

4958

Diag. Cht No. 4117

4958

Form 504 Ed. June, 1928 DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY R. S. PATTON, Director	
State: <u>Hawaiian Is.</u> Terr. of Hawaii	
DESCRIPTIVE REPORT Topographic } Sheet No. 5. 4958 Hydrographic }	
LOCALITY Territory of Hawaii. Kaula Island and Niihau Island. Search for rocks off Kaula Development of Shoal S.E. of Niihau	
1929	
CHIEF OF PARTY K. T. ADAMS.	

Descriptive Report

to accompany

Hydrographic Sheet No. 5

Date of Instructions.

This hydrographic sheet was laid out and executed in compliance with instructions contained in paragraph 15, project 22, dated March 26, 1928 and paragraphs 2,3,4, and 5, project 33, dated April 12, 1929.

Area and scale.

The sheet consists of a search for three reported submerged rocks off Kaula Island and a survey extended to the 1000 fathom curve on all sides of Kaula Island except the north and east. It also contains the development of a shoal area southeast of Niihau Island, which area was found while completing certain work in this vicinity on Hydrographic sheet #6C.

The scale of this sheet is 1 : 60,000, this being the largest scale sheet which would include the necessary signals.

Survey Methods.

All soundings were taken by the Fathometer, the ship being run standard speed. The control was almost entirely by three point fixed positions on Kaula Rock, peaks on Niihau Island and two buoys. There were a few positions not rigidly controlled. These few positions were either controlled by a bearing and angle or by a short dead reckoning run.

The two buoys were located by cuts taken from the ship at various fixed positions north of the buoys. This was not in accordance with instructions paragraph 3, project 33; but these instructions were based on my recommendation, and at the time that recommendation was made I thought it impossible to locate the buoys by cuts. I feel sure that the buoys were located more accurately than would have been possible by dead reckoning runs.

Buoy "Shoals" was anchored on the 6 fathom rock found and located by the Steamer "Discoverer" and this gives perhaps a better location of the rock than the previous location.

Discrepancies.

The present survey is to be considered the basic survey of this area, inasmuch as it was better controlled than the survey previously made by the Steamer "Discoverer". This

is in accordance with instructions paragraph 4, project 33. In general the edge of the shoal area as located by the Steamer Discoverer checks well with the present survey but on the western edge of the shoal, the former depth curves appear to be too far from Kaula Rock.

Dangers.

No dangers were found other than the known 6 fathom shoal at the location of Buoy "Shoal". The three reported rocks four miles west of Kaula Rock were not found and are believed to be non-existent.

Shoal area off Niihau Island.

The shoal area south-east of Niihau was discovered while filling in some holidays in previous work. It was found while running lines on Sheet 6C but was developed on this sheet.

Previous work off Kaula Rock.

In October 1928 a search was made for the three reported rocks off Kaula Rock. Also many soundings were taken from a whale-boat on the one six fathom known rock in order to obtain the least depth. This least depth on October 25, 1928 was found as 5 fathom 3 feet which reduced to 5 fathom 1 ft and has been entered on this sheet and in this record. Buoy "Shoal" was anchored on this rock and gives a location of the least depth. This depth was reported to you in letter dated March 21, 1929.

The remainder of the work done in 1928 was rejected as it was poorly controlled at best, and it did not adequately cover the correct area due to an error in the boat sheet being used.

Reduction of Soundings.

Red light soundings were reduced for velocity of sound and slope. White light soundings were reduced for slope only, the velocity of sound reduction being omitted in accordance with your authority dated December 12, 1929 which was based on the following data copied from my letter dated December 5, 1929.

"I give herewith a resume' of the reductions necessary on one sheet which has already been reduced.

From zero to 200 fathoms the reductions are plus and gradually increase from zero to three fathoms.

From 200 fathoms to 450 fathoms the reductions gradually decrease from plus three fathoms to zero.

From 450 fathoms to 1500 fathoms the reductions are negative and gradually increase from zero to seven fathoms.

From 1500 to 2250 fathoms the reductions are negative and gradually decrease from seven fathoms to zero.

From 2250 fathoms to 2635 fathoms the reductions are again positive and gradually increase from zero to eleven fathoms.

It is therefore to be seen that this reduction is

always less than one half of one percent and is generally very much less than that. Also this reduction is always less than half of the probable error of observation of a white light sounding. "

Slope corrections were made by drawing the depth curves on the boat sheet and using a transparent celluloid scale originated by Lieut. J.A. Bond.

K.T. Adams
K. T. Adams,
H & G Engineer.

Verification Report.

The accompanying sheet and records have been inspected and approved by me. The actual locating of the buoys was done directly under my supervision as was most of the sounding.

Your attention is called to the fact that the summit of Kaula Rock is very flat and indefinite. It is my understanding that when this was located by triangulation from Niihau Island, no signal was built upon it, the summit only being cut in. This makes the location of the summit somewhat weak. Also the fact that it is so flat makes the three point fixes weaker than desirable. However, in general, the control of the work checked well.

K. T. Adams
K. T. Adams,
H & G Engineer.

Tidal Note.
Hydrographic Sheet No. 5.
Kaula Rock and Niihau Island.
July 10 - 12, 1929

No tidal observations were made at either of these places by this party. The soundings were compared with Honolulu tides and the corrections found to be less than one percent in most cases.

On July 10th a few soundings had a correction of over one percent. For these the Honolulu tide was used with a correction for Niihau Island of (-) 20 minutes in time and (-)0.2 feet in height.

July 10, 1929.

	Above "0" Honolulu Staff	Above MLLW Honolulu	Corr- ection
5:00 P.M.	5.3 ft.	1.8 ft.	-2.0 ft.
6:00 P.M.	5.5 ft.	2.0 ft.	-2.0 ft.

C O P Y

Letter 219/1929
Division of Charts

To Accompany Hydrographic Sheet No. 4958 Descriptive Report

Steamer GUIDE, Honolulu, T.H., March 21, 1929.

To: DIRECTOR, Coast & Geodetic Survey, Washington, D. C.
From: Commanding Officer, U.S.C. & G.S.S. GUIDE.
Subject: Hydrography near Kaula Rock.
Reference: Par. 15, Instructions dated March 26, 1928.

While this party was making a revision survey at Port Allen, Kauai Island, this vessel proceeded to Kaula Rock to comply with the instructions for field work contained in paragraph 15 of the instructions dated March 26, 1928.

It is very difficult to obtain adequate control in this area. When this vessel started the search for the 6-2/6 fathom sounding it was through that a bearing and an angle would locate the vessel, however finally we had to resort to running lines toward and away from Kaula Rock on bearings until we discovered the shoal.

The shoal was discovered. Bottom is plainly visible for some distance. A whaleboat was put over and out of many soundings the least depth found was 5 fathoms 3 feet which reduced on account of tide to 5 fathoms 1 foot.

No position was obtained but this sounding is on the 6-2/6 fathom spot, which, scaled from the photostat copy #4632, is 7520 meters 301° true from \triangle Kaula.

While the whaleboat was feeling for the least depth on this rock, this vessel spiralled around the rock sounding with the fathometer and keeping a sharp lookout for discolored water. No other shoal spot was found.

After this, the vessel tried to sound out the area in which the three sunken rocks were reported four miles west of Kaula Rock. A system of lines was run toward and away from the Rock, with an occasional bearing and one angle to try to fix the position. It was practically impossible to tell where the ship was, although at the time it was thought that the area was being covered.

Now, upon trying to smooth plot this work it is found that there was a two minute error in the longitude of the boat sheet between Kaula Rock and the main station on Niihau. This puts all of the sounding we did too far offshore to cover the area desired. I have rejected this work and will not send the sounding volumes in unless instructed by you to do so. The only other work in the volume is the one sounding mentioned above on the shoal.

