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U. S. NAVAL TECHNICAL MISSION TO JAPAN
CARE OF FLEET POST OFFICE
SAN FRANCISCO, CALIFORNIA

2 January 1946

RESTRICTED

From: Chief, Naval Technical Mission to Japan.
To : Chief of Naval Operations.

Subject: Target Report - Japanese Hydrography, Article 2 - Wind and Weather Data, Including High Altitude Radar Maps.

Reference: (a)"Intelligence Targets Japan" (DNI) of 4 Sept. 1945.

1. Subject report, covering a portion of Japanese hydrography outlined by Target X-18 of Fascicle X-1, of reference (a), is submitted herewith.

2. The investigation of the target and the target report were accomplished by Captain Jerry H. Service, USNR, assisted by Lieut. John Catt, RNVR, and by Lt.(jg) Richard E. Clark, USNR, as translator.

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Captain, USN

JAPANESE HYDROGRAPHY - ARTICLE 2
WIND AND WEATHER DATA
INCLUDING HIGH ALTITUDE RADAR MAPS

"INTELLIGENCE TARGETS JAPAN" (DNI) OF 4 SEPT. 1945

FASCICLE X-1, TARGET X-18

JANUARY 1946

U.S. NAVAL TECHNICAL MISSION TO JAPAN

SUMMARY

MISCELLANEOUS TARGETS

JAPANESE HYDROGRAPHY - ARTICLE 2
WIND AND WEATHER DATA, INCLUDING HIGH ALTITUDE RADAR MAPS

The collection of "charts of all sea, river, and inland sea areas of Pacific", and of "wave and tide and current data" was quite thoroughly accomplished by the Intelligence Division, Office of the Chief Engineer, GHQ AFPAC, as reported in NavTechJap "Japanese Hydrography, Article 1 - Organization, Operation, and Methods", Index No. X-18-1. The officers who prepared this report assisted the Office of the Chief Engineer in setting up machinery for the collecting and shipping of these materials and of keeping proper records. However, in the case of considerable numbers of charts and publications, the desired numbers of ten each for charts and five each for publications was not completely attained. Except in a very few cases, at least one copy of every known chart or publication of the Japanese Hydrographic Office was collected through the Office of the Chief Engineer. Detailed information on what charts and publications are missing is given in the body of this report.

"Wind and weather data, including high altitude" has been construed to mean all charts and publications published by the Japanese Hydrographic Office that are meteorological in subject matter. This restricted construction is believed justified in view of the content of NavTechJap Report. "Japanese Aerology", Index No. X-16. In the body of this report is given a complete list of the subject charts and publications with English Translations of their titles and a statement of the almost complete collection of these charts and publication by the Office of the Chief Engineer.

"Sea bottom studies", insofar as this subject is not covered in the publications of the Japanese Hydrographic Office collected by the Office of the Chief Engineer, are reported upon in NavTechJap Report "Oceanography in Japan", Index No. X-40(N).

With reference to "radar maps of all areas", reported interrogation of Japanese chart and map making personnel always produced the information that the Japanese had not prepared or published any such maps.

Japanese hydrographic equipment and procedure was quite extensively studied by the Office of the Chief Engineer and this Mission. Detailed results of this study are set forth in the body of this report, but in general it can be stated that the equipment as well as the procedures and methods are good. However, practically nothing, either in equipment of method, is any improvement over United States equipment or method. The personnel perparing this report were scarcely in a position to test how well the Japanese utilize their good equipment and procedures and how accurate are their hydrographic results.

Incidental to the execution of this report, there were collected for the U. S. Hydrographic Office certain issues missing from the files of that office of a number of Japanese hydrographic and oceanographic journals, as enumerated in detail in the body of the report. The investigating personnel also located for seizure, or photographing and shipment, certain material pertaining to terrestrial magnetism and seismology. One hydrographic research project was investigated.

TABLE OF CONTENTS

LIST OF ENCLOSURES

REFERENCES

A. Location Of Target:

1. Imperial Japanese Hydrographic Office, Tsukiji, TOKYO.

2. Branch of the Japanese Inperial Hydrographic Office, KASAOKA, Honshu.

B. Japanese Personnel Who Assisted in Gathering Documents:
(All from Imperial Japanese Hydrographic Office.)

1. Captain Shinichi DAITO, IJN.

2. Commander Shozo OTSUKA, IJN.

3. Commander Fumiyo SATO, IJN.

C. Japanese Personnel Interviewed:

1. Commander Masaake BANDO, IJN, who was in charge of meteorological work (mostly charts) formerly done by the Japanese Hydrographic Office, after meteorological work was separated from that office about 1 December 1944.

2. Commander Hisayo IIDA, IJN, who was associated with Comdr. BANDO and succeeded him when Comdr. BANDO was demobilized.

D. Related Reports:

1. NavTechJap Report, "Japanese Hydrography, Article 1 Organization, Operation, and Methods", Index No. X-18-1.

2. Accession List of G-2, GHQ, SCAP.

3. "Scientific Intelligence Survey in Japan, Sept-Oct, 1945".

INTRODUCTION

The personnel assigned to the investigation of this report considered their mission to consist of the following parts:

1. To determine and report to what extent Intelligence Division, Office of Chief Engineer, GHQ AFPAC, had collected one copy each of "charts of all sea, river and inland sea areas of Pacific", and to assist that office in setting up machinery and records for the further collection and shipment of such charts. It was understood that such collection would continue for some months, and that when the available sources were exhausted, charts, of which some copies have been collected, would be reproduced in numbers necessary to complete shipment and distribution (that is, one copy of each to be filed in the Office of the Chief Engineer, and nine copies of each to be shipped to the United States.)

2. To prepare lists, with titles translated into English by security classifications, of all charts and publications published by the Japanese Hydrographic Office which are meteorological in subject matter. Also to determine and report to what extent these have been collected, and to assist the Office of the Chief Engineer in setting up machinery and records for the further collection of such charts and publications. Inasmuch as available sources had not been exhausted, such collection would continue for some months.

