Diag. Cht. No. 4116

Form 504
Rev. Dec. 1933
DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, Director

DESCRIPTIVE REPORT

Topographic }
Hydrographic } *Sheet No.* _____

4833 - 4788
4788A

State _____

LOCALITY

_____

_____

_____

_____

193___

CHIEF OF PARTY

_____

U.S. GOVERNMENT PRINTING OFFICE: 1934

PERMANENT MEMORANDUM CHARGE

In accordance with request of the Chief, Division of
Charts, dated   11/5/30   the Descriptive Report
numbered below was transferred to the ~~confidential~~ files in
the Division of Charts.

Hydrographic No. 4788^{d} and 4833^{d} ~~Addil Wr.~~ (Combined)

Topographic No. _____

Authority filed in folder labeled "Archives Records--
Transfers," lodged in Librarian's private file case.

L-28

PERMANENT MEMORANDUM CHARGE

In accordance with request of the Chief, Division of
Charts, dated NOV. 3, 1931, the Descriptive Report
numbered below was transferred to the ~~confidential~~ files in
the Division of Charts.

Hydrographic No. 4833
Topographic No. _____

Authority filed in folder labeled "Archives Records--
Transfers," lodged in Librarian's private file case.

L-28

PERMANENT MEMORANDUM CHARGE

In accordance with request of the Chief, Division of
Charts, dated   11/5/30   the Descriptive Report
numbered below was transferred to the ~~confidential~~ files in
the Division of Charts.

Hydrographic No. __4833__ Ad.Wk. (Combined with 4788)

Topographic No. _____

Authority filed in folder labeled "Archives Records--
Transfers," lodged in Librarian's private file case.

L-28

4788

Diag. Cht. No. 4116

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE   REPORT

Type of Survey *Hydrographic*

Field No._____ Office No. *4788*

LOCALITY

State *Hawaiian Island*

General locality *East Side of*

Locality *Oahu. Southern*

Part of Kaneohe Bay

1927

CHIEF OF PARTY

E. R. Hand.

LIBRARY & ARCHIVES

DATE _____

8-1870-1 (1)++

4788
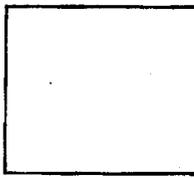
State: Hawaiian Is.

DESCRIPTIVE REPORT

~~Topographic~~
Hydrographic } *Sheet No.* **4788**

LOCALITY

East Side of Oahu

Southern Part of Kaneohe Bay

1927

CHIEF OF PARTY

E.R. Hand

Form 537

REG. NO. 4788

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 21

REGISTER NO. 4788

State ~~Territory of~~ Hawaiian Is.

General locality ~~Northeast Oahu~~ East Side of Oahu

Locality Southern Part of Kaneohe Bay, ~~West End of Mokapu Peninsula to Trig. Sta. POND.~~

Scale 1:5000 Date of survey Aug. 2 - Sept. 8, 19 27

Vessel "Oahu Inshore Hydrographic Survey"

Chief of Party Eoline R. Hand.

Surveyed by " " "

Protracted by " " "

Soundings penciled by " " "

Soundings in ~~fathoms~~ feet

Plane of reference MLLW

Subdivision of wire dragged areas by - - - -

Inked by

Verified by

Instructions dated Jan 10, 1924. , 19

Remarks: ~~The sounding books have already been forwarded, also the tide book; tides were observed## in this (Kaneohe) bay.~~

DESCRIPTIVE REPORT

(H.4788),

To accompany hydrographic sheet No. 21, west end Mokapu Peninsula to triangulation station POND (southeast end Kaneohe Bay) Island of Oahu, Territory of Hawaii. Surveyed August, 1927.   Eoline R.Hand, Chief of Party.

This sheet embraces one third of Kaneohe Bay and, like the preceding sheets, it was executed with the purpose in mind of furnishing information for the defense plans of the Hawaiian Department.

This portion of the bay, once entered, may be regarded in its entirety as "excellent landing". The water is deep - averaging seven fathoms - and the bottom surprisingly flat: and this bottom consists of mud, sand, and dead coral fragments, with the proportion of mud over sand increasing toward the shore. Coral patches, as interesting as they are unusual, are scattered with profusion throughout this water area from which they rise steep sided and symmetrical. The shore too is paralleled with this coral formation and also abrupt-edged, so that were it possible to hold out the sea one walking on the level floor would appear to be in canyons with wide pillars all about.

The edges of both patches and main reef are of live coral (mostly the fine branched variety) while behind in all cases is bright yellow sand, hard and flat. Troops can land on the patches and proceed across them, or can land on the main reef at any point and pass readily to the shore.

A number of inlets will be noticed making into the main reef, and at their heads there is generally no coral shown: these are doubtless caused by small streams of fresh water keeping down the coral growth.

The ocean swell does not at any time make into this portion of the bay, and that is why the coral is found growing as it is. While at the north end of the bay (sheet 23) the swell does make in with the result that both the main reef and patches are of a different character.

Were it possible for large vessels to enter this portion of the bay under discussion and maneuver among the patches they could pass almost anywhere without grounding: but unfortunately steamers cannot enter this harbor without a channel is cut across an extensive fifteen foot flat to the open sea. Though it has been proposed the difficulties attendant upon such a project are regarded at present, I believe, as almost insuperable. But smallboats (Japanese sampans as well as other light sail and motor craft) pass readily between this part of the bay and the open sea, utilizing the one entrance, which is stations "Dim" and "Oct". But in so doing they must pass over the above-mentioned shoal which is untenable in heavy northeast weather, breaking badly. At best they must maintain themselves on close ranges, well known locally. Smallboats cannot come into the bay east of "Oct" though they might safely run on to the coral flat for a short distance north of this station, and passengers might then pass readily across to Mokapu Peninsula. But smallboats may pass easily from this sheet to middle Kaneohe Bay (sheet No. 22) by utilizing any of the passages between station "Dim" and the sharp peninsula to the WSW on which is triangulation station POND.

There is no one prominent landing on this sheet: the Heeia wharf (off "Win") has disappeared: the Kaneohe Yacht Club operates from the wharf at "Pir": many private yachts utilize the wharves off stations "Dan" and "Doc": the wharf shed and viaduct at VENICE trig. station is abandoned.

Tides for this sheet were observed at "Pir" where gauge is indicated. Present symbol used instead of coral as the position of spots and main reefs could be better defined thereby.

DUPLICATE: Original in office Commanding General (G2)
Hawaiian Department.

Eoline R.Hand H&GS.

LIST OF STATISTICS
to accompany hydrographic sheet 21,West end of Makapu Peninsula to Trig.Sta.Pond.
1927   Eoline R.Hand,Chief of Party

Date	Letter	Vol.	Pos.	Sndgs.	Mi.Statue	Vessel
Aug. 2		1	110	387	5.5	Whaleboat
" 3		1	107	401	6.0	"
" 4		1	73	262	4.2	"
" 5		1	89	266	4.3	"
" 5		2	29	46	1.0	"
" 8		2	102	302	5.9	"
" 9		2	105	281	6.1	"
" 10		2	99	284	2.5	"
" 11		2	95	220	4.1	"
" 11		3	27	76	1.0	"
" 12		3	98	276	5.7	"
" 13		3	89	279	4.2	"
" 15		3	98	239	4.6	"
" 16		3	95	207	5.1	"
" 16		4	7	19	1.1	"
" 17		4	92	260	4.6	"
" 18		4	131	241	5.0	"
" 23		4	105	170	4.1	"
" 24		4	101	237	5.0	"
" 25		4	51	128	2.5	"
" 25		5	72	203	3.2	"
" 26		5	97	239	4.6	"
" 29		5	56	149	3.5	"
" 30		5	118	216	5.2	"
" 31		5	76	217	4.7	"
Sept 1		5	62	101	3.0	"
" 1		6	47	98	2.3	"
" 6		6	80	155	3.5	"
" 7		6	92	188	3.4	"
" 8		6	31	61	1.1	"
TOTAL			2434	6208	118.0	

Chief of Party - E.O. Hand
Surveyed & protracted by E.O.H
Inked by J.T.Stessin
Verified by J.T.S.

