

4235

4235

Form 504	
DEPARTMENT OF COMMERCE	
U. S. COAST AND GEODETIC SURVEY	
State: <u>Hawaiian Islands</u>	
11-5613	
DESCRIPTIVE REPORT.	
Topographic Sheet No.	4 4235
LOCALITY:	
<u>Niihau Island, T.H.</u>	
<u>North end of Niihau</u>	
<u>1926</u>	
CHIEF OF PARTY:	
<u>Lieut. Comdr. Clem L. Garner.</u>	

C. & G. SURVEY
D & A
FEB 23 1927
Acc. No.

Applied to Chart 4181 Sept. 3, 1940 J.H.S.

DESCRIPTIVE REPORT
to accompany

TOPOGRAPHIC SHEET #4, NORTH END NIIHAU ISLAND, T.H.

Instructions to Chief of Party dated November 23, 1925.

LIMITS: The topography on Sheet #4 includes: (1) A detailed survey of the shoreline of the north half of Niihau Island and connects with the shoreline of the south half of the Island. (2) A detailed survey of Lehua Island. (3) Contours of Lehua Island and the north half of Niihau Island.

GENERAL DESCRIPTION: The north half of Niihau Island is mostly high and rugged and rises to an average height of about 1000 feet except at the extreme north end and on the west shore of the island. Puu Paniau and Kaea cone are the most conspicuous peaks on the north end of Niihau and the peak on Lehua Island is unmistakable. Kaea is a cone-shaped peak 1018 feet high near the center of the island of Niihau and is easily distinguished from seaward. Puu Paniau is the highest point on the island but is somewhat hard to identify on account of the numerous other rounded knobs of nearly the same height.

The ~~eastern~~ shore of Niihau Island from topographic station LAN to Pueo Pt. is rocky and presents an almost continuous bluff line. Landings can be made during very smooth weather in the bights shown along this shore. From Pueo Pt. to topographic station DWP the shoreline is more steep

INSHORE REEFS: The only reefs of any importance on this sheet are on the north end of Niihau. The reef just north of signal "House" is made up of five rocks which are bare at all times, surrounded by several smaller rocks which are awash at time of high water. A sunken rock located about 3/4 mile west-southwest of triangulation station BLACK is described in the hydrographic report of this area. The coral reef just off signal "Pan" extends about 1/3 mile to the northwest. This is more clearly shown on the hydrographic sheet.

LANDINGS: The only commercial shipping point on this sheet is Kii Landing located in the small bay on the east side. This landing is only used in the winter months during the time that Monopapa Landing cannot be used. A small dock and the three buildings shown identify the place. Steamers of the Inter-Island Steam Navigation Co. call here only by previous arrangement. Cargo is lightered out to the ships in whale boats.

STREAMS: There are no streams on either Niihau or Lehua Islands. On Niihau Island water is supplied by rainfall and from water-holes. The whole of Niihau is devoted to stock raising and the production of honey. Lehua Island is uninhabited.

(Above written by J.C.P.)

SURVEY METHODS: Practically all of the field topography on this sheet was done by Lieut. (J.G.) Knox who was injured while engaged in the work and later sent to San Francisco for treatment. A report of his method of survey, written from memory, is attached and should be used for the area he covers.

Before going further with this subject an explanation should be interposed regarding the triangulation of Niihau and the later connection to the triangulation of Kauai.

Triangulation had been extended to Niihau many years ago and it was at first assumed that the stations could be used in the control of the work on and around that island. According to the descriptions only one of these stations was marked but on examination the station PANIAU was found permanently marked and at each of the other stations, where the location was almost certain, there was found a pile of rocks around an old stake, seemingly marking the station itself. Without doubt these were the old stations. As no other triangulation was to be extended from Niihau, other than an intersection station on Kaula Island, it appeared that these stations would be sufficient although the connection to Kauai was rather obscure.

The topography and hydrography were accordingly started, using the positions of these stations as furnished. It was necessary, however, to determine some intersection stations along the coast and at the same time it was decided to observe regular figures and be prepared for future connection with Kauai should it be found necessary. It was assumed that the triangulation stations would not in any event be out enough to be noticeable on sheets of scale 20,000. When the two quadrilaterals of the island were completed it was found that the lengths of lines were not at all in agreement and on the line Panian-Lehua there was a difference of 33 meters in length.

Connection by triangulation with Kauai was then made joining on to Kauai stations Lani and Pele. When the observations were computed it was found that the entire of Niihau was moved about 500 meters to the westward and that all of the triangulation stations on that island were out by about that amount, except that the difference varied through a range of about 30 meters. On the south end the differences were practically the same and would not show when plotted on the projections of scale 1:20000.

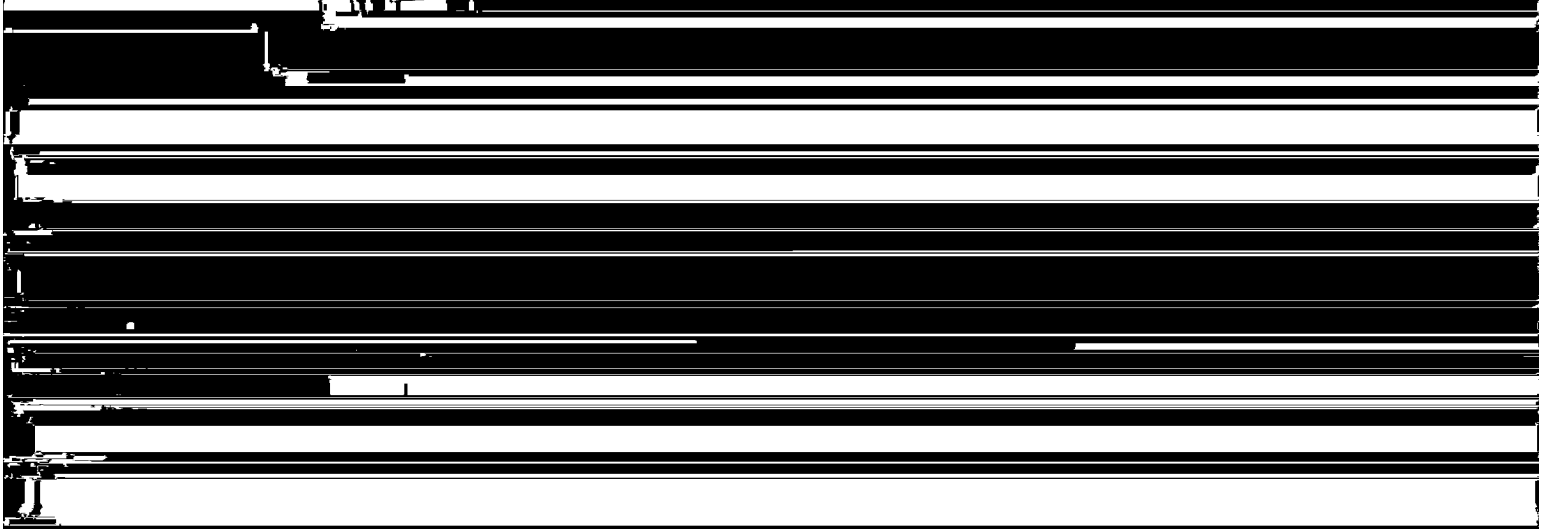
The topography and most of the hydrography had been completed at this time. It was possible, therefore, to move the projection on the south sheet so that all stations would be in their true positions. On the north sheet this was not possible because of the varying corrections to the triangulation stations and also because of a discrepancy in the topography of the east side of Niihau from the vicinity of Kii Landing to the end of the traverse southward at signal Lew. It was therefore necessary to take a new sheet and make a resurvey from Del to the south and west while the work from triangulation station SAND around to Del was transferred from the old sheet, corrections for the discrepancies between triangulation stations being applied. Between SAND and BLACK the shore line was transferred directly, no adjustment being necessary as these two stations had been changed by practically the same amounts. Between BLACK and Del, the location of the latter being determined by three point fixes, the shore line was transferred with protractor by taking off the angles from the old sheet and plotting on the new sheet, the intervening shore line between such points being transferred by vellum.

The traverse southward from Kii Landing to Lew was checked in the only possible manner by many intersections from stations in the vicinity of Kii Landing the difference in position being only 20 meters which was adjusted.

From station Lew south and west much of the topography had to be filled in with sextant cuts as it was impossible to get along the shore line on foot and the coast could only occasionally be seen from the hills. Pencil notations of these are more in detail on the sheet. From Puelo Point to the first small indentation about one mile southwest the topography is from plane table while each of the small indentations at signals Buck and Log and as much as possible on each side are from plane table work. In the first case the plane table positions were used and found to agree exactly with sextant cuts. It was necessary, however, to determine the positions of Buck and Log by sextant cuts and orientation of the plane table work was from lines of orientation drawn to triangulation stations HOA and BLUFF from those bays. From signal Cent west the work is all plane table traverse. All shore line not otherwise mentioned was secured from sextant cuts, using the utmost care to select good fixes and take all angles at one position as quickly as possible. The intersections checked unusually well for this class of work and it is believed that the coast line is not more than 25 or 30 meters out at any point as a good deal of time was spent in sketching in between intersection stations. The entire of this work was done by the Chief of Party. It should be stated that Lan was also determined by the sextant observation as a check on the traverse and acute intersections from the east and the location agreed within 10 meters of the topographic position.

It is to be regretted that there are not airplane photographs of this coast line available as they would be of great value in correcting or checking up such topographic details. Under the circumstances there was no other way of accomplishing this topography other than with sextant intersections in the manner described.

The contours and elevations are copied from the Geological Survey topography on a scale of 31,680, the work being executed simultaneously with that of the DISCOVERER parties. The Geological Survey spent about two months on this work and it is believed to be quite accurate. The



Airplane Landings-Niihau Island.

There are two possible airplane landing fields on the north end of the island as shown in pencil on the sheet. These positions are approximate as the topographer did not include them on the sheet but sketched from memory by the undersigned. These can be used for emergency landings and with little cost could be made very useful if necessary.


Clem L. Garner.

POST-OFFICE ADDRESS:

TELEGRAPH ADDRESS:

EXPRESS OFFICE:

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

Notes on

METHODS OF SURVEY

North Topographic Sheet

NIHAU ISLAND

The survey of shore line consisted of a traverse from Δ SAND to Δ BLACK with a closure of less than 10 meters, which was not adjusted. From Δ BLACK to $\overset{Del}{O}^a$ (a flag erected atop a low sand hill 400 or 500 meters east of Kii) the survey was by traverse and control by three point fixes using signals PIN, BLACK, LEHUA, PANIAU, and $\overset{Gam}{\Delta}^a$ (the station built by Buckingham on north-central portion of island) Three point fixes were determined about every three miles. The position of $\overset{Del}{O}^a$ was determined by three point fix using Δ 's LEHUA, PIN and a flag located about $1\frac{1}{2}$ miles WNW of Kii; the latter flag itself being determined by a fix using Δ 's LEHUA, $\overset{Gam}{\Delta}^a$ and PIN.

From $\overset{Del}{O}^a$ to $\overset{Lew}{O}^b$ (the flag which was erected as far down the rock line as possible) the survey of the shore line was by traverse, with a closure at $\overset{Lew}{O}^b$ of (?) meters which was not adjusted. Station "c" was determined by cuts taken at Δ 's Paniau, $\overset{Del}{O}^a$ and several points along the first part of the traverse.

From $\overset{Lew}{O}^b$ southward to Pueo Point the shore line was sketched in between points determined by slim intersections of lines drawn to objects along the beach from the stations used in determining

sketched Supplemented by sextant cuts from ship and when passing, about 100 meters off shore.

POST-OFFICE ADDRESS:

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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

the position of ^{Lew} ~~O~~.

