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U. S. COAST & GEODETIC SURVEY  
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Form 504

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

State: ~~Territory of~~ Hawaiian  
Is.

DESCRIPTIVE REPORT

Topographic } Field No. 6A  
Hydrographic } Sheet No. 5050

LOCALITY

Hawaiian Ids.

~~Shoal area East of Nihoa Id.~~

Shoal between Nihoa and  
Niihau Is

1928

CHIEF OF PARTY

K. T. Adams

GOVERNMENT PRINTING OFFICE

5050

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO. 5050

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. 6 A

REGISTER NO. 5050

State ~~Territory of Hawaiian Is.~~

General locality Shoal between Nihoa and Niihau Is.

Locality Latitude  $22^{\circ} 40'$  N, Longitude  $161^{\circ} 02.5'$  W

Scale 1:50,000 Date of survey October 12 to 13, 1928

Vessel GUIDE

Chief of Party K. T. Adams

Surveyed by K. T. Adams

Protracted by F. L. Gallen

Soundings penciled by F. L. Gallen

Soundings in fathoms feet-

Plane of reference M L L W

Subdivision of wire dragged areas by

Inked by John G. Radd

Verified by " " "

Instructions dated March 26, 1928, 19

Remarks: SUB-PLAN of Sheet No. 6

DESCRIPTIVE REPORT  
to accompany  
HYDROGRAPHIC SHEET NO. 6A  
Hawaiian Islands

DATE OF INSTRUCTIONS: This survey was made in compliance with instructions for Project 22, dated March 26, 1928.

SCOPE OF WORK: This survey is a survey of a detached shoal, on a sub-plan, scale 1:50,000, of the larger Sheet No. 6, scale 1:500,000. Scale 1:50,000 was chosen, as it gave a good survey of the area desired and being exactly 1/10th of the scale of larger survey, made possible the use of scales and data made for the 1:500,000 sheet.

The detail executed on this sub-plan was an examination of the shoal proper and a survey to at least 500 fathoms, delineating the edges of the shoal and giving depth curves to which to tie in the dead reckoning lines of Sheet No. 6.

SUB-PLAN: Although the work is plotted on a separate sheet and a separate descriptive report is written, this sheet is still a sub-plan and must be considered as such, because all of the data cannot be separated from that accompanying Sheet No. 6.

Insofar as possible the records and data are separated and such records as accompany this sheet are separate and complete in themselves.

However, for all data not found separately marked for this sheet reference should be made to the records accompanying Sheet No. 6.

SURVEY METHODS; All soundings were made by the Fathometer, an officer reading the Fathometer.

One buoy established on the shoal was located by star sights.

All sounding lines were dead reckoning, full speed run loops; from the buoy out into deep water and back, and tied in again to the buoy.

Two logs were streamed. All sounding and dead reckoning data were entered in the sounding record. No separate dead reckoning book was used.

For method of treating star sights, for method of reducing Fathometer soundings, and for method of constructing dead reckoning sheets, refer to the descriptive report accompanying Sheet No. 6.

DATA: Data used on this sheet, for which reference must be made to the data accompanying Sheet No. 6, are the following:

Salinity used: 34.0



Serial temperature used was that taken west of Kauai Island.  
Compass deviation curve used was dated September 16, 1928.  
Log factors used were-No. 194, 0.875; No.195, 0.945.


All soundings were reduced for velocity correction and slope.  
Soundings less than 100 fathoms were corrected for tide and index error.

BOAT SHEET: The boat sheet is without projection, or latitude or longitude, it merely having an azimuth line drawn through the buoy. All sounding lines were plotted in nautical miles on a 1:50000 scale, the azimuth line being north and south.

DISCREPANCIES: The 222 fathom sounding on Position 12B and the 170 fathom sounding following are very probably 322 and 270 and have been so pencilled on the sheet. These errors were not discovered until after the day's work was completed.

RECORDS: The following records form a part of and accompany this sheet:

- 1 Title Sheet
- 1 Descriptive Report
- 1 Sounding Volume
- 1 Smooth Sheet
- 1 Boat Sheet
- 1 Table of Statistics
- 1 Table of Velocity Factors

Work on adjoining sh. H. 5055a proves a shoaling in this area + that original soundings are OK. 

For the following, refer to Sheet No. 6:

- Star Sight Position of Buoy
- Compass Curve used
- Serial Temperature

*K.T. Adams*  
K. T. Adams,  
H & G E,  
U.S.C. & G.S.

VERIFICATION REPORT: This will certify that I have examined the smooth sheet and records and hereby approve same.

The field work was done under my direct supervision.

This sheet was completed early in 1929, but was held on board until Sheet No. 6 was completed so that it could be sent in as a sub-plan of that sheet.

*K.T. Adams*  
K. T. Adams,  
Commanding,  
Steamer GUIDE.



SHEET NO. 6-A.

SHOAL AREA EAST OF NIHOA ID., T. H.

STATISTICS

DAY	DATE	Red Lt. Sta. Miles	Sta. mi.	No. sndgs.		V. C.	Tot Sta. mi. forday	Tot.No. Sndgs.	Pos.
				W.L.	R.L.				
A	10/12/28	77.5	23.4	73	267	1	100.9	<del>74</del> 341	83
B	10/13/28	74.6	5.4	22	184	2	80.0	<del>24</del> 208	65
TOTALS		152.1	28.8	95	451	3	180.9	<del>98</del> 549	148

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January 29, 1931

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in  
1 volumes of sounding records for

HYDROGRAPHIC SHEET 50 50

Locality Territory of Hawaii (East of Nehoa Id.)

Chief of Party: K. T. Adams, in 1928

Plane of reference is mean lower low water, reading  
3.5 ft. on ~~tide staff at~~ tabulations at Honolulu  
17.3 ft. below B. M. 2

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.



Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 5050

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

Number of positions on sheet	..14.8
Number of positions checked	<del>None</del> <i>See sketching</i>
Number of positions revised	<del>None</del>
Number of soundings recorded	54.9
Number of soundings revised	....18
Number of signals erroneously plotted or transferred	<del>None</del>

Date: ..... Oct. 17 ..... 1931 .....

Cartographer: ..... John G. Ladd .....

Temp Delta Sheet 6 A		Mean surface temp		D.C.2	
		obtained by comparison with mean station Keenan + F.H.			
19%	26.1				
20%	26.0	52.1	26.15	0.027	+0.7
40	25.2	77.3	25.17	0.27	+1.8
57%	23.4	100.7	25.18	0.46	+1.4
66%	21.3	122.0	24.4	0.15	+1.7
80	19.7	141.7	23.12	0.03	+1.8
92%	18.4	160.1	21.86	0.22	+2.0
100%		32.18	20.0	+2.1	
120		21.50	19.9	+2.3	
		20.86	20.8	+2.4	
160		20.23	20.6	+2.4	
		19.64	20.5	+2.4	
		18.08	20.5	+2.6	
		18.55	20.4	+2.6	
		18.02	20.3	+2.6	
		17.52	20.2	+2.6	
		17.07	20.1	+2.5	
		16.62	20.0	+2.4	
		16.19	20.0	+2.3	
		15.78	20.0	+2.1	
		15.34	20.0	+2.0	
		14.92	20.0	+1.8	
		14.50	20.0	+1.6	
		13.97	20.0	+1.3	
		13.67	20.0	+1.0	
		13.27	20.0	+1.1	
		12.88	20.0	+0.8	
		12.32	20.0	+0.8	
		12.55	20.1	+0.4	
		12.36	20.1	+0.4	
		12.07	20.0	.00	
		11.85	20.0	.00	
		11.64	20.1	-0.5	
		11.43	20.1	-0.5	
		11.24	20.2	-1.0	
		11.05	20.2	-1.0	
		10.87	20.2	-1.0	
120		10.70	20.3	-1.6	
		10.54	20.3	-1.6	
		10.37	20.3	-1.6	
		10.22	20.4	-2.2	
		10.08	20.4	-2.3	
		9.93	20.4	-2.4	
160		9.80	20.5	-2.7	

0.200 18.03 825.0 828.7  
 200.400 7.07 811.3 820.0  
 400.600 4.30 807.5 808.4  
 600.800 3.41 810.8 814.8  
 800.1000 814.4 814.4  
 1000.1200 814.9 814.9  
 1200.1400 815.0 815.0  
 1400.1600 815.8 815.8  
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 1400.1600 815.8 815.8  
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Section of Field Records.  
Report on Hydrographic Sheet No. 5050.  
Shoal Between Nihoa and Niihau Islands.,  
Hawaiian Islands.  
Instructions dated Mar. 26, 1928 (Guide)

Surveyed by K. T. Adams.  
Chief of Party - K. T. Adams.  
Protracted by - F. L. Gallen.  
Verified and inked by - J. G. Ladd.

1. The work conforms to the requirements of the General Instructions.
2. The plan and character of development fulfill the requirements of the Specific Instructions.
3. The sounding line crossings are in good agreement, but it is believed more line crossings might have been made.
4. The 50 fathom curve can be completely drawn on the sheet. The 100 and 200 fathom curves can be completely drawn on the sheet, with the exception of two spots, lat.  $22^{\circ} 42'$ , long.  $160^{\circ} 57'$  and lat.  $22^{\circ} 45'$ , long.  $160^{\circ} 58'$  where more development would have been desirable.
5. H. 5055a crosses over this sheet with several sounding lines. On page 11 of the descriptive report H5055a is described the method used for adjusting lines which cross H. 5050 and other sheets done on larger scales, as follows: "When the line crossed a sheet done on a larger scale, i.e. (Necker, Nihoa, 6-A, 6-B. French Frigate) the line was plotted on the scale of these sheets on tracing cloth and shifted to best fit the soundings on that sheet, and bearings, if any".

On page 2, same report, the Chief of Party recommends that the work done on H. 5055 a which crosses H. 5050 should not be used for charting, "because", he says, "the hydrography on the larger scale sheets is much better controlled and the soundings closer spaced and more accurate."

The overlapping work, however, was given a rough inspection in view of the above statements and it was found to agree as well as could be expected considering the big difference in the scales of the two sheets.

A 32 fathom sounding was transferred from H. 5055a to H. 5050 and is the shoalest sounding on both sheets in this area. It is believed this sounding should be considered when charting.

6. There are three spots on this sheet where it is thought more development might be considered: lat.  $22^{\circ} 42'$ , long.  $160^{\circ} 57'$ ; lat.  $22^{\circ} 45'$ , long.  $160^{\circ} 58'$ ; lat.  $22^{\circ} 45'$ , long.  $160^{\circ} 55'$ .

7. Comparison with old surveys shows a 24 fathom spot on chart No. 4000, lat.  $22^{\circ} 36'$ , long.  $161^{\circ} 10'$ , which plots off the surveyed area of this sheet. It is believed, however, that the shoal is out of position and may belong somewhere in the vicinity of the buoy location shown on this sheet, though no sounding of this depth had been found.

This sounding is reported in H. O. Notice to Mariners, 1922, Item 1856 and apparently was the source used for applying it to the old charts.

It is recommended that this sounding be ignored for charting as the original data appears dubious as for accuracy and location.

8. There are two soundings at position, lat.  $22^{\circ} 45'$  long.  $160^{\circ} 56'$  which were questioned by the field party who added 100 fathoms to the original soundings making them read 272 and 324 for 172 and 224, respectively. The field party made a somewhat unsatisfactory note in the record, page 17, regarding the change.

Investigation of this area with soundings of the adjacent sheet, H. 5055a, shows a semblance of a shoal in this area. On H. 5055a this shoaling is quite pronounced as indicated by two dead reckoning lines, the shoalest sounding being 181 fathoms and plots near the 172 fathom sounding on H. 5050.

The fathometer apparently was not giving trouble and the readings were by the direct red light method. With the above facts in hand there does appear to be no good reason for changing the original soundings in the records and so have been retained. This retention of the original soundings have been approved by the Assistant Chief of Field Records Section.

Attention is called to changes made to a number of soundings located at the outer ends of several lines, whose slope corrections ranged from about 75 to 266 fathoms. These particular soundings made a very unnatural continuation of the bottom slope with adjoining work of H. 5055a, due to the excessive slope corrections applied. It was decided by the Assistant Chief of Field Records Section to disregard slope corrections for these soundings. The resulting juncture with H. 5055a not only is improved, but makes a more natural and undoubtedly a more correct continuation of the bottom slope.

The changes to the soundings involved in these slope corrections are shown in blue in the sounding record.

9. Character, scope of surveying and field drafting - good.
10. Reviewed by G. Risehari. Dec. 29, 1931.



Note by A. L. Shalowitz.

Referring to Par. 7, above, it should be noted that the 24 fathom sounding mentioned was removed from the chart when the unverified sheet H-5055a was applied. It is assumed that the advisability of its removal was fully considered at that time, and its further consideration at the present time would be purely academic.

Sheet Inspected by - A. L. Shalowitz, Jan. 1932.

*Approved*

*A. M. Sobieralski*  
*Chief, Field Records Section.*

Applied to Chart 4181

7/31/40

J.K.S.