

4356

CONFIDENTIAL

Form 504	
DEPARTMENT OF COMMERCE	
U. S. COAST AND GEODETIC SURVEY	
....., Director	
<div>G. & G. SURVEY L. & A. JUL 30 1928 Acc. No.</div>	
State: Hawaiian Is.	
DESCRIPTIVE REPORT	
Topographic Hydrographic	Sheet No. ^A 4356
LOCALITY	
120 miles NW by W. of Nihau	
Nihoa Island	
1928	
CHIEF OF PARTY	
T. J. Maher	

GOVERNMENT PRINTING OFFICE

DECLASSIFICATION BY NOAA
PURSUANT TO DOC SYSTEMATIC REVIEW
GUIDELINES AS DESCRIBED IN SECTION
3.3 (a), EXECUTIVE ORDER 12356

RABBITS CONVERT ISLAND INTO DESERT

One of U. S. Group in Pacific
Deserted by Human
Family.

Uncle Sam has just discovered that one of his many thousands of islands has been living for years under false pretenses.

On the charts of the world Laysan Island, largest member of the Leeward group of islets that extends for 1,300 miles northwest from Hawaii, is shown in a position where in reality the waves of the Pacific roll unbroken. The island actually lies four miles north of the charted position and will be moved to its proper situation on future maps.

"Laysan furnishes a striking example of the unforeseen effects that flow from tampering, even in a minor degree, with nature's balanced forces," says a bulletin from the National Geographic Society.

Once Covered With Vegetation.

"When the island was discovered, and for many years afterward, it was covered with green vegetation and was the nesting place of myriads of sea birds and the home of thousands of land varieties of the feathered family. Then the guano deposits were exploited and headquarters for the workers was established.

"By 1899 the fertilizer deposits were exhausted. Laysan and its neighboring isles were made into a bird reservation that year and human inhabitants of the island departed. But they left behind them an apparently innocuous pair of domestic rabbits, whose descendants made a veritable desert of the island.

"When officials of the bird reservation visited Laysan in 1923 they found that every blade of grass, every weed and shrub and all but three or four trees had been destroyed by the rodents. Considerable areas were covered with the bleached bones of thousands of rabbits that had starved after their food supplies had been exhausted, and with the bones of birds overwhelmed by the drifting sands. Even the ranks of the birds that lived from the sea had been noticeably thinned. The last few living rabbits were killed and trees were planted.

Bird Family Totals a Million.

"The survey of the island that has just been completed disclosed that with the rabbits out of the way the trees have thrived, grasses and other plants are covering the island, and the bird inhabitants have increased to approximately a million. Laysan thus becomes the most important bird breeding ground in the Central Pacific.

"The island is a mile and three-quarters long and a mile wide. It is a relatively low sand isle with an elevated rim rising somewhat abruptly from the beach to a height of 20 to 40 feet. In the center is a lagoon, with water concentrated by evaporation until it is more saline than the sea.

"Best known of the islands—that with Laysan make up the northwestern extension of the Hawaiian group—is Midway, which lies near the 180th meridian. It is under the jurisdiction of the Navy Department, and is leased to a cable company to serve as its midocean relay station. About 30 people, half whites and half Orientals, dwell on the island in a little handmade community whose materials have been brought from the United States and Hawaii, even to the soil in which grow the little patches of lawn and the tiny vegetable gardens.

"Only one island of the Leeward group lies west of Midway. It is Ocean Island, about 50 miles away. It consists of an irregular circle of coral 4 miles or so in diameter, with a semi-circular fragment, known as Green Island, 1,800 yards long by 300 yards wide, at its eastern side. On its beaches the Hawaiian monk seal breeds in great numbers.

Once Inhabited by Polynesians.

"The nearest of the 'Bird Islands' to the main Hawaiian group is Nihoa. It is a small rock island with steep slopes and cliffs rising more than 800 feet above the sea. Its caves and terraces give evidence that Polynesians once had a colony of several hundred persons there.

"Necker Island, nearly 200 miles to the west, is an isolated rock rising from the sea. There, too, temple platforms show the former occupancy by ancient, more or less primitive man.

"A hundred miles farther west are the 13 little sand islands and the pinnacle rock that mark French Frigate Shoal, and 200 miles farther lies Gardner Island, a rock only 200 yards long. Beyond Gardner lie Dowsett and Mora Reefs, merely coral rings marked by breakers and with no visible land. It is barely 75 miles from these reefs to Laysan Island.

"Between Laysan and Midway the only dry land is Lisiansky Island. It is a rough parallelogram a mile long and less than a mile wide. A ridge rising 40 feet above the sea marks its highest point. Like Laysan, it was denuded by rabbits introduced from that island. Since the creatures starved to death, vegetation has come back to the island and it is again an important bird refuge."

applied to chart 4181 Aug. 13, 1940 g.H.S.

T-4356

DESCRIPTIVE REPORT
to accompany
TOPOGRAPHIC SHEET NO. A
Scale 1:2,500.
Nihoa, I.

Surveyed April 27 - May 7, 1928

Thos. J. Maher - H. & G.E. Chief of Party
H. C. Warwick, Jr. H. & G.E. Topographer

LIMITS: The limits of this sheet include all area inside the low water line of Nihoa Island, including off lying rocks.

CONTROL: Plane table triangulation, using stadia measurements for a base, and the astronomic station on the island as a point of origin, constituted control for this survey. Upon the completion of the field computation for latitude, longitude and azimuth a polyconic projection (scale 1:2,500) was constructed on the sheet showing every 30 seconds of meridian arc and parallel.

METHOD: Before beginning the topography several small signal flags were erected on the various peaks. The first set up was made on Millers Peak and plane table cuts were taken to astronomic station, all the signals and the natural features on the island. The second set-up was made on the bluff about mid-way between Millers Peak and the south shore. From this station by a series of observations a good distance between a astro. station and a Miller was determined, establishing this base. Also a number of vertical angles and measurements to the M.T.L. were taken to establish and elevation of a Miller and furnish sufficient vertical control. From this station as well as from several other set-ups sufficient rod readings and vertical angles were taken on the various ridges, cliffs, gulches, bluffs etc., to enable the topographer to draw in the contours to a good degree of accuracy. The natural features of the island such as clumps of palm trees, stone temples, terraces, ruins, and walled caves were rodded in. The high water line on the south shore was rodded in by the usual stadia methods. Due to the continual surf it was impossible to rod in the limits of the low water line, so the edge of the rocky ledge which constitutes this line, was sketched in as close as possible. The shore line on the east, north, and west sides of the island consist of precipitous cliffs, with sea caves along the shore making the usual methods of topography impossible. Due to the continual heavy seas, landings on these sides are impossible.

This part of the shore line was done during my absence under the supervision of the commanding officer, from the ship. Angles being taken to natural objects ashore. This part cannot be considered accurate, but only a determination of the shore line as it appeared from the vessel. Accurate positions of the ship could not be obtained, as the inclined angles to the summits gave inaccurate positions of the vessel. The contours as shown on the sheet overlap the shore line on this side indicating overhanging cliffs and sea caves. Magnetic bearings were then tried but local variation was found within $1/3$ mile from the beach in places. This amounted to only two or three degrees, but was sufficient to give inaccurate positions. By anchoring the ship at various places and taking pelorus angles and sun azimuths, a fairly accurate representation was obtained.

A stellar azimuth was measured from an unmarked station in the vicinity of Astro Sta. to Miller, and a solar azimuth was measured from Astro Sta. to Miller. Miller was then occupied with a theodolite and directions measured to the other signals on the island. This data is to be forwarded separately as triangulation data.

No magnetic meridian appears on the sheet due to the fact that several stations were occupied with the declinometer and these observations are considered stronger than those that could be obtained with the declinatoire.

DESCRIPTION: Nihoa island is a high, rugged, lava island of a little less than a mile in length and in an east and west direction and from $\frac{1}{4}$ to $\frac{1}{2}$ mile in width. On the east, north and west sides it has the appearance of being broken off in a vertical plane, so steep are the sides.

The extreme eastern point of the island terminates at a sharp knife edge. The top of the edge about 300 feet high and almost vertically above high water line. This edge or corner has a daylight sea cave through it near the junction of the blade and the main body of the island. The location of the cave or tunnel is approximate. This edge has the appearance of being formed by the conversion of two dikes (or strata of denser material running at right angles to the lava beds) at a point, and the separation and dropping off of the seaward parts of the island.

The southeast and southwest sides of the island terminate at points forming a bay known as Adams Bay. There are three small bights inside this bay, the western most one of which has a sand bottom with scattered sunken rocks. The gradually sloping bottom causes breakers and a heavy surf to run in most all weather. Landing in this cove is impracticable and dangerous if not impossible. The shore line, on the extreme south side of the island, with the exception of the sand beach in the west cove, consists for the most part of a rock ledge easily traversed except in two or three places.

The middle cove is probably the best landing place of any, however great care must be taken in doing so. The rise and fall of the swell is quite enough to capsize a boat should one end become caught on top of a rock at the edge of the ledge. In fact, that identical thing happened the morning this party was landed on the island. The boat with all hands, instruments, camp gear and supplies capsized. Fortunately all hands could swim and no one was lost or hurt. All instruments were recovered by the few expert swimmers in the party who dove for them. After effecting a landing on this ledge a good but steep trail is to be had to the top of the bluff, on the west side of the two draws which drain into this cove. Here the camp was established. This is as good and convenient a site as could be found. At the foot of the bluff below the camp seepage water can be obtained. This water is not suitable for drinking but may be used for washing.

The north, east, and northwest end of the island are marked by peaks, Tanager Peak 874 feet high, and Miller's Peak 910 feet high, the latter being the highest point on the island. There are several other peaks along the north and west edges of lesser heights. The average slope from these peaks to the south shore is about 23 degrees. The slope ends at the shore line at bluffs above the rock ledge of from twenty to eighty feet in height. The slope is by no means regular, but consists of ridges and gulches, and high cliffs. There are two groups of scrubby palm trees about 10 feet high on the island, one group about 400 feet in elevation in the draw which drains to the east cove and the other group about 250 feet in elevation in the draw which drains the west cove. Covering the entire slope of the island is a dense carpet of coarse brushy growth from one to two feet high. This growth makes going very difficult. There are numerous holes all over the island, made by the birds and these holes and the loose stone make footing very uncertain.

The only form of animal life on the island aside from various smaller insects and bugs are the thousands of sea birds. It would be hard for one who has never been on shore here to conceive of the number of birds that inhabit this island.

The most impressive features on the island are the high cliffs on the east north and west sides. Two very singular and remarkable features are the "Needle" and "Devils Slide". The former on the top of the west cliff is about 10 feet in diameter and projects about 30 feet above the top of the cliff. It has the appearance of a stove pipe on a cabin. This formation is explained by Mr. Palmer of the Bishop Museum of Honolulu, as the extension of one of the dikes. The Devils Slide on the northwest point of the island consists of a steep chute like gash through the north west corner of the island. This is explained by Mr. Palmer as removal of the weaker flow lavas from the region between two dikes. This formation impresses the layman as that part

of the island separating from the main part at a dike. The floor of this slide slopes from the level of the plateau down to an elevation of about 500 feet, and from here takes the slope of the face of the cliff. For further description of the island see Bulletin #35, Bernice P. Bishop Museum, Honolulu T.H. A copy of this bulletin accompanies the semi-annual report of the Chief of Party.

LANDMARKS: The most prominent land marks on this island are the two high peaks, namely, Millers Peak, Tanager Peak, and the Needle, all three of these features are described under list of plane table positions.

NEW PLACE NAMES: The following names were taken from the blue print of the survey made by C. S. Judd and H.S. Palmer during June 1923 of the Tanager Expedition for the Bishop Museum of Honolulu. A copy of this blue print is attached hereto and constitutes a part of this report.

Devils Slide, Needle, Tanager Peak, Tunnel Cave.

H. W. Wick
Respectfully submitted

Forwarded

Thos. J. Maher

Signals were erected on all of the prominent peaks. These were occupied and angles (direction method, 1 D & 1 R, were taken as a check on the topographic work. Referring to the remarks in this report relative to Adams Bay, eastern bight, I desire to state that no attempt was made to land there. We would have landed there if we found landing in the middle bight difficult. Mr. Brown reported to me that there was a place in that bight which at times looked all right. If this information is used for coast pilot notes, recommend that the middle bight, where we landed be referred to as the best place but remarks to the effect that landings can not be made in the eastern bight be omitted.

* The maximum error in the shoreline as found by the hydrographic party is 82 meters. By direction of cliff, the shoreline was found to be correct within 100 meters in 1928.

* The shoreline of the north and west coasts was found by the hydrographic party to be erroneous and was revised by this party. See descriptive report of H. 5018, E.P.E. Aug. 20, 1930. Inspected and found adequate.
E.P.E. July, 1928

LIST OF PLANE TABLE POSITIONS

Independent datum

Name	Latitude Longitude	D M D P	Height <i>above mean tide level</i>	Note: DM's - DP's measured from 30 second meridians and parallels
South Peak	23-03-00 161-55-30	+ 658.0 - 263.0 + 183.5 - 670.5	341 Feet	Highest point of most southerly peak on the S. W. face
Flag	23-03-00 161-55-30	+ 869.0 - 54.0 + 322.0 - 532.0	594 Feet	Highest point of second peak along the S.W.Face.
Needle	23-03-30 161-55-30	+ 24.5 - 898.5 + 322.7 - 531.3	568 Feet	Bent pinnacle rock, stove pipe shape in saddle on west face.
Miller	23-03-30 161-55-30	+ 361.0 - 562.0 + 250.0 - 604.0	910 Feet	See Description: 5 meters west of circular stone cairn on highest point of island, known as Miller's peak, about 4 feet below summit, standard disk Hydrographic mark cemented in rock.
R.A.R. Shack	23-03-30 161-55-00	+ 123.0 - 800.0 + 658.0 - 196.0	238 Feet	A 6' x 8' shack built to house radio equipment for R.A.R. station on Nihoa island, on the east side of a draw and north of the landing in the middle bight
West Twin	23-03-30 161-55-00	+ 246.5 + 446.5 - 407.5	638 Feet	Highest point of westernmost twin peak on north face.
East Twin	23-03-30 161-55-00	+ 262.0 + 379.0 - 475.0	671 Feet	Highest point of easternmost twin peak on north face.

LIST OF PLANE TABLE POSITIONS

NAME	LONGITUDE	D M D.P.	Height <i>above mean tide level</i>	Note: IM's and DP's measured from 30 second meridians and parallels
Mid.	23-03-30 161-55-00	+ 284.8 + 210.0 - 644.0	675 Feet	Highest point of peak midway between twin peaks and Tanager peak on north face.
Tan	23-03-30 161-55-00	+ 263.5 + 7.5 - 846.5	874 Feet	Top of stone cairn on highest part of highest peak near eastern end of island known as Tanager Peak, from U.S.S. Tanager Expedition of 1923
East Peak	23-03-30 161-54-38	+ 234.0 + 807.8 - 46.2	850 Feet	Peak on east slope of Tanager Peak.
Nose	23-03-00 161-55-00	+ 661.0 - 262.0 + 221.0 - 633.0	125 Feet	Projecting rock on S.E. point having the appearance of a dogs snout.
Ninno Astro Station	23-03-00 161-55-00	+ 915.2 + 730.3	49 Feet	See description.
Gut	23-03-00 161-55-00	+ 793.0 - 130.0 + 308.0 - 546.0	58 Feet	Projecting ledge of rock, white washed in east cove.
Dike	23-03-00 161-55-38	+ 665.0 - 258. + 82.5 - 771.5	8 Feet	Bottom of northernmost and most prominent of the dikes on west shore of west cove.

Station:-

Observer:-

Object

Time Tel
Dur R.

Rept. Angle

State:-

Inst.

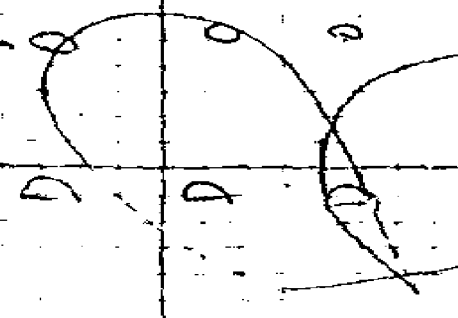
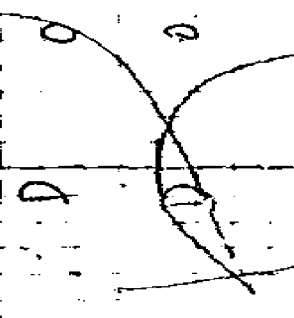
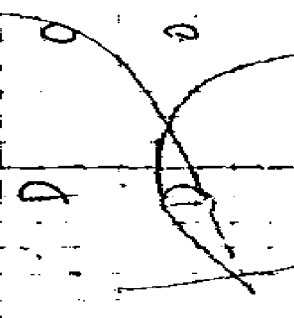
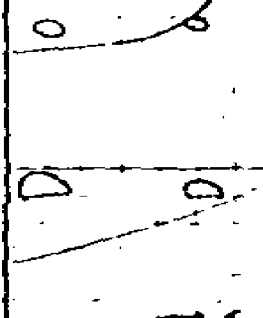
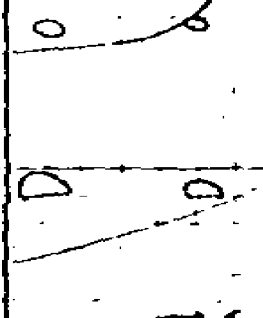
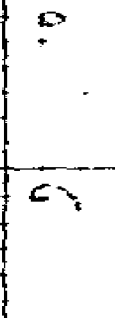
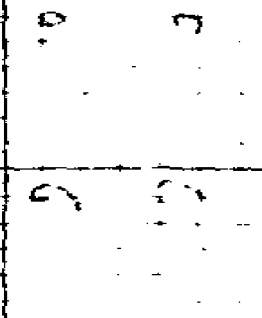
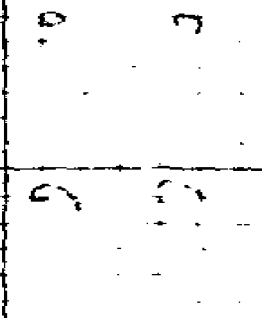
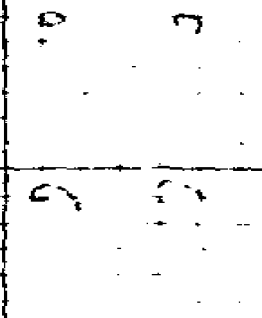
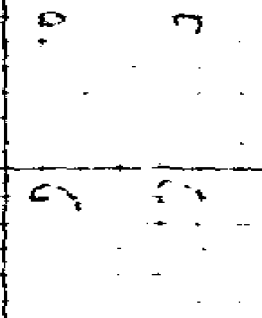
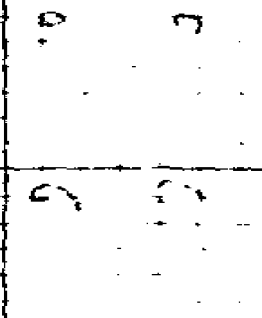
Island:-

Date:-

Nihoa I. Ter. of Hawaii

Cuts for topography

Filed in aces. report
of T. 4356

Station	State	Island	Angle	H.	B	Mean	Angled. + R.
Observer: G.E.B.	VT	Nihoa					
Object Observed	Time	Tel. Dir. Rep's.					
Felro Sta?			00 00	30	70	00	
Temple			16 06	00	00	00	
Flag			22 32	00	50	45	
Steeple			28 00	00	30	45	
Pillar	<u>Inst. slipped</u>		54 46	00	00	00	
Light tower			54 54	00	30		
Light tower			249 04	00	30		
Light tower			75 34	00	30		
Light tower			250 34	00	30		
Light tower			211 10	00	00	00	
Light tower			31 54	00	00	04	

Station: W. I. W. in Observer: G. E. B.	Island: Nihoa	Date: June 5, 1928		
Object Observed	Time Tel. Dir.	Angle. H. A.	B. Man.	Angle D. + R.
Astro. Star?	D 35	00	00	
Mark	R 180	00	30	
? Simmons Park Site	D 64	16	00	
	R 184	30	30	
Flag?	D 22	30	30	
Needle	R 202	31	00	
Bent Jack	D 28	00	00	
	R 208	01	00	
	D 54	45	00	
Miller (on flag)	R 234	46	00	
Litang Jack	D 64	02	-	
on N. side of Id	R 211	02	30	
Strong P. A.	D 70	35	50	
	R 150	35		
E. Twin	D 211	10	00	
	R 31	11	30	
Tapee	D 222	47	00	
	R 42	47	30	

Sighting on Nihoa
at waterline 1/2°

Station: E Twin Observer: G.E.B.	1912 Island: Nihoa	Date: June 5, 1928	Angle D.R.		
Object Observed	Time Tel. Dark Rep. is	Angle	A	B	Mean
Summers, S. W. Peak	D	00	00	00	
Flag		180	00	00	
Needle		51	00	00	
V.E. Twin		196	00	00	
		21	00	30	
		201	00	30	
		24	30	00	
		204	00	00	
Radio		46	00	00	
		226	00	30	
Paris L. Peak		59	00	—	
on N. side ID	V.P. 13-15	239	00	—	
Long Island		61	30	—	
	V.P. 13-16	241	00	—	
Tanger		218	00	30	
		38	30	30	

Can't see
on 16-17
on 21-22

Station - Observer - G.E.B.	Time	Island: Nihoa	Date: June 5 1928
Object Observed.	Tel. Dir.	Angle.	B. Mean
Simmons S.W. Peak	R D	180 00 00 00	00 00 00 00
Flag?	R D	196 50 16 51	60 00 00 00
Needle	R D	201 53 21 54	60 00 30 30
WE Twin	R D	204 49 24 50	30 00 00 00
Miller	R D	226 15 46 15	00 00 00 00
Tanger	R D	38 35 218 35	00 00 00 00

Station 1 - W. Twin
Observer: G. F. B.

Island: - N. Island Id.

Date: - June 5, 1928

Stamp

S.W. Peak

Flag?

Needle

Miller

Rock 1 Top

Rock 2 Top

W. Twin

Tangle

P	00	00	00	00
R	179	58	00	00
P	04	16	00	30
R	184	13	30	60
P	22	31	00	30
R	202	29	30	60
P	28	00	00	00
R	207	58	30	60
P	54	46	00	00
R	234	44	30	60
P	10	01	30	30
R	249	01	00	00
P	70	31	00	-
R	250	30	00	00
P	211	05	00	00
R	31	06	00	00

222
42

Carroll
S. W. Peak

LOCATION - G.F.B. Island - Nihoa Id. Date - Jun 5, 1928
 Observer - G.F.B.

Two Peaks Simms.
 Dogs Head.

Flag?

Needle

W. Twin.

East Twin

Miller

East Pk.

Extreme point S.W.
 at water edge

R	00	00	00
R	180	00	00
R	11	53	00
R	191	52	00
R	15	33	60
R	195	33	30
R	25	03	30
R	205	04	50
R	27	13	60
R	207	12	60
R	32	11	30
R	212	11	00
R	237	49	00
R	57	48	60
R	350	22	00
R	v.f. 12-45	21	00

Ecc. Angle 224 51
 to Tangent
 Cairn Dist. 0.96 m.

Observer	Inst.	Island	Nihoa Id.	Date	Time
SW Peak. Simmons	G.F.B.	180	00 00 00	June 5, 1928	
		00	00 00 00		
Flag? Left of needle		191	52 00 30		
		11	53 00 00		
Needle		195	33 00 30		
		15	34 00 00		
W. Twin		205	63 00 30		
		25	64 00 00		
East Twin		207	13 00 00		
		27	14 30 00		
Miller (Flag)		212	11 00 00		
		32	11 30 30		
East PK.		57	48 30 60		
		237	49 30 30		
Extreme point SW		172	22 30 00		
Water edge		350	23 00 30		

Station	Observer	East PK G.E.B.	Islands - Nihog Is.	Wmiles	Date June 5, 1978
S.W. Peak (Simms)	D R		00 00 00 00	180	
Flag?	D R		11 24 30 00	191	
Needle	D R		14 58 30 00	194	
Miller	D R		31 02 00 00	211	
Tanager	D R		55 31 00 00	235	
S.W. Point, waters edge.	D R	V.A. 12-11'	37 37 00 00	350	

Station: East PK.		Island - Nihoa II		Date - June 5, 1928	
Observer - G.F.B.					
S.W. PK.	R 170	180	00 00	00	00
Flag (Stones)	R	00	00 00	00	00
Needle	R	141	24 30	00	00
Miller (Flag)	R	11	24 00	30	30
Targer	R	194	58 30	30	30
	R	14	58 30	00	00
	R	211	02 00	00	00
	R	31	02 00	00	00
	R	235	32 00	00	00
	R	55	31 30	30	30
S.W. Point	R	170	56 00	00	00
water edge	R	350	39 00	00	00



4356

ISLAND OF NIOHA

EDWARD M. JOSE, JR., U.S.A.
 From survey of 1923, 1924, and 1925
 (Scale 1:25,000)
 Map of the Island of Nihoa, Hawaii
 U.S. GEOLOGICAL SURVEY
 WATER RESOURCES DIVISION
 WASHINGTON, D.C. 20540

Donnerstag, 12. 11. 1954

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 4356

TOPOGRAPHIC TITLE SHEET

CONFIDENTIAL

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

Field No. A

REGISTER NO. **4356**

State ~~Territory of Hawaiian Is.~~

General locality Nihoa Island 120 miles NW. by W of Nihoa

Locality Nihoa Island.

Scale 1:2,500 Date of survey April 27-May 7, 1928

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

Chief of Party Thos. J. Maher

Surveyed by H. C. Warwick

Inked by H. C. Warwick

Heights in feet above M.T.L. to ground to tops of trees

~~Contour~~; Approximate contour, ~~form line interval~~ 20 feet

Instructions dated March 26, 1928

Remarks: Survey based from astronomic observations at station on

Nihoa island. Latitude, longitude and azimuth. Records - 2 Volumes
Form 250 containing, Star Azimuths, Sun azimuth, angles at
station and vertical angles.

*Also see reports submitted by E. J. Brown
containing sketch and other location
of stations.*

J. Maher