3. To examine and report upon Japanese hydrographic equipment and to inquire into their hydrographic methods.

THE REPORT

1. STATUS OF COLLECTION OF CHARTS AND PUBLICATIONS

As of 1 January 1946, the status of the collections by the Office of the Chief Engineer of charts and publications published by the Imperial Japanese Hydrographic Office was as given below. The totals given for the various types of charts and publications are approximate for comparison purposes, being in each case the result of a single counting of the office list. Although in numerous cases the desired number of copies of a chart or publication had not been collected, in the tabulation below only those are reported missing for which not one copy had been obtained.

a. Top Secret (Gunki) Hydrographic Charts:

Number published 213
Number missing ..... none

b. Secret (Gungokuhi) Hydrographic Charts:

Number published 144
Number missing ..... none

c. Confidential (Hi) Hydrographic Charts:

Number published 147
Number missing ..... six

Missing

No. 111 - Charts for receiving wireless ocean current reports, publ. 1939, 50 sheets in 1 vol. half size.

No. 521 - Overall charts of weather conditions in waters adjacent to Japan. June 1941 (supplemented in Notices to Mariners).

No. 522 - Overall charts of weather conditions in Siberia. September 1938. 88 sheets (supplemented in Notices to Mariners).

No. 525 - Chart of upper air winds over CHOSEN, Manchuria, KARAFUTO, and CHISHIMA. December 1938. 1 volume.

No. 562 - Tidal and ocean current charts of Nansei Islands areas. Observations 1906 to 1930, published 1940.

No. 2767 - Military weather charts for Indian Ocean. May 1943. Observations 1924 to 1938, published 1943, one-fourth size in one binding.

d. Unclassified Hydrographic Charts:

Number published 2004
Number missing ..... none

e. Classified Aeronautical Charts:

Number published 180
Number missing ..... seven

Hi 701 - Upper level wind charts for China. March 1940.

Gungokuhi 901 - Aero weather charts for China. (March through May 1938) Published March 1939.

Gungokuhi 902 - Aero weather charts for China. (June - August 1939) May 1939.

Gungokuhi 903 - Aero weather charts for China. (September - November 1938) October 1939.

Gungokuhi 904 - Aero weather charts for China. (December - 1938 Febuary 1939) January 1940.

Gunki 1551 - Aero weather charts for waters adjacent to Japan, May 1935. 13 sheets.

Hi 5063 - From Sumisu-Jima to Chichi-Jima, Published November 1944.

Interrogation 28 December 1945 of Commander IIDA, (IJN), indicated that 901-904 were old, with probably few if any copies in existence, and that 1551 had been superseded by 91.

f. Unclassified Aeronautical Charts:

Number published 37
Number missing ..... none

g. Classified Aeronautical Publications:

Number published 39
Number missing ..... one

Gunki 1701 - Aerial photography for air navigation. Volume 1. Kurile Islands and vicinity. Published October 1937.

h. Classified Hydrographic Publications:

Number published 86
Number missing ..... two

Missing

Gunki 631 - A study of the typhoons met by the Russian Fourth Fleet on 26 September 1935, Published December 1937.

Gungokuhi 8181 - Summary Report of the Hydrographic Department. Volume 1. Published July 1944.

i. Unclassified Hydrographic Publications:

Number published 138
Number missing ..... none

It will be seen that of some 2988 charts and publications published by the Japanese Imperial Hydrographic Office, only sixteen are missing. Inasmuch as the sources are not exhausted, many of these shortages may be cleared up.

2. NAVAL GENERAL STAFF CHARTS

The Japanese Navy prepared a set of General Staff Charts, consisting of (1) basic charts, which actually convey no real information, and (2) cipher charts. Information furnished by the Japanese indicated that on 15 August 1945 they had destroyed the cipher charts in compliance with an order issued by the Japanese Government on the preceding day. Enclosure (A) is the English translation of the chart index submitted by the Japanese. One copy (in Japanese) of this index, together with two copies of each of the two seized basic charts, (under NavTechJap Document No. ND50-5901) have been forwarded dierctly to the U.S. Hydrographic Office, Washington, D.C.

3. ARMY GENERAL STAFF CHARTS

The Intelligence Division, Office of the Chief Engineer, GHQ, AFPAC, obtained knowledge of a series of Japanese Army General Staff Charts. The Office of the Chief Engineer then succeeded in obtaining from the Japanese Government:

a. Photostats (2 copies) of the two sheets of the Japanese index of a series of thirty-four charts;

b. A 3 sheet index chart prepared by the Japanese Government for the office of the Chief Engineer on a 1: 2,000,000 scale on Japanese hydrographic charts, all three sheets within the latitude belt 4^0N to 15^0 13'N: 132^0 30'E to 149^0 50'E, 145^0 40'E to 163^0 E, and 158^0 E to 175^0 20'E;

c. At least one copy of each of the thirty-four charts in the series. The charts themselves are compilations of hydrographic and land survey information. The Japanese stated that the charts were prepared for use in amphibious operations. The three items listed are as of 1 January 1946, and are on file in the Office of the Chief Engineer, Tokyo.

4. COMPILATION DRAWINGS

Dispatch 132050 of November 1945 from U. S. Hydrographic Office to Naval Technical Mission to Japan reads in part as follows: "In addition original index plus listing of surveys desire copies smooth not boat sheets only for former mandated islands and all war time Japanese surveys in China and other areas except Japan proper also original unpublished survey materials".

In explanation of the above dispatch it may be stated that in the U. S. Coast and Geodetic Survey it is the practice when a marine area is to be surveyed, first to prepare a blank projection of the area with hydrographic signals plotted thereon. This sheet is the work sheet of the hydrographic party and the "fixes" (usually the soundings also) are plotted on it as fast as they are observed. It is called a "boat sheet". All data are also recorded and the field party (in U. S. practice) prepares a second blank projection of the area and thereupon carefully replots all fixes, soundings, etc. This is called a "smooth sheet". However, in Japanese practice there is no smooth sheet in the U. S. sense. Instead, from the "boat sheet", triangulation data, shoreline survey data, etc., are assembled by means of tracings and carbon papers, and a smooth copy containing all available surveying information, properly called a "compilation drawing" is prepared.

In compliance with the above quoted dispatch, the Japanese Government was ordered to deliver to the Office of the Chief Engineer:

a. A listing, and also a graphic index, of all "compilation drawings" covered by the dispatch. Each compilation drawing has a general locality number, encircled in a series 1 to 20, inclusive, and a sheet number.

b. Two copies of each compilation drawing, one of which was to be shipped by the Office of the Chief Engineer to the U. S. Hydrographic Office along with the listing of the graphic index and the other of which was to be retained on file in the Office of the Chief Engineer.

c. One additional copy of each "compilation drawing" of Alaskan, Hawaiian, and Philippine areas, such additional copy to be shipped to the U. S. Coast and Geodetic Survey by the Office of the Chief Engineer.

d. It is to be noted that original unpublished survey materials are available only for surveys made since the earthquake of 1923, which destroyed all records.

5. NOTICES TO MARINERS

The Imperial Japanese Hydrographic Office published Notices to Mariners in three classifications: Gunki (top secret), Hi (confidential), and Non-Restricted. The Office of the Chief Engineer confiscated the complete "Notice to Mariners" file of the Japanese Hydrographic Office, which consists of one copy of each issue (number) of Notices to Mariners published during the war years. This complete file is now being retained in the Office of the Chief Engineer, pending the location of other copies for distribution to the U. S. Hydrographic Office and other necessary recipients. It is hoped that such other copies may be collected from the various chart depots within the next few months. The file in the Office of the Chief Engineer is composed of the following:

Top Secret

1941, 1942, 1943, 1944 each complete in one binder.
1945 Nos. 1 and 2 (6 and 19 Jan.) only, in one binder.

Confidential

1941 Japanese Hydrographic Office file copies reported lost by fire.
1942, 1943, 1944 each complete in one binder.
1945, Nos. 1, 2, and 3 (6, 15, and 25 Jan.) only, in one binder.

Non-Restricted

1941, 1942, each complete in two binders.
1943 and 1943 supplement, complete in three binders.
1944, complete in one binder.
1945, complete through No. 16 (27 October), in one binder.

At the request of the Fleet Liaison Office, Supreme Commander Allied Powers (FLOSCAP), the Office of the Chief Engineer began with the issue of 15 December to airmail promptly each week upon receipt one copy of the Notices to Mariners (in Japanese) to the U. S. Hydrographic Office.

6. METEOROLOGICAL CHARTS AND PUBLICATIONS

Enclosure (B) is expected to be a complete list of all charts and publications of meteorological subject matter published by the Imperial Japanese Hydrographic Office. Except for those items marked on the left with an asterisk, at least one copy of each of these charts and publications has been collected by the Office of the Chief Engineer.

In April 1944 the meteorological personnel of the Japanese Hydrographic Office were transferred out of that organization to the Navy Ministry. In December 1944 the Hydrographic Office was relieved of responsibility for meteorological charts and publications; at the same time a new set of numbers was assigned by the Navy Ministry to the meteorological charts and publica-

tions that had been compiled and published by the Hydrographic Office. Attempts to obtain a complete list of the corresponding old and new numbers was not successful; all these lists were said to have been destroyed by fire due to the bombing. However, in some cases these new numbers were learned and are shown in parentheses in the lists of Enclosure (B).

Interrogation of Mr. IIDA (formerly Comdr.,IJN) disclosed that the meteorological personnel (of whom he was one) transferred from the Hydrographic Office. The new meteorological organization in the Navy Ministry published only the following items, of which the items marked with an asterisk were destroyed by the air raids, and hence are not available:

Pamphlet for Meteorology.
Pamphlet on Typhoon.
Pamphlet on Forecasting Weather.
*Pamphlet on Baiyu (Rainy Season).
*Climatic Charts on the Neighboring Sea of Japan. (June, July, August).

The first three items were collected, to be forwarded through regular channels, by the Far Eastern Air Force.

7. HYDROGRAPHIC INSTRUMENTS AND EQUIPMENT

The personnel preparing this report examined nearly every type of hydrographic instrument and equipment used by the Japanese. The instruments they did not examine were for the most part heavy non-portable items mounted on survey ships, many of which had been sunk. No instrument or item of equipment examined was any improvement over, or essentially different from, corresponding United States items; hence no instruments or equipment were collected to be shipped to the United States for further study. In the following are set down some notes on examined hydrographic equipment:

a. Japanese Navy hand anemometer, four-cup, indicating 0-60 mph, weight about 3 lb, excellent.

b. Two types of portable binoculars used by Japanese Navy, 7 x 50mm and 6x24mm.

c. Aboard the carriers KATSURAGI and RYUHO at KURE were seen large mounted binoculars said to be about 45 X.

d. Experiments had begun with "buoys, transmitting" for measuring surface (water) currents (no samples available). It was released from a ship, transmitted a radio signal which was followed by RDF's from two or more ships, range about 20 miles, with accuracy of bearing at that distance $\pm 3^0$; weight about 30 kg.

e. Three-arm protractors ("station pointers") were all of metal (none plastic). Two types were examined, one with an 8-inch circle reading to one minute with 12-inch arms not extensible, one with 6-inch circle with 18-inch arms, extensible to 36 inches.

f. Beam compasses are of bright alloy, light, excellent.

g. Two types of water-sampling equipment (for sub-surface levels) are described in NavTechJap Report, "Oceanography in Japan", Index No. X-40(N).

h. A (water) current meter is also described in NavTechJap Report, "Oceanography in Japan", Index No. X-40(N).

i. For PH determination, also for expression of color of sea water, the Japanese use two sets of eleven comparison tubes each. These are describ-

ed in NavTechJap Report, "Oceanography in Japan", Index No. X-40(N).

j. Pantographs used were made by G. Conradi, Zurich, Switzerland, and are graduated from 2/3 to 1/20.

k. Aboard the carrier KATSURAGI in Kure harbor was examined a very elaborate compass attachment for observing compass bearing of the sun. It was called HOIKYO, and was manufactured by the Chiyoda Kogaku Seiko Kaisha in either NAGOYA or GIFU.

l. The navigator of KATSURAGI, when questioned about the echo-sounding gear, stated that it was considered reliable from 10 meters to 6000 meters depth, but that the use of the hand lead was started when the water had shoaled to 30 meters. KATSURAGI's echo-sounding gear (for navigation use) was manufactured by the Tokyo Electric Company; it was indicating and not recording; sound frequency 16 kc/sec; 15 wave trains per minute emitted. (See NavTechJap Report, "Japanese Sonar and Asdic", Index No. E-10)

8. NOTES ON HYDROGRAPHIC PROCEDURE

In general, the personnel preparing this report gained the impression that the Japanese are very painstaking in their hydrographic work. In some respects, such as taking a three-point fix on every sounding, they seem to be painstakingly careful out of proportion to some other practices. Their method of preparing "compilation drawings" directly from their boat sheets would seem to render the completed charts liable to errors greater than would probably be introduced by a lesser frequency of three-point fixes while sounding.

The questionnaire, Enclosure (C), brings out some information concerning Japanese hydrographic practice.

9. COLLECTION OF MISSING JOURNALS

Enclosure (D) is a copy of a memorandum dated 14 September 1945 from the United States Hydrographic Office to Lt. Col. (then Major) G. W. MOORE, who was Intelligence Officer, Office of the Chief Engineer, GHQ, AFPAC, during much of the working period of this report. The authors undertook the collection of the missing volumes and numbers of Japanese hydrographic and oceanographic journals indicated in the memorandum as required by the United States Hydrographic Office. Most of the work involved was completed, although collection was still in progress as of 1 January 1946. The journals have been shipped by NavTechJap directly to the United States Hydrographic Office, under NavTechJap Document Nos. ND50-5902 to 5919, inclusive.

10. HYDROGRAPHIC RESEARCH

In reference (a), Vice Admiral KIMURA's reply to a questionnaire, Section 9 (Research), is of special interest to the United States Coast and Geodetic Survey:

"On the surveying (1945)

Researched the horizontal transmission course of the sound in the water by three processes of refraction, surface and bottom reflection, and acknowledged almost their courses.

Note: By Engineer Susumu KUWABARA.
Published as a table for hydrophone."

A report on this work was called for from the Japanese Hydrographic Office, and was submitted in the form of Hydrographic Charts Hi 2775 and Hi 2776, with English translations of the essential portions of the text matter of the

charts pasted thereupon. Both of these charts were collected in full quantity by the Office of the Chief Engineer and forwarded through the regular channels. The report (two charts with attached translations) has been forwarded directly to the Director, United States Coast and Geodetic Survey, Washington, D.C., under NavTechJap Document No. ND50-5900. The charts, furthermore, have been reproduced in color in NavTechJap Report, "Japanese Anti-Submarine Warfare", Index No. S-24

The charts show the values of two constants "a" and "b" over large areas of the Pacific Ocean, in summer and winter, Chart 2776 being on the larger scale. These two constants, which depend upon the physical characteristics of the water, determine the speed of sound in water. Attenuation and maximum audible range equations are derived in the text matter printed on Chart 2775. While study of the charts has been by no means thorough, consideration seems to be confined to (1) the direct wave from source to hydrophone and (2) the once-surface-reflected wave from source to hydrophone. On Chart 2775 two tables of attenuation are printed, in decibels and in Io/I, respectively, where Io is at one meter from source. For example: for "a" = 30, at 1000 meters Io/I is tabulated as 0.30×10^6, Io/I = 65, approximately, and this is the value in Table I. Chart 2776 is on a larger scale, and gives examples of the use of the charts.

Captain Service, who worked on the transmission of sound through sea water for the U. S. Coast and Geodetic Survey in the 1920's and published some work on the subject (Jour, Frank. Inst. 1928), after a cursory study of the charts and the text and tables printed upon them, had the feeling that the assumptions are over-simplified and the computation and tabulation of maximum range over-rationalized. However, further study by the U. S. Coast and Geodetic Survey, in connection with radio-acoustic ranging, is recommended.

11. LOCATION OF MATERIALS PERTAINING TO TERRESTRIAL MAGNETISM AND SEISMOLOGY

Enclosure (E) is a partial copy of a memorandum dated 21 September 1945 from the Director, U. S. Coast and Geodetic Survey, to Lieutenant Colonel Glen W. Moore, U. S. E. D. and of Lt. Col. Moore's reply relative to the subject materials.

While assuming no responsibility for the collection or photographing or shipment of the material involved, the authors assumed the task of locating the material. The Office of the Chief Engineer was to collect or photograph and ship the material. The location work was well underway as of 1 January 1946.

Consultation with the appropriate NavTechJap investigators indicated negative returns on Items 8, 9, 10, 11, and 12 of paragraph (1e) of Enclosure (E) to this report. Concerning Item 12, the personnel investigating geophysical instruments (NavTechJap Report, "Japanese Geophysical Research", Index No. X-06) reported that there had been no improvement in the Ishimoto tilt meter in fifteen years, and that there was only one instrument in operation in Japan for measuring tilt of the earth's crust - a water level instrument at Mt. Tsukuba near TOKYO.