Hydrographic sheet No.4788, Hawaiian Islands

Notes:

	Recorded	Checked	Revised	Revised per cent of the total number	Remarks
Soundings	6208	6208	215	3.47	
Boat positions	2434	1065	31 (Revised or plotted)	1.27	
Signals			none		

Boat positions coinciding: 15e & 16e; "Ven" & 58b; 54a & 57a; 69a & 41a; 44p & 45a; 19,18 & 20b.

Boat positions rejected: 51 L, 87p, 31o (to be checked)

Doubtful plottings: 66g, 21p, ~~64 & 65p~~, 94p & 95p

Distance for reefs not shown (p.29, vol.6; p.25, vol.6, etc.)

On the sheet there are a number of plotted points with notes "stake," "yellow sign," et cetera, but no data for plotting of these points (✓) can be found in the field records

Boat positions revised or plotted: 46L, 47L, 59w, 49w, 17o, 73o, 87p, 11m, 49 L, 2L, 54e, 56e, 76e, 17e, 4j, 2h, 4h, 66g, 91e, 110h, 44p, 53a, 54a, 55a, 56a, 57a, 54g, 53g, 52g, 51g, 10w

　　Before inking this sheet had a neat appearance; the lettering was legible; reefs shown clearly. A number of boat positions, however, were plotted rather with minimum of care.

Nov. 24, 1928

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in
   6 volumes of sounding records for

    HYDROGRAPHIC SHEET **4766**

Locality: **Northeast Shore of Island of Oahu, T. H.**

Chief of Party: **H. R. Hand in 1927**
Plane of reference is **Mean lower low water, reading**
0.6 ft. on tide staff at **Kaneohe Bay (Kaneohe Yacht Club Pier).**

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.
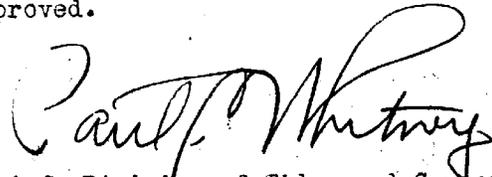
Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

WASHINGTON

SECTION OF FIELD RECORDS

Review of Hydrographic Sheet No. 4788

Southern Part of Kaneohe Bay, Island of Oahu, Hawaii

Surveyed in 1927

Requested by Hawaiian Department, U.S.Army

Chief of Party, E. R. Hand

Surveyed by E. R. H.

Protracted and soundings plotted by E. R. H.

Verified and inked by J. T. Stessin

1. Records - The sounding records conform in general to the re-
   quirements. Some of the notes are rather hard to read due to
   faint writing. The same is true of the boat sheet. The Des-
   criptive Report should have been more complete, especially
   with reference to local marks or aids to navigation.

2. Sounding lines - Most of the sounding was done from the whale-
   boat under oars and with the wind and current. The crossings
   on the few cross lines run are consistent. "No bottom" sound-
   ings are the only ones taken in a small part of the channel be-
   tween the reefs (lat. 21°26 1/2', long.157°47 1/2'); in all
   other places the development is satisfactory. Three of the
   stakes or beacons were transferred from the boat sheet; all the
   others were checked by notes in the sounding records.

3. Depth curves - The usual depth curves have been shown on the
   sheets.

4. Adjacent sheets - The junction with H. 4833 to the northward is
   satisfactory.

   The survey of 1910 (H. 3252) though on a smaller scale, agrees
   in general features. One reef is shown on that sheet that is
   disproved by the 1927 survey. (See comments below by A. L.
   Shalowitz.)

5. **Reason for survey** - The survey was made "with the purpose in mind of furnishing information for the defense plans of the Hawaiian Department" and is adequate for that purpose.

6. **Drafting** - The field drafting was well done.

7. **Additional work** - No additional surveys in the area covered by this sheet are deemed necessary at this time.

8. Reviewed by R. J. Christman, January 1932.

MEMO. BY A. L. SHALOWITZ

1. **Reef shown on 1910 survey (H. 3252)** - This reef is located in lat. 21°26', long. 157°46'.8 and was apparently located by the 1910 party by sextant fixes, as there are about 7 prick points indicated on the smooth sheet similar to those used in plotting the other reefs. A thorough search was made in the 1910 sounding records by Mr. Murray and myself for authority for this reef, but no angles could be found locating it, although locations for all the other reefs in the vicinity were found. Nor was any reference to it found on the adjacent sounding lines. There is no boat sheet covering this area and as far as our records go no boat sheet was ever received. While there is a bare possibility that the positions were recorded in some miscellaneous record and failed to find their way into the sounding records, the fact that the new survey shows 48 and 49 feet directly across the reef, would seem to indicate that it is erroneously indicated on the old survey.

    <u>It is recommended</u> that this reef be omitted from the charts unless it is corroborated by a further investigation. This matter has been referred to the Chief of the Section of Field Work and will be finally disposed of when additional work is done.

2. **General comparison with previous work** - A close comparison has been made with the 1910 survey, H. 3252 and it is found that the new survey shows depths consistently deeper by one to four feet. The Division of Tides was consulted and it was found that the 1910 tidal plane was determined from a very good series of observations, and while the tide staff for the 1927 work was located very close to the old staff, the old bench marks were not recovered. Although the 1927 series of observations were not as rigid as the 1910, since the mean range of the tide is only 1.5 feet any error in the determination of the tidal plane would not explain the differences that are noted between the two surveys.

Another possible source of error that was considered was the
lead line. While no actual comparisons appear in the records
there are notes marked "leadline correct." Hence if we accept
these notations as valid, we must look for still another ex-
planation. The one that suggests itself at the present time is
that there has been a subsidence in this area.

It is recommended that when the reef mentioned in paragraph 1
of this memorandum is investigated, some soundings should also
be taken in the vicinity to verify the depths on the new survey.
We will then at least know what the present condition is and
have a better basis for evaluating possible changes.

3. Note to compiler - The new survey should supersede the old work
within the limits of H. 4788.

Approved:

_____
Chief, Section of Field Records (Charts)

_____
Chief, Section of Field Work (H.andT.)

HYDROGRAPHIC SHEET No. *4788*

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet *2434* .

Number of positions checked *1065* .

Number of positions revised *31* . . .

Number of soundings recorded . *6208* .

Number of soundings revised *215* . .

Number of signals erroneously

plotted or transferred . . *None* .

Date: *March 21, 1929*

Cartographer: *John F. Stewart*

4833

Diag. Cht. No 4116

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, *Director*

State: Hawaiian Is.

DESCRIPTIVE REPORT

Topographic
Hydrographic } Sheet No. 4833
Field #22   4833 (Add'l. Wk.) (Filed with H 4788?)

LOCALITY

East Coast of Oahu

Kaneohe Bay, North to Waiahole

1927

CHIEF OF PARTY

F. Rodland

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET
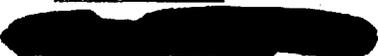
The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 22

REGISTER NO. 4833

State Hawaiian Is.

General locality East Coast of Oahu

Locality Kaneohe Bay, north to Waiahole

Scale 5000 Date of survey Sept - Nov. , 1927

Vessel

Chief of Party E. R. Hand

Surveyed by

Protracted by Army Engineers

Soundings penciled by "   "

Soundings in ~~fathoms~~ feet

Plane of reference

Subdivision of wire dragged areas by

Inked by G. H. Streeter

Verified by G. H. S.

Instructions dated , 192

Remarks:

GPO

May 3, 1929.

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in
5   volumes of sounding records for

HYDROGRAPHIC SHEET   **4853**

Locality: **Makapuu Pt. to Waimanalo, E. Coast of Oahu I., T. H.**

Chief of Party: **E. B. Hand in 1927.**
Plane of reference is   mean lower low water, reading
*3.5   ft. on tide staff at   Honolulu
ft. below B. M.
XXXXXXXXXXXXXX

*With range allowance for tide at Kailua Bay.

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted!
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

Chief, Division of Tides and Currents.

