated): isolated hill, 325 feet high, with a single palm on it. (Chg. 1)

264-Title of Illustration should read: Selat Pantar, North Entrance, Pulau Ternate, bearing 180° (Chg. 1)

265-R-4 (midday) After line 4 add: There is a Government hospital. (Chg. 1)

266-R-23 (Parimbala): Parimbala and Tandjung Gumuk, is mountain- (Chg. 1)

266-R-41 (Gunuk): Gumuk is mountainous, gradually decreasing (Chg. 1)

269-L-9 (southwest) After line 9 add:

It was reported (1963) that Nusa Manuk was a good radar target at a distance of 21 miles. (Chg. 1)

307-R-24 (west) After line 24 add:

CAUTION.—Indonesian Notice to Mariners No. 33/254 dated 15 August 1964 indicates establishment of a PROHIBITED AREA in Teluk Bone. Co-ordinates, only given for two positions in the notice (4°15' S., 121°20' E. and 4°29' S., 120°24' E.), do not clearly define the prohibited area. Mariners should use caution in this area. (Chg. 2)

310-R-34 (on) After line 34 add:

It was reported (1963) that an ore-loading pier is located on the southeast coast of Lemo Islet and that a vessel anchored in 23 1/2 fathoms about 875 yards northeastward of the pier. It was also reported (1963) that a stake, on which there is a LIGHT at night, stands on the extremity of the drying reef that extends in a southeasterly direction from the southeast side of Lemo Islet. (Chg. 1)

328-L-31 thru 33 (13 miles): 13 miles. Numerous above-water rocks lie off the point, and three rocks awash lie about 1 1/4 miles southward, with a similar rock about the same distance westward of it. An above-water rock lies about 2 3/4 miles northeastward of the same point about 1/2 mile offshore. The west coast of Borneo, north- (Chg. 1)

333-Delete names at upper left corner of illustration (Chg. 1)

XX

334-L-31 (80) After line 31 add:

A LIGHT BUOY, painted in red and white stripes, is moored about 1 1/4 miles southward of the outer bar. (Chg. 1)

338-L-10 (praus): praus are available. A 20-ton crane is located (Chg. 2)

338-L-19 (The pressure): The pressure is low; rate of delivery about 5 tons per hour. The water should be (Chg. 1)

346-R-30 (with depths): with depths of 7 1/2 to 8 1/2 fathoms, have been (Chg. 1)

346-R-32 (ban Bank.): ban Bank. A shoal bank with a depth of 8 1/2 fathoms was reported (1963) to lie about 20 miles northeastward of Martaban Bank. (Chg. 1)

353-R-37 (east-southeastward): east-southeastward of Tandjung Pamukan. A depth of 2 1/2 fathoms was reported (1962) to lie about 2 miles northeastward of Addington Reef. A (Chg. 1)

354-L-26 thru 28 (with sand): with sand and stones. (Chg. 1)

354-L-37 and 38 (A Wreck):

A WRECK lies sunk about 6 miles east- (Chg. 1)

358-L-21 (miles) After line 21 add:

It was reported (1963) that Pulau Seturian was a good radar target at a distance of 12 miles. (Chg. 1)

358-L-27 (from) After line 27 add:

It was reported (1963) that Pulau Sebangkatan was a good radar target at a distance of 19 miles. (Chg. 1)

362-R-14 thru 16 (are): are marked by buoys. A dangerous wreck with its mast visible is located about 9 2/5 miles 105° from the light structure on Tokong (Chg. 2)

362-R-25 and 26 (reef): reef. A dangerous wreck with its masts visible is located a little less than 1 mile north-northwest of Tokong Hill. A green spherical BUOY is moored close south of the dangerous wreck. (Chg. 2)

367-R-40 and 41 (westward): westward of Tandjung Pegah. The above mentioned buoy is equipped with a radar reflector. A lighted buoy, painted in (Chg. 2)

368-Folio head: for "MAHAKAN" read MAHAKAM. (Chg. 2)

368-L-7 thru 10 (jung Pegah): jung Pegah. (Chg. 1)

370-R-30 (the): the river. The population was 69,715 (1961). The town is surrounded by a dense (Chg. 2)

375-R-19 (miles): miles. In 1964 a RADAR RETURN in excess of 40 miles from Tandjung Mangkalihat was reported. A LIGHT is shown from a position (Chg. 2)

381-L-29 (fairway) After line 29 add:

It was reported (1963) THAT Pulau Bilangbilangan was a good radar target at a distance of 16 miles. (Chg. 1)

389-R-36 and 37 (flecting): flecting material, is moored a little over 1 1/4 miles south by west of Tandjung Arang. (Chg. 2)

397-R-2 (shipping) After line 2 add:

DANGER AREA.—A danger area has been established bounded by a line connecting the following positions:

- (a) 4°06' S., 119°37' E.
- (b) 3°40' S., 118°23' E.
- (c) 1°00' S., 119°00' E.
- (d) 1°00' S., 119°29' E. (Chg. 2)

398-Upper Illustration: Delete name "Batu Lua" (Chg. 1)

398-Illustration Title: for "Luri Lompo" read "Pulau Balang-Lompo" (Chg. 1)

402-Illustration Title: for "051°" read "056°" (Chg. 1)

402-R-39 (asar) After line 39 add:

It was reported (1963) that this is the only safe swept route to Makasar. (Chg. 1)

406-L-33 (with): with a depth of about 6 fathoms (1965). (Chg. 2)

407-L-34 (able): able from 0600 to 2400 daily. It was reported (Chg. 2)

409-L-11 thru 19 (machine): machine shop. Divers and diving gear are available.

In 1965 a shipyard, which when completed will have a slipway capable of accommodating a 2,000-ton ship, was under construction. At that time the only slipway in use had a capacity of 200 tons. (Chg. 2)

409-R-2 (specialist): specialist is possible after previous arrange- (Chg. 2)

410-L-34 (no) After line 34 add:

CAUTION.—Teluk Mandar was reported (1964) to be closed to foreign shipping (Chg. 2)

413-L-40 (ward) After line 40 add:

Teluk Mamudju was reported (1964) to be closed to foreign shipping. (Chg. 2)

417-L-15 (seen) After line 15 add:

The island was reported (1964) to be a good radar target. (Chg. 2)

418-Move Title of Illustration at bottom of page to top illustration. New title for bottom illustration should read "NORTHWEST COAST OF CELEBES, TANDJUNG BENAR (BESAR) (STROOMEN KAPP) 33 MILES 090°" (Chg. 1)

419-L-43 thru 44 (close southward): close southward of Pulau Simatang, is a low islet and lies close within the east edge of a drying reef which extends southwestward and westward for about 1/2 mile. The west extremity of the reef is marked by a white conical BUOY. The islet is covered with coconut palms and is uninhabited. (Chg. 1)

422-R-10 and 11 (11D-1):

11D-1 TANDJUNG BENAR (BESAR) (STROOMEN KAPP) (1°20' N., 120°49' E.) is a prom- (Chg. 1)

431-L-8 (least depth): least depth of less than 6 feet, lie off the entrance (Chg. 1)

438-L-36 (there) After line 36 add:

It was reported (1963) that Pulau Bangka was a good radar target at a distance of 21 miles. (Chg. 1)

439-L-38 (miles) After line 38 add: miles. It was reported (1964) that the island was a good radar target from a distance of 24 miles. (Chg. 2)

XXII

440-R-8 (Lembah) After line 8 add:

There are about 20 rectangular tanks, painted black, close eastward of the wharf at Bitung. (Chg. 2)

440-R-38 thru 41 (should): should anchor and await Port Authorities and pilot, southwestward of the southwest limit of the port.

The southwest limit of the port is defined by lines extending northward and eastward from a position about 1 1/3 miles southwestward of Tandjung Labuan Compenie light structure. The northeast limit of the port is defined by lines extending westward and southward from a position about 2 3/4 miles east-northeastward of the same light structure.

Pilots disembark (Chg. 2)

441-L-14 thru 19 (stroyed): stroyed. The wharf is 1,410 feet long and can accommodate three ocean-going vessels. In 1965 the least depth alongside was reported to be 33 feet. The wharf is equipped with a mobile crane. Cargo is handled by ship's (Chg. 2)

441-L-22 thru 24 (The):

The port had one tug in 1965 to assist vessels in docking and undocking. Water may be obtained by barge. (Chg. 2)

445-Upper Right Corner of Illustration for "Beu" read "Beau"

Title of Illustration: for "Punta" read "Puntu" (Chg. 1)

446-L-3 (south): south of the equator, form a very striking fea- (Chg. 2)

446-R-16 (jung): jung Palasa (Pelasa); it shows discoloration and is (Chg. 2)

452-R-30 (BEACON) After line 30 add:

A ROCK with 6 feet or less over it is located close southward of a position about 2 miles west of Pulau Lahei. (Chg. 2)

457-L-8 (detached) After line 8 add:

A shoal with a depth of 49 feet lies about 800 yards east-northeastward of the head of the pier. (Chg. 1)

460-R-28 (jung): jung Palasa (Pelasa), about 19 miles northeastward, has (Chg. 2)

460-R-43 (TANDJUNG):

TANDJUNG PALASA (PELASA) (0°28' N., 120°25' (Chg. 2)

464-L-3 (island.) After line 3 add:

Banks extend about 3 miles southward, 1 1/4 miles westward, and nearly 2 miles northward from Pulau Masoni. A least depth of 13 feet at the outer extremity exists on the west side of the island. (Chg. 1)

INDEX CORRECTIONS

489-After Baru Tandjung (Sumbawa) add:

Teluk (Sumbawa), 5C-6 (Chg. 1)

490-After Beatrice Reefs add:

Beau, 12B-2 (Chg. 1)

491-Delete "Besar, Tandjung" and insert:

Besar, Tandjung Celebes, N. coast, 11D-10

—, —, —, NW extremity, 11D-1 (Chg. 1)

- 491-After Boko, Lehek add:
Boko, Tandjung, 5C-13 (Chg. 1)
- 493-After Bulukumba add:
Bulumanuk, Pulau, 3E-6 (Chg. 1)
- 498-Gumuk, Tandjung, 7B-2, 7B-12, 7B-13 (Chg. 1)
- 498-Delete: Gunuk, Tandjung (Chg. 1)
- 500-Delete: Karangbolong (Chg. 1)
- 506-Delete: Light Vessels (Chg. 1)
- 507-After Tokoh, Toro, add:
Tokokaja, islet, 11D-10 (Chg. 1)
- 507-After Lumpur, Tandjung add:
Lumuli, Gunung, 12B-2 (Chg. 1)
- 508-After Maliowo, peak add:
Malo, islet, 11D-10 (Chg. 1)
- 511-After Mota Besikama, river add:
- Masin, 7B-10 (Chg. 1)
- 513-For Padelagan, Tandjung substitute:
Padelegan, Tandjung, 2F-13 (Chg. 2)
- 514-After Palao Islands, add:
Palasa, Tandjung, 12B-18
-, -, depths, 12B-3 (Chg. 2)
- 516-For Pelajaran Nasional Indonesia, substitute:
Pelajaran, Alor, 2F-27
-, Nasional Indonesia, 1-15 (Chg. 2)
- 516-For Pelasa, Tandjung, and
-, -, depths, substitute:
Pelasa, Tandjung (Palasa), 12B-18 (Chg. 2)
- 519-For Sakuntji, island and -, reef substitute:
Sakuntji, 5E-1 (Chg. 1)
- 521-For Sari, Tandjung (Java) substitute:
-, - (Java), 2B-13
-, - (Nusa Penida), 5A-18 (Chg. 1)
- 522-After Seleh, Tehuh, tidal currents, add:
Seleret, Gunung, 2F-14 (Chg. 1)
- 523-After Signals add:
Sigunung, Pulau, 4C-8 (Chg. 1)
- 524-For Stroomen Kaap substitute:
Stroomen Kaap, 11D-1 (Chg. 1)

529-After Tokohbatu, Pulau, add:
Tokong Hill, 10C-7 (Chg. 1)

529-For Tokong, Pulau, substitute:
—, Pulau, 9B-11
—, Tandjung, 10C-7 (Chg. 1)

530-Delete: Tukong Hill (Chg. 1)

532-After West Gat, tidal currents, add:
West Irian, 1-6 (Chg. 2)

.

.

.

.

.

.

.

.

.

|

|

|

|

|

CHAPTER I

	Section Number
Indonesia.....	1—1
Islands.....	1—2
Government.....	1—5
Portuguese Timor.....	1—7
Currency—Weights—Measures.....	1—8
Navigational Aids—Buoyage.....	1—12
Communications.....	1—15
Signals.....	1—17
Regulations.....	1—22
Cautions.....	1—23
Deratization.....	1—28
Pilotage.....	1—29
Climatology.....	1—31
Ocean Currents—Oceanography.....	1—43
Routes.....	1—55

H. O. PUB. NO. 72

1

2

3

4

5

6

7

8

9

CHAPTER 1

GENERAL REMARKS ON INDONESIA—BUOYAGE—SIGNALS—REGULATIONS— CAUTIONS—PILOTAGE—CLIMATOLOGY—OCEANOGRAPHY—ROUTES

GENERAL REMARKS

PLAN.—This volume contains a description of the west portion of the eastern archipelago, namely Java, and the islands eastward as far as and including Timor; also Java and Flores Seas; the south, southeast, and east coasts of Borneo, Makasar Strait, and Celebes. Indonesia has a coastline of 25,000 miles.

The west limit commences with Udjung Krawang on the north coast of Java and Tandjung Tjankuang on the south coast of that island. The east limit includes the east coast of Celebes, Pulau Taliabu, Wetar, and Timor.

INDONESIA

1-1 GENERAL REMARKS.—Indonesia comprises a vast archipelago lying between the parallels of 6° N. and 11° S., and between the meridians of 95° E., and 135° E. The component islands number more than 2,000 and vary in size from some of the largest in the world to very small islets and coral reefs. The archipelago straddles the equator, forming a belt about 2,500 miles long from east to west, and 1,000 miles wide from north to south. The most important island is Java which contains the capital city of Djakarta.

The greater part of Indonesia is mountainous and covered with tropical rain forest. The lowland plains are limited in extent and are mostly confined to the coastal regions.

PHYSICAL FEATURES.—The dominating terrain feature, and a source of great benefit to the economy, is the many volcanoes that form an almost continuous chain through the southern arc of the islands. The volcanic ash and the abundant rainfall produce soils of extraordinary fertility. Volcanoes are found in an arc traversing the length of Java, Sumatra, and

the Lesser Sundas from Bali to Alor. They then curve northeastward and northward through the small islands of Damar and Serua to the Banda Islands and to Halmahera in the Moluccas. Volcanoes are also found in the Menado area of the Celebes, and in the nearby Sangihe Islands.

NOTE.—The vowel “oe” in Indonesian names should be rendered by the letter “u”. Where place names are concerned, this will account for alternate or obsolete names in this volume or on the chart.

CHARTS.—Some parts of the area herein described has been but partially explored, and much of the information is still from reports of early navigators.

Nearly all of the area described in this volume has been surveyed. The resulting charts have been used in the revision and compilation of issued H.O. Charts and in others in preparation. Areas not yet thoroughly surveyed are the southeast coast of Java, portions of Timor, Taliabu Island, and Banggai; in these areas the existing charts are imperfect and great caution is necessary.

It is therefore unjustifiable to use the charts without at the same time consulting other sources such as Sailing Directions, light lists, tide tables, etc.

INDONESIAN CHART DEPOTS.—Charts, Sailing Directions, Notices to Mariners, Light Lists, Tide and Current Tables and other navigational publications can be obtained at Djakarta at the following address: Djawatan Hidrografi Angkatan Laut, Djalan Gunung Sahari, 87 Djakarta, Indonesia. These publications can also be obtained at the Offices of the Harbormaster in Belawan, Surabaya, Balikpapan and Makasar, and from the harbormasters at all major ports. Djawatan Hidrografi (Hydro Service) at Djakarta publishes "Notices to Mariners" (B.P.I.) and a yearly index.

All persons are asked to send all data of value to mariners to Djawatan Hidrografi, Indonesia at Djakarta.

ISLANDS

1-2 JAVA AND MADURA.—Java, together with the smaller island of Madura to the northeast, has a coastline of 1,600 miles. Java is long and narrow. Its extreme length is 570 miles and its maximum width is 125 miles. The two islands cover an area of 50,952 square miles.

The north coast of Java is rather flat, low, and muddy. The coastline is reported to be extending seaward in the vicinity of the river deltas. Many small bays indent this coast. Djakarta, described in H.O. Pub. 71, and Surabaya are the major ports on this coast.

The south coast is bold and precipitous, being less indented than the north coast. This coast is exposed to a heavy and dangerous surf which rolls in upon the shore at all seasons. Tjilatjap is the most important port on this coast.

A range of volcanic mountains traverses the length of Java. The watershed thus formed is flanked to the northward by lowlands and to the southward by limestone ridges. The rivers of Java flow mostly north or south and as a rule

are short and rapid. The longer slope of the island is for the most part on the north, and it is in this direction that the main rivers flow.

LESSER SUNDA ISLANDS.—This group comprises the following islands: Bali, Lombok, Sumbawa, Flores, Solor, Adanara, Lomblen, Pantar, Alor, Sumba, Sawu, and Roti, with the smaller islands in their vicinity. With the exception of Sumba, and Pulau Sawu and Pulau Roti, these islands form a chain running east and west, about 700 miles in length.

The predominant physical feature of this group is a line of volcanic mountains running from the main chain from end to end. The general trend of the mountain chain is from east to west, but there are local variations in the different islands. The mountains are highest at the west end.

Sumba, Pulau Sawu, and Pulau Roti, however, are off the main volcanic line, and, though the fact is not definitely established, it is probable that there are no volcanoes on these islands.

Flores, Sumbawa, and Sumba are the largest islands, but Bali and Lombok are economically more important. None of these islands have a railway or a good system of roads. The principal ports are served by the interisland shipping lines.

1-3 TIMOR, divided between Indonesia and Portugal, is the easternmost of the Lesser Sunda Islands. Timor differs considerably in physical characteristics from the rest of the islands in the group. The island, as a whole, is traversed by a series of parallel mountain chains. The mountains of Indonesian Timor (west part of island) are in general somewhat lower than those of Portuguese Timor (east part of island).

The north and west coasts are deeply indented and for the most part steep. The south coast is flat in its east part and is backed by lagoons and mangrove swamps. The west part of this coast is steep and rocky.

Kupang and Atupupu in Indonesian Timor, and Dilly, in Portuguese Timor, are the most

important ports. Malaria is prevalent along the coasts of Timor. There are many languages and dialects on the island.

BORNEO is about 730 miles in length and about 600 miles in width; its average width is about 350 miles. Borneo has an area of 290,000 square miles of which 208,000 belong to Indonesia. It has a coastline of 1,700 miles most of which is low, marshy, and densely overgrown with mangroves. A few mountain spurs approach the coast. The sea forms the natural frontier on three sides, while the Pegunungan Kapuas, and its continuation northeastward, forms the natural boundary between Indonesian Borneo and the British Protectorates of Sarawak and Brunei and British North Borneo. Toward the northeast it has been settled that the frontier shall coincide with the parallel of 4°10' N.

The Pegunungan Kapuas form the chief range of the island, terminating in Kina Balu, 13,450 feet high, located in British North Borneo. The mountains in general consist of many short and irregular ranges, radiating from the one central range traversing the island from south-southwest to north-northeast.

The coast of Borneo is very slightly indented with bays, and nowhere by deep inlets. The few bays it possesses are toward the northeast extremity, where the coast is somewhat higher and more abrupt. The largest rivers are the Kapuas in the west, the Barito in the south; the Kutei, Berau, Bulungan, and Sesajap in the east. All these rivers have countless tributaries, and in the lower parts flow in very winding channels through a vast extent of forest-covered and swampy alluvial plains. The rivers are the chief means of communications and most of the important towns are situated on the river banks.

1-4 CELEBES.—The island of Celebes consists of a central part from which radiate four long and narrow arms, forming three deep gulfs on the east side, while the west side has a curved and nearly even coastline. The island

has 3,000 miles of coastline and an area of 72,954 square miles. Celebes is traversed by a series of parallel mountain ranges with a general north and south trend. Extensive plateaus or wide valleys, which follow continuously from north to south, lie between the ranges. A number of lakes, fed by rivers flowing in a north and south direction and reaching the east and west coasts through breaks in the chains, are found in these valleys. The rivers, for the most part, are small and of little navigational importance.

The southwest peninsula, which has Teluk Boni to the east and Makasar Strait to the west, is the most important peninsula. A chain of mountains runs through this peninsula. Makasar, on the southwest end of the peninsula, is the center of trade for the Celebes.

The north peninsula is rugged and mountainous. Its extremity is the only part where active volcanoes are known to exist, the loftiest of these, Gunung Klabat, having an altitude of 6,635 feet. A range of mountains runs through the peninsula, the general height being about 2,000 feet. The northeast extremity constitutes the fertile and cultivated district of Minahasa, the capital of which is Manado. This district is exceedingly fertile, producing abundant crops of rice, coffee, and oranges.

The eastern peninsula of Celebes, which has Teluk Tomini to the north and Teluk Tomori to the south, is the least known. A chain of islands stretches 200 miles due east from the peninsula.

The southeast peninsula, separating the gulfs of Tomini and Boni, is of little importance. At its extremity are Pulau Buntung and Pulau Muna, beyond which stretch eastward the group of islands called Kepulauan Tukangbesi.

GOVERNMENT

1-5 INDONESIA became a sovereign Asian nation on 27 December, 1949. It has a constitutional form of government based on a belief in God, nationalism, guided democracy,

and social justice. The legislative powers of the unitary state are vested in a house of representatives. The executive functions are performed by a president and a cabinet. The judicial organization, under the minister of justice, consists of a supreme court, high courts of appeals (in larger towns), and courts of first instance. In civil law, the population is divided into three main groups, namely, Indonesian, European, and foreign orientals to whom different law systems are applicable.

The first general election was held in 1955. In July, 1959 President Sukarno assumed dictatorial powers and dissolved the Constituent Assembly. The constitution of 1945 was re-instated. Later Parliament was dissolved and a national front formed.

PROVINCES.—Indonesia is divided into provinces as follows:

PROVINCE	ADMINISTRATIVE CENTER
Sumatera Utara (north Sumatra).	Medan
Sumatera Tengah (central Sumatra).	Bukitlinggi
Sumatera Selatan (south Sumatra).	Palembang
Djawa Barat (west Java)-----	Badung
Djawa Tengah (central Java)---	Semarang
Djawa Timur (east Java)-----	Surabaya
Atjeh (in north Sumatra)-----	Kotaradja
Riau (Riouw Archipelago)-----	Pakan Baru
Djambi (in southeast Sumatra)---	Djambi
Kalimantan Barat (west Borneo).	Pontianak
Kalimantan Selatan (south Borneo).	Bandjermasin
Kalimantan Timur (east Borneo).	Samarinda
Kalimantan Tengah (central Borneo).	Pahundut (Palangka Raja)
Sulawesi Utara (north Celebes)---	Manado
Sulawesi Selatan (south Celebes).	Makasar
Bali -----	Singaradja
Nusa Tenggara Barat (west Lesser Sundas).	Mataram
Nusa Tenggara Timur (east Lesser Sundas).	Kupang
*Maluku (Moluccas)-----	Ambon

NOTE.—In Java, Greater Djakarta and special areas of Jojakarta enjoy status of provinces.

In Borneo the native population is under the immediate control of their own chiefs, who are appointed or recognized by and under the supervision of the government.

1-6 PORTS AND HARBORS.—There are over 400 harbors and anchorages in Indonesia. The major ports are Tandjungpriok and Surabaya. The most important oil ports are Balikpapan, Tandjunguban, Sungai Pakning, and *Bilitung.

CUSTOMS.—Indonesian ports, for customs purposes, are divided into "Seaports" and "Coastal Ports". Foreign flag vessels may call at the seaports without a customs permit, but to call at the coastal ports a permit known as a "flag dispensation" must first be obtained. Flag dispensations, obtained from customs headquarters in Djakarta, require the name of the vessel, tonnage, flag, number of crew, expected date of call, and reason for calling. The final decision to grant the flag dispensation rests with the Indonesian Navy.

The following ports are seaports as understood above (all other ports and roads are coastal ports):

Atapupu	Kotabaru
Bagensiaplapi	Kramat
Bandarchalifah	Kualu (Tg. Mengeidar)
Bandjermasin	Kudap
Banjuwangi	Kula Gaung
Batu Pandjang	Kula Mandah
Belawan-Deli	Kumai
Belinju	Labuhanbilik
Bengkalis	Ledung
Besuki	Lhok Seumawe
Bitung	Lingkas (Tarakan)
Cberibon (Tjirebon)	Litong
Dabo	Makasar
Djambi	Maras
Djebus	Manado
Genting	Midai
Groot Tembelan	Muara Sabak
Indramaju	Muntok
Ketam Putih	Pakanbaru
Koba	Pakning

Palembang	Siak Sri Indrapura
Panarukan	Sibolga
Pandjang	Sineboi
Pangkalanbalem	Singkawang
Pangkalanbranda	Sungaibrombang
Pangkalan Dode	Sungailiat
Pangkalan Susu	Sungeigutong
Panipahan	Sungeikembung
Pasuruan	Sungi Kolak
Pekalongan	Surabaya
Pemangkat	Tarempa
Penagih (Hula)	Tandjungbalai
Penjalai	Tandjung Beringin
Penuba	Tandjungkedabu
Perigiradja	Tandjung Medang
Pontianak	Tandjung Pandan
Probolinggo	Tandjung Pinang
Pulaukidjang	Tandjungpriok
Pulau Kumpai	Tandjungpura
Pulau Palas	Tandjung Samah
Pulau Pandjang	Tandjungtiram
Rengat	Tandjung Uban
Sabang	Tegal
Samarinda	Teluk Bajur
Sambas	Telukbetung
Sambu	Teluk Nibung
Sampit	Tembilahan
Selatpandjang	Tjeribon
Semarang	Tjilatjap
Semuda	Toboali
Sepat	Tungkal
Serassan	

STANDARD TIME.—The Indonesian Republic is divided into three time zones. The Western Zone, 7 hours fast of G.M.T., includes Bali, Banka and Billeton, Java and Madura, and Sumatra. The Central Zone, 8 hours fast of G.M.T., includes Flores, Indonesian Borneo, Celebes, Lombok, Sumba, Sumbawa, and Timor. The Eastern Zone, 9 hours fast of G.M.T., includes Aru, Kei, Moluccas, Tanimbar, and West New Guinea (West Irian).

POPULATION.—The population of Indonesia was about 97,000,000 (1961), of which nearly two thirds live in Java. Indonesian Borneo is as sparsely settled as Java is overcrowded. The population is distributed as follows: Java and Madura—63,000,000;

Sumatra—15,700,000; Lesser Sundas—6,500,000; Celebes—7,000,000; Indonesian Borneo—4,000,000; West Irian—700,000 (estimated 1962). Djakarta, the capital of Indonesia, has a population of about 3,000,000.

CULTURE.—Approximately 90% of the population are of the Mohammedan faith. Bahasa-Indonesian, a developed form of the Malay language, is the official language. It is written in the Romanized alphabet, or in Arabic script. Javanese is the second most important language. English is taught in all the schools.

HOLIDAYS.—The following is a list of National Holidays in Indonesia: May 1 and 26; June 5, 6, and 25; August 17; September 3; December 25 and 26. No work is permitted on May 1 and August 17.

PORTUGUESE TIMOR

1-7 PORTUGUESE TIMOR consists of the east part of that island and the neighboring islands of Cambing and Jaco, a total area of 14,925 square miles. It is an independent province of Portugal with a population of about 545,000 (1963). The chief exports are coffee, sandalwood, sandalroot, copra, and wax. Dili, the capital and chief port, has a population of about 7,000. In 1959, 47 ships of 54,579 tons entered and cleared. Communications consist of a fairly good road system, telephones, telegraph, and radio stations.

CURRENCY — WEIGHTS AND MEASURES

1-8 The monetary unit of Indonesia is the rupiah (abbreviated Rp) divided into 100 sen. There are bank notes of 1, 2½, 5, 10, 25, 50, and 100 rupiahs. Aluminum coins of 1, 5, 10 and 25 rupiahs are in circulation. There are cupro nickels of 50 sen. The rate of exchange is 45 rupiahs for one U.S. dollar.

The metric system of weights and measures

is in force in Indonesia. The old system, which may still be in use in some areas, is given below:

1 Pikol=136.16 lbs. avoirdupois.

1 Katti=1.36 lbs. avoirdupois.

1 Bau=1.7536 acres.

1 Sq. Pah=561.16 Acres or 227 hectares.

1 Tjenkal=4 yards.

1 Pal (Java)=1,506 metres.

1 Pal (Sumatra)=1,852 metres.

AGRICULTURE AND PRODUCTS

1-9 AGRICULTURE accounts for 70% of the gross national income and 50% of the export earnings. About 10% of the total land area is under cultivation. There are many large estates, as well as small scale acreage, under cultivation.

The production (1958) in 1,000 metric tons was as follows: sugar—770; rice—7,553; tea—46; coffee—77; maize—1,985; palm kernels—35; palm oil—147; peanuts—194; copra—102; cassava—8,039; sweet potatoes—1,746; and soybeans—372. Other products are sisal, indigo cantala, abaca, kapoc, cinchona, spices, tobacco, cocoa, and livestock.

PRODUCT	WHERE GROWN
Sugar.....	Central and east districts of Java.
Rice.....	Java, Madura, Indonesian Borneo, Bali, and Lombok.
Tea.....	West Java and East Sumatra.
Coffee.....	East Java, South Sumatra, Bali, Lombok, Celebes.
Maize.....	Java, Madura, Lesser Sundas.
Palm kernels.....	East Sumatra.
Palm oil.....	East Sumatra, Indonesian Borneo.
Peanuts.....	Java.
Copra.....	Celebes, Moluccas, Lesser Sundas, Indonesian Borneo, Sumatra, and Java.
Cassava.....	Java and Madura.
Sweet potatoes.....	Everywhere in the archipelago.
Soybeans.....	Java.
Sisal.....	Java and Sumatra.
Indigo.....	Java.
Cantala.....	Java and Madura.
Abaca.....	Sumatra.

Kapok.....	Java.
Cinchona.....	West Java, southwest Sumatra.
Spices.....	Lesser Sundas, Java, Celebes.
Pepper.....	South Sumatra, Bangka, Indonesian Borneo.
Tobacco.....	East Sumatra, Indonesian Borneo, central and east Java.
Cattle, livestock.....	East Java, Bali, and Celebes Madura. (Most animals are raised for draft purposes).
Resin.....	Indonesian Borneo.
Gums.....	Indonesian Borneo, Celebes.
Gutta percha.....	Indonesian Borneo.
Sago.....	Indonesian Borneo.
Hides.....	Celebes.
Birds of paradise.....	Celebes.

FORESTRY—MINES—FISHING

1-10 FORESTS cover about 67% of the total land area of Indonesia. Teak forests are found in east and central Java, Celebes and Lesser Sundas. Forest products include copal, damar, rattan, teak, and rubber. The latter is found mainly in east Sumatra, Java, and Indonesian Borneo.

MINERALS.—Indonesia is rich in minerals, the chief of which are petroleum products, tin, coal, iron, bauxite, manganese, and nickel. Indonesia is the second largest tin producer, supplying 20% of the world's supply. Tin mining activities are centered on the islands of Bangka, Belitung and Singkep. Indonesia is the major producer of bauxite in Asia. Bauxite mining is centered on the islands of Bentan, Kojan, and in Kidjang Strait area. Manganese is found in Java. Salt is found in Java and Madura. Sulphur is mined in Java, north Celebes, and central Sumatra.

Petroleum is found in Indonesian Borneo, Sumatra, and Java. Refineries are located at Palembang and Balikpapan. Indonesia is the principal producer of oil in the far east. Coal is mined in Sumatra and in eastern Indonesian Borneo.

FISHING.—Indonesia has a well-developed fishing industry which accounts for 8% of the

gross national income. The fish, which are raised in fish ponds or caught in the deep sea, are used mostly for native consumption.

INDUSTRIES

1-11 **INDONESIA** is not highly industrialized and must import most of its machinery. There are, however, textile mills, sugar refineries, cement plants, paper mills, match factories, auto assembly plants, glass factories, chemical factories and shipyards.

SHIPBUILDING AND REPAIR.—Small ships of up to 800 tons can be built at Tandjungpriok and Surabaya. Major additions to the fleet are built in Japanese or European shipyards. There are small shipyards at Semarang and Ambon. There are numerous boat yards which specialize in the building of wooden fishing craft and launches. Drydocks up to 300 feet long are found in Tandjungpriok and in Surabaya.

NAVIGATIONAL AIDS—BUOYAGE

1-12 **INDONESIAN BUOYAGE (NEW) SYSTEM.**—The following lateral system of buoyage is now in use in Indonesian waters: The term "starboard hand" means that side which would be on the right hand, going with the main stream of flood or in entering a harbor, river or estuary from seaward. The term "port hand" means the left hand side under the same circumstances.

STARBOARD SIDE OF CHANNEL.—Buoys are conical, odd-numbered, and painted black or in black and white checkers or

in black and yellow checkers. Topmarks are black diamond-shaped, or cone-shaped with the point upward. If lighted, they show a green or white flashing light.

Fixed beacons are black spars, with topmarks of one or two black cones, point or points up. They may show a white or a green glow by means of reflectors.

PORT SIDE OF CHANNEL.—Buoys are can-shaped, even-numbered, painted entirely red, or in red and white checkers or red and yellow checkers. Topmarks are red, cylindrical, or T-shaped. If lighted, they show a white or red flashing light.

Fixed beacons are red spars, with topmarks of one or two red cylinders. They may show a white or a red glow by means of reflectors.

MIDDLE GROUND, BIFURCATION AND JUNCTION MARKS.—Buoys are spherical, and are painted in red and white horizontal bands. If lighted, they carry an occulting white light. Buoys which mark the inner end of a middle ground have a red cross topmark. Those which mark the outer end of a middle ground have no top mark.

Fixed beacons are red spars. Beacons which mark the inner end of a middle ground have a topmark consisting of a red and white horizontally banded ball surmounted by a red cross. Those which mark the outer end of a middle ground have a topmark consisting of two balls, the lower of which is red and white horizontally banded and the upper a solid red. Beacons may show a red, a white, or a green glow by means of reflectors. If lighted, the lights will have different char-

acteristics than the lights which mark the sides of the channel in the vicinity.

OUTER BUOYS are conical, and red and white vertically striped. Topmark, if any is a red "X". If lighted, they show a flashing white light.

WRECK BUOYS are painted green and marked with a "W" in white. If lighted, they show a flashing green light. Can buoys are to be left to port, conical buoys are to be left to starboard, and spherical buoys may be passed on either side.

DUMPING GROUND BUOYS are conical in shape, with the lower part painted black and the upper part yellow.

QUARANTINE ANCHORAGE BUOYS are conical in shape and painted yellow.

PRACTICE AND FIRING AREA buoys are conical in shape, painted in blue and white vertical stripes, and marked "D.A." in red letters.

CAUTION.—The system of buoyage formerly in use in these waters may be encountered. Mariners should be guided accordingly.

OLD SYSTEM OF BUOYAGE.—In Indonesian waters, the aids are gradually being changed to the new International System, with slight modifications. The old system as given below will probably be met with for some time to come, and mariners are to be guided accordingly.

On the starboard side of the channel there are:

(a) White light buoys showing a white or green light.

(b) White lantern buoys (can buoys with tripod) showing a green light.

(c) White conical buoys.

(d) Iron beacons with white spherical topmark.

On the port side of the channel there are:

(a) Black light buoys showing a white or red light.

(b) Black lantern buoys showing a red light.

(c) Black can buoys.

(d) Iron beacons with black truncated cone topmark.

Fairway buoys lie to seaward of a channel and are red and black horizontally striped light buoys showing a white light, or red and black horizontally striped conical buoys with spherical topmark the same color as the buoy.

The fork of a channel, the junction of two channels, or the beginning or the end of a shoal lying in midstream, are marked by white and black horizontally striped light buoys showing a white light, as well as white and black horizontally striped conical buoys with spherical topmark the same color as the buoy. These may also be indicated by iron beacons with a white ball, above or below which is a black truncated cone.

An isolated danger spot, or also a measured mile, are marked with white and black checkered light buoys showing a white or red light, and white and black checkered conical buoys with spherical topmark the same color as the buoy.

Beacons indicating an isolated danger spot are provided with a topmark of either a white ball or a black truncated cone. Double top-

marks may be used, when necessary, to distinguish a beacon from others of the same kind in the vicinity.

Wrecks are marked by green conical or green can buoys, depending on whether the wreck is on the starboard or port side of the channel. If the wreck is in mid-channel, it will be marked by a can buoy on one side and a conical buoy on the other side, which buoys are to be treated as port or starboard hand buoys according to shape.

Telegraph buoys and buoys marking a naval practice firing zone, etc., are red conical buoys with or without spherical topmark, or buoys of varying construction. When such buoys mark at the same time the starboard or port side of the channel, the conventional white conical and black can buoys may also serve as telegraph buoys.

Where it is necessary to distinguish a light buoy, an ordinary buoy, or a beacon from others of the same type in the vicinity, the following special markings are used:

(a) The red and black or white and black bands are vertical instead of horizontal.

(b) The buoy is checkered red and black instead of white and black.

(c) If the buoy is a white conical buoy, it has a white spherical topmark, and if it is a black can buoy, it has a black truncated conical topmark.

(d) Where a beacon has one topmark, a second similar topmark of the same color is placed above it.

The light of a light buoy is occulting, that of a lantern buoy is fixed. Whether a white,

green, or red light is used depends upon local conditions (distances at which the light must be visible, risk of confusing it with fishing lights, etc.); the charts and the light lists indicate the color of the light.

In some places there will be found unofficial buoys and beacons of various shapes and colors, whose presence cannot be relied upon.

Reflectors have been erected on the banks of some of the rivers in Indonesia, and also on some buoys, as an aid to navigation at night. This apparatus, consisting of three mirrors disposed vertically, is constructed so that if an observer on board holds a light directed on the reflector, the light will be reflected back to the vessel. To prevent being dazzled, it is recommended that only ordinary flashlights, with a highly concentrated light derived from 3 to 5 dry batteries, be used. On a dark night, under normal conditions, it can then be estimated that the reflector will be picked up at a distance of about $\frac{1}{2}$ mile, and with heavy rainfall at a distance of from 200 to 300 yards. The direction of the axis line of the reflector, where given, must be laid off from the reflector; only beams of light which strike this apparatus at an angle of less than 45° with the axis are reflected back to their sources.

LORAN—RADAR

1-13 LORAN is a system of position finding by reception of radio signals from specially designated transmitting stations of known position. The name is derived by combining the first two letters of "long" and the first two letters of "range", and the first letter of "naviga-

tion". It is designed to furnish reliable positions to navigators at greater distances from the transmitting stations than is possible by other methods of radio navigation.

The principle of the Loran system is the determination of the difference of the distances of two radio transmitting stations from the observer, though not the actual distance of either station. This is accomplished by determining how much more time a signal or pulse from one station takes to reach him than a signal or pulse from the other. Upon a chart a curve is drawn through all points whose distances from these stations differ by the amount found from the observation. The vessel must be somewhere on this curve, which is the Loran line of position with reference to these stations. Similarly, another line of position is obtained by comparing the signal received from another pair of stations. Since the vessel must be on both lines, the point of their intersection is its position.

Because of the velocity of propagation of radio waves, 162,000 nautical miles per second, the time differences are extremely small, being measured in millionths of a second. These small time intervals are determined visually by measuring on the luminous time scale of the receiver aboard ship or aircraft the separation between reference marks made by the reception of the pulses from the transmitting stations. This time scale is formed by the motion of a point of light, which is the tip of a ray of electrons, controlled by electrical circuits in the receiver. The components of this motion take place in a few millionths of a second and are

not visually perceptible, but the complete cycle in the formation of the time scale is repeated over and over at the rate of approximately 25 times per second. Due to persistence of vision, the eye sees a continuous pattern, as in the motion picture. It is on this microsecond time scale that the time difference is measured.

The position of the vessel is found from the time difference by the use of Loran charts or tables. For the service area of each pair of transmitting stations the time difference which a vessel would observe are laid down in a pattern of lines. Each line is labeled with the time difference which is common to all points on it. The navigator has only to select the line of position indicated by the reading of the Loran receiver. Loran tables are used to determine positions of greater accuracy than is possible with the average small-scale Loran chart. The tables furnish the data necessary to plot, on any chart, the required segment of the line of position.

CAUTION.—Loran position determinations on or near the baseline extensions are subject to considerable error and therefore should be avoided whenever possible. For accurate position determinations in the base line extension area, the use of a radio bearing (or other means) along with Loran lines from another rate is recommended.

Loran charts, instructions and tables are compiled and distributed by the U.S. Navy Hydrographic Office. A list of stations and descriptive details of the Loran System are given in H.O. Pub. 117B, Radio Navigational Aids. They are available for all effective Loran service areas, which include the more frequented

portions of the North Atlantic, North Pacific, South Pacific, and Indian Oceans.

The U.S. Coast and Geodetic Survey is printing Loran lines of positions on the various sailing and inshore navigational charts.

1-14 RADAR (RADIO DETECTION AND RANGING) is one of the more important navigation devices. The advantages of radar during periods of darkness or low visibility are obvious. Its use during routine navigation can quickly provide navigational information of great value.

Chapter XII (Direction and Distance by Electronics). American Practical Navigator, H.O. Pub. No. 9 contains detailed information concerning radar. Several articles which provide useful information in the use of this equipment have appeared on the pilot charts.

COMMUNICATIONS

1-15 SHIPPING.—There is regular steamship service between the principal ports of Indonesia and Singapore, Malaya, Europe, the Orient, Australia, Japan, and the United States. Small coastal vessels and interisland steamers connect the outports with the main ports. The principal exports are rubber, petroleum, tin, copra, coffee, tea, and tobacco. Other exports are palm oil, sugar, spices, hard fibres, kapok and resins.

The Pelajaran Nasional Indonesia (PELNI), a government shipping agency, has 68 regular shipping services which connect all main islands at least once a month. Most ships are under 4,000 tons and are used primarily for the inter-island services.

Djakarta is the center for both foreign and domestic trade. Tandjungpriok, the port for Djakarta, is the most important Indonesian shipping place. Surabaya is the center of trade between Java and Indonesian Borneo and the Lesser Sundas.

Regular service is maintained between Surabaya and Makasar. The latter port is the center of the copra and spice trade between Celebes and the Lesser Sundas. Motor schooners carry copra from Manado to Japan. Semarang and Tjilatjap, in Java, serve as shipping places for the estate products. Medan, Padang, and Palimbang serve as trading centers for north, central, and south Sumatra, respectively.

Most of the shipping places of Indonesian Borneo are river ports. Bandjermasin and Pontianak serve as trading centers for southeast and west Borneo, respectively. Balikpapan, Samarinda, and Tarakan serve as main distribution centers for east Borneo.

Tankers maintain constant services between Singapore and Balikpapan.

INLAND WATER TRANSPORTATION.—This method of transportation is of greatest importance in Sumatra and Borneo where there are extensive areas of low, flat country traversed by river systems. The river systems of Java and Celebes are of lesser importance. The Sungai Barito flows through an area rich in rubber. Bandjermasin is the center of trade for this river and for the adjacent Sungai Murung. The Sungai Mahakam serves an area rich in coal, timber, rattan, and other forest produce. Samarinda is the center of trade for this river and can be reached by vessels drawing 15 feet.

1-16 ROADS.—Java, and Madura have a network of fairly good roads. Of a total of 44,000 miles of roads in Indonesia, 17,000 miles are found in the above islands and 16,000 in Sumatra. There are only 2,500 miles of roads in Indonesian Borneo. Road systems in the other islands are poorly developed. There are good roads in the vicinity of Makasar and Manado.

RAILROADS.—There are 3,785 miles of railroad lines in Java, Sumatra, and Madura. Approximately 75% of the total are found on Java. Banjuwangi, a rail terminus at the east end of Java, is a port of departure for Bali.

AIRLINES.—Indonesia is served both by domestic and foreign airlines.

POSTAL FACILITIES are available throughout Indonesia. The out-lying islands are serviced by mail boats. There is daily air mail service between Djakarta and Singapore, and weekly service between Makasar and Ambon.

TELEPHONE AND TELEGRAPH.—The principal ports have telegraph offices and local telephone service. There is cable service to all ports of the world. Makasar is connected by submarine cable to Java and Balikpapan. A submarine cable connects Manado with Shanghai via the Palao Islands, and from the Palao Islands to Yap, Guam, Midway, Hawaii and San Francisco. Pontianak is connected with Java and Billeton via Tandjung Pandan by submarine cable. From Balikpapan there are cables to Surabaya, Makasar, Kwandang and Manado.

INDONESIAN RADIO STATIONS.—Radio stations are established at various places in Indonesia, for which reference should be made to the International Telecommunications Union List of Coast Stations and Ship Stations. The Indonesian government publishes a "List of Stations" which transmit time signals, weather reports, press reports, epidemic warnings, Notices to Mariners (B.P.I.s), medical advice and test signals, as well as for radio ranging stations.

IMPORTANT NOTICES TO MARINERS, announcement of which require no delay, are transmitted by "Radio Republic Indonesia" at Djakarta, daily except Sunday from 1530 to 1540, Java time, in English, on 19, 25, and 41 meter bands.

WEATHER REPORTS for Indonesia are transmitted by "Meteo" Kemajoran (Djakarta C) over station POB 7 at 1000 GMT on 16,200 kc. and 8055 kc.

SIGNALS

1-17 IMMIGRATION SIGNALS.—Vessels arriving from a foreign port will fly the "N" flag at every Indonesian port called at.

DOCKING AND HARBOR SIGNALS.—The following signals with flags of the International Code of Signals may be made from shore signal stations.

SIGNAL	MEANING
Pennant No. 3 and A flag*--	Your berth is Pier I.
Pennant No. 3 and B flag*--	Your berth is Pier II.
Pennant No. 3 and C flag*--	Your berth is Pier III.
Pennant No. 3 and D flag*--	Your berth is Pier IV.

SIGNALS

CHANGE
1

15

SIGNAL	MEANING
Pennant No. 3 and E flag*--	Your berth is Pier V.
Pennant No. 3 and F flag*--	Your berth is Pier VI.
Pennant No. 3 and G flag*--	Your berth is Pier VII.
Pennant No. 3 and I flag--	Time ball has not fallen at the exact moment.
Pennant No. 3 and K flag--	Time signal is out of order.
Pennant No. 3 and R flag*--	You must anchor in the road.
Blue flag-----	No communication because of bad weather.

*In the event of two or more vessels entering the harbor at the same time, the berthing or anchoring signal for one particular vessel will be indicated by hoisting her company (or national) flag below the signal.

The following signals with flags of the International Code of Signals may be made by vessels:

SIGNAL	MEANING
Pennant No. 1 and H flag--	I need dock assistance.
Pennant No. 2 and M flag--	Please send a motorboat.
Pennant No. 3 and J flag--	I require water.
Pennant No. 1 and N flag--	I have passengers from outside Indonesia, either directly or after transshipping, who wish to disembark.
Pennant No. 3 and V flag--	I require an ash boat.
Pennant No. 3 and Q flag (to be replaced at night by a red light over a white light 6 feet apart).	I have, in my opinion, one or more cases of infectious nature (plague, cholera, or yellow fever) on board or taken on board during the voyage.

Flag "B" of the International Code of Signals may also be used to denote "I am loading or unloading light inflammable material".

Vessels requiring the company's doctor to attend on board should hoist their company's

flag above flag "W" of the International Code of Signals.

Flags LLV, at Surabaya, denotes "I am in passage". To be shown only within harbor or roadstead area.

SUPPLEMENTARY DISTRESS SIGNALS.—While the United States Government vessels and planes in distress may exhibit the recognized International Distress signals as set forth in the International Rules of the Road, they are also equipped with an additional distress signalling device intended to supplement the regular distress signals. This apparatus, if used, emits an orange smoke visible by day and red flames which can be seen at night.

1-18 UNITED STATES SUBMARINE EMERGENCY IDENTIFICATION SIGNALS:

1. Submarine emergency identification signal colors and meanings are as follows:

(a) GREEN.—Indicates torpedo has been fired. Will be used to simulate torpedo firing on special exercises such as convoy exercises.

(b) YELLOW.—Indicates that submarine is about to come to periscope depth from below periscope depth. Surface craft terminate anti-submarine counter attacks and clear vicinity of submarine. Do not stop propellers.

(c) RED.—Indicates an emergency condition within the submarine and she will surface immediately, if possible. Surface vessels clear the area and stand by to give assistance after the submarine has surfaced. In case of repeated red signals, or if the submarine fails to surface within a reasonable time, she may be assumed to be disabled. Buoy the location, look

for submarine marker buoy, and attempt to establish sonar communications. Advise naval authorities.

2. The foregoing, all of which mark the submarine's position, are fired from a submerged signal ejector into the air to a height of about 300 feet, then float downward slowly, suspended from a small parachute, and give colored illumination for about 30 seconds.

3. Submarines are also equipped with messenger buoys which are about 3 feet in diameter, and are painted international ORANGE. A submarine on the bottom in distress and unable to surface will, if possible, release this buoy. An object of this description which is sighted on the surface of the water should be investigated and naval authorities advised.

4. Transmission of the international distress signal "SOS" will be made on the submarine's sonar gear, either independently or in conjunction with the red emergency signal set forth in (c) above, as conditions permit.

5. Submarines may employ any or all of the following additional means to attract attention and indicate their position while submerged:

- (a) Release of dye marker.
- (b) Release of air bubble.
- (c) Ejection of oil.
- (d) Pounding on the hull.

BRITISH SUBMARINE SIGNALS.—

British vessels fly one of the two International Code groups "HP" or "OIY" to denote that submarines, which may be submerged, are in the vicinity. Vessels are cautioned to steer so as to give a wide berth to any vessel flying either of these signals. A vessel which for some reason finds it necessary to approach a vessel displaying such a signal should proceed at slow speed until the latter vessel has indicated the danger zone by means of flags, other signals, or megaphone; a good lookout should be kept meanwhile for submarines whose presence may only be indicated by their periscopes or snorkels showing above water.

A submarine submerged below periscope depth may sometimes indicate her position by releasing a smoke candle, which gives off a considerable amount of smoke on first reaching the surface; her position may also be indicated sometimes by red and white or red and yellow buoys or floats, which tow on the surface close astern.

It must not be inferred from the above that submarines exercise only when in company with escorting vessels. Under certain circumstances warnings that submarines are exercising in specified areas may be broadcast.

INDONESIAN SUBMARINE MANEUVERS.—Craft carrying out joint exercises with submarines, or which accompany submerged submarines, fly a red flag at the topmast.

All ships must give craft flying a red flag at the topmast sufficient room.

Any ship which for any reason is obliged to draw near to a craft flying a red flag at the topmast, must maintain slow speed until the latter craft has made known the danger area by means of flag signals, the megaphone, etc. In any case, in such circumstances a good watch must be kept for submarines, the periscope alone of which may appear above water.

In Surabaya roadstead a motor launch is used to display the red flag.

1-19 **INDONESIAN TIDAL CURRENT SIGNALS** are as follows:

SIGNAL	MEANING
White flag-----	Slack water.
Blue flag-----	Falling or out-going tide.
Red flag-----	Rising or in-coming tide.

VESSELS INCONVENIENCED BY SEARCHLIGHTS.—A vessel inconvenienced by the glare of searchlights near a port should make the International Code Signal "ZO" (— . . . —) by lamp and whistle, siren, or fog horn.

Whenever possible, both flashing lamp and sound signals should be used and the signals should be repeated until the inconvenience is removed.

H.O. 72

U.S. AIRCRAFT AND MERCHANT VESSEL DISTRESS ASSISTANCE PROCEDURES.

1-21 AIRCRAFT PROCEDURES FOR DIRECTING SURFACE CRAFT TO SCENE OF DISTRESS INCIDENT.—The following procedures performed in sequence by an aircraft mean that the aircraft is directing a surface craft toward the scene of a distress incident:

1. Circling the surface craft at least once.
2. Crossing the projected course of the surface craft close ahead at low altitude, opening and closing the throttle, or changing the propeller pitch.
3. Heading in the direction in which the surface craft is to be directed. The surface craft should acknowledge the signal by changing course and following the aircraft. If, for any reason, it is impossible to follow, the surface craft should hoist the international code flag, N, or use any other signaling means available to indicate this.

When the following procedure is performed by an aircraft it means that the assistance of the surface craft is no longer required:

1. Crossing the wake of the surface craft close astern at a low altitude opening and closing the throttle or changing the propeller pitch.

MERCHANT VESSEL PROCEDURES FOR ASSISTING AN AIRCRAFT THAT MUST DITCH.—The following are recommended procedures for assisting an aircraft that desires to ditch alongside:

BY DAY:

- ✱ 1. Establish a radiotelephone watch on 2182 kcs. if equipped. Attempt to contact the aircraft on this frequency.
2. Maintain a radiotelegraphy watch on 500 kcs. The Rescue Coordination Center controlling the case will try to contact the ship on this frequency via a shore radio station. Communications with the aircraft may have to be relayed in this manner.

3. Be prepared to send homing signals for the aircraft on 410 kcs.

4. Provide black smoke if possible to aid aircraft in sighting the ship.

5. Post extra lookouts.

6. Prepare to stop vessel or proceed towards plane according to circumstances.

7. Have two lifeboats and lifeboat crews ready. Include in each lifeboat two ring buoys with buoyant heaving lines, and fire extinguishers.

8. Have medicine chest, stretchers, blankets, hot drinks, and food ready.

9. Have ship's hospital prepared to receive injured persons.

10. Rig Jacobs ladders. Rig cargo net or rope mail sling on lee side amidships by cargo boom, to be used if necessary to heave up exhausted survivors. Injured persons should be left in the lifeboat to be hoisted aboard with it.

11. Be prepared to give aircraft information on weather and sea conditions. Aircraft will want to know wind direction and force; direction, height, and length of primary and secondary swell systems. If pilot selects ditch heading in sufficient time and conditions otherwise permit, lay foam path along ditching course.

12. When aircraft is in sight set course parallel to ditch heading that pilot had chosen. If not in communication with the aircraft by the time the plane is sighted and unable to obtain pilot's ditch heading, set course parallel to the main swell system and into the wind component, if any.

13. If on board, use a liferaft or buoyant apparatus in water as a landing platform at the Jacobs ladder.

14. Instruct coxswains to recover those survivors in the water or clinging to wreckage before recovering those in liferafts.

15. Keep the Rescue Coordination Center advised by radio, prior to, and subsequent to ditching.

BY NIGHT:

In addition to procedures recommended for daytime, the following are also recommended if the emergency occurs at night:

1. Lay a string of not less than 6 ring buoys with water lights approximately 500 feet apart in a single line along the ditch heading received from the pilot. Take station two-thirds down the lighted lane off to one side. The aircraft will attempt to land close to the lighted lane. Do not use carbide water lights because of the danger of gasoline on the water.

2. Light up the ship with all fixed deck lights and rig cargo lights on masts, king posts, top of decks, etc., if possible.

3. Use searchlights as visual beacons, shining one vertically and sweeping the sky at 15° off the horizon with the other.

Do not shine lights toward the aircraft at any time, since this would blind the pilot.

REGULATIONS

1-22 IMMIGRATION.—No persons are allowed on board until Immigration officials notify the ship that it is cleared.

QUARANTINE.—All vessels arriving from a foreign port may only call at one of the first class harbors without advance notice in order to obtain free pratique. If a vessel calls at a second class port coming from a foreign port, a provisional pratique has to be requested from the ministry of health, Epidemiology and Quarantine section well ahead of time of arrival as these permits must be cabled to the port concerned in good time. If more Indonesian ports are scheduled the next port must be a first class port in order to obtain a free pratique certificate. The provisional pratique is only valid for one second class port. If the second class port is the only port called at, it will not be necessary to call at one of the first class ports.

The first class ports are as follows: Belawan, Tandjungpriok, Makasar, Surabaya, Padang, Djambi, Palembang, Tjirebon, Tjilatjap, Semarang, Pontianak, Balikpapan, Samarinda and Benoa.

The second class ports are as follows: Pangkalpinang, Tandjung Pinang, Sabang,

Bandjermasin, Tarakan, Ambon, and Ternate.

All other ports are third class harbors or roads and a free pratique certificate must be obtained at one of the first class ports.

TERRITORIAL WATERS.—On February 18, 1960, the Republic of Indonesia proclaimed the limits of the Indonesian territorial sea and the Indonesian internal waters as follows:

1. The territorial sea is a belt of sea having a breadth of 12 nautical miles measured from the outermost points of the low water line off the outermost islands. In the case of straits of 24 or less miles in width, and of which Indonesia is not the sole coastal state, the boundary is drawn through the middle of the strait.

2. Indonesian internal waters mean all the waters enclosed by the islands of Indonesia.

Peaceful navigation in the Indonesian territorial sea and internal waters is open to foreign waterborne vehicles, subject to government regulation.

A 1962 report states every vessel entering Indonesian waters from Singapore is required to stop at the Bintan (Riouw) Island check point.

REGULATIONS FOR ENTERING ROADSTEADS AND HARBORS.—The following regulations are made by the Indonesian government:

Maneuvers or other causes may necessitate the closing of the various roadsteads and harbors to vessels or may make their entry subject to special reservations.

In normal cases the following signals may be shown on signal masts upon the harbor shores or signal posts, as well as on the pilot light ships:

- (a) A black ball over a black cone (point upwards) over a black ball, or a red light over a white light over a red light, indicating: entering prohibited.

- (b) A black cone (point downwards) over a black cone (point upwards) over a black ball, or a green light over a white light over a red light, indicating: entering and departing prohibited.

(c) Three black cones, the upper and bottom ones with points downwards and the middle one with point upwards, or a green light over a white light over a green light, indicating: departure prohibited.

In special cases the following are shown in the aforementioned places: Three black balls, or three red lights, one below the other, indicating: entering strictly prohibited on account of serious events.

When such signals are seen by a vessel approaching, the vessel, unless prevented by the direction of the wind or the state of the sea, must proceed toward the examination vessel stationed in the entrance of the roadsteads.

Permission or refusal to proceed is given after examination. All vessels proceeding must do so under the charge of a pilot, or be preceded by a warship or pilot vessel, since from the time of making the signals all exemptions from the necessity of taking a pilot are canceled. Captains and masters of vessels are to carry out the instructions of the official who has come on board from the examination vessel and obey all signals.

If the shot is fired, where safety permits, the engines must immediately be stopped in the vicinity of the examination vessel. Failure to comply with these regulations may result in danger to the vessel and crew. As a general rule permission to enter by night will not be granted.

If a signal is made from the shore to intimate that vessels are subject to examination, and if there is no examination, they must anchor or lie off.

The coming into operation of such regulations at any particular roadstead or harbor will not be announced beforehand.

OIL POLLUTION

PREVENTION OF THE POLLUTION OF THE SEA BY OIL.—The Oil Pollution Act, 1961, of the United States, in implementing the provisions of the International Convention

for the Prevention of Pollution of the Sea by Oil, 1954, designates **PROHIBITED ZONES** throughout the world within which the discharge of oil or any oily mixture which fouls the surface of the sea is unlawful. The intent of the Act is to ensure that oil or oily mixtures are discharged at a sufficient distance offshore to ensure that coastal waters, beaches, and shores will not be contaminated.

All seagoing ships of American registry are subject to the provisions of the Oil Pollution Act with the following exceptions: ships used as naval auxiliaries, ships navigating in the Great Lakes of North America, ships under 500 tons gross, and ships engaged in the whaling industry. These exceptions are subject to specific regulations for their particular disposition. A distinction is made between tankers and ships other than tankers in these regulations.

It should be further considered that all foreign vessels will abide by these or similar regulations in the common interest established by the International Convention.

Nothing in the Oil Pollution Act, 1961, or in the regulations issued thereunder shall be construed to modify or amend the provisions of the Oil Pollution Act, 1924 (33 U.S.C. 431-437), or of section 89 of title 14, United States Code.

The prohibited zones in this volume for tankers and ships other than tankers shall be all sea areas within 50 miles from land.

Notices to Mariners should be consulted with respect to the reduction or extension of the prohibited zones.

CAUTIONS

1-23 SUBMARINE CABLES.—Submarine cables may be laid within the area covered by this volume. In view of the serious consequences resulting from damaged submarine cables, vessels should take special care to avoid anchoring or fishing in the cable areas.

Vessels fouling a submarine cable should attempt to clear without damaging the cable. Anchors or gear that cannot be cleared should

be slipped and abandoned, and no attempt should be made to cut a submarine cable. Certain cables carry high voltages, and serious injury or loss of life may result from attempting to cut a submarine cable.

The owners of vessels who are able to prove that they have sacrificed an anchor, a net, or other fishing gear, in order not to damage a submarine cable, may be compensated by the owner of the cable.

In order to establish a right to such compensation it is necessary, if possible, immediately after the accident, to draw up a report confirming the loss, supported by the testimony of the men in charge of the equipment; and the master of the vessel, within 24 hours after his arrival at the first port of return, or of call, to make his report to competent authorities. They will notify the consular authorities of the country of the owner of the cable.

FLOATING MARKS.—Floating marks, such as light vessels, buoys, and floating beacons are considered inferior to fixed aids. They may be shifted, carried away, capsized, or sunk. Lighted buoys may be extinguished and sound buoys may not function.

WRECKS.—Numerous wrecks, in addition to those described, exist in the waters of the area covered by this publication. Many of these are in the process of being removed.

DANGER AREAS.—Certain danger areas exist in places described in this volume, due to mines, unexploded depth charges, etc. Mariners should consult H.O. Pub. 110, "DAPAC", for full particulars of these areas.

CAUTION WITH REGARD TO SINGLE SHIPS APPROACHING SQUADRONS OR AIRCRAFT CARRIERS.—The attention of mariners is called to the danger to all concerned which is caused when a single vessel approaches a squadron of naval vessels or merchant ships in convoy so closely as to involve risk of collision or attempts to pass ahead of or through such a squadron or convoy. Mariners are therefore

warned that a single vessel should take early action to keep out of the way of a squadron or convoy.

Attention is also invited to the uncertainty of the movements of aircraft carriers, which must usually turn into the wind when aircraft are taking off or landing.

1-24 FIRING DANGERS AREAS—GENERAL.—Firing and bombing practices take place in many areas of the world. The principal types of practices carried out are:

(a) Bombing practice from aircraft. Warning signals usually shown.

(b) Air to air, and air to sea or ground firing. The former is carried out by aircraft firing at a large red or white sleeve or flag towed by another aircraft flying on a steady course. The latter is carried out by aircraft firing at towed or stationary targets on sea or land, the firing taking place to seaward in the case of those targets on land.

As a general rule, warning signals are shown when the target is stationary, but not when towed targets are used.

(c) Antiaircraft firing.

This may be carried out by antiaircraft guns or machine guns firing at a target towed by aircraft as in (b) above, or at balloons or kites. Practice may take place from shore batteries or ships.

As a general rule, warning signals are shown from shore batteries but not from ships.

(d) Firing from shore batteries or ships at sea at fixed or floating targets.

Warning signals usually shown as in (c).

Warning signals, when given, usually consist of red flags by day and red fixed or red flashing lights at night. The absence of any such signal does not mean, however, that a practice area does not exist. Warning signals are shown from shortly before the practice commences until it ceases.

A vessel may be aware of the existence of a

practice area from Local Notices to Mariners or similar method of notification and by observing the practice or the warning signals.

Whenever possible, a vessel should avoid passing through an area in which a practice is in progress, but if compelled to do so she should endeavor to clear the area at the earliest possible moment.

If during air to air, air to sea, air to ground, or antiaircraft firing practice, projectiles or splinters are observed to be falling near a vessel, she should maintain her course and speed and all persons on board should take cover. Every practicable precaution, however, will be taken by the Authority in charge of the practice to avoid the risk of damage from falling shell splinters, bullets, etc., to vessels and all persons on board of them within the practice area.

1-25 FIRING PRACTICE IN OR NEAR CHANNELS.—When firing practice is held on the north coast of Madura, in the east and west channels of Surabaya, in the area around Probolinggo, in Teluk Balikpapan, and in the region of Tarakan, one or more of these areas of the sea is unsafe for navigation, with the understanding that remaining in these areas is forbidden, while passage remains free.

Ships and other craft which are in unsafe areas when the warnings listed below are hoisted must remove themselves as quickly as possible.

The period of time in which firing practice will be held will be indicated from one hour before commencement of firing practice to its cessation by the following warning signals:

NORTH COAST OF MADURA, EAST AND WEST CHANNELS OF SURABAJA:

The area between 112°49' E., 113°01' E., 6°45'54" S. and the Madura shore will each time be subject to special regulation, both by day and by night.

The area between 112°37' E., 112°45' E., 6°52' S., 7°04' S., the Java coast, and the Madura coast, is subject to the following signals:

BY DAY: a red flag on the pilot and light vessel in the West channel, on the tide gauge structure at Sembilangan and on the harbor office at Surabaya.

BY NIGHT: a 360° red light at these positions.

The area between 112°46'54" E., 112°55' E., 7°10' S., 7°17'48" S., the Madura coast, and the Java coast, is subject to the following signals:

BY DAY: a red flag on the pilot and light vessel in the East channel and two red flags on the harbor office at Surabaya;

BY NIGHT: one 360° light at the first position and two 360° lights at the second.

IN THE AREA OF PROBOLINGGO between 113°06' E., 113°14' E., 7°36' S., the Java-
nese coast, and the line connecting the following positions: 7°41' S.—113°14' E., 7°41'24" S.—113°12'54" E., 7°44'42" S.—113°10'06" E., is subject to the following signals:

BY DAY: a red flag on the light tower at the sea end of the West mole at Probolinggo and two red flags on the pilot and light vessel in the East channel of Surabaya;

BY NIGHT: one 360° red light at the first position and two 360° red lights at the second.

IN THE AREA OF TJILATJAP

The area between 109°01' E., 109°10'12" E., 7°46'42" S., the Javal coast and the coast of Nusa Kambangan is subject to the following signals:

BY DAY: a red flag upon Tjimiring Hill on Nusa Kambangan and on the end of the boat wharf at Sentolo Kawat;

BY NIGHT: a 360° red light at these points.

TELUK BALIKPAPAN

The area between 116°52'06" E., 1°13'30" S., 1°23'24" S., and the Borneo coast is subject to the following signals:

BY DAY: a red flag on the observation post on Tokong Hill and on the pilot and light vessel;

BY NIGHT: a 360° red light on these positions.

IN THE AREA OF TARAKAN

The area between 117° 25' E., 117° 35' E., 3° 33' N., 3° 23' N., and the coasts of the enclosed and neighboring islands is subject to the following signals:

BY DAY: a red flag on the hill near Tandjung Djuata;

BY NIGHT: a 360° red light on this position.

The area between 117° 29' E., 117° 41' 54" E., 3° 21' 24" N., 3° 07' 30" N., and the coasts of the enclosed and adjacent islands, is subject to the following signals:

BY DAY: a red flag on the high light beacon on the coastal reef of Menulun and on the light and pilot vessel;

BY NIGHT: a 360° red light on these positions.

When one or more patrol vessels are present during firing practice at the above named places or close by the dangerous areas, this is made known by day by a red flag, and by night by a 360° red light.

Such patrol vessels may be assisted by an airplane.

Ships which are in, or which enter, the danger area must follow any directions given by such patrol vessels or aircraft.

Any craft carrying a target will bear the same signals as a patrol vessel.

1-26 ROCKET FIRING AND BOMBING PRACTICE AREA.—The area bordered by the straight lines connecting the following points will be used by the Indonesian Navy for rocket firing and bombing practices:

- | | |
|-------------------|-----------------|
| 1. 07° 05' S. | 112° 42' 40" E. |
| 2. 07° 05' S. | 112° 40' 25" E. |
| 3. 07° 03' 04" S. | 112° 40' 25" E. |
| 4. 06° 58' 50" S. | 112° 43' 20" E. |
| 5. 06° 58' 50" S. | 112° 46' 25" E. |
| 6. 07° 05' S. | 112° 42' 40" E. |

Aforementioned area has therefore been declared as a dangerous area since it will constantly be used as a training area and the rocket firing and bombing will be done without any advance notice whatsoever as to when the practices will be held.

All vessels plying in this area are hereby warned to sail cautiously.

1-27 PROHIBITED AREAS.—Without the permission of the Chief of Staff of the Indonesia Navy, or an official appointed by him

for this purpose, navigation or fishing is prohibited in the following territorial waters included in this volume:

The coast of West Java from Tandjung Lajar (6° 45' S., 105° 13' E.) to the east part of Teluk Penandjung (7° 43' 30" S., 108° 40' 30" E.) including the waters around Deli and Tindjul islands.

CAUTION.—Indonesian Notice to Mariners No. 32/245 dated 8 August 1964 indicates establishment of a PROHIBITED AREA bounded by the following coordinates:

- | | |
|-----------------|-----------------|
| 07° 12' 00" S., | 112° 44' 00" E. |
| 07° 15' 00" S., | 112° 53' 00" E. |
| 07° 05' 00" S., | 112° 53' 00" E. |
| 07° 05' 00" S., | 112° 41' 00" E. |
| 07° 10' 30" S., | 112° 44' 00" E. |

NOTE: Literal application of this edict prohibits traffic in the east part of Surabaya Harbor and the eastern approaches thereto. No explanation was given as to the reasons for or the scope of this prohibition.

In 1965, it was reported that the eastern approaches to Surabaya through Madura Strait had been mined.

The west, north, east and south coasts of North Celebes from Sapuringgi (0° 10' S., 110° 48' E.) to Kasimbar (0° 10' S., 120° 04' E.), including the waters of the islands located in the bay of Dondo, Kwardang, Mantarawu, Bangka and Lembeh.

Ports in these areas may only be visited with a "sailing permit" issued by the Indonesian Navy, and in some cases, by the Indonesian Army. Permits are soonest obtained in Djakarta, but may also be had from Indonesian consulates.

Ships navigating between these closed areas and foreign countries, or vice versa, must pass inspection points. By decree of December 14, 1960, the following places are listed as inspection points (within the area of this volume): For the closed areas of north Celebes: Tarakan and Makasar.

MEDICAL—DERATIZATION

1-28 INFIRMARIES and/or a harbor doctor are found at the following Indonesian ports: Ampenan; Balikpapan; Bandjermasin; Banjuwangi; Benoa; Buleling; Buton; Bonthain; Tjeribon, Djuana; Gorontalo; Gersik; Indramaju; Djapara, Kendari; Kg. Kuala Kapuas; Kolonodale; Kota Baru; Kraksaan; Linkas; Madjene; Makasar; Mamudju; Manado; Pa-

leleh; Palu; Palopo; Panarukan; Pare Pare; Pasuruan; Pekalongan; Poso; Probolinggo; Raha, Rembang; Samarinda; Semarang; Sumbawa; Sumenep; Surabaya; Tahuna; Tarakan; Tegal; Teluk Bajur; Tjilatjap; and Tuban.

The main diseases are malaria, plague, dysentery, typhoid and para-typhoid fevers, smallpox, venereal diseases, dengue, pneumonia, influenza, tuberculosis, diphtheria, trachoma, leprosy, yaws, hookworm, tetanus, and various skin diseases.

DERATIZATION.—Djakarta (Tandjungpriok) and Surabaya are equipped to carry out the deratting of vessels and to issue Deratting and Deratting Exemption Certificates. Makassar and Belawan Deli issue Deratting Exemption Certificates only.

Deli, in Portuguese Timor, issues Deratting Exemption Certificates only.

PILOTAGE

1-29 **PILOTAGE** is compulsory for all Indonesian ports at which pilots are available. Pilot signals are in accordance with the International Signal Code; such signals must be shown until the pilot is aboard or until an answering signal has been made. Pilot signals for specific ports are given with the description of that port.

The following answering signals are given by pilot light vessels to entering vessels that display the pilot signal:

Day signal	Night signal	Meaning
Code flag "D" or a ball over a cone, point up.	Red light over a white light.	No pilot available on the light vessel; Proceed until you meet a pilot.
Do.....	White flare or a swinging white light.	The pilot will proceed to the vessel.

FUEL

1-30 **COAL** is obtainable at the following Indonesian ports: Tandjungpriok; Surabaya; Tjilatjap; Palembang; Bandjermasin; Samarinda; Tandjung Redeb; and Makassar.

FUEL OIL is obtainable at the following Indonesian ports: Tandjungpriok; Surabaya; Tjilatjap; Padang; Pangkalan Brandan; Pangkalan Susu; Sambo; Belawan Deli; Tandjung Uban; Palembang; Balikpapan; Samarinda; Tarakan; and Bula.

NOTE: Full functioning of these stations cannot always be counted upon.

CLIMATOLOGY*

1-31 **GENERAL REMARKS.**—The climate of Indonesia and the adjacent seas is quite similar in many respects to that of other ocean areas near the Equator. However, there are a few very important differences. Due to the proximity of the Australian and Asiatic continents, the climate has some rather typical monsoon characteristics with a seasonal reversal of the direction of the prevailing winds, a distinct rainy and dry season in many areas, and only brief periods of calm.

BAROMETRIC PRESSURE

1-32 **PRESSURE.**—During northern hemisphere winter (December–March) there is a general decrease in the normal sea level pressure in a southeastward direction from Asia toward Australia, while during the summer months (June–September) the pressure gradient is reversed with the higher pressure now located over Australia, and the pressure generally decreasing northward. The pressure in the area contained within this volume averages 1008–1012 mb. with the lower values found toward the north. The annual range of the pressure is quite small with the greater seasonal variation found in the south portion. Day-to-day changes are also small since the weaker tropical disturbances are usually accompanied by only slight drops in pressure. However, there is a rather marked diurnal variation in pressure having a range of about 3 mb. The pressure usually reaches its highest values at about 1000 and 2200, and its lowest at 0400 and 1600 local time.

For additional pressure data see the appendix tables.

TROPICAL CYCLONES

1-33 **TROPICAL CYCLONES.**—Tropical cyclones are infrequent and usually do not have the severity of this type of storm in other areas of the world. They have their source in (Continued on page 27)

*Prepared by U.S. Weather Bureau, Dept. of Commerce.