ENCLOSURE (A)

INDEX TO CIPHER CHARTS OF NAVAL GENERAL STAFF CHARTS
(Destroyed 15 August 1945)

(Compiled, relying on the memory of the people concerned)

Classification	Date of Reproduction	Type of Map	Remarks
Top Most Secret	1941 and 1942	Special Military (Place) Map New Guinea Solomons Australia Hawaii Timor New Caledonia Fiji New Hebrides Aleutians Pacific Archipelago	Used for First Strategies
Secret and Confidential	1941	Military Map Philippines Hawaii Aleutians Guam Union Soviet Socialist Republics (East Area) Malayan Peninsula West Coast Canada Mexico West Coast India New Guinea, Solomons Burma Dutch East Indies China New Zealand New Caledonia New Hebrides Ceylon Australia Timor Isle	
	Date Obscure	Land Aerodrome Examination Map Philippines North Korea, Manchukuo District Pacific Islands India Australia French Indo China	
Confidential	1941 about September	Map for use for Naval Strategy	A=1: 6,000,000 B=1: 3,000,000 Geographical position charts, using letters ("AIUEO") and numerals. For use from the

ENCLOSURE (A), continued

Confidential (Cont.)			beginning of the War to December 1942
	1942 about October	Map for use for Naval Strategy	A map which uses numerals and Torinaku alphabet. For use from Jan. 1943 to Jan. 1945.
	1944 about March	Map for use for Naval Strategy	Changing the above, a map which uses Iroha alphabet and numerals. For use from June 1945.
	1944 about May	Combined military Map Marianas Islands Saipan Guam Tinian West Carolines Palau Yap S.W. Pacific Islands Iwo Jima Chichi Jima Haha Jima Amami o-shima Okinawa Island Miyako Island Ishigaki Island Chishima Retto	A combined Army and Navy map which uses numerals and the first letters (in Kana) of the names of the various islands.
	1945 about June	A combined Army and Navy Map for use in "KETSU" type operation	It is a map made in sections for places where landings were anticipated against Japan, taking as material the 1: 50,000 Army and Navy charts and converting them to 1: 100,000 ones.

ENCLOSURE (B)

METEOROLOGICAL CHARTS AND PUBLICATIONS

Published by Japanese before Meteorology was separated from the Hydrographic Office. Items preceded by an asterisk were destroyed in air raids, and hence are unavailable.

1. Described in Japanese Index of Secret Hydrographic Charts and Publications. (Charts, p. 40; publications, p. 41 et seq).

Charts

*Hi 522	Overall charts of weather conditions in Siberia Sept. 1938. 88 sheets (supplemented in Notices to Mariners).
Gunki Misc. 551	Weather charts for waters adjacent to Japan. May 1935. 22 sheets.
*Hi 521	Overall charts of weather conditions in waters adjacent to Japan. June 1941 (supplemented in Notices to Mariners).
Hi Misc. 113	General weather conditions in Northern waters. July 1941. 13 sheets.
*Hi 525	Chart of upper air winds over CHOSEN, Manchuria, KARAFUTO, and CHISHIMA. Dec. 1938.
Hi Misc. 91	Weather charts for North Pacific (sheets 1-27) Sept. 1939.
Hi Misc. 2763	Military weather charts for Coral Sea approaches. Feb. 1943.
Hi Misc. 112	General weather conditions in outer South Seas, June 1941. 13 sheets.
*Hi Misc. 2767	Military weather charts for Indian Ocean. May 1943.
Hi Misc. 2771	Military weather charts for northern waters (sheets 1-175) Dec. 1943.
Hi 2995	Overall charts of weather conditions in Pacific and Indian Oceans. Feb. 1942 (supplemented in Notices to Mariners).

Publications

Hi 169	Weather in Far Eastern USSR, Manchuria, KARAFUTO (553) and CHISHIMA. Oct. 1939.
Hi 162	Weather in the Maritime Provinces and on the East (516) coast of CHOSEN. Aug. 1938.
Hi 137	Fog in the CHISHIMA area. Aug. 1939 (453)
Hi 142	Supplement to military weather notices. Vol. 1. Weather tables for sea coasts of the Homeland. Sept. 1937.
Hi 144	Supplement to military weather notices, Vol. 3, Weather tables for China. May 1940 (413)
Hi 170	Weather reference data for Szuchuan Province, China. (May through Oct.). May 1939. (514)

ENCLOSURE (B), continued

Hi 171	Weather reference data for Szuchuan Province, China. (Nov. through April). Nov. 1939. (515)
Hi 143	Supplement to Military Weather Notices, Vol. 2. Weather tables for foreign coasts (China and Philippines). Aug. 1939 (432)
Hi 168	Weather in S. China and S. tidal currents. Sept. 1938.
Hi 145	Supplement to Military Weather Notices, Vol. 4. Outer South Seas Weather tables. April 1941. (433)
Hi 8514	Supplement to Military Weather Notices, Vol. 5. Australia, New Zealand, New Guinea, Pacific Islands weather tables. March 1942
Hi 8525	Supplement to Military Weather Notices, Vol. 16. Wireless Weather Bulletins. 2nd Vol. Aug. 1941.

(All 1938 only)

Hi 141	Weather Studies. Jan. 1937 ff.
Hi 151	Navy Monthly Weather Reports. May 1937 ff.
Hi 152	Navy Yearly Weather Reports. July 1939.

2. Described in Japanese Index of Secret Aeronautical Charts and Publications (Charts p. 21 et seq; publications p. 30 et seq).

Charts

*Gunki 1551	Aeroweather charts for waters adjacent to Japan. May 1935. 13 sheets.
*Gungokuhi 901	Aeroweather charts for China (March through May 1938) published March 1939.
*Gungokuhi 902	Aeroweather charts for China (June - Aug. 1939) May 1939.
*Gungokuhi 903	Aeroweather charts for China (Sept. - Nov. 1938) Oct. 1939.
*Gungokuhi 904	Aeroweather charts for China (Dec. 1938 - Feb. 1939) Jan. 1940.
*Hi 701	Upper level wind charts for China. March 1940

Publications

(All 1938, 1939 only)

Hi 341	Navy monthly reports on upper air weather. Dec. 1936 (covers Sept. 1936 on).
Hi 342	Navy yearly reports on upper air weather, July 1939.

ENCLOSURE (B), continued

3. Described in Japanese "Index of Ordinary Hydrographic Charts and Books".

Charts

6030	A	Weather chart for North Pacific in	Jan.	Dec.	1931
	B		Feb.	Jan.	1935
	C		Mar.	Feb.	1932
	D		Apr.	Mar.	1932
	E		May	Mar.	1932
	F		June	Apr.	1932
	G		July	May	1932
	H		Aug.	June	1932
	I		Sept.	June	1932
	J		Oct.	Aug.	1932
	K		Nov.	Sept.	1932
	L		Dec.	Dec.	1932
6032	A	Weather charts for Indian Ocean & Australian Waters in Dec, Jan, Feb.		Nov.	1932
	B	Weather charts for Indian Ocean & Australian Waters in March.		Jan.	1933
	C	Weather charts for Indian Ocean & Australian Waters in April.		Mar.	1933
	D	Weather charts for Indian Ocean & Australian Waters in May.		Mar.	1933
	E	Weather charts for Indian Ocean & Australian Waters in June, July, August.		Apr.	1933
	F	Weather charts for Indian Ocean & Australian Waters in September.		Apr.	1933
	G	Weather charts for Indian Ocean & Australian Waters in October.		May.	1933
	H	Weather charts for Indian Ocean & Australian Waters in November.		Oct.	1932
6042		Charts of weather & ocean currents in Japanese Waters.		Jan.	1939

Publications

222	Methods of Ocean Weather Observation.	March		1933

ENCLOSURE (C)

QUESTIONNAIRE AND REPLY

ON

JAPANESE HYDROGRAPHIC PRACTICE

ENCLOSURE (C)

QUESTIONNAIRE SUBMITTED TO IMPERIAL JAPANESE HYDROGRAPHIC OFFICE
24 December 1945

1. On what date was meteorology removed from the work of the Japanese Hydrographic Office?

2. What organization then assumed responsibility for the work in meteorology that had previously been done by the Japanese Hydrographic Office?

3. What official was immediately in charge of this work?

4. Have the Japanese ever used echo sounding devices in hydrographic surveys?

5. In ship hydrography (using ships larger than launches) accomplished by hand lead, how often were soundings taken (every 30 seconds, or so many per hour, or how)?

6. In ship hydrography, how was the position of the ship fixed? How often (that is, how many times per hour)?

7. In small boat hydrography, how often were soundings, and fixes taken?

8. Was the position of the survey ship ever determined by under water sound ranging? If so, how satisfactory did the Japanese find this method to be?

9. In three-point fixes on hydrography, many shore signals are needed. Assuming that the most important of these were located by triangulation, how were the minor intermediate ones located?

10. On the bridge of a survey ship while hydrography was being done, what officers and men were employed and what were the duties of each?

11. Was the technical surveying work of a survey ship managed by naval officers or by civilian engineers or by both?

12. Were the naval officers assigned to survey duty specialists in that work or did they rotate?

13. Did the Japanese Navy establish any shore high frequency radio transmitters for use by ships to fix their position? If so, were any charts specially prepared and issued to the ships to make more easy the use of these shore stations? If so, you will furnish copies of such charts.

ENCLOSURE (C), continued

JAPANESE HYDROGRAPHIC
DEPARTMENT

H: 1 10 January 1946

MEMORANDUM FOR: U.S. Naval Technical Mission to Japan.

SUBJECT: Answers put on December 24, 1945.

With reference to your questions put at our office on the date of December 24, 1945, we shall be glad to submit herewith the answers with following descriptions.

S. KIMURA,
Chief Hydrographer.

ENCLOSURE (C), continued

ANSWERS FOR YOUR QUESTIONS
PUT ON THE DATE OF DECEMBER 24, 1945

1. On April 15, 1944, meteorology was removed from the work of the Japanese Hydrographic Office.

2. The organization was the Naval Meteorological Department, which was under the command of the Chief Hydrographer, but was dissolved on September 15, 1945.

3. The work was in charge of Rear Admiral Akira SOJI.

4. The Japanese have used echo-sounding devices in hydrographic survey from the year 1938.

5. In surveying ships larger than launches, soundings by hand lead were not taken; but when the ship came to anchorage, soundings by hand lead were taken during the course of casting anchor.

6. In ship hydrographic survey, when any land mark could be found in the neighborhood, the position of the ship was fixed with the sextant and the station-pointer every fifteen minutes, and meanwhile fixes were taken by bearings at an interval of about five minutes.

In the ocean where no land marks were visible, the position line of the ship was fixed by means of astronomical observations.

Astronomical observations were accomplished at about sunrise, noon, and sunset, and sometimes in the course of the night.

Position lines were generally taken by observing the sun in the daytime at an interval of about half an hour to fix the ship's position. When Venus was visible, observation of Venus together with the sun was done without fail.

7. In small boat hydrographic survey, soundings by land lead were taken where water was shallower than 20 meters, and where ever deeper than 20 meters, manual wire soundings were accomplished.

When sounding in water deeper than 5 meters, sometimes the echo-sounding apparatus was used in the course of hydrographic surveys.

(a) Soundings except when echo-sounding devices were used

The boat was stopped to sound by hand lead at each sounding and the position of the boat was fixed with the station-pointer and the sextant at each sounding.

Standards of the interval of sounding are as follows:

Interval between two sounding-points

Scale	Near the shore line	3 miles or so from shore	5 miles or so from shore
1:10,000	1:30 mile	1:13 mile	
1:20,000	1:20 mile	1:7 mile	
1:30,000	1:14 mile	1:6 mile	1:2.4 mile
1:40,000	1:10 mile	1:4 mile	1:1.8 mile
1:50,000	1:8 mile	1:3 mile	1:1.5 mile
1:75,000	1:5 mile	1:2 mile	1
1:100,000	1:4 mile	1:1.5 mile	1:0.7 mile

(b) Soundings when echo-sounding devices were used

The position of the boat was generally fixed once a minute.

8. It was somewhat sifficult to determine the position of the survey ship by underwater sound ranging and the Japanese did not find this method to be satisfactory in practice.

9. In three-point fixes on hydrographic survey, the most important of many shore signals was located by triangulation, and the minor intermediate signal was located as a point of intersection of sight-lines sighted from more than three-points by the method of fore-sighted intersection; and also by the method of back-sighted intersection, it was determined to be the same one as the point located.

The standards of the distance at which the Japanese established minor intermediate signals or auxiliary signals are as follows:

Scale	Approx. Distance (mile)
1:10,000	One-Twelfth
1:20,000	One-Eighth
1:30,000	One-Fifth
1:50,000	One-Third
1:100,000	One-half

10. (a) On the bridge of a survey ship where hydrographic survey was being done there was an officer specialist in survey or a naval officer who was especially appointed as navigator from general naval officers, unless there was an officer specialist in survey. Several sailors acted as assistants in surveying work.

Duties of each were as follows:

Personnel	Duties
Captain	Manages general things
Officer, Specialist in Survey or Navigator	Manages surveying work and fixes the position of the ship
Assistant Navigator	Assistant in the fixes
Signal man (one person)	Reads off the chronometer and records
Specialist in survey sent from the H.O.	Reads off the echo-sounding apparatus
Sailors (one or two persons)	Assistant of officer above mentioned

In addition, there were the quartermaster, the telegraphman, and the watches necessary for navigation.

(b) On the survey ship where naval officers were not on board, a civilian engineer and his assistants were employed and the duties of each were as follows:

ENCLOSURE (C), continued

Personnel	Duties
Captain	Fixes the position of the ship
Chief officer	Assistant in the fixes
Specialist in survey sent from the H.O.	Manages the surveying work
Assistants (three persons)	Reads off the chronometer and echo-sounding apparatus and records

In addition there were the quartermaster, the telegraphman, and the watches necessary for navigation.

11. (a) On the survey ship the technical surveying work was managed by the naval officer specialist in survey; or by the naval officer who was appointed navigator, unless there were officer specialists in survey.

(b) On the survey ship where naval officers were not on board, the technical surveying work was managed by the civilian engineers.

(c) In small boat hydrographic survey, the surveying work was managed by the civilian engineer.

12. Naval officer specialists in hydrography were generally assigned to survey duty.

Some of the naval officers had finished university courses to become specialists in survey, and the rest had finished the one year course of special education at the Hydrographic Department.

The chief officer of the surveying team was appointed from among these specialists and the navigator of the surveying ship from the specialists in survey or general naval officers.

13. The Japanese Navy has established high frequency radio transmitters ashore for use by ships to fix their positions. Naval affairs special charts were prepared and issued to the ships to simplify the use of these shore stations, but the Hydrographic Department had no relation to their issue. In the preparation of special charts, M. SEKI, naval engineer in the Hydrographic Office, was employed to calculate at request. The charts were burned owing to the fire caused by air attack on 10 March 1945, and none of the copies remained.

(End)

Note: Inquiry was also made as to the whereabouts of the survey ships (sounding ships) used by the Japanese Hydrographic Office, in order that they might be examined. The information came back that all these ships had been assigned to transport duty and hence were not available for examination.

ENCLOSURE (D)

COPY OF MEMORANDUM REQUESTING CERTAIN MISSING JOURNALS

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14 September 1945

M E M O R A N D U M for Major Moore.

Subject: Partial list of Japanese oceanographic publications desired for the Hydrographic Office.

1. Two Japanese journals which cannot be located anywhere in this country are:

a. TOKYO. Imperial Fisheries Institute. Report science investigations. Vol. 1, 1912. (early volumes issued by Imperial Bureau of Fisheries). "Gyogyo Kihonchosa Hokoku" is the Japanese title. Only Vol. 1-2 and 5 are now available in the United States. At least nine volumes have appeared, maybe more.

b. UMI to SORA (Variously translated as "Sea and Sky", or "Sky and Water".) Published by Marine Society (Kaiyo Gakukai), KOBE. Vol. 1-17; 1929-1937.

2. The following journals containing oceanographic papers, are not available in the Hydrographic Office and complete sets should be obtained:

a. CHOSEN. Fishery experiment station. Report of the oceanographical investigations. (Vol. 1, 1926; 2, 1927; 3, 1933 and any new ones).

b. CHOSEN. Fishery experiment station. Bulletin, No. 4-5 only. (Others on fisheries and chemistry).

c. Japan. Hydrographic department. Suiro Zasso. (Hydrographic reports; miscellaneous). These have been issued since the early part of the century, are irregular in timing of issue; very valuable for currents, tides, etc.

d. Japan. Imperial Fisheries Experiment station. Semi-annual report of the oceanographical investigation. No. 44-64; January June 1929-January June 1939. And any more recent ones.

e. Japan. Imperial Marine observatory, KOBE. Iho (variously translated as Bulletin or Memoir). These are numbered individually and should not be confused with the Memoirs issued by volumes.

f. SENDAI, Japan. TOHOKU TEIKOKU DAIGAKU. Institute of geology and palaeontology. Contributions No. 10, 16, 17, 18, 19, 21, 23, 24, 28. 1934-1937. These particular numbers are on the topography (incl. submarine) and coral reefs of South Sea Islands of Japan.

3. The Hydrographic Office has more or less complete sets of the following and the sets should be completed:

a. CHOSEN. Fishery experiment station. Annual report of hydrographical observations and appendices (Oceanographical charts).

H.O. has No. 5/6 (without appendix) and No. 7 complete.

Desirable to get: 1, 2, 3, 4, appendix for 5/6, 8 and any new ones.

ENCLOSURE (D), continued

b. Japan. Hydrographic department. Bulletin of the Hydrographic department.

H.O. has Vol. 1-9; 1917-1940.

Desirable to get any new ones (Time of issue irregular)

c. Japan. Hydrographic department. SUIRO YOHO (Hydrographic bulletin).

H.O. has 1925-1940, 1941 No. 1-10.

Desirable to get: 1923, 1924, 1941, No. 11-12, 1942 on. (Monthly).

d. Japan. Imperial Marine observatory, KOBE. The mean air temperature, cloudiness and sea surface temperatures of the North Pacific Ocean and the neighboring seas for the years.

H.O. has 1916-1938.

Desirable to get: 1939 on.

e. Japan. Imperial Marine observatory, KOBE. Memoirs.

H.O. has Vol. 1, No. 2-4; Vol. 2, No. 1-2 and 4; Vol. 3, No. 2-4; Vol. 4 No. 1-2; Vol. 5, No. 1-4; Vol. 6, No. 2-4; Vol. 7, No. 1-2 (July 1939).

Desirable to get: Vol. 1, No. 1; Vol. 2, No. 3; Vol. 3, No. 1; Vol. 4, No. 3-4; Vol. 6, No. 1; Vol. 7, No. 3-4; Vol. 8 on.

f. Journal of Oceanography. Imperial Marine Observatory, KOBE.

H.O. has Vol. 1-12, No. 2; 1929-1940.

Desirable to get: Vol. 12, No. 3 and 4 and any new ones.

g. Records of oceanographic works in Japan (published by National Research Council of Japan).

H.O. has Vol. 1-4, Vol. 5, No. 1; Vol. 6, No. 2; Vol. 7, No. 2; Vol. 8-12 1928-1941.

Desirable to get: Vol. 5, No. 2; Vol. 6, No. 1; Vol. 7, No. 1; Vol. 13.

4. While H.O. has a few atlas on tides, currents, weather, etc., it is desireable to obtain anything of this nature which may be found.

5. It is desirable to locate the "Bulletin of the Tropical Ind. Institute, PALAU. Vol. 6, 1940 contains an article on coral reefs of Agiguan.

S. E. DODSON
By direction of the
Hydrographer.

ENCLOSURE (E)

COPY OF MEMORANDUM (AND REPLY) REQUESTING CERTAIN MATERIALS PERTAINING TO TERRESTRIAL MAGNETISM AND SEISMOLOGY

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41-MCC

OFFICE MEMORANDUM UNITED STATES GOVERNMENT

TO: Major Glenn Moore, U.S.E.D. Date: 21 September 1945
FROM: Director, U.S. Coast and Geodetic Survey

SUBJECT: Seismological and Magnetic Affairs in Japan

1. In the course of your operations, the interests of this Bureau in subject matters should be borne in mind along the following general lines:

(a) General Policy should be to let all epuipment in established stations remain in operation, as information obtained in Japan will be worth more than if the instruments are shifted and used elsewhere.

(b), (c), (d) omitted.)

(e) Instruments. Following is a list of geophysical instruments which this Bureau would be deeply interested in seeing if surplus instruments are found and if they could be sent here without disrupting actual work in progress in Japan.

1. Field magnetometers, suspended magnet type.
2. Magnetic field balance.
3. Magnetic compasses (except ships compass).
4. Magnetic variometers (suspended magnet type for photographic registration; or knife edge type for photographic registration).
5. Magnetograph recorder, photographic type.
6. Magnetic vertical intensity variometer, horizontal quartz suspension type, for photographic registration.
7. Small nonmagnetic theodolites, similar to Wild or Bamberg (Askanix).
8. Special magnets (samples, with chemical composition and properties, if possible).
9. Any nonmagnetic alloys (hard) such as beryllium-copper (samples).
10. Vibration instruments or equipment used in study of ground, building, or ship vibrations(portable).
11. Seismographic, if of photographic type - portable types.
12. Tilt meters (Ishimoto type).
13. Photographs of any instruments or equipment of special types now in operation (if not surplus).
14. Apparatus for analyzing seismograms, including integrating machines (not reading boards).

(Copy)

L. O. Colbert
Director

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ENCLOSURE (E), continued

ADVANCE ECHELON

28 December 1945

CE 000.93 (28 December 1945) I

TO: The Director, U. S. Coast and Geodetic Survey, Washington, D.C.

SUBJECT: Seismological and Magnetic Affairs of Japan.

1. Reference is made to your office memorandum data 21 September 1945 No. 41-MCC. Lt. Col. R. V. Smith, GSC, Chief, Washington Document Center (ADV) is responsible for the collection of subject data. A representative of the Washington Document Center called upon the Seismological Institute of Tokyo Imperial University. Dr. IMAMURA retired about 10 years ago. The acting head of the Institute, Mr. S. NASU, stated that the Japanese were not yet permitted to communicate with foreign organizations but he did furnish complete files of records available. These are the bulletins of his Institute for the period 1940 to 1944 inclusive. None were issued during 1945. Additional copies are being obtained and forwarded to the Washington Document Center, Washington D.C. for retransmission to the Institutes mentioned in your memorandum.

2. Steps have been taken to obtain seismological records from the following Imperial Universities to be handled similarly to Tokyo University: Kyoto, Sendai, Sapporo, and Hakata.

3. Magnetic records are kept at the Central Observatory, TOKYO. A Dr. FUJIWARA was interviewed there and copies were obtained of Kisho Yoran (Meteorological Review) and Kenshin Jippo (Seismological Journal). The Central Observatory is making up a file of Magnetic Records and they will be sent to the Washington Document Center.

4. Commander Jerry N. Service, USNR, of U. S. Naval Technical Mission to Japan, is temporarily assigned to the Office of the Chief Engineer. Commander Service was formerly with the Coast and Geodetic Survey. He expects to finish his work and go back to the States within the next few weeks, but before he goes will locate for the Office of the Chief Engineer the instruments listed in (e) of your memorandum of 21 September. The Office of the Chief Engineer will then either obtain for you the instruments themselves or photographs of them.

GLENN W. MOORE
Lt. Col., CE