In obtaining control for the shore line south and west of Pueo Point it was first necessary to determine the position of one of the sharp peaks in the vicinity east of Puulua. This was done by the three point method using signals PANIAU, KAEO and ^{Del} ~~Del~~. From this point a traverse was run to and along the edge of the top of the cliff line. The position of as many point as possible along the shore line were located by intersection. The shore line was sketched between such points.

Robert W. Knox
Robert W. Knox,
Jr H & C Engr.

This report is of the original sheet.
C.L.G.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

E. Lester Jones, Director

Top. 4235

State: Hawaiian Islands

SKETCHBOOK

ABSTRACT OF CONTENTS:

Sextant cuts taken from DISCOVERED
to locate signals south of Puelo Pt.

1926

CHIEF OF PARTY:

Lieut. Comdr. Clem L. Garner

Vols.

11-4821

Vol.

(Objects)

(Angles)

(Cuts)

Hos 47 40
Lew 46 05
Pt. #1 36 58
Lew 55 58
Bluff

Lew - Pt. #1 41 38
Lew - Pt. #2 40 03
Lew - Grass 26 52

Lew - Dump 35 37

Hos 22 00
Lew 65 40
Bluff

Lew - Lan. 52 35
" - Dump 24 46
" - Pt. #2 36 57
" - Pt. #1 40 17

Hos 22 04
Lew 65 33
Bluff

Lew - Tree 46 28
" - Sing. Rk 55 56

Stern 19 52
Pa 86 06
Bluff

Pa - Dump 21 52
" - Pt. #2 40 07
" - Pt. #1 44 50
" - Tree 59 08

High 44 16
Pt. #1 63 10
Bluff

Pt. #1 - Tree 27 11
" - Spot 20 45
" - Green triang. 34 43

High 43 58
Pt. #1 63 12
Bluff

Dump - Pt. #1 29 18

(over)

High 36 30
Green
Bluff 104 39

Buck-Green = 25-30
Log - " - 12-10

High 29 08
Green
Bluff 128 21

Buck-Green 22-08
Log - " 11-00

High 75 28
Pt.#1 58 23
Bluff

Horse 25 08
Lew 80 25
Bluff

High 112 35
Tree
Bluff 47 40

High 98 55
Tree
Bluff 65 18

High 84 08
Tree
Bluff 82 51

High 34 41
Pt.#1
Bluff 80 18

Pt.#1 - Spot 28 53
" - Green
triang. 39 08
Tan.Pt. North Pt. - Pt.#1
79 16

Lew - Grass 17 00

Spot - Bluff 76 57
Stk - Bluff 91 40

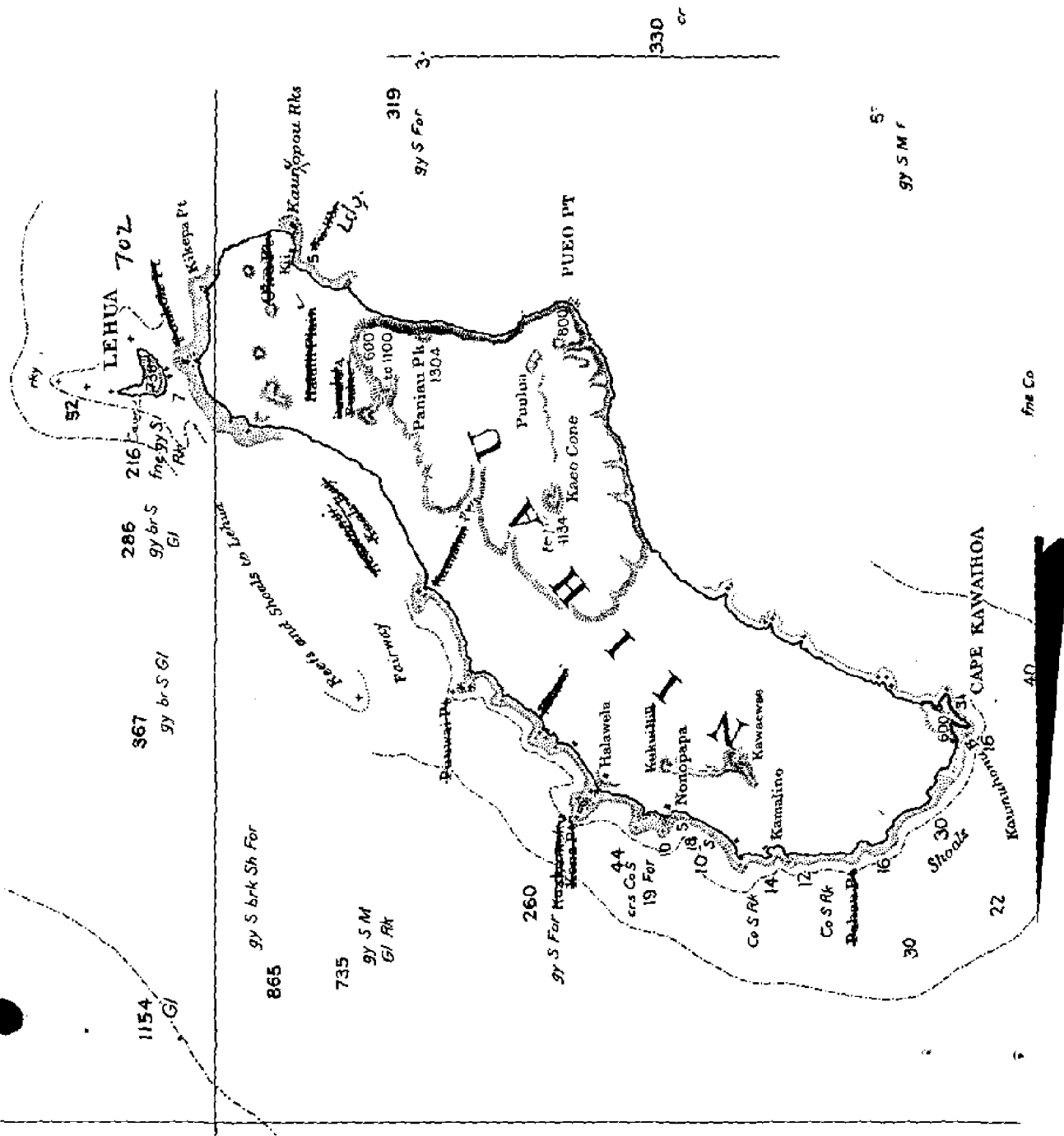
Wash - Bluff 80 45
Tan - " 60 55
Green - " 42 07
Tan - " 24 03

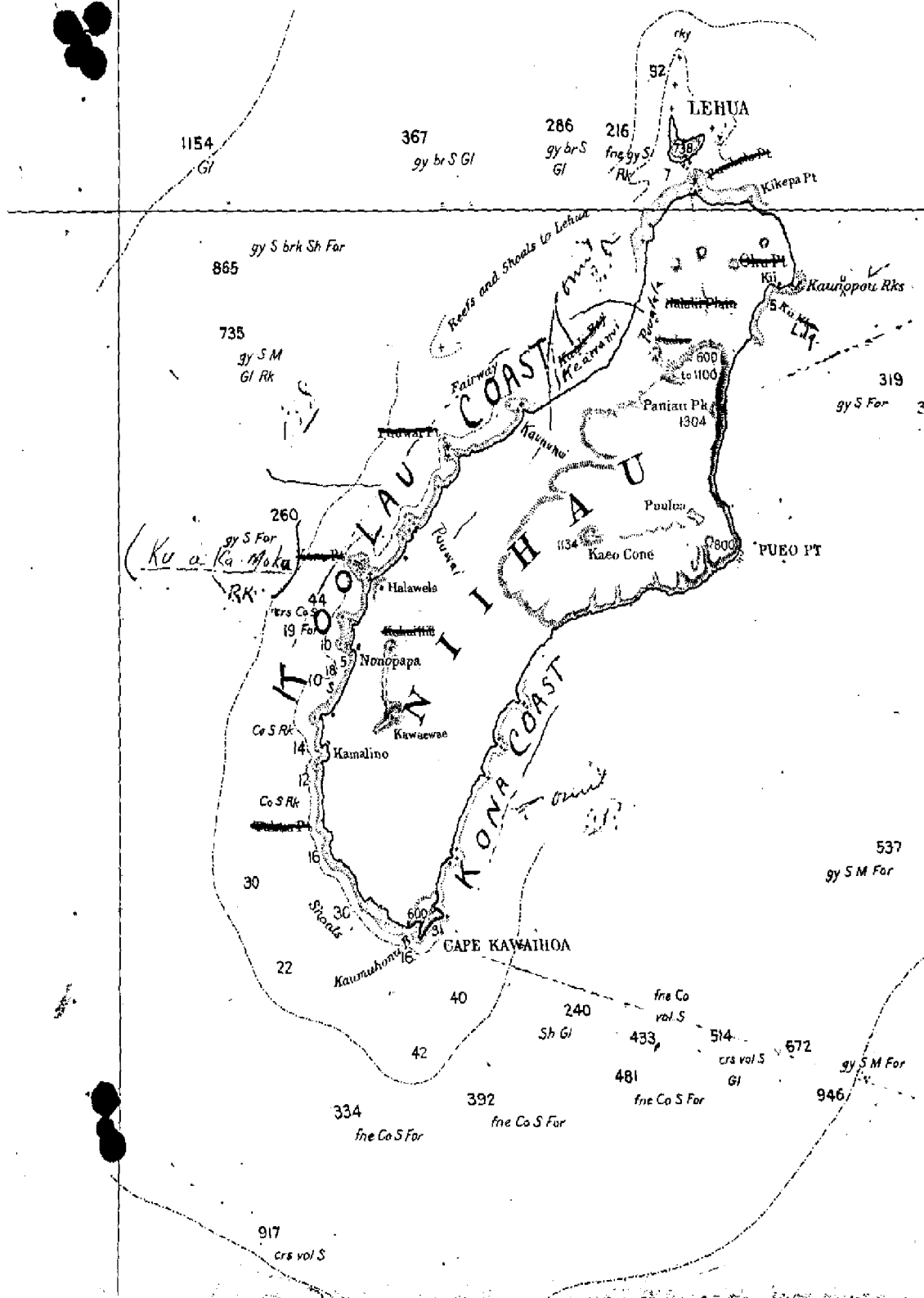
EndLog- Bluff 90 24
Cliff - " 87 04
Mk - " 72 04
Sig - " 44 08

Buck - Bluff 73 35

Also see pages 29 - 30, Sounding Vol. 3,
DISCOVERER, North Niihau Sheet.

Copied. H.M.H.
Copy checked: H.M.H.





Makaweli, Kauai, T. H.,
October 9, 1926.

Ensign. Comdr. Glem L. Garner,
U. S. Coast & Geodetic Survey,
Steamer Discoverer,
Honolulu.

Dear Sir:-

Your letter of September 25, 1926, was duly received. The section of coast survey chart of the islands of Nihoa and Niihau has had my careful attention and I have endeavored to revise the local names as you request. A number of the names on the chart are incorrect and have been eliminated by me. The name Kaunupou, near Kii, has been misspelled; it should be Kaunupou rather than Kaunopou as entered in the chart. On account of the small scale of the chart I hesitate to enter revised names although all points have their local names. I have, however, inserted the following on the map as near as I can make it to their correct locations: Puualala, Keawanui, Kaununui and Uuui. The anchorage at Kii is as you know merely an open roadstead with a somewhat uncertain boat landing and appears more correctly entered as Kii Landing rather than Harbor. I have so marked on the chart the Kona and Koolau coasts.

I trust that these notes may be of some assistance,

Yours very truly,

Gyler F. Robinson

LIST OF PLANE TABLE POSITIONS.

(Object)	(Latitude)	(D. M. meters.)	(Longitude)	(D.P. meters)	(Height)	(Remarks)
House	22° 00'	463	160° 05'	1141	12	SW corner of house, N. end of island.
Wag	22° 00'	291	160° 05'	655	7	NW corner of above.
Hum	21° 59'	750	160° 03'	1688	190	Rock on cone-shaped hill.
Hos	21° 57'	981	16° 04'	883	10	East gable house near beach.

Statute miles of shoreline -	29.7
Square statute miles area covered -	28.1
Statute miles of roads-	7.5

74000	21	46	54.390	1672.8
	160	12	20.413	586.4

Paul 21 54 10.669 328.1

21	54	01.791	✓	55.1
160	08	20.2381		580.91

✓	✓	✓	✓	✓	✓
160	21	50	13	49.077	1,509.4
				08.652	248.4

~~15 Aug 1964~~
~~Apr. 30/27~~

42.42

 700 = 4231 -

David	21	55	37.90	1,165.7
	160	10	45.26	1,298.9
Alan	21	46	54.37	1,672.2
	160	12	20.09	577.2
Lehman	22	01	09.95	306.0
	160	06	02.28	65.4
Paul	21	54	10.59	325.7
	160	12	37.80	1,085.0
Kee	21	54	01.72	52.9
	160	08	14.95	572.6
Barnum	21	56	20.81	640.1
	160	05	08.66	248.5
Paul	21	50	49.02	1,507.7
	160	13	08.33	239.2

Sheet
 Computation
 (Was on field 01/15)

IN REPLY ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY
AND NOT THE SIGNER OF THIS LETTER

AND REFER TO No. 11-DEM

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

WASHINGTON

April 25, 1927.

SECTION OF FIELD RECORDS

Report on Topographic Sheet No. 4235

North End of Nihaun, Hawaiian Islands

Surveyed in 1926

Instructions dated November 23, 1925 (DISCOVERER)

Chief of Party, C. L. Garner.

Surveyed by R. W. Knox.

Inked by J. C. Partington.

1. The records conform to the requirements of the General Instructions.
2. The plan and character of the survey conform to the requirements of the General Instructions.
3. The plan and extent of the survey satisfy the specific instructions.
4. The junction with the adjoining sheet is adequate.
5. The sheet was inked by a member of the field party. The drafting is excellent except for the marsh ruling which should have been done with lines parallel to the parallels of latitude and the vegetation legends should have been inked.
6. The conditions attending the application to the sheet of the contours, which were surveyed by the Geological Survey, are not known in the office. If it was possible to have obtained prints from the Geological Survey these should have been forwarded to the office in accordance with paragraphs 173 and 174 of the General Instructions, instead of reducing them in the field.
7. The legibility of the contours would have been increased if the 10-foot contours had been inked in a different color (preferably brown) from the 50-foot contours.

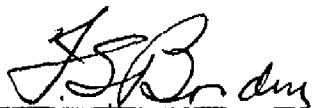
It is not customary to show 10-foot contours on C. & G. S. surveys or charts and it is questioned if they were needed in this case.

8. No further surveying is required.
- 9.- The character and scope of the surveying and field drafting are excellent.
10. Reviewed by E. P. Ellis, April, 1927.

Approved:



Chief, Section of Field Records (Charts)



Chief, Section of Field Work (H. & T.)

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

TOPOGRAPHIC TITLE SHEET

The finished Topographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Register No. ⁴4235

4235

State Hawaiian Is.

General locality . . . ~~Niihau Island~~

Locality North end Niihau Island

Chief of party Clem L. Garner

Surveyed by R. W. Knox

Date of survey July 1926

Scale 1 : 20,000

Heights in feet above Mean high water

Contour interval ^{50 and 10}~~10, 50~~ feet.

Inked by J.C. Partington Lettered by J.C. Partington

Records accompanying sheet (check those forwarded): Photographs,

Descriptive report, Horizontal angle books, Field computations,

Data from other sources affecting sheet . Contours taken from.

U.S. Geological Survey sheet of same area; scale 1 : 31,680.

Remarks: