4235

Form 504

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

State: Hawaiian Islands

11—5613

DESCRIPTIVE REPORT.

Topographic *Sheet No.* 4 4235

LOCALITY:

Niihau ~~Island, T.H.~~

North end of Niihau

1926

CHIEF OF PARTY:

Lieut. Comdr. Clem L. Garner.

4235

Applied to Chart 4/81 Sept. 3, 1940 G.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 unmistakeable. Kaeo 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 [redacted] 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 DUB the shoreline is very steep and rocky, the bluffs rising almost vertically from the water's edge. From topographic station DUB around to topographic station COP the shoreline is low and rocky except for a few short sand beaches. From topographic station COP to triangulation station SAND the shoreline is low and sandy. Landings can be made on the west and north shores of Niihau and on the east shore at Kii Landing during favorable weather. The northwest coast cannot be landed on during the winter months, however, and during that time Kii Landing is used.

Lehua, off the northwest point of Niihau Island, is a cresent shaped island 702 feet high at the highest point. On the west side of Lehua Island is a conspicuous hole or cave having an average width of 15 feet and rises from the waterline to a height of about 60 feet. This cave extends through the rocky wall to the opposite shore. The shoreline of Lehua Island is high and rocky and landings are best made in the small bight shutheast of Lehua Peak.

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 Nonopapa 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 PAILAU 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 perpared 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 Paniau-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 becuase of the varying corrections to the triangulation stations and also becuase 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. Penciled notations of these are more in detail on the sheet. From Pueo 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 contours were copied in Honolulu using a pantograph loaned by the Territorial Surveyor, it seeming desirable to have the transfer made by officers engaged in the field work. The contours of Lehua Island are by Lieut. Knox. These were copied by the Geological Survey.

A self-explanatory letter from Aylmer F. Robinson relative to Niihau names is attached hereto.

Respectfully submitted

Clem L. Garner

Clem L. Garner, Lieut. Comdr.
Commanding Officer,
Str. DISCOVERER.

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

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

NIIHAU ISLAND

The survey of shore line consisted of a traverse from △ SAND to △ BLACK with a closure of less than 10 meters, which was not adjusted. From △ BLACK to ⊙ ~~"a"~~ Del (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 △ ~~"b"~~ Gam (the station built by Buckingham on north-central portion of island) Three point fixes were determined about every three miles. The position of ~~"a"~~ Del was determined by three point fix using △'s LEHUA, PIN and a flag located about 1½ miles WNW of Kii; the latter flag itself being determined by a fix using △'s LEHUA, ~~"b"~~ Gam and PIN.

From ⊙ ~~"a"~~ Del to ⊙ ~~"c"~~ Lew (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 ⊙ ~~"c"~~ Lew of (?) meters which was not adjusted. Station "c" was determined by cuts taken at △ Paniau, ⊙ ~~"a"~~ Del and several points along the first part of the traverse. [illegible]

From ⊙ ~~"c"~~ Lew 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 along coast about 100 meters off. C.L.G.

P[redacted]-OFFICE ADDRESS:

TELEGRAPH ADDRESS:

EXPRESS OFFICE:

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

the position of ⊙ Lew.

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. 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 & G Engr.

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

FORM 274

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 DISCOVERER to locate signals south of Pueo Pt.

192 6

CHIEF OF PARTY:

Lieut. Comdr. Clem L. Garner

Vols. 11—4821 *Vol.*

(Objects)	(Angles)	
Hos	47	40
Lew		
Bluff	46	05
Hos	36	58
Lew		
Bluff	55	58
Hos	22	00
Lew		
Bluff	65	40
Hos	22	04
Lew		
Bluff	65	33
Stern	19	52
Pa		
Bluff	86	06
High Pt.#1	44	16
Bluff	63	10
High Pt.#1	43	58
Bluff	63	12

(Cuts)		
Lew - Pt.#1	41	38
Lew - Pt.#2	40	03
Lew - Grass	26	52
Lew - Dump	35	37
Lew - Lan.	52	35
" - Dump	24	46
" - Pt. #2	36	57
" - Pt.#1	40	17
Lew - Tree	46	28
" - Sing.Rk	55	56
Pa - Dump	21	52
" - Pt.#2	40	07
" - Pt.#1	44	50
" - Tree	59	08
Pt.#1 - Tree	27	11
" - Spot	20	45
" - Green triang.	34	43
Dump - Pt.#1	29	18

(over)

High
Green 36 30
Bluff 104 39

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

High
Green 29 08
Bluff 128 21

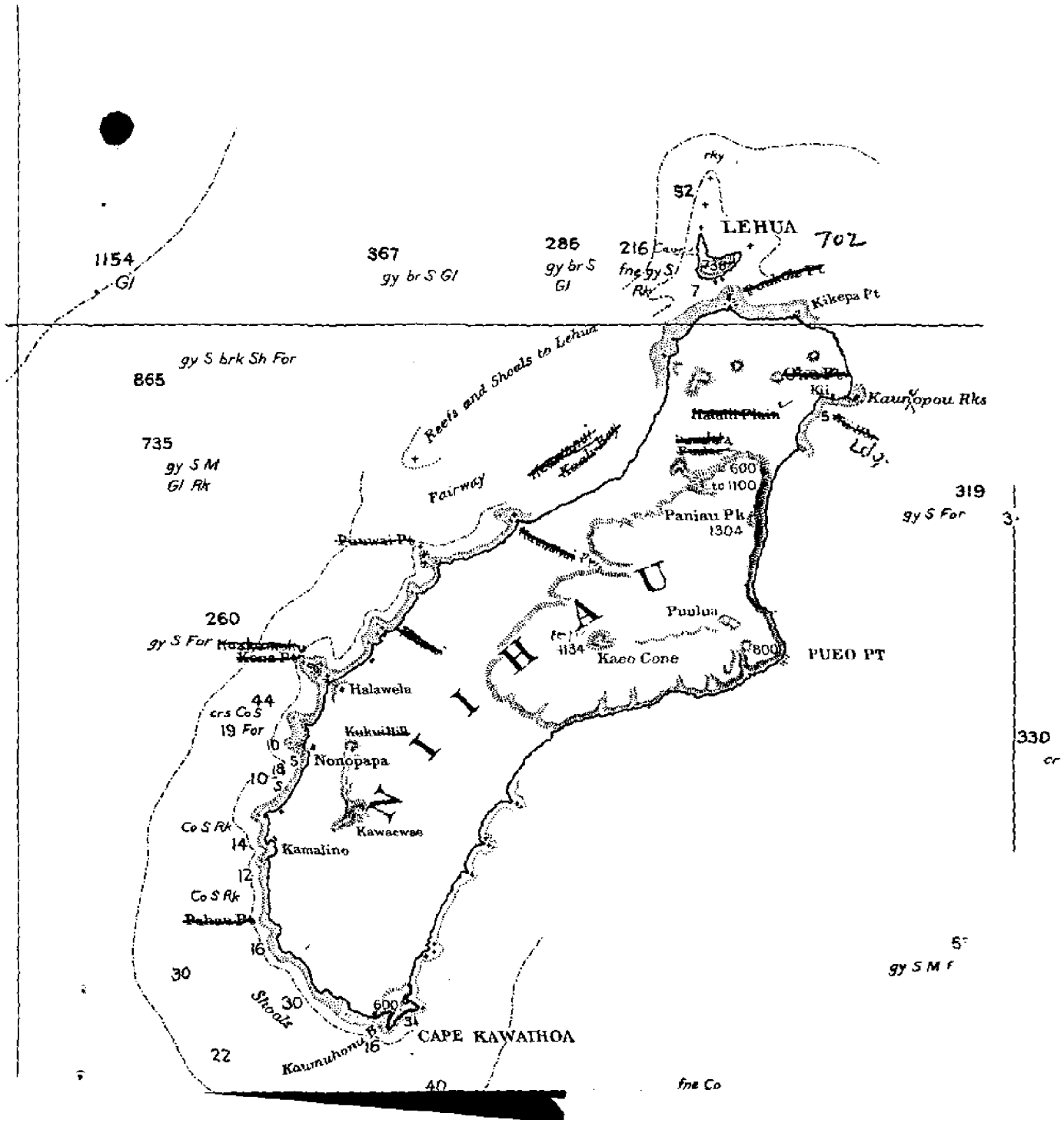
Buck-Green 22-08
Log - " 11-00

High	75	28	Pt.#1 - Spot	28	53
Pt.#1	58	23	" - Green triang.	39	08
Bluff			Tan.Pt. North Pt - Pt#1	79	16
House	25	08			
Lew			Lew - Grass	17	00
Bluff	80	25			
High	112	35	Spot - Bluff	76	57
Tree			Stk - Bluff	91	40
Bluff	47	40			
High	98	55	Wash - Bluff	80	45
Tree			Tan - "	60	55
Bluff	65	18	Green - "	42	07
			Tan - "	24	03
High	84	08	EndLog- Bluff	90	24
Tree			Cliff - "	87	04
Bluff	82	51	Mk - "	72	04
			Sig - "	44	08
High	34	41			
Pt.#1			Buck - Bluff	73	35
Bluff	80	18			

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

Copied. H.M.H.

Copy checked: MAN.


LEHUA
Kikepa Pt
Kaunaopou Rks
Reefs and Shoals to Lehua
Fairway
Panian Pk
1304
Puulua
Kaeo Cone
1134
PUEO PT
Halawelu
Kukuihill
Nonopapa
Kawaewae
Kamalino
Shoals
CAPE KAWATHOA
Kaumuhonu
1154 Gl
367 gy br S Gl
286 gy br S Gl
216 fne gy S Rk
865 gy S brk Sh For
735 gy S M Gl Rk
319 gy S For
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gy S M f
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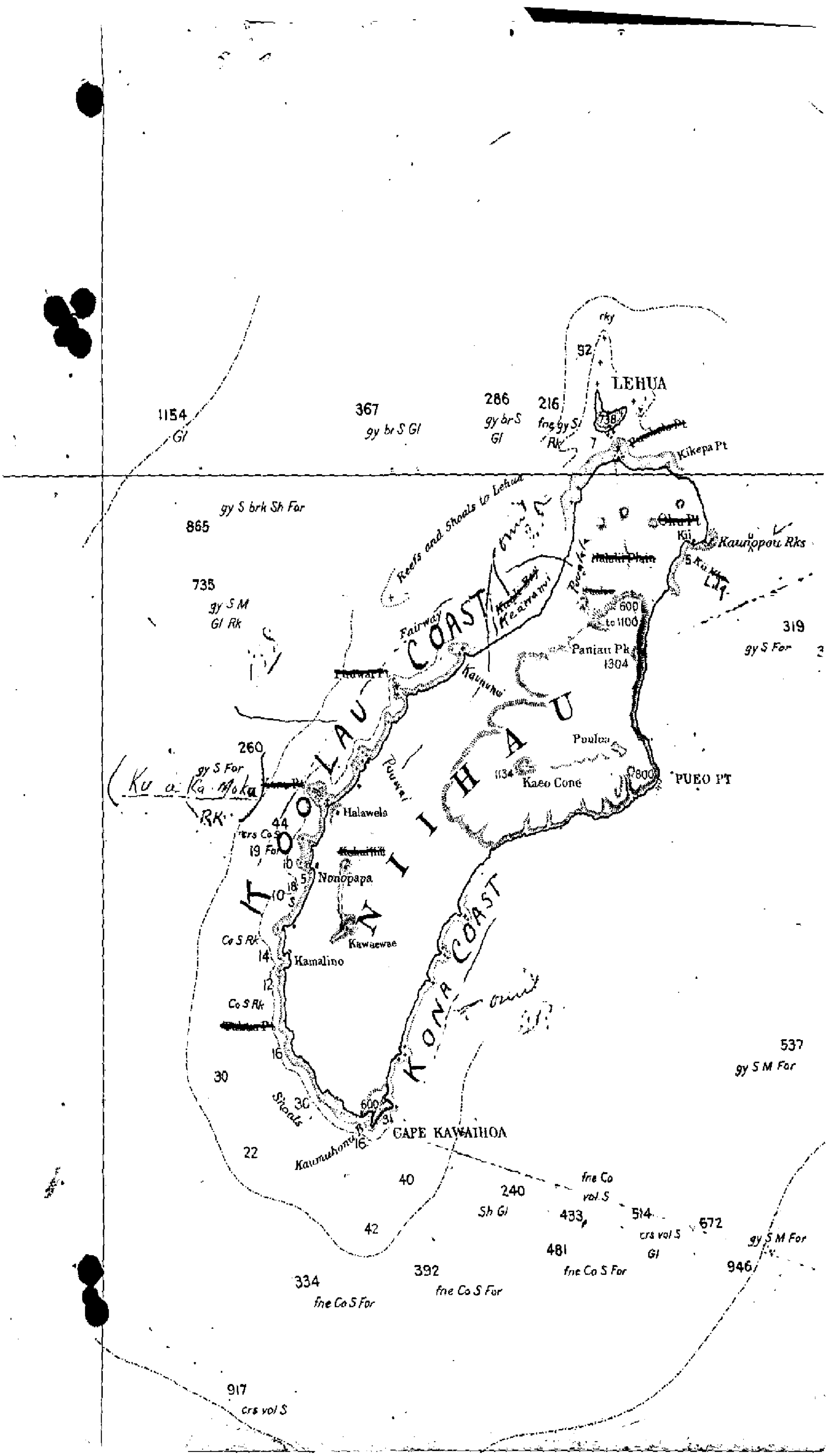
LEHUA
rky
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216
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gy br S
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gy br S Gl
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735
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Reefs and Shoals to Lehua
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COAST
Kauunoopou Rks
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to 1100
Paniau Pk
1304
319
gy S For
Kaununui
NIIHAU
Pouwai
Poulua
PUEO PT
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1134
Kaeo Cone
260
gy S For
Ku a Ka Moku
Rk
KO'OLAU
Halawela
44
crs Co S
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Kawaewae
Co S Rk
14
Kamalino
12
Co S Rk
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Shoals
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Kaumuhonu B
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22
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42
240
Sh Gl
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crs vol S
Gl
672
gy S M For
481
fne Co S For
946
334
fne Co S For
392
fne Co S For
917
crs vol S