In my opinion the only adequate way of investigating this area is to plant and locate a buoy on the 6-2/6 fathom shoal and one half way between that and Kaula Rock. These buoys should be located by a double full speed run from Kaula Rock.

If you so instruct, I can do this on some trip to the westward when passing near Kaula Rock.

(Signed) K. T. Adams, Commanding
Steamer GUIDE.

DEPARTMENT OF COMMERCE

AND REFER TO No. 82-DRM

U. S. COAST AND GEODETIC SURVEY

WASHINGTON

July 25, 1933.

SECTION OF FIELD RECORDS

Review of Hydrographic Survey No. 4958

Surveyed in 1929

Instructions dated March 26, 1928 and April 12, 1929 (GUIDE)

Chief of Party, K. T. Adams

Surveyed by Party of Ship GUIDE

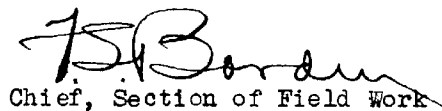
Protracted and soundings plotted by G. E. Boothe

Verified and inked by W. H. Bamford

1. The original review for this sheet has been misplaced and cannot be located at this writing. Since the only question of importance on the sheet is that relating to the existence or non-existence of 3 pinnacle rocks in this vicinity (see review of H. 4632) it was not deemed necessary to prepare another exhaustive review.
2. In the opinion of the Chief, Section of Field Records, this survey disproves the existence of any rocks other than the 5 1/6 fm. spot shown on the sheet. It is also accepted that "Buoy Shoal" was placed on the position of the 5 1/6 and it is so shown on the sheet.
3. Attention is called to the fact that the finding of the 37 fm. shoal southeast of Niihau was the result of examining a 174 fm. indication on H. 4630. This indication and the need for additional work around it was noted in the review of H. 4630.
4. Note to compiler - Because of the more rigid control on this sheet for the work around Kaula Rock, so much of the work on H. 4632 as falls within the limits of H. 4958 should be superseded by the latter sheet.
5. Reviewed by A. L. Shalowitz, July 1933.

Approved:


Chief, Section of Field Records


Chief, Section of Field Work


Chief, Division of Charts


Chief, Division of H. and T.

TABLE OF STATISTICS

TO

ACCOMPANY

HYDROGRAPHIC SHEET NO. 57

KAULA ISLAND AND NIIHAU ISLAND.

1929.

DATE	DAY	VOD.	ALL SHIP SOUNDING.		STAT. MILES WHITE LIGHT	STAT. MILES RED LIGHT	V.C.
			NO. OF POSITIONS	NO. OF SOUNDINGS WHITE LIGHT			
1929.							
July 10	A	1	93	141	24.0	55.0	1
July 11	B	1	126	147	45.7	35.4	1
July 12	C	1	36	8	2.0	19.6	---
TOTALS	3		255	296	71.7	110.0	2

LOG DATA

PERIOD	Factors to be Used				REMARKS
	Log No.	Factor	Log No.	Factor	
1928					
Apr. 25 - July, 3. 3:10 P.M.	182	1.024			Using one log only on 157
ly, 3 - Aug. 1 5:10 P.M.	182	1.024	157	1.091	Changed rotator
Aug. 1 - Aug. 23 2:40 A.M.	182	1.024	157	1.043	
*Sept. 6 - Sept. 30 2:50 A.M.	194	0.973	195	0.980	
Sept. 30 Jan. 3, 1929	194	0.875	195	0.945	
1929					
Jan. 11 - Apr. 28 5:00 P.M. 5:30 A.M.	194	0.965	195	1.049	Log hit bouy in 194
Apr. 28 - May 31 5:30 A.M. A.M.	194	0.931	195	1.013	Changed rotator on on 195
May 31 - July 27 A.M. 9:50 A.M.	194	0.9645	195	1.035	Replaced log line 195
July 27,- Sep. 29	194	1.0074	195	1.034	Changed rotator on

Checked by *gEB*

DETERMINATION OF TEMPERATURE CORRECTIONS.

for

HYDROGRAPHIC SHEET NO. 5.

Kaula Island and Niihau Island.

Vicinity of Kauai Island:- Mean surface temperature - 24.77 C.

Salinity - - 34.50
00

Depth fms.	Temp. °C.	Sum of temp.	Mean Temp. for layer.	Factor.	Corr. fms.	Summary of Corr. Depth	Corr. fms.
13 1/2	24.7		24.70	+ 0.0264	+ 0.35	13 to	
26 2/3	24.1	48.8	24.40	+ 0.0256	+ 0.68	14.3	+ 0.3
40	22.1	70.9	23.63	+ 0.0243	+ 0.97	18.4	+ 0.4
53 1/3	21.2	92.1	23.02	+ 0.0230	+ 1.23	22.4	+ 0.5
66 2/3	20.6	112.7	22.54	+ 0.0221	+ 1.47	26.4	+ 0.6
80	19.9	132.6	22.10	+ 0.0212	+ 1.69	31.0	+ 0.7
93 1/2	18.6	151.2	21.60	+ 0.0202	+ 1.88	35.7	+ 0.8
106 2/3	17.5	168.7	21.09	+ 0.0192	+ 2.05	40.3	+ 0.9
120	15.7	184.4	20.49	+ 0.0180	+ 2.16	45.4	+ 1.0
133 1/3	14.4	198.8	19.88	+ 0.0168	+ 2.24	50.6	+ 1.1
146 2/3	13.0	211.8	19.25	+ 0.0157	+ 2.30	55.8	+ 1.2
160	12.1	223.9	18.66	+ 0.0147	+ 2.35	61.4	+ 1.3
173 1/3	11.2	235.1	18.09	+ 0.0137	+ 2.37	66.6	+ 1.4
186 2/3	10.5	245.6	17.56	+ 0.0126	+ 2.35	72.7	+ 1.5
200	9.8	255.4	17.03	+ 0.0115	+ 2.30	78.8	+ 1.6
213 1/3	9.2	264.6	16.55	+ 0.0106	+ 2.27	86.0	+ 1.7
226 2/3	8.6	273.2	16.07	+ 0.0096	+ 2.17	93.0	+ 1.8
240	8.2	281.4	15.64	+ 0.0086	+ 2.04	100.8	+ 1.9
253 1/3	7.7	289.1	15.22	+ 0.0075	+ 1.90	265.0	+ 2.0
266 2/3	7.3	296.4	14.82	+ 0.0065	+ 1.73	347.0	+ 1.0
280	7.0	303.4	14.45	+ 0.0056	+ 1.57	436.0	0.0
293 1/3	6.7	310.1	14.10	+ 0.0047	+ 1.42		
306 2/3	6.3	316.4	13.76	+ 0.0040	+ 1.23		
320	6.1	322.5	13.44	+ 0.0034	+ 1.09		
333 1/3	5.8	328.3	13.13	+ 0.0028	+ 0.93		
346 2/3	5.6	333.9	12.85	+ 0.0022	+ 0.76		
360	5.4	339.3	12.57	+ 0.0016	+ 0.58		
373 1/3	5.2	344.5	12.31	+ 0.0011	+ 0.42		
386 2/3	5.1	349.6	12.06	+ 0.0006	+ 0.23		
400	4.9	354.5	11.82	+ 0.0001	+ 0.04		
413 1/3	4.8	359.3	11.60	- 0.0003	- 0.12		
426 2/3	4.7	364.0	11.38	- 0.0007	- 0.30		
440	4.6	368.6	11.17	- 0.0012	- 0.53		

Checked by GEB

NOTE:

No serial temperatures were taken at Kaula Island. The nearest both for time of year, and position were those taken off Kauai and Niihau Islands on August 23, 1928.

COAST AND GEODETIC SURVEY STEAMER "....."

Locality,, Date,, 19.....

Sounding No. Line

DEPTHS, IN FATHOMS.	TEMPERATURES.						REMARKS.		
	Reading.		Correction.		Corrected.			No. of the Thermometer.	Kind of Thermometer used.
	Min.	Max.	Min.	Max.	Min.	Max.			
Surface.								Temperature of Air Temperature of Thermometer, Locker Abstract of Serial Water Temperatures taken 40 mi. NW of Kauai, Id. T.H., and used for reduction of soundings on Sheet No. 5, Kaula Island and Niihau Island, T.H. U. S. C. & G. S. S. GUIDE. This is a checked copy of the original record. The original record is being retained at this time as it is a part of the volume containing all serial temperatures taken by this party. " " " " " "	

Signature of the Officer of the Deck:

Signature of the Recorder:

COAST AND GEODETIC SURVEY STEAMER "GUIDE"

Locality, 40 mi. NW of Kauai Id., T.H. Date, August 23, 1928.

Sounding No. Lat. 22° 21.30' N. Long. 160° 23.95' W. Line

DEPTHS, IN FATHOMS.	TEMPERATURES.						No. of the Thermometer.	Kind of Thermometer used.	REMARKS.
	Reading.		Correction.		Corrected.				
	Obs.	Obs.	Min.	Max.	Min.	Max.			
Surface.							Deep Sea	Temperature of Air _____ Temperature of Thermometer. _____ Locker _____	
2	25.50					15005	"		
10	25.45					"	"		
25	25.50					"	"	Taken after serial temp. completed; as check.	
25	25.00					4104	"	" " " "	
40	22.85					15005	"		
60	22.55					"	"	(Reject)	
60	21.50					"	"	" " " "	
75	20.50					"	"	" " " "	
85	20.10					"	"		
92 1/2	19.90					"	"		
100	18.15					"	"		
107 1/2	18.30					"	"		
115	16.25					"	"		
122 1/2	16.90					"	"		
130	16.85					"	"		
130	17.60					4104	"	" " " "	
130	16.40					"	"	" " " "	
130	15.50					"	"	" " " "	

Signature of the Officer of the Deck: Glendon E. Boothe, Jr. H & G E
Francis B. Quinn, Jr. H & G E

Signature of the Recorder: Glendon E. Quinn, Jr. H & G E
Francis B. Quinn, Jr. H & G E

A+ day

July 10, 1929.

Sheet No. 5.

Pos. No.	Time	Elapsed Time (min)	Change (min)	Log No.	Diff. (m)	Log No.	Diff. (m)	Expected (m)	Mean	Total	True Course	Remarks	
71	4-25-00	62.09		93.10							206.7	Shal. normal 20-05	
	4-26-00			(0.10)	(0.11)	(0.14)	(0.17)					On course	
	4-28-00			63.43 (0.37)	93.51 (0.33)	63.52 (0.34)	0.349	0.349	0.349	0.349		Legs normal.	
72	4-30-00			63.00	0.37	93.04	0.33	0.356	0.342	0.698			
73	4-36-00			64.15	0.95	94.71	0.87	0.916	0.901	1.606		C. Course Bearing on Shal.	
									1.606				
	4-37-00			(0.16)	(0.15)	(0.19)	(0.15)				95.7	On course	
74	4-40-00			65.23 (0.34)	95.16 (0.33)	65.44 (0.34)	0.444	0.444	0.444	0.444		Legs normal. Bearing on Shal.	
75	4-45-00			66.00	0.77	95.87	0.71	0.743	0.735	1.183		change course	
									1.183				
	4-50-00			66.68	0.68	96.52	0.65	0.656	0.674	0.670	0.670	96.9	
77	4-55-00			67.41	0.73	97.20	0.68	0.704	0.704	1.374		Bearing on Shal.	
78	5-00-00			68.15	0.74	97.89	0.69	0.713	0.714	2.088			
	5-02-00			68.41	0.26	98.11	0.28	0.252	0.240	2.359		change course	
									2.359				
79	5-05-00			68.83	0.42	98.33	0.36	0.405	0.373	0.389	112.5	Bearing on Shal.	
80	5-10-00			69.56	0.73	99.24	0.69	0.704	0.715	1.099			
81	5-11-30			69.56	0.33	99.52	0.30	0.318	0.311	1.413		50' 42.22' - 54.7 m. on 1000' beam. Bearing on Shal.	
									1.413				

SECTION OF FIELD RECORDS

REPORT ON SHEET No. H-4958

MARCH - 20 - 1930.

CHIEF OF PARTY - K.T. ADAMS.
SURVEYED IN - JULY - 1929.
SURVEYED BY - PARTY OF STR. GUIDE.
PROTRACTED BY - GLENDON E. BOOTHE
PENCILED BY - GLENDON E. BOOTHE
VER. & INKED BY - WARREN H. BAMFORD.

- 1./ The records were found to conform to the requirements of General Instructions for Field Work, except that there were no bottom characteristics noted.
- 2/ The protracting was found to be very good.
- 3/ The soundings were spaced fairly well, but were penciled so large that frequently they were found to be slightly out of their correct position.
- 4./ The sounding line crossings were found to be fairly good considering the excessive bottom slopes in this locality.

- 5/ The development of shoals was sufficient except in the vicinity of the Buoy "SHOAL". A minimum depth of 5½ fathoms is noted on the previous survey of this area, but the shallowest depth found on the present survey was 25 fathoms.
- 6/ It was possible to draw the usual depth curves.
- 7/ The sheet was clean and the work was legible although exceptionally large.
- 8/ The field plotting was completed to the extent prescribed in the General Instructions.
- 9/ The office draftsman had to respace and re-plot a number of soundings due to their large size, when the time interval was small.
- 10/ There are no adjacent contemporary sheets in this area.

11./ The slope correction varied from zero to forty-percent, in this area. A pencil note was made by all soundings that had slope corrections over fifteen percent, to indicate that they were questioned due to the excessive slope corrections.

Respectfully Submitted
Warren H Bamford.

(COPY FOR FILES OF FIELD RECORDS SECTION)

March 6, 1930

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in
1 volume of sounding records for

HYDROGRAPHIC SHEET 4958

Locality: Vicinity Kaula Rock and Nihau I., T. H.

Chief of Party: K. T. Adams, in 1929
Plane of reference is mean lower low water, reading
3.5 ft. on tide staff at Honolulu

~~XXXXXXXXXXXX~~

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.

Paul C. Whitney

Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.
4958

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. 5

REGISTER NO. 4958

State ~~Territory of Hawaiian Is.~~

General locality Kaula Island and Niihau Island.

Locality Search for rocks off Kaula I. and shoal southeast of Niihau.

Scale 1-60,000. Date of survey July 10, 11, & 12, 1929.

Vessel U. S. C. & G. S. S. GUIDE.

Chief of Party K. T. ADAMS.

Surveyed by ^{Party of Str. GUIDE} Commanding Officer and Ship's Officers.

Protracted by Glendon E. Boothe

Soundings penciled by Glendon E. Boothe.

Soundings in fathoms ~~xxxx~~

Plane of reference MLLW.

Subdivision of wire dragged areas by

Inked by Warren H. Bamford

Verified by WHB

Instructions dated March 26, 1928. April 12, 1929. 192

Remarks:

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. 4958

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

Number of positions on sheet 255 . . .
Number of positions checked 43 . . .
Number of positions revised 3 . . .
Number of soundings recorded 445 . . .
Number of soundings revised 66 . . .
Number of signals erroneously
plotted or transferred . . . NONE . . .

Date: March 20 - 1930 . . .

Cartographer: Warren H. Bowford

Applied to Chart 4181 Sept. 3, 1940 G.A.S.