HYDROGRAPHIC SHEET No. 4833

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet   1758

Number of positions checked   1154

Number of positions revised   496

Number of soundings recorded   5924

Number of soundings revised   1611

Number of signals erroneously

plotted or transferred   4

Date:... April 15, 1931 ....

Cartographer:.... G. H. Streeter ....

Report on H-4833
Chief of Party C. R. Hand
Protracted by Army Engineers
Verified and Inked by G. H. Streeter

Surveyed by C. R. Hand
Soundings plotted by Army Engineers
Topography inked by Army Engineers

1. Changes in speed was not always recorded.
   The required list of signals was not prepared and the position numbers were written too close to the position, in many cases obscuring the position number when the sounding was inked in.
   The soundings were put in, fairly heavy, with a hard pencil making the necessary erasing difficult.

2. 3. 4. This is an Army Engineer survey.

5. The usual depth curves can be drawn.

6. Station "Pans" was not plotted on the smooth sheet.

7. It was necessary for the office draftsman to extend the projection and mark the latitude and longitude.
   The projection, which was incompletely drawn, is entirely too heavy.
   Topo. Station "Pan" is plotted but crossed out on the boat sheet and "Pans" is used. "Pans" was not plotted on the smooth sheet and all plottings from that station were protracted from "Pan". "Pans" was plotted, by the office draftsman, from T-4383 and the protracting corrected accordingly.
   Topo. stations "Ram" and "Dim" are not plotted on any topographic sheets covering this

Territory (T-4353, 4381, 4382) and the smooth sheet does not conform with the boat sheet positions. The smooth sheet plotting of topo. station "Oct" does not agree with T-4382 nor the boat sheet. These three stations "Dim", "Oct" and "Ram" were moved to agree with H-4788 and protracting corrected accordingly. The original position of:

"Dim" is 58.5 meters north, 19°22' east of the present location
"Oct" is 60   "   "   15°05' "   "   "   "   "   "
"Ram" is 100   "   "   35°59' "   "   "   "   "   "

Protracting from these original positions placed the soundings in erroneous positions.

8. The junction with adjacent sheets is satisfactory with the exception of two four-feet soundings falling about 190 meters north-east of "Dim" - of the coral reef. These boat sheet positions (H-4788) would would agree with this sheet.

~~9. There is an Army Engineer survey the development is considered satisfactory.~~

10. Stations "Dim" "Oct" and "Ram" are probably not in their exact positions for the protracting does not coincide exactly as it should. The boat sheet position of these stations were used but disregarded as the protracted positions were erroneous.

11. (a) On an Army Engineer survey the character and scope of the surveying is considered satisfactory.
    (b) The field drafting is poor.

Respectfully submitted,

April 15, 1931

g. H. Streeter.

Section of Field Records

Report on additional Work on H-4833   Surveyed in 1933
Chief of Party   H. A. Paton   Surveyed by H. A. Paton
Protracted by R. E. De Ment   Soundings plotted by R.E.D.
Verified and inked by G. H. Streeter

The soundings in blue, just East of Haiakok, are
plotted from volume 1 of H-4833ᵃ, 1 to 38 b.
The boat sheet work for these soundings are
plotted in black on H-4833ᵃ.

A recorded 30 second interval immediately preceding
33 b is plotted as 10 seconds. This change
agrees with the boat sheet work and also with
the previous survey of 1927. The soundings in
blue check quite well with the soundings in black.

The remainder of Paton's 1933 work in this
vicinity is plotted in black on H-4833ᵃ
                                    Replotted on + 4833

                    Respectfully submitted,
                    Gaylord H. Streeter

Sept. 20, 1933

Section of Field Records
Review of Hydrographic Sheet No. 4833.
Kaneohe Bay, North to Waiahole, Island of Oahu, Hawaii
Surveyed Sept. - Nov. 1927
Requested by Hawaiian Department, U. S. Army.

Chief of Party - E. R. Hand.
Surveyed by - E. R. Hand.
Protracted and soundings plotted by - Army Engineers.
Verified and inked by - G. H. Streeter.

1. Records.

The sounding records in general conform to the requirements. More extended notes in the "Remark" column to assist in the plotting are desirable. No separate Descriptive Report was furnished for this sheet. The Report for Hydrographic sheet 4788 should be consulted for general information in this vicinity.

2. Sounding lines.

The sounding was done from the whaleboat under oars, most of the lines being run in one direction, with the wind and current, the whaleboat proceeding to the beginning of the line with the motor. The lines are well spaced; any change from the intended direction being noted in the records. The lines 20u to 26u, and 37u to 39u were replotted by using Θ Uha instead of Θ Ahu for right signal in several positions in order to adjust them to other hydrography in the locality. Although no description of these two signals was found it was assumed that accidental errors in observation were made in these positions.

3. Depth curves.

The usual depth curves are shown. Inside the bay the reefs are fringed with live coral and the 30 foot and 18 foot curves are very close to the edge of the reef almost awash.

4. Adjacent sheets, etc.

The junction with H. 4834 to the northward is not entirely satisfactory. A few more lines should have been run to better define some of the depth curves. The junction with H. 4788 to the southward is satisfactory, see par. 2 this report for explanation of adjustment. The survey of 1910 is on a much smaller scale (H. 3252, scale 1-20,000) but agrees closely in the main features. For the area covered the 1927 survey should be given preference.

5. Reason for survey.

The survey was made "with the purpose in mind of furnishing information for the defense plans of the Hawaiian Department" and seem to be adequate for that purpose.

6. Drafting.

The field plotting was done by Army Engineers.

H. 4833 - 2

The verifier corrected the plotting of several signals and replotted the sounding lines depending on them. A very few errors in plotting of soundings were discovered by the reviewer. The beacons shown on the sheet are not official beacons. They are placed and maintained by local interests to mark the edge of the reefs.

7. No additional work in this area is deemed necessary. (See memo. by A.L.S.).

8. Reviewed by - R. J. Christman.

Memorandum by A. L. Shalowitz.

As systematic differences have been found between this survey and H. 3252 surveyed in 1910, a boat sheet has been prepared with numerous sounding lines transferred and the sheet referred to the party now engaged in completing the surveys around Oahu I. for verification. As it is possible that a constant correction may have to be applied to the soundings on the new survey, the sheet cannot be finally disposed of at this time. *See review of H-4833* *Additional* *(Filed with H.4788a)* *Work of 1933*

Sheet Inspected by - A. L. S. - June 1933.

C H Green   Examined and approved   *Colbert*

Chief, Section of Field Records.   Chief, Division of Charts.

B Borden   *Hude*
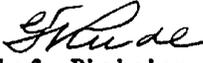
Chief, Section of Field Work.   Chief, Division of H. & T.

4788a.━4833

4788
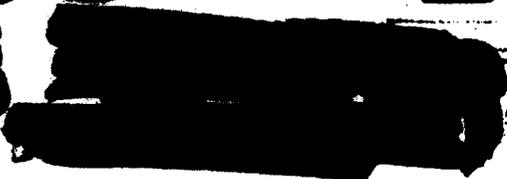
4833

4788a━4

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4788

4788

Diag. Cat. No 4116

DER
10-6-98

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE   REPORT

Type of Survey *Hydrographic*

Field No. .... Office No. *4788 A*
4833 A

LOCALITY

State *Hawaiian Island*

General locality *Northern*

Locality *Coast of Oahu*

Island. Kaneohe Bay.

1933

CHIEF OF PARTY

Hubert A. Paton

LIBRARY & ARCHIVES

DATE ....

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

R. S. Patton, *Director*

State: Hawaii

DESCRIPTIVE REPORT

Topographic | Sheet No. 4788 & 4833
Hydrographic | 4788ª 4833ª

LOCALITY 4788

Northeast Coast of Oahu Island

Kaneohe Bay

19 33

CHIEF OF PARTY

Hubert A. Paton

U. S. GOVERNMENT PRINTING OFFICE 1931

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. __21__

to accompany
REGISTER NO. 4788   4788ª

State .... Hawaiian Is.

General locality .... East Coast of Oahu

Locality .... Southern Portion of Kaneohe Bay   *PART*

Scale 1:5000 ....   Date of survey July ...., 19 33

Party ~~Vessel~~ Inshore Hydrographic Survey of Oahu

Chief of Party .... Lieut. Hubert A. Paton

Surveyed by .... Sgt. S. D. Jones and H. A. P.

Protracted by .... "   .... "

Soundings penciled by ....

Soundings in ~~fathoms~~ feet

Plane of reference .... Mean Lower Low Water

Subdivision of wire dragged areas by ....

Inked by ....

Verified by ... Warren H. Bamford.

Instructions dated ...., 19 ....

Remarks: Surveyed in cooperation with the U. S. Army

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. __22__ (to accompany H-4833)

REGISTER NO. 4833a

State .... Hawaiian Is.

General locality .... East Coast of Oahu

Locality .... Central Portion of Kaneohe Bay

Scale 1:5000 .... Date of survey June-July ...., 19 33

Party
~~Vessel~~ ...... Inshore Hydrographic Survey of Oahu

Chief of Party ... Hubert A. Paton

Surveyed by ...... Hubert A. Paton

Protracted by ....

Soundings penciled by ....

Soundings in ~~fathoms~~ feet

Plane of reference Mean Lower Low Water

Subdivision of wire dragged areas by ....

Inked by ....

Verified by ... Warren H Bamford

Instructions dated ...., 19 ....

Remarks: Surveyed in cooperation with the U. S. Army

DESCRIPTIVE REPORT

To Accompany

~~Boat Sheet~~ #H-4833ª & 4788ª

INSTRUCTIONS:

The work on this sheet was done in accordance with the instructions penciled on the sheets.

METHODS:

On sheet 4788 a considerable number of old signals were recovered. It was necessary to transfer only Signal LAY from Topographic Sheet "T" on Mokapu Peninsular.

The shore line of Mokuoloe Island was located by means of sextant fixes.

On sheet 4833 it was necessary to build and locate Signals Wag, Clif, and Pier. These were located by means of sextant angles and plotted with a protractor. Later the stations were computed and the geographic positions obtained. The final positions check the first locations quite closely. All computations are enclosed with this report.

·DISCREPANCIES:

SHEET 4833 ª

The 26 foot sounding shown at Latitude 21°27'.6, Longitude 157°49'.2 could not be found and it is recommended that it be rejected. It will be noted that in this area that the soundings check one line of the 1927 survey and appear to be about two feet less than the other lines. *The 26 ft sdg is considered disproved, It was found to have been plotted in an incorrect position on H-3252 (1910)*

In the area east of signal Clif the depths were found to be from one to two feet less than the 1927 survey and one to two feet more than the 1910 survey. This area has a mud and soft sand bottom. The area is protected, and accurate soundings could be obtained.

In the area east of Longitude 157°48' (Heeia Entrance) some of the work desired had been done previously by this survey party. See sheets 20 and 24.

These sheets are being forwarded to the office. Conditions for accurate work in this area are not favorable at this time of the year. A moderate easterly breeze prevails which produces four foot waves over the portion shown.

On account of this it was not possible to develope the area as thoroughly as desired.

If the present work is not sufficient, it will be possible for this party to do some additional developing this fall when conditions will be more favorable.

A new shoal of 4 foot depth was found in Latitude 21°27'.9, Longitude 157°47'.7. This is verified by a 5 foot sounding on the adjacent line.

A discrepancy with the 1927 survey in Latitude 21°28', Longitude 157°47'.5. of eight feet was found. Additional work here could not be done on account of rough seas. *4ft. sdg of 1927 survey retained, other soundings in agreement R.P.J*

A few of the shoal soundings in the 1910 survey were checked to within one or two feet. These were all found to be in coral bottom. However the 4 foot spot in Latitude 21°27'.4, Longitude 157°47'.5 could not be found and it is recommended that it be rejected. *4ft sdg. rejected. See par 2 b 2 of review R.P.J*

All the shoaler soundings in the vicinity of Latitude 21°27'.8, Longitude 157°47'.2 could not be found. It is believed that this area is subject to change on account of its exposure to the sea. Storms pile up new ridges of sand and remove the older ones. It is believed the work of 1927 is correct in this area and it is recommended the soundings taken in 1910 be rejected.

SHEET 4788ᵃ

The depths in all three areas were found to be about one foot less than the 1927 survey and one to two feet deeper than the 1910 survey.

The shoal shown on the 1910 sheet in Latitude 21°26', Longitude 157° 46'.9 does not exists. This was proven both by soundings and by viewing the bay from the surrounding mountains. The shoals are all plainly visible at all stages of the tide and no shoal in this area could escape notice. It is recommended that it be removed from the charts.

The sounding on Position 55"&" and one proceeding it, fail to check the work of 1927 by eight to ten feet. It is recommended that additional work be done in this area. *May be irregularities in bottom. Not considered sufficiently important for additional work. a.r.s.*

Respectfully submitted,

HUBERT A. PATON
Lieut. U.S.C.&C.S.

STATISTICS

To Accompany

Sheets 4833 & 4788

	Sheet #4833		Sheet#4788
Statute miles of sounding line -------------:	28	:	11.7
Number of soundings -------------:	1772	:	429
Number of positions -------------:	348	:	111

Note:

These computations have been checked
by myself, only.   Please have them
given an independent check.

                          HAP

LIST OF DIRECTIONS

Station __Waiahole__   State __Hawaii__

Chief of party __H. A. Paton__   Date __June 29, 1933__   Computed by __H.A.Paton__

Observer __HAP__   Instrument __Sextant #650__   Checked by _____

OBSERVED STATION	Observed direction	Eccentric reduction	Direction corrected for eccentricity	Sea level reduction *	Corrected direction with zero initial *.	Adjusted direction*
	° ′ ″	′ ″	′ ″	″	″	′ ″
Pyramid Rock	00 00					
Wag	10 49					
Clif	30 13					
Pier	45 00					
Hawaiiloa Hill	8 42					
Kapapa	(348 13)					

*The last three columns to the right are for office use and should be left blank in the field.   11—9503

Station: Ken State: Maryland

Chief of party: C. V. H. Date: 1917 Computed by: O. P. S.

Observer: C. V. H. Instrument: No. 168 Checked by: W. F. R.

OBSERVED STATION	Observed direction			Eccentric reduction		Direction corrected for eccentricity		Sea level reduction	Corrected direction with zero initial	Adjusted direction
	°	′	″	′	″	′	″	″	″	′ ″
Chevy	0	00	00.00	−	7.31	59	52.69			
Tank west of △ Dulce	29	03	37.0	−1	09.8	02	27.2			
Ken (center), 3.469 meters	176	42						(These	three colu	mns are for
Forest Glen standpipe	313	24	53.0	+3	01.2	27	54.2	office use	only.)	
Home	326	31	30.21	+	31.93	32	02.14			
Bureau of Standards, wireless pole	352	17	20.8	+	5.7	17	26.5			
Reno	357	28	48.63	−	1.16	28	47.47			
Reference mark, 16.32 m	358	31	20							

Ken eccentric

To Home ——○ 3.469m △ Ken 179° 56′
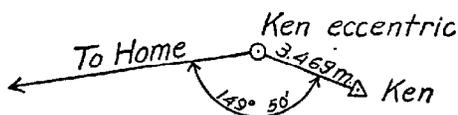
This form, with the first four columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon. 11—9503

LIST OF DIRECTIONS

Station __Pond__   State ___Hawaii___

Chief of party ____H.A.Paton____   Date ___June 22, 1933___   Computed by ___HAP___

Observer _____HAP_____   Instrument _Sextant #650_   Checked by _____

OBSERVED STATION	Observed direction	Eccentric reduction	Direction corrected for eccentricity	Sea level reduction°	Corrected direction with zero initial°.	Adjusted direction°
	° ′ ″	′ ″	′ ″	″	″	′ ″
Kapapa	00 00					
Wag	343 46					

*The last three columns to the right are for office use and should be left blank in the field.   11—9503

LIST OF DIRECTIONS

Station __Cliff__   State __Hawaii__

Chief of party __H. A. Paton__   Date __June 27, 1933__   Computed by __HAP__

Observer _____HAP_____   Instrument __Sextant #650__   Checked by _____

OBSERVED STATION	Observed direction			Eccentric reduction		Direction corrected for eccentricity		Sea level reduction*	Corrected direction with zero initial*	Adjusted direction*	
	°	′	″	′	″	′	″	″	″	′	″
Kapapa	00	00									
Wag	1	04									
Pyramid Rock	45	17									
Hi	245	50									
Waiahole	274	27									

*The last three columns to the right are for office use and should be left blank in the field.   11—9503

LIST OF DIRECTIONS

Station __Wag__   State __Hawaii__

Chief of party __H. A. Paton__   Date __June 26, 1933__   Computed by __HAP__

Observer __HAP__   Instrument __Sextant #650__   Checked by _____

OBSERVED STATION	Observed direction			Eccentric reduction		Direction corrected for eccentricity		Sea level reduction*	Corrected direction with zero initial*.	Adjusted direction*	
	°	′	″	′	″	′	″	″	″	′	″
Kapapa	00	00									
Pond	142	14			•						
Waiahole	255	52									
White Church	238	43									
(Kahaluu M.E.Church)											

*The last three columns to the right are for office use and should be left blank in the field.   11—9503

LIST OF DIRECTIONS

Station Pier   *State* Hawaii

Chief of party H. A. Paton   *Date* June 27, 1933   *Computed by* HAP

Observer HAP   *Instrument* Sextant #650   *Checked by*

OBSERVED STATION	Observed direction	Eccentric reduction	Direction corrected for eccentricity	Sea level reduction*	Corrected direction with zero initial*.	Adjusted direction*
	° ′ ″	′ ″	′ ″	′ ″	″	″	′ ″
Waiahole	00 00					
Wag	124 13					
Clif	153 13					
Kahaluu, M.E. Ch.	278 56					

*The last three columns to the right are for office use and should be left blank in the field.

11—9503

INVERSE POSITION COMPUTATION

$$s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2}\right) = \frac{\Delta\lambda_1 \cos \phi_m}{A_m}$$

$$s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2}\right) = \frac{-\Delta\phi_1 \cos \frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha = \Delta\lambda \sin \phi_m \sec \frac{\Delta\phi}{2} + F(\Delta\lambda)^3$$

in which $\log \Delta\lambda_1 = \log (\lambda' - \lambda) -$ correction for arc to sin*; $\log \Delta\phi_1 = \log (\phi' - \phi) -$ correction for arc to sin*; and $\log s = \log s_1 +$ correction for arc to sin*.

NAME OF STATION

		°	′	″			°	′	″
1.	ϕ	21	28	43.64	Waiahole 1926	λ	157	50	43.98
2.	ϕ'	21	28	47.69	Kapapa 1926	λ'	157	48	07.15
$\Delta\phi\ (=\phi'-\phi)$				4.05	$\Delta\lambda\ (=\lambda'-\lambda)$			− 2	− 36.83
$\frac{\Delta\phi}{2}$				2.02	$\frac{\Delta\lambda}{2}$			− 1	− 18.42
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$		21	28	45.66					
$\Delta\phi$ (secs.)				″4.05	$\Delta\lambda$ (secs.)				−156.83

log $\Delta\phi$	0.607 455	**log** $\Delta\lambda$	2.195429 n	
cor. arc − sin	−	cor. arc − sin	−	
log $\Delta\phi_1$		log $\Delta\lambda_1$		
log cos $\frac{\Delta\lambda}{2}$		log cos ϕ_m	9.968739	
colog B_m	1.487 914	**colog** A_m	1.490471	
$\log\left\{s_1 \cos \left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.095 369	$\log\left\{s_1 \sin \left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.654639 n	
(opposite in sign to $\Delta\phi$)		$\log\left\{s_1 \cos \left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.095369 n	
log $\Delta\lambda$	2.195 429 n	$\log \tan \left(\alpha+\frac{\Delta\alpha}{2}\right)$	1.559 270	
log sin ϕ_m	9.563 678	$\alpha+\frac{\Delta\alpha}{2}$	268° 25′ 10.88″	
log sec $\frac{\Delta\phi}{2}$		$\log \sin \left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.999835 n	
log a	1.759 107 n	$\log \cos \left(\alpha+\frac{\Delta\alpha}{2}\right)$	8.440556 n	
a	−57.42	**log** s_1	3.654804	
b		cor. arc − sin	+	
$-\Delta\alpha$ (**secs.**)	−57.42″	log s	3.654804	
$-\frac{\Delta\alpha}{2}$	−28.71″		4516.5	
	28.71″			

Table in middle column (3 log Δλ / log F / log b):

3 log Δλ	
log F	
log b	

	°	′	″
$\alpha+\frac{\Delta\alpha}{2}$	268	25	10.88
α (**1 to 2**)	268	24	42.17
$\overline{\Delta\alpha}$			57.42
	180		
α' (**2 to 1**)	88	25	− 39.59

* Use the table on the back of this form for correction of arc to sin.

NOTE.—For log s up to 4.52 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 10′, omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 6 decimal places.   11—9810

Table of arc-sin corrections for inverse position computations

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
4.177	1	2.686	5.223	124	3.732	5.525	497	4.034
4.327	2	2.836	5.234	130	3.743	5.530	508	4.039
4.415	3	2.924	5.243	136	3.752	5.534	519	4.043
4.478	4	2.987	5.253	142	3.762	5.539	530	4.048
4.526	5	3.035	5.260	147	3.769	5.543	541	4.052
4.566	6	3.075	5.269	153	3.778	5.548	553	4.057
4.599	7	3.108	5.279	160	3.788	5.553	565	4.062
4.628	8	3.137	5.287	166	3.796	5.557	577	4.066
4.654	9	3.163	5.294	172	3.803	5.561	588	4.070
4.677	10	3.186	5.303	179	3.812	5.566	600	4.075
4.697	11	3.206	5.311	186	3.820	5.570	613	4.079
4.716	12	3.225	5.318	192	3.827	5.575	625	4.084
4.734	13	3.243	5.326	199	3.835	5.579	637	4.088
4.750	14	3.259	5.334	206	3.843	5.583	650	4.092
4.765	15	3.274	5.341	213	3.850	5.587	663	4.096
4.779	16	3.288	5.349	221	3.858	5.591	674	4.100
4.792	17	3.301	5.356	228	3.865	5.595	687	4.104
4.804	18	3.313	5.363	236	3.872	5.600	702	4.109
4.827	20	3.336	5.369	243	3.878	5.604	716	4.113
4.857	23	3.366	5.376	251	3.885	5.608	729	4.117
4.876	25	3.385	5.383	259	3.892	5.612	743	4.121
4.892	27	3.401	5.390	267	3.899	5.616	757	4.125
4.915	30	3.424	5.396	275	3.905	5.620	771	4.129
4.936	33	3.445	5.403	284	3.912	5.624	785	4.133
4.955	36	3.464	5.409	292	3.918	5.628	800	4.137
4.972	39	3.481	5.415	300	3.924	5.632	814	4.141
4.988	42	3.497	5.422	309	3.931	5.636	829	4.145
5.003	45	3.512	5.428	318	3.937	5.640	845	4.149
5.017	48	3.526	5.434	327	3.943	5.644	861	4.153
5.035	52	3.544	5.440	336	3.949	5.648	877	4.157
5.051	56	3.560	5.446	345	3.955	5.652	893	4.161
5.062	59	3.571	5.451	354	3.960	5.656	909	4.165
5.076	63	3.585	5.457	364	3.966	5.660	925	4.169
5.090	67	3.599	5.462	373	3.971	5.663	941	4.172
5.102	71	3.611	5.468	383	3.977	5.667	957	4.176
5.114	75	3.623	5.473	392	3.982	5.671	973	4.180
5.128	80	3.637	5.479	402	3.988	5.674	989	4.183
5.139	84	3.648	5.484	412	3.993	5.678	1005	4.187
5.151	89	3.660	5.489	422	3.998			
5.163	94	3.672	5.495	433	4.004			
5.172	98	3.681	5.500	443	4.009			
5.183	103	3.692	5.505	453	4.014			
5.193	108	3.702	5.510	464	4.019			
5.205	114	3.714	5.515	474	4.024			
5.214	119	3.723	5.520	486	4.029			

11—9810

INVERSE POSITION COMPUTATION

$$s_l \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_l \cos\phi_m}{A_m}$$

$$s_l \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_l \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which log $\Delta\lambda_l$=log $(\lambda'-\lambda)$—correction for arc to sin*; log $\Delta\phi_l$=log $(\phi'-\phi)$—correction for arc to sin*; and log s_l=log s_l+

correction for arc to sin*.

NAME OF STATION

	°	′	″			°	′	″
1. ϕ	21	28	-47.693	Kapapa I.1926	λ	157	-48	- 07.151
2. ϕ'	21	26	-43.391	Pond 1926	λ'	157	-48	- 39.334
$\Delta\phi$ $(=\phi'-\phi)$		- 2	-04.302		$\Delta\lambda$ $(=\lambda'-\lambda)$			32.183
$\frac{\Delta\phi}{2}$		- 1-	02.151		$\frac{\Delta\lambda}{2}$			16.092
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	21	27-	45.542					
$\Delta\phi$ (secs.)		- 124.302″			$\Delta\lambda$ (secs.)			32.183″

log $\Delta\phi$	2.094 478 n			**log** $\Delta\lambda$	1.507 626		
cor. arc—sin	−			cor. arc—sin	−		
log $\Delta\phi_l$				log $\Delta\lambda_l$			
log cos $\frac{\Delta\lambda}{2}$				log cos ϕ_m	9.968 789		
colog B_m	1.487 914			**colog** A_m	1.490 470		
log$\left\{s_l \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.582 392	(opposite in sign to $\Delta\phi$)		**log**$\left\{s_l \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	2.966 885		
				log$\left\{s_l \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)\right\}$	3.582 392		
log $\Delta\lambda$	1.507 626	3 log $\Delta\lambda$		**log tan**$\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.384 493		
log sin ϕ_m	9.563 356	log F		$\alpha+\frac{\Delta\alpha}{2}$	13° 37′ 28.2″		
log sec $\frac{\Delta\phi}{2}$		log b		**log sin**$\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.372 097		
log a	1.070 982			**log cos**$\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.987 604		
a	11.776			**log** s_l	3.594 788		
b				cor. arc—sin	+		
$-\Delta\alpha$ **(secs.)**		11.8″		log s	3.594 788		
$-\frac{\Delta\alpha}{2}$		5.9		s	3,933.6		
		5.9″					
$\alpha+\frac{\Delta\alpha}{2}$	13°	37′	28.2″				
α **(1 to 2)**	13	37	34.1				
$\Delta\alpha$			-11.8				
	180						
α' **(2 to 1)**	193	37	22.3				

*Use the table on the back of this form for correction of arc to sin.

NOTE.—For log s up to 4.52 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 10′, omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 6 decimal places.

State: Hawaii

11—9121

	NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
		2-3						3.654 804
		1 Wag	104-08					0.013 349
		2 Waiahole	(22-36)					9 584 665
		3 kapapa	53-16					9 903 864
		1-3					1789.9	3 252 818
		1-2					3732.7	3 572 017
		2-3						3 572 017
		1 Clif	86.37					0.00 745
		2 Waiahole	19.24					9.521 349
		3 Wag	(73.59)					9.982 805
		1-3					1242.0	3.094 111
		1-2					35 93.9	3.555 567
		2-3						3.654 804
		1 Clif	85.33					0.001 311
		2 Waiahole	42.00					9.825 511
		3 Kapapa	(52.27)					9.899 176
		1-3					3031.3	3.481 626
		1-2					3591.6	3.5552291
		2-3						3.594 788
		1 Wag	142.14					0.212 931
		2 Kapapa	(21.32)					9.564 716
		3 Pond	16.14					9.446 459
		1-3					2357.4	3.372 435
		1-2					1795.5	3.254 178

Do not write in this margin

State: Hawaii

	NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
		2-3						3 572 .017
		1 Pier	124-13					0.082 538
		2 Waiahole	34-11					9.749 615
		3 Wag	(21-36)					9.565 995
		1-3					2536.1	3.404 170
		1-2					1661.7	3. 220 550
		2-3						3.094 111
		1 Pier	29-00					0.314 429
		2 Wag	(52 23)					9.898 787
		3 Clif	98-37					9.995 070
		1-3					2029.2	3.307 327
		1-2					2532.9	3.403 611
		2-3						
		1						
		2						
		3						
		1-3						
		1-2						
		2-3						
		1						
		2						
		3						
		1-3						
		1-2						

Do not write in this margin

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

			°	′	″				°	′	″
α	2	to 3	268	24	42	α	3	to 2	88	25	40
2d ∠		&	+ 22	36		8d ∠		&	− 53	16	
α	2	to 1	291	01		α	3	to 1	35	10	
Δα					+ 44	Δα					
α′	1	to 2	180	02	00.0	α′	1	to 8	180	00	00.0
			111	02					215	10	
φ	21	28	43.64	2	Waiohole	λ	157	50	43.98	φ	21	28	47.69	3	Kapapa	λ	157	48	07.15
Δφ	−	43.53		ΔΛ	2	01.02	Δφ		47.58		ΔΛ		35.81
φ′	21	28	00.11	1 Wag	χ′	157	48	42.96	φ′	21	28	00.11	1 Wag	χ′	157	48	42.96

FIRST ANGLE OF TRIANGLE   104   08

	Logarithms	Values in seconds			Logarithms	Values in seconds
s	3.572017	3.38	s	3.252 818	
Cos α	9.554 658	1841.91	Cos α	9.912 477	
B	8.512 085		B	8.512 085	
h	1.638 760	43.53	h	1.677 380	47.58
s²			s²		
Sin² α			Sin² α		
C			C		
h³			h³		
D			D		
		−Δφ				−Δφ

½(φ+φ′)	21 − 28 − 20		½(φ+φ′)	21 − 28 − 23
	Logarithms	Values in seconds		Logarithms	Values in seconds
s	3.572 017	1256.9	s	3.252 818	
Sin α	9.970 103 n	490.6	Sin α	9.760 390	
A′	8.509 530		A′	8.509 530	
Sec φ′	0.031 223		Sec φ′	0.031 223	
ΔΛ	2.082 873 n	121.02	ΔΛ	1.553 961	35.81
Sin½(φ+φ′)	9.5634		Sin½(φ+φ′)	9.5634	
−Δα	1.6462 n	− 44	−Δα	1.1321	

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

First computation

		°	′	″
α	2	to 3	291	01	
2d ∠		&	+19	24	
α	2	to 1	310	25	
Δα				+	34
α′	1	to 2	130	26	00.0
		180	00	00.0	
		86	37	

First Angle of Triangle 21 28 05

φ	21	28	43.64	2 Waiahole
Δφ		−1	15.76	
φ′	21	27	27.881 Cliff

	λ	157	50	43.98
ΔΛ		−1	35.03
λ′	157	49	08.95

s	Logarithms	Values in seconds
s	3.555 567	857.4
		987.8
Cos α	9.811 804	
B	8.512 085	
h	1.879 456 1st term 75.76
		−Δφ +
		½(φ+φ′) 21 28 05
		Logarithms	Values in seconds
s	3.555 567	257.7
Cos α		1469.7
B	8.512 085	
h	1.508 259 1st term 32.23
Sin α	9.881 584n	
A′	8.509 530	
Sec φ′	0.031 196	
ΔΛ	1.977 877n −95.03
Sin ½(φ+φ′)	9.563	
2d term + −Δα	1.540 −34
3d term + −Δφ	

		°	′	″
α	3	to 2	111	02	
2d ∠		&	− 73	59	
α	3	to 1	37	03	
Δα					
α′	1	to 3	217	03	
		180	00	00.0	

φ	21	28	00.11	3 Wag
Δφ			32.25	
φ′	21	27	27.88 1 Cliff

	λ	157	48	42.96
ΔΛ			25.99
λ′	157	49	08.95

s	Logarithms	Values in seconds
s	3.094 111	
Cos α	9.902 063	
B	8.512 085	
h	1.508 259 1st term 32.23
		−Δφ +
		½(φ+φ′) 21 − 27 − 44
		Logarithms	Values in seconds
s	3.094 111	
Sin α	9 779 965	
A′	8.509 530	
Sec φ′	0.031196	
ΔΛ	1.414 802 25.99
Sin ½(φ+φ′)	9.563	
2d term + −Δα	0.980
3d term + −Δφ	

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

Station 1

	°	'	"
α 2 to 3	291	01	
2d L &			
α 2 to 1	325	12	
Δα			
α			
a' 1 to 2	145	12	
	180	00	00.0
a'			

FIRST ANGLE OF TRIANGLE 124° 13'

	°	'	"			°	'	"
φ	21	28	43.64	2 Waiahole	λ	157	50	43.98
Δφ			44.37		Δλ			32.94
φ'	21	27	59.27	1 Pier	λ'	157	50	11.04

	Logarithms	Values in seconds		½(φ+φ')	
s	3.220 550	1822.8			
Cos α	9.914 432	22.5			
B	8.512 085				
h	1.647 057	1st term	44.37		
s²				Sin α	9.756 418
Sin²α				A'	8.509 530
C	2d term	+		Sec φ'	
				ΔΛ	0.031225
		−Δα		Sin ½(φ+φ')	1.517721
h²					−32.94
D	3d term	+			
	−Δφ				

λ Logarithms 3.220 550   Values in seconds 317.8   1409.6

Station (Wag)

	°	'	"
α 3 to 2	111	02	
3d L &	21	36	
α 3 to 1	89	26	
Δα			
α			
a' 1 to 3	269	25	
	180	00	00.0
a' −1			

	°	'	"			°	'	"
φ	21	28	00.11	3 Wag	λ	157	48	42.96
Δφ			.82		Δλ			28.09
φ'	21	27	59.29	1 Pier	λ'	157	48	11.05

	Logarithms	Values in seconds		½(φ+φ')	
s	3.404 170			21–28	
Cos α	7.995 198				
B	8.512 085				
h	9911 453	1st term	0.82		
s²				Sin α	9.999 979
Sin²α				A'	8.509 530
C	2d term	+		Sec φ'	
				ΔΛ	1.944902
		−Δα		Sin ½(φ+φ')	9.968
h²					88.09
D	3d term	+			
	−Δφ				

λ Logarithms 3.404 170   Values in seconds   1.910   81

GEOGRAPHIC POSITIONS

Locality __Kaneohe Bay, Oahu__   Datum __1930   Standard__   Accession No. of Computation: _____   State __Ter. of Hawaii__

STATION	LATITUDE AND LONGITUDE	SECONDS IN METERS	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE		
	° ′ ″		° ′ ″	° ′ ″		LOGARITHM (METERS)	METERS	FEET
Waiahole , 1926 M.D.	21 28 43.64							
	157 50 43.98							
Kapapa I , 1926 N.M	21 28- 47.69		88- 25 - 39.6	268-24-42.2	Waiahole	3.654 808	4516.5	
	157 - 48- 07.15							
Wag. 1926 N.M.N.D	21- 28 -00.11	3.4	111- 02	291 -01	Waiahole	3.572 017	3732.7	
	157- 48- 42.96	1236.9	215- 10	35- 10	Kapapa I	3.252 818	1789.9	
Cliff. 1926 N.M.N.D	21- 27- 27.88	857.4	130- 26	310 -25	Waiahole	3.555 567	3593.9	
	157 - 49 -08.95	257/7″	217- 03	37- 03	Wag	3.094 111	1242.0	
Pier. 1926 N.M.N.D	21- 27- 59.27	1822.8	145 - 12	325 - 12	Waiahole	3.220 550	1661.7	
	157 - 50- 11.04	317.8	269- 25	89 - 26	Wag	3.404 170	2536.1	
Pond. 1926 M.D	21 - 26- 43.39		193 - 37 - 22.3	13 - 37 - 34.1	Kapapa I.	3.594 788	3933.6	
	157 - 48 - 39.33							

APPROVAL OF RECORDS

To Accompany Sheets 4833ᵈ & 4788ᵈ

The above sheets and records have been examined and are approved.

Hubert A. Paton
HUBERT A. PATON
Lieut., U. S. C. & G. S.
Chief of Party

September 5, 1933

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in
   1 volumes of sounding records for

      HYDROGRAPHIC SHEET   4788 - Additional Work

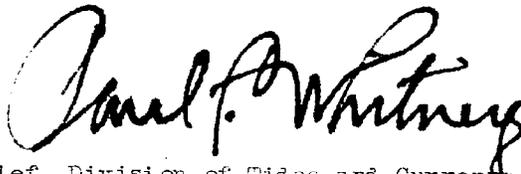Locality   Southern Portion of Kaneohe Bay, Oahu I., T. H.

Chief of Party: Hubert A. Paton in 1933
Plane of reference is Mean lower low water reading
2.8   ft. on tide staff at   Heeia
4.2   ft. below B. M. 1 (1933)

   Heigh of mean higher high water above plane of reference is 2.1 feet.

Condition of records satisfactory except as noted below:

Paul P. Whitney

Chief, Division of Tides and Currents

HYDROGRAPHIC SHEET No. 4788 (ADDTL. WK)

The following statistics will be submitted with the

cartographer's report on the sheet:

Number of positions on sheet   111

     Number of positions checked   12

     Number of positions revised   4

Number of soundings recorded   429

     Number of soundings revised   28

Number of signals erroneously

     plotted or transferred   NONE

Date: ...September 12, 1933...............

Cartographer: ...Warren H Bamford...

Section of Field Records

Report on ~~Additional Work~~ on H-4788a

Sept. 12, 1933

Surveyed in (June)-(July)-1933.

Chief of Party - Hubert A. Paton.

Surveyed by - Sgt. S.D. Jones + Hubert. A. Paton

Protracted by - H.A.P and Sgt. S.D. Jones

Sdgs. Plotted by -

Verified by - W.H. Bamford.

1./ The sounding record was found to be neat, legible, complete and to conform to the requirements of the Hydrographic Manual.

2./ The protracting was not checked except where a discrepancy was apparent.

3./ The soundings were checked with the reduced soundings in the sounding record and made to conform with them — The spacing of the edge was not checked by use of the spacing dividers.

The accepting of the protracting and spacing of the soundings was upon the orders of the chief of Field Records Section.

4./ The shoreline of Mokuaoloe Island was located by means of sextant fixes - but was not sketched in by the Field Party -

5./ In Lat. 21°-26' + 350 m. and Long 157°-47' + 1350 m. (approx.) - Position 556 with a sounding of 39 ft. falls close to soundings of 47 ft. from the 1927 survey. There is a discrepancy here of approximately eight feet.

Respectfully Submitted

Warren H Bamford.

SECTION OF FIELD RECORDS

REPORT ON ~~ADDITIONAL WR~~. ON H- 4833 a

SEPT. 12, 1933.

SURVEYED IN JUNE - JULY - 1933

CHIEF OF PARTY - HUBERT. A. PATON

SURVEYED BY - H. A. P.

PROTRACTED BY . —

SDGS. PLOTTED BY - —

VERIFIED BY - W. H. BAMFORD.

1./ The sounding records were found
to be neat, legible, complete and
to conform to the requirements
of the Hydrographic Manual.

2./ Only a small amount of protracting
was checked by the verifier - (on
orders from the Chief of Field Records
Section) - and this was done only
to determine the amount of
variation in plotting - due to using
the positions of the several signals
whose geographic positions were computed
by the field party - there being

a slight difference between the newly computed positions and the old ones.

3./ The soundings were not spaced with spacing dividers — between positions as usual, on orders from the chief of Field Records Section - However the soundings were checked against the reduced soundings appearing in the sounding volumes and made to conform with them — A number of soundings were plotted erroneously by the field party - part of them being plotted as the next whole number when half feet resulted from applying lead line or tide correction.

4./ The signals "PIER", "CLIF" & "WAG" whose geographic positions were computed by the 1933 Field Party — were replotted in the office - and their positions were found to be slightly different from the old positions shown on the additional work - sheet - NOTE:- The signals

shown on the additional work sheet were not plotted on this sheet - but transferred to it from the original H-4833 smooth sheet - by means of a tracing of the original sheet.

5./ Due to the fact that the additional work called for east of <u>Waiahole</u> - Lat. 21°- 28.8 and Long. 157°- 49.8 (approximately) - was to fill in a gap between the 1927 surveys H-4833 + H-4834 - this work - i.e. pos 1b- 38b - Volume 1. - was plotted in blue upon the original H 4833 smooth sheet. Upon checking the protracting of some of this work - on H. 4833 additional work sheet - using the new determination of the signals PIER and CLIF - It was found that the plotting is slightly changed by the shift in the signals - as stated above this work was replotted on H. 4833 (in blue).

H 48332 (ADDTL. WK.)

6./ The additional work called for approximately 400 meters North west of Signal "CLIF" - to verify the existence of the 26 foot sounding from the 1910 survey - was not replotted although the positions fall approximately eight meters east of their present location - when the revised positions of signals "CLIF" + "WAG" are used. The 26 foot sounding was *not* verified and there is no indication in the sounding records that the field party "felt around" - for the shoal, although it is stated in their report that "shoals are all plainly visible at all stages of the tide" Leaders indicate revised positions of some of the positions.

7.ª/ In Latitude 21°- 27' + 1100 m and Longitude 157°- 47' + 1120 m - the five foot sounding from the 1910 survey shown in blue - is verified by a

7(CONTD.)

five and one half foot sounding obtained on the 1933 addl. wk. survey - pg 44. Vol #1.

b/ The discrepancy referred to in the report by the field party in Lat. 21°-28', Long. 157°-47.5' was eliminated by replotting positions ✓ 34a - 36a - pg. 11 vol. #1 - using the new location of signal "WAG" determined by the 1933 field Party.

c/ In Lat. 21°-27' + 1570 m. and Long. 157°-47' + 1130 m. (approx.) - A shoal of four feet was found by the 1933 hydrographic party and verified by a five foot sounding on an adjacent line. Previous depths shown here were nine and ten feet.

d./ In latitude 21°-27' + 1200 m and longitude 157°-48' + 960 m (approx) - The shoal referred to - pg 31. vol #1 - verifies the existance of the coral reef

7.d. conᴛᴅ./

located here by the 1927 survey party.

8/ Upon replotting triangulation station "WAIAHOLE" 1926 It was found to have been transferred from H. 4833 erroneously. This replotting was done by Sherr and checked by G Streeter.

Respectfully Submitted.

Warren H Bamford.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should ██████ accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. ....

REGISTER NO. 4833 (ADDITIONAL WORK)

State...Hawaiian Is..

General locality....East Coast of Oahu.........................

Locality........Central Portion of Kaneohe Bay...............

Scale..5,000....:..... Date of survey..June 27, 1933............,192

Vessel...

Chief of Party....H. A. Paton.....................................

Surveyed by..........H.A.P...

Protracted by....R. E. DeMent.....................................

Soundings penciled by.............R.E.D............................

Soundings in ✗✗fathoms✗✗ feet

Plane of reference...

Subdivision of wire dragged areas by.............................

Inked by...(in blue)..G. H. Streeter............................

Verified by....*A. F. Barford*.......................................

Instructions dated..,192

Remarks:......Additional work is plotted in blue on original

sheet, H-4833, and the sounding volume is filed with H-4833a

G P O

82 Rae

Division of Hydrography and Topography:

✓ Division of Charts:

. Tide Reducers are approved in
  2   volumes of sounding records for

  HYDROGRAPHIC SHEET   4833 Add'l.

Locality   Central portion of Kaneohe Bay, Oahu Island, T. H.

Chief of Party: Hubert A. Paton in 1933
Plane of reference is mean lower low water, reading
  2.8 ft. on tide staff at Heeia
  4.2 ft. below B. M. 1

  Height of mean higher high water above plane of reference is 2.1 feet.

Condition of records satisfactory except as noted below:

Chief, Division of Tides and Currents

Sept. 2, 1933.

HYDROGRAPHIC SHEET No. 4833 (ADDTL. WK.)

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet   348

    Number of positions checked   38

    Number of positions revised   4

Number of soundings recorded   1772

    Number of soundings revised   84

Number of signals erroneously

    plotted or transferred   ONE

Date: September 12, 1933

Cartographer: Warren H Bamford

Section of Field Records.

REVIEW OF HYDROGRAPHIC SURVEY NO. 4833 (Additional Work of 1933)

Kaneohe Bay, East Coast of Oahu
Surveyed Sept.-Nov. 1927
Instructions as per boatsheet.

Hand Lead Soundings - 3 Point Fixes on Shore Signals.

Chief of Party - H. A. Paton.
Surveyed by - H. A. Paton.
Protracted and soundings penciled by - R. E. DeMent.
Verified by - W. H. Bamford.
Inked by - G. H. Streeter.

1. Purpose of Survey.

The purpose of the additional surveying was three fold:

a. To investigate certain general discrepancies between the 1910 survey (H-3252) and the 1927 survey(H-4833)as noted in the review of the latter sheet.

b. To investigate certain shoal soundings found in the 1910 survey that were not indicated on the 1927 survey.

c. To fill certain gaps in the 1927 work.

2. Results of Survey.

All of the above have been accomplished and will be considered independently.

a. General discrepancies between 1927 and 1910 work.

A comparison of the soundings taken in 1933 with the soundings taken in 1910 and 1927 shows the 1933 work to be about 1.8 feet shoaler than the 1927 work and about 1.4 feet deeper than the 1910 work. There are average differences, the actual differences with the 1927 work runs from agreement to 3 feet shoaler. It is possible that the larger differences are due to irregularities in the bottom. In view of this it is not considered justifiable to apply an average correction to the 1927 work to make it conform to the 1933 work.

b. Investigation of Shoal soundings on 1910 survey.

(1) The 26 foot sounding from H-3252(1910) in lat. 21°27'1145m. long. 157°49'500m. has been investigated by running a number of closely spaced lines in the immediate vicinity. The depths found check generally the 1927 work and shows rather uniform bottom with minimum depths of 41 feet. Further investigation

of the original records showed that the 26 had been plotted
in an incorrect position on H-3252 (1910), (pos 70r to pos.
71r) and that it actually belonged fairly close to the reef.
The field party's recommendation that the old 26 **feet** sounding
be considered disproved is concurred in.

(2) The <u>4 foot shoal</u> from H-3252(1910) in lat. 21°27'735m.,
long. 157°47'785m. was examined and depths of 11 to 13 feet
found in the immediate vicinity on lines spaced about 1**0** meters
apart. There is a possibility that the original sounding which
was not O.Ked in the record, was a fathom in error and though
there is no evidence th..t the party "felt around", the visibility
of shoals in these waters is such that the search may be con-
sidered sufficient. The 4 foot sounding has been rejected as
recommended by the Chief of Party.

(3) In the area between lat. 21°27' and 21°28', and long. 157°47'
and ' 157°48' there are some shoaler soundings on H-3252(1910)
which werendt all found. The field party believe th.t this area
is subject to changes because of its exposure to the sea and
recommend that the work of 1910 be rejected. The bottom is mostly
sandy with a little coral and the sand ridges are said to be
constantly shifting. The new soundings show evidence of changes
in most of the areas and for this reason only a few soundings
from H-3252(1910) have been carried forward in **such** areas where
no general change is indicated.

c. <u>Gaps in the 1927 work</u>.

These gaps have been satisfactorily filled.

3. <u>Superseding Old Surveys</u>.

Within the area covered, the present survey, with the indicated
additions from previous surveys, supersedes the following survey
for charting purposes:

   H-3252 (1910) in part.

4. Reviewed by - A. L. Shalowitz and R. L. Johnston, February 1935.

Inspected by - A. L. Shalowitz

Examined and approved:

C. K. Green,
Chief, Section of Field Records.

Chief, Section of Field Work.

Chief, Division of Charts.

Chief, Division of H. & T.