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

Lieut. Comdr. Clem 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 Niihau and Lehua 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 Kaunuopou, near Kii, has been misspelled; it should be Kaunuopou 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 out to their correct locations: Puualala, Keawanui, Kaununui and Puuwai. 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 also marked on the chart the Kona and Koolau coasts.

I trust that these notes may be of some assistance,

Yours very truly,

Aylmer F. Robinson.

LIST OF PLANE TABLE POSITIONS.

(Object)	(Latitude)	(D. M. meters.)	(Longitude)	(D.P. meters)	(Height)	(Remarks)
[redacted]se	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

Sand	φ	21	55	37.737	1,160.7
	λ	160	10	45.259	1,298.9
Hoa		21	46	54.390	1,672.8
		160	12	20.413	586.4
Lehua		22	01	10.063	309.5
		160	06	02.562	73.5
Kal		21	54	10.669	328.1
		160	12	38.115	1,094.0
Kaeo		21	54	01.791	55.1
		160	08	20.238	580.9
Paniau		21	56	20.88?	642.2
		160	05	08.944	256.7
Kaw		21	50	49.077	1,509.4
		160	13	08.652	248.4

Office Computation

Kaui datum
apr. 30/27

Hawaiian Islands

T.? = 4231
4242

Field computation
(Used on field sheets)

Sand	21	55	37.90	1,165.7
	160	10	45.26	1,298.9
Hoa	21	46	54.37	1,672.2
	160	12	20.09	577.2
Lehua	22	01	09.95	306.0
	160	06	02.28	65.4
Kal	21	54	10.59	325.7
	160	12	37.80	1,085.0
Kaeo	21	54	01.72	52.9
	160	08	19.95	572.6
Paniau	21	56	20.81	640.1
	160	05	08.66	248.5
Kaw	21	50	49.02	1,507.7
	160	13	08.33	239.2

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

AND REFER TO No. 11-DRM

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 Niihau, 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:

L. O. Colbert

Chief, Section of Field Records (Charts)

J. S. Brady

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

Form 537a
11—5813

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.

4235

U. S. Coast and Geodetic Survey.

Register No. 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 ~~10,50.~~ 50 and 10 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: