

11828

11828

Form 504	
U. S. DEPARTMENT OF COMMERCE	
COAST AND GEODETIC SURVEY	
DESCRIPTIVE REPORT	
Type of Survey <u>SHORELINE (PHOTOGRAMMETRIC)</u>	
Field No.	Office No. <u>T-11828</u>
LOCALITY	
State	<u>HAWAII</u>
General locality	<u>MOLOKAI</u>
Locality	<u>H</u> <u>CAPE KALAWA</u>
<u>1964¹-1965</u>	
CHIEF OF PARTY	
<u>H. J. SEABORG, CHIEF OF PARTY</u>	
<u>P. A. STARK, PHOTOGRAMMETRIC OFFICE</u>	
LIBRARY & ARCHIVES	
DATE	

DESCRIPTIVE REPORT - DATA RECORD
T - 11828

PROJECT NO. (II):

~~21044~~ PH-6201

FIELD OFFICE (III):

HONOLULU, HAWAII

CHIEF OF PARTY

H. J. SEABORG

PHOTOGRAMMETRIC OFFICE (III):

PORTLAND, OREGON

OFFICER-IN-CHARGE

P. A. STARK

INSTRUCTIONS DATED (II) (III):

APRIL 25, 1962	
MAY 31, 1962	
DECEMBER 14, 1962	
FEBRUARY 20, 1963	
JANUARY 8, 1964	

AMENDMENT I:

AMENDMENT II:

AMENDMENT III:

METHOD OF COMPILATION (III):

KELSH INSTRUMENT

MANUSCRIPT SCALE (III):

1:10,000

STEREOSCOPIC PLOTTING INSTRUMENT SCALE (III):
1:5000 AND 1:3000

PANTOGRAPH SCALE 1:10,000

DATE RECEIVED IN WASHINGTON OFFICE (IV):

DATE REPORTED TO NAUTICAL CHART BRANCH (IV):

APPLIED TO CHART NO.

DATE:

DATE REGISTERED (IV):

GEOGRAPHIC DATUM (III):

OLD HAWAIIAN

VERTICAL DATUM (III):

MEAN ~~SEA LEVEL~~ *High Water* EXCEPT AS FOLLOWS: X

Elevations shown as (25) refer to mean high water

Elevations shown as (5) refer to sounding datum

i.e., mean low water or mean lower low water

REFERENCE STATION (III):

MOKUMOONIKI 2, 1962

LAT.:

21° 08' 08.864"

LONG.:

156° 42' 21.695"

☒ ADJUSTED☐ UNADJUSTED

PLANE COORDINATES (IV):

= 291,458.12

x = 486,586.48

STATE

HAWAII

ZONE

11

ROMAN NUMERALS INDICATE WHETHER THE ITEM IS TO BE ENTERED BY (II) FIELD PARTY, (III) PHOTOGRAMMETRIC OFFICE,
OR (IV) WASHINGTON OFFICE.

WHEN ENTERING NAMES OF PERSONNEL ON THIS RECORD GIVE THE SURNAME AND INITIALS, NOT INITIALS ONLY.

DESCRIPTIVE REPORT - DATA RECORD

FIELD INSPECTION BY (III): LEONARD F. VAN SCOY		DATE: JANUARY - OCTOBER 1962
MEAN HIGH WATER LOCATION (III) (STATE DATE AND METHOD OF LOCATION): MAY AND AUG. 1962 BY FIELD INSPECTION. COMPILATION BY KELSH INSTRUMENT.		
PROJECTION AND GRIDS RULED BY (IV): A. ROUNDTREE		DATE 7-11-62
PROJECTION AND GRIDS CHECKED BY (IV): L. F. BEUGNET		DATE 7-11-62
CONTROL PLOTTED BY (III): R. H. MEYER		DATE 3-4-64
CONTROL CHECKED BY (III): D. N. WILLIAMS		DATE 3-4-64
RADIAL PLOT OR STEREOSCOPIC CONTROL EXTENSION BY (III): (IN PART) E. H. RAMEY		DATE JULY 1962
STEREOSCOPIC INSTRUMENT COMPILATION (III):	PLANIMETRY D. N. WILLIAMS	DATE 3-19-64
	CONTOURS NONE	DATE
MANUSCRIPT DELINEATED BY (III): SMOOTH DRAFT: D. N. WILLIAMS		DATE 3-26-64
SCRIBING BY (III): J. L. HARRIS STICK-UP: C. C. HARRIS		DATE 5-18-64
PHOTOGRAMMETRIC OFFICE REVIEW BY (III): ROUGH DRAFT: J. L. HARRIS ADVANCE: J. L. HARRIS		DATE 3-23-64 6-11-64
REMARKS:		

DESCRIPTIVE REPORT - DATA RECORD

CAMERA (KIND OR SOURCE) (III):

C&GS SINGLE LENS "W"

PHOTOGRAPHS (III)

NUMBER	DATE	TIME	SCALE	STAGE OF TIDE
61 W 983 THRU 987	9-24-61	11:45	1:15,000	0.4' ABOVE M.L.L.W.
61 W 976 THRU 981	"	11:42	"	0.4' " "
62 W 1850 THRU 1853	1-19-62	08:44	1:25,000	0.3' " "
62 W 1946 THRU 1957	"	12:10	1:15,000	0.5' " "
62 W 2710 THRU 2714	2-3-62	-	1:25,000	-
RATIO PRINTS				
61 W 976 THRU 981	9-24-61	11:42	1:10,000	0.4' " "
62 W 1946, 1948, 1950 & 1952	1-19-62	12:10	"	0.5' " "
COLOR PHOTOGRAPHS				
62 W 2754 AND 2755	2-6-62	11:06	1:15,000	0.1' BELOW "
62 W 2756 THRU 2761	"	11:16	1:25,000	0.1' " "
62 W 2444 THRU 2452	2-1-62	15:20	1:10,000	0.4' ABOVE "

TIDE (III)

	RATIO OF RANGES	MEAN RANGE	DURNAL RANGE
REFERENCE STATION: HONOLULU		1.2	1.9
SUBORDINATE STATION: WAIMANALO		1.1	1.8
SUBORDINATE STATION: PUKOO HARBOR		1.4	2.1

WASHINGTON OFFICE REVIEW BY (IV):

Leo F. Beugnot, Atlantic Marine Center

DATE:

Sept. 1970

PROOF EDIT BY (IV):

DATE:

NUMBER OF TRIANGULATION STATIONS SEARCHED FOR (II):

21

RECOVERED:

7

IDENTIFIED:

4

NUMBER OF BM(S) SEARCHED FOR (II):

1

RECOVERED:

1

IDENTIFIED:

1

NUMBER OF RECOVERABLE PHOTO STATIONS ESTABLISHED (III):

NONE

NUMBER OF TEMPORARY PHOTO HYDRO STATIONS ESTABLISHED (III):

18

REMARKS:

COMPIATION RECORD

COMPLETION DATE

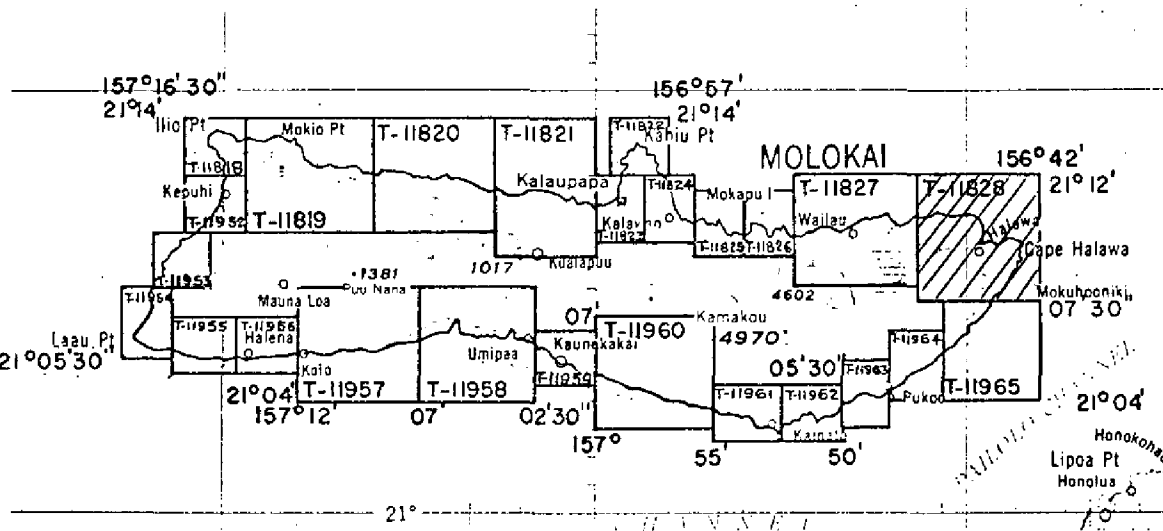
REMARKS

Along shore area for hydro-support	June 1964	
Final Review	Sept. 1970	

PROJECT PH-6201

SHORELINE MAPPING

1:5,000 AND 1:10,000 SCALES
MOLOKAI ISLAND HAWAII



Official Mileage for Cost Accounts

Sheet No.	Shoreline Lin. Mi.	Area Sq. Mi.	Sheet No.	Shoreline Lin. Mi.	Area Sq. Mi.
11818	4	4	11952	3	3
11819	6	6	11953	3	3
11820	6	6	11954	2	2
11821	4	4	11955	3	3
11822	3	3	11956	3	3
11823	1	1	11957	6	6
11824	3	3	11958	5	5
11825	3	3	11959	3	3
11826	3	3	11960	6	6
11827	6	6	11961	3	3
11828	9	9	11962	4	4
			11963	3	3
			11964	3	3
			11965	3	3
Total			98	98	98

5

SUMMARY TO ACCOMPANY
DESCRIPTIVE REPORT T-11828

Shoreline survey T-11828 is one of twenty-five similar surveys in project PH-6201. The surveys in this project cover the entire coast of Molokai. This survey covers that part of the north and east coast extending from Keaina Bay to Puahaunui Point. See page 5 of the Descriptive Report for the area within the project.

Field work preceding compilation consisted of identification of horizontal control, selection of photohydro signal sites and shoreline and field inspection.

Compilation was at 1:10,000 scale by Kelsh Instrument using the photography of 24 September 1961, 19 January 1962, and 3 February 1962. Cronaflex copies of the manuscript, ozalids and specially prepared photographs were subsequently provided for transfer of the shoreline to the boat sheet, location of photo-hydro signals and field edit use.

The manuscript was a vinylite sheet 4 minutes in latitude by 5 minutes in longitude. The survey was scribed and reproduced on cronaflex. Final review was in the Atlantic Marine Center in September 1970. One cronaflex copy and a negative of the final reviewed survey are forwarded for record and registry.

FIELD INSPECTION REPORT

Map Manuscripts
T-11952 thru 11965
T-11818 thru 11828

Project PH-6201

January - October 1962

2. AREAL FIELD INSPECTION

The area covered by this report encompasses the whole of the island of Molokai. This is the fifth largest of the group of islands that form the State of Hawaii. The island was originally formed by the eruption of two volcanoes. One was located somewhere near the east end of the island and the other somewhere near the west end. Following these eruptions the numerous deep drainages were created by stream erosion and the ocean created the great cliffs along the north coast. A later eruption formed the Makenalua Peninsula on the north central coast. The Kauhako Crater remains as evidence of this eruption. The highest peak is Kamakou which is 4958 feet above sea level.

The climate of the island varies considerably depending on the elevation and location in relation to the prevailing trade winds. The mean annual temperature at sea level is about 74 degrees. The temperature seldom varies more than 10 degrees except at the higher elevations. The yearly rainfall varies from about 7 inches around Kaunakakai to over 150 inches in the high mountain sections of the northeast.

The only port in use on the island is located at Kaunakakai. A small wharf connected to the shore by a long mole is used to load and unload barges, and serve small commercial and private boats. At one time a railroad connected the wharf to the area now known as Hoolehua Homesteads. It was abandoned soon after completion as the sugar plantation it was constructed to serve was a failure. The economy of the island is almost wholly dependent on the growing of pineapple and cattle ranching.

The wharf located at Kolo was used for a time to load pineapple from the Maunaloa area. It was later abandoned and since that time has been partially destroyed by fire. The wharf located at Kamalo is now in poor condition and seldom used except by an occasional small fishing or pleasure boat. The wharf located at Pukoo is no longer in evidence. Located at Haleolon is a small harbor protected by a breakwater. This is a private harbor and is used to load sand and cinder barges for shipment to Oahu. A small private airstrip is located along the easterly breakwater.

Located on the Makenalua Peninsula is the small settlement of Kalaulapa. The settlement is maintained by the State of Hawaii, Department of Health for the treatment of Hansen's Disease (Leprosy). Special permission must be obtained from the state before visiting this area. No facilities for serving the public are permitted on the peninsula. The U.S. Coast Guard maintains an isolated light station at the northern tip of the peninsula. The area is served by limited airplane service and supplies are brought in by barge at infrequent intervals. A small wharf protected by a short breakwater is located at the settlement. This area is isolated from the remainder of the island except for a foot trail that leads down the steep rocky cliffs from the top of the pali southwest of the settlement.

Shoreline around the island vary from the almost vertical rock cliffs along most of the north and east coast, to the narrow and relatively flat coastal areas along the south coast. Most of the south coast is protected by an offshore reef. A few sandy beaches are located along the south and west coasts. Most of the north coast is accessible only by boat and any landings there should be attempted with extreme caution.

Photography was adequate for the identification of horizontal control and shoreline inspection for most of the island. A few sections of the shoreline along the northeast coast of the island were in complete shadow from the most vertical cliffs.

The shoreline for the entire island was visually inspected at the mean high water noted on the field photographs. The shoreline along the north coast except for the Makenalua Peninsula was inspected by cruising offshore in a small boat. The work was difficult due to the small size of the boat, the rough seas, and strong winds. A few landings were made on the more prominent points along the northeast coast. The remainder of the island was inspected by walking the shoreline in the more accessible areas, and by observations from vantage points along bluffs and cliffs where the shoreline could not be otherwise visited. Scattered sections of the shoreline along the south coast were obscured by overhanging Keawe trees and dense growths of Mangrove trees.

3. HORIZONTAL CONTROL

(a) The following described intersection stations were located by traverse or triangulation as nautical aids, aeronautical aids, and landmarks.

Kolokai Lighthouse
 Kolokai Airport Beacon
 Waihuna, Aero Beacon Red Light
 Kaulapuu, Aero Beacon Red Light

Molokai VOR (MCK)
 Puu Apalu, Tank
 Ilio Pt., Coast Guard Loran Mast
 Waiahewahewa, Aero Beacon Red Light
 Lahu Pt. Light
 Kaunakakai Harbor, Entrance Range, Front Light
 Kaunakakai Harbor, Entrance Range, Rear Light

(b) No datum adjustments were made by the field party.

(c) WATILI 2, 1945 was the only control station identified that was not established by the Coast and Geodetic Survey. This station was established by the Territory of Hawaii and can be considered as third order accuracy. The station was destroyed before it could be tied to the 1962 work. HELENA, 1962 which is located about a half mile west of this station was later identified. All other control stations identified were established by the Coast and Geodetic Survey or tied to by the geodetic party during the 1962 season. Many of the old stations could not be recovered and new stations had to be established to meet the control requirements.

(d) Control stations were positively identified in all areas indicated on the control diagram.

(e) All control stations within the limits of the project except for a few along the inaccessible northeast coast of the island were searched for. Part of this recovery was performed by the geodetic party located on the island. All station searched for were listed on Form 526 which was submitted to the Honolulu District Officer. A complete list of all stations reported lost on Form 526 would have to be obtained from the Honolulu District Officer or the Division of Geodesy. No stations that were listed as lost were identified for use in the plot.

(g) The quality of identification of each station or substitute station has been indicated on the control station identification card. None of the identification was considered to be sub-standard.

4. VERTICAL CONTROL

The only vertical control requirement was the recovery of all tidal bench marks in the project area and identification of one mark in each of the groups.

All tidal bench marks listed at Fukoo, Kamalo, Kaunakakai, and Kolo were searched for. A total of 18 bench marks were searched for. All marks were listed on Form 685 which was submitted to the Honolulu District Officer.

A total of 13 U. S. Geological Survey bench marks were searched for. These marks were used in conjunction with the tellurometer traverse work on the island and for use in determining the elevation of landmarks. All marks were listed on Form 685 which was submitted to the Honolulu District Officer.

5. CONTOURS AND DRAINAGE

Contours not applicable

Drainage is self evident on the photographs. All streams except for a few in the larger valleys of the northeast coast and near the east end of the south coast are intermittent. During the wet season there are dozens of waterfalls cascading from the tops of the cliffs and rims of the valleys of the northeast coast. Marsh areas have been indicated on the field photographs.

6. WOODLAND COVER

The mountainous areas of the northeast part of the island is covered with a dense growth of native ferns and hardwoods. A large stand of planted softwoods is located along the top of the pali in the north central part of the island. Keawe trees which were introduced to the island about 100 years ago cover most of the remainder of the island except for the cultivated areas. Along the mud flats of the south coast there are scattered stands of introduced Mangrove trees.

7. SHORELINE AND ALONGSHORE FEATURES

(a) The mean high water line was indicated on the photographs. Along some sections of the northeast coast the shoreline was obscured due to the shadows created on the photographs from the almost vertical cliffs. In some areas of the south coast the shoreline was partially obscured by low overhanging Kiawe trees. In most cases this overhang was less than 10 meters and the approximate correct location was indicated on the photographs. Also along the south coast there are scattered stands of Mangrove trees. In these areas the mean high water line was indicated as apparent shoreline.

The shoreline along the north, east, and small areas of the west and southwest coast contain many areas of alongshore rocks, projecting reefs and ledges, and almost vertical bluffs. These features combined with a normally heavy surf breaking along the shore tend to confuse the location of the mean high water line on the photographs.

Where possible especially along the beach areas and the more accessible sections of the coast the location of the mean high water line was determined by measurements to near by objects.

(b) The low water line was not indicated on the photographs.

(c) Where possible the character of the foreshore was indicated on the photographs.

(d) The north, east, and sections of the west and southwest coast is bordered by rocky cliffs. In some cases these cliffs are over 2000 feet high. Along most of the south coast, sections of the west coast, and the Moomomi area the land has a more gradual slope with a small relatively flat area adjacent to the coast.

(e) The only unnatural features to be found in the project area were located at Kalaupapa, Kamalo, Kaunakakai, Kolo, and Haleolono. All information regarding these features was indicated on the field photographs.

(f) Not applicable

(g) Along the south shore there are the remains of many fishponds. The stone walls for some of these have been completely leveled and for most of the others large sections of the walls have been leveled. The location of these fishponds is apparent on the photographs.

8. OFFSHORE FEATURES

Offshore rocks are located along many areas of the north, east, and sections of the west and southwest coast. Most of these rocks that are visible on the photographs are adjacent to the shore. In these areas it is probable that there are many rocks that are not visible on the photographs but are close enough to the surface of the water to consider the foreshore as being foul with submerged rocks. The height of many of the rocks along the shore were estimated at the time the shoreline was inspected.

A reef about 0.5 to 1.0 mile offshore is located along most of the south coast. Between the reef and the shore there are scattered areas of sand and many coral heads that project at low water.

9. LANDMARKS AND AIDS

(a) All charted landmarks were investigated by the field party. A total of 13 old landmarks were deleted from the charts and four old landmarks were retained. A total of 11 new landmarks were selected for charting. The old landmarks which were to be deleted were indicated on the sections of the charts on which they appeared. These sections of the charts will be submitted with the field records. All old landmarks that were retained and the new landmarks selected for charting were listed on Form 567, and the elevation for each landmark was determined by the field party.

(b) No interior landmarks were selected for charting.

(c) The geographic positions for the following charted aeronautical aids was determined by traverse or triangulation during the 1962 field season.

Molokai, Airport Beacon
 Waiahewa, Aero Beacon Red Light
 Waihuna, Aero Beacon, Red Light
 Kualapuu, Aero Beacon, Red Light

The geographic position of one new aeronautical aid selected for charting was determined during the 1962 field season.

Molokai VOR (MKK)

All aeronautical aids to be charted were listed on Form 567 and the elevation for each aid was determined by the field party.

(d) The geographic positions of the following list of aids to navigation was determined by the field party during the 1962 season.

Molokai Lighthouse
 Lanai Pt. Light
 Ilio Pt., Coast Guard Loran Mast
 Kaunakakai Harbor, Entrance Range, Front Light
 Kaunakakai Harbor, Entrance Range, Rear Light

All nautical aids to be charted were listed on Form 567 and the elevation for each aid was determined by the field party.

(e) Not applicable

10. BOUNDARIES, MONUMENTS, AND LINES

Not applicable

11. OTHER CONTROL

No recoverable topographic stations were established.

In all areas where identifiable objects could be found photo hydro sites were selected. In some cases it will be necessary to locate a more suitable location for the hydrographic signals from the selected photo hydro sites.

12. OTHER INTERIOR FEATURES

All roads in the project area were classified on the field photographs in compliance with the project instructions.

All public buildings with their function was indicated on the field photographs.

The main airport serving the island is located south of the Hoolehua Homestead area in the central section of the island. A small airport for use by small aircraft is located on the Makaanalua Peninsula. A small private airstrip is located at Haleolon near the southwest end of the island.

No bridges or overhead cable crossings over navigable water are located in the project area. There are no submerged cables connecting the island with other areas.

13. GEOGRAPHIC NAMES

Not Applicable

Approved:

H. J. Seaborg
H. J. Seaborg
Capt., C & G S
Honolulu District Officer

OCT 30 1962

Respectfully submitted:

Leonard F. Van Scoy
Leonard F. Van Scoy
Supervisory Survey Technician
Unit Chief, C & G S

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Aerotriangulation Report
PH-6201
Molokai, Hawaii
Strip 4

21. Area Covered

This report covers T-sheets 11821 and 11823 through 11828 along the Northeastern shore of Molokai Island.

22. Method

A horizontal bridge was run on the C-8 stereoplanigraph to provide control for compilation using photographs 62-W-1850 through 1865. The adjustment on the IBM 650 utilized four control stations with one station as a check. A supplemental straight line adjustment was made in the area of Strips #6 and #7.

23. Adequacy of Control

The horizontal control provided complied with project instructions in quantity but not in quality. Station Kikipua 2, 1962 was identified by only one sub-station and this point could not be positively identified. At station Mokohola 1962 two sub-stations plus the home station for Mokohola HGS (old station) were identified. Of these three points only Mokohola HGS (old station) was of any quality and it was doubtful. The adjustment of this strip holds all control within the accuracy of National Standards, however, tie points to Strips #6 and #7 plus a mathematical strain in the adjustment indicates a possible bad adjustment. In view of the above facts, it is requested that stations Kikipua 2, 1962 and Mokohola 1962 be re-identified and that T-sheets in this area be treated as preliminary sheets.

24. N.A.

25. Photography

The photography was adequate in coverage and overlay, however, the time of photography (09:45) along with the steep cliffs in the areas caused large and deep shadows. These shadows prevented picking points in many areas and caused considerable trouble in joining models.

15
-2-

26. In attempting to drop pass points for control of flight 62-W-1850 through 1865 it was found that due to shadows and extreme elevations only a few common points could be provided and these were along the shoreline. Since these points are insufficient to allow detailing by machine methods the shoreline must be delineated by graphic methods and additional points must be pricked by the hydro party.

Submitted by,

John D. Perrow, Jr.
John D. Perrow, Jr.
Cartographer

Approved by,

Henry P. Eichert

Henry P. Eichert
Chief, Aerotriangulation
Section

PH-6201
Molokai, Hawaii
Strip 4

NOTES TO COMPILER

This strip was recomputed on the adjusted control which is now available. The points in the northeastern area moved only 2-3 feet and the junction with Strip #1 showed no appreciable change. The new adjusted positions should be used in preference to those provided earlier.

Aerotriangulation Report
MOLOKAI Island, Hawaii
Project PH-6201
July 1962

Aera Covered

This report discusses the results of aerotriangulation of three strips of photographs on the southeast portion of Molokai Island. It covers shoreline surveys T-11828 (in part) at 1:10,000 scale, T-11958 (in part) at 1:10,000 scale, T-11959 at 1:5000 scale, T-11960 at 1:10,000 scale, T-11961 thru T-11964 at 1:5000 scale and T-11965 at 1:10,000 scale. Other parts of this project will be covered by subsequent reports.

Method

The three strips were done by stereoplanigraph and furnish sufficient pass points for compilation of shoreline details by Kelsh instruments. Strip #3 coordinates were computed by a linear transformation using the Clary Computer. Strip #1 and #2 were computed by the IBM-650 Computer. Although two stations did not hold in the adjustment for Strip #2 (See Item 23 below), the adjustment for all strips is believed to be satisfactory for the required accuracy of these surveys. This is based on the closures to other stations and the ties between strips. (See appended sketch)

23. Adequacy of Control

With exceptions below, control was adequate and complied with project instructions.

Advance field positions for Stations HALEAHI, 1962 and RAYKAMI, 1962 were used. Both indicated a similar error in X-coordinates. Inconsistencies were detected in directions furnished by the field party which could account for these discrepancies. Positions affected in Strip #2 should be verified after the receipt of final positions.

24. Supplemental Data

None.

25. Photography

Adequate for aerotriangulation.

Submitted by:

Everett H. Ramey

Everett H. Ramey
Chief, Aerotriangulation Section

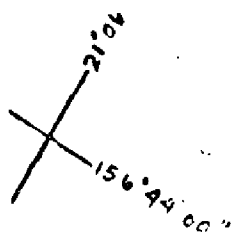
ISLAND OF HAWAII, HAWAII
PH - 5201
STRIP 1

THRU 61-W-998 TAKEN
24 SEP 61

18

LIPEHU, 1915

SUB A (-0.3, +0.9)
SUB B (-0.8, +1.3)



88000

KUMIMI

SUB B (+4.8, -2.3)
SUB A (+2.8, -3.6)



90000

90000

POU MANO, 1915 (+3.6, -3.2)



HONOMUNI, 1925 (+0.7, -1.6)



92000

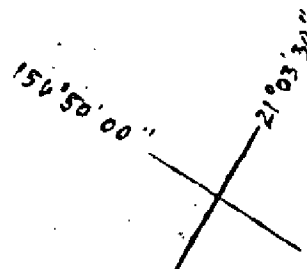
94000



SUB B (-2.5, +3.5)
SUB A (-3.3, +3.3) MAPULEHU, 1925

96000

96000



98000

KEAWANUI

SUB A (+2.3, -3.6)
SUB B (+0.5, -1.3)



98000

 HORIZONTAL CONTROL USED
IN ADJUSTMENT

5 JULY 1962

ISLAND OF MOLOKAI, HAWAII

PH - 6201

STRIP 2

PHOTOGRAPHS 61-W-715

THRU 61-W-733 TAKEN

23 SEP 61

157°04'30"

21°07'00"

SUB B (-0.3, +0.2)
SUB A (0, +0.1)

PUU E. KAHANUI

19

16000

18000

HALEALI, 1962 SUB B (+14.8, +5.2)
SUB A (+13.5, +3.5)

21000

ONINU, 1915 (+0.2, 0)

24000

27000

PUU PAPAI SUB A (+4.2, 0)

30000

RAYKAMA, 1961

SUB B (+4.1, -3.1)
SUB A (+1.0, -4.0)

32000

HORIZONTAL CONTROL USED
IN ADJUSTMENT

6 JULY 1962

SUB B (-0.2, +2.7)
SUB A (0, 0)

KEAWANUI, 1915

21°02'45"

156°51'15"

PH - 6201

STRIP 3

PHOTOGRAPHS 61-W-976
THRU 61-W-980 TAKEN
24 SEP 61

20

LUPEHU, 1915

SUB PT. B (0,0)
SUB PT A (+2.3, -1.0)

⊖ 88310 - TIE PT. TO STRIP 1
(-5.5, -8.2)

TIE PT. TO STRIP 1 - 87330
(+1.2, -1.5)

76000

77000

△ SUB PT A (+0.2, +4.2)
△ SUB PT B (+1.0, +5.6) PVV O HDKV, 1915

78000

79000



HORIZONTAL CONTROL USED
IN ADJUSTMENT

19 JULY 1962



SUB PT C (+0.2, -0.5)
SUB PT B (0,0)

KAPUU POI 23,
1962

155° 42' 45"
21° 09' 30"

DESCRIPTIVE REPORT CONTROL RECORD

MAP T- 11828 PROJECT NO: 21044 SCALE OF MAP 1:10,000 SCALE FACTOR None

STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR Y COORDINATE LONGITUDE OR X COORDINATE	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS (1 ft. = 3048006 meter) FORWARD (BACK)
KAPUPOI 2, 1962	PC P. 28	OLD HAWAIIAN	300,979.56	
SUB. PT. A		"	483,540.04	
			300,975.3	
			483,421.5	
SUB. PT. B		"	300,956.7	
			483,661.1	
			300,826.6	
			483,730.8	
KAWAIKAPU 2, 1962	PC P. 28	"	302,450.13	
			469,099.80	
SUB. PT. A		"	302,451.0	
			468,989.0	
SUB. PT. B		"	302,526.1	
			469,109.5	
SUB. PT. C		"	302,465.1	
			469,141.7	
PUAHAUNUI	PC P. 4	"	307,255.03	
			463,640.96	
PUU O HOKU, 1915	PC P. 28	"	292,310.14	
			477,316.81	
SUB. PT. A		"	292,372.4	
			477,055.5	
SUB. PT. B		"	292,481.9	
			477,277.0	
COMPUTED BY D.N.W.	DATE 3-3-64	CHECKED BY R.H.M.	DATE 3-4-64	2/

SCALE FACTOR	NONE
1	1
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100	100

SCALE OF MAP 1:10,000

[illegible]

COMPILATION REPORT
MAP MANUSCRIPT T-11828
PROJECT 21044

31. DELINEATION:

PLANIMETRY WAS COMPILED BY THE KELSH INSTRUMENT AND DRAFTED IN ACCORDANCE WITH METHOD 3. THE NORTH SHORE BETWEEN LAMALOA HEAD AND PUAMAUNUI POINT WAS OBSCURED BY HEAVY SHADOW DUE TO THE BORDERING HIGH CLIFFS. AS A CONSEQUENCE, ALONGSHORE FEATURES IN THIS AREA COULD NOT BE DELINEATED AND IN A FEW LOCATIONS THE POSITION OF THE SHORELINE IS UNCERTAIN.

32. CONTROL:

ADEQUATE SUPPLEMENTARY CONTROL WAS ESTABLISHED BY BRIDGING WITH THE ZEISS STEREOPLANIGRAPH BASED ON IDENTIFIED HORIZONTAL CONTROL AND ADJUSTED BY USE OF THE I.B.M. COMPUTER.

33. SUPPLEMENTARY DATA:

NONE.

34. CONTOURS AND DRAINAGE:

CONTOURS ARE NOT APPLICABLE.

THE INTERMITTENT DRAINAGE SHOWN WAS COMPILED FROM FIELD INSPECTION AND FROM STEREOSCOPIC EXAMINATION OF THE PHOTOGRAPHY. THIS IS IN GENERALLY GOOD AGREEMENT WITH THE U.S.G.S. QUADRANGLE OF THE AREA.

35. SHORELINE AND ALONGSHORE DETAILS:

DATA FURNISHED BY THE FIELD PARTY WAS ADEQUATE FOR THE COMILATION OF THE MEAN HIGH WATER LINE WITH THE EXCEPTION NOTED UNDER SIDE HEADING 31. NO LOW WATER LINE WAS FIELD INSPECTED OR DELINEATED. LEDGES AND A SHALLOW LINE WERE DRAWN AS INTERPRETED FROM STEREOSCOPIC EXAMINATION OF THE PHOTOGRAPHY. SEVERAL ROCKS WERE LOCATED BY THE FIELD UNIT AND THEIR HEIGHTS DETERMINED FOR THE TIME OF OBSERVATION. THESE ELEVATIONS WERE ADJUSTED TO THE MANUSCRIPT DATUM.

36. OFFSHORE DETAILS:

THREE SMALL ISLANDS WERE LOCATED.

12. 24
37. LANDMARKS AND AIDS:

NONE.

38. CONTROLS FOR FUTURE SURVEYS:

EIGHTEEN PHOTO-HYDRO STATIONS WERE SELECTED BY THE FIELD PARTY AND LOCATED ON THIS MANUSCRIPT. NUMBERS AND DESCRIPTIONS OF THESE STATIONS ARE INCLUDED IN PARAGRAPH 49, NOTES FOR THE HYDROGRAPHER.

39. JUNCTIONS:

SATISFACTORY JUNCTION WAS MADE WITH T-11965 TO THE SOUTH. MANUSCRIPT T-11827 TO THE EAST HAS NOT BEEN COMPILED.

40. HORIZONTAL AND VERTICAL ACCURACY:

46. COMPARISON WITH EXISTING MAPS:

COMPARISON WAS MADE WITH THE U.S.G.S. $7\frac{1}{2}$ MINUTE, HALAWA, HAWAII QUADRANGLE, SCALE 1:24,000, EDITION 1952.

47. COMPARISON WITH NAUTICAL CHARTS:

COMPARISON WAS MADE WITH NAUTICAL CHART 4130, SCALE 1:80,000 AT LAT. $20^{\circ} 51'$, 3RD EDITION, DEC. 30, 1936, REVISED APRIL 23, 1962.

ITEMS TO BE APPLIED TO NAUTICAL CHARTS IMMEDIATELY:

NONE.

ITEMS TO BE CARRIED FORWARD:

NONE.

APPROVED:

P. A. Stark
P. A. STARK, CDR, C&GS
PORTLAND FIELD OFFICER

SUBMITTED:

James L. Harris
JAMES L. HARRIS
CARTOGRAPHER

JLB

GEOGRAPHIC NAMES

FINAL NAMES SHEET

PH-6201

T-11828

Alanuihipaka Ridge
Apuuiki Gulch
Cape Halawa
Halawa Bay
Halawa
Halawa Stream
Halawa Valley
Halawaiki Gulch
Haunakea
Hinalenale Point
Honowewe Bay
Honokio Gulch
Kahei Point
Kaluaahole
Kanaha Rock
Kapalihiolo
Kapaliloa
Kuunohonu
Keaina Gulch
Keaina Bay
Keanakapua
Kehahi
Kekuaaiopihi

Kepuhi
Kikoula Gulch
Kioko
Kua Point
Kunaka
Lamalao Gulch
Lamalao Head
Lelemako Gulch
Mokupapapa Island
Mokuhooniki Island
Molokai
Nakeikiapua
Pacific Ocean
Pailolo Channel
Papaloa
Pipiwai Gulch
Pohakupili Gulch
Puahaunui Point
Punawai
Punolohi
Waiialana Gulch
Waiialapa Gulch
Wailoku Gulch

Approved by:

A. J. Wraight
A. J. Wraight
Chief Geographer

Prepared by:

F. W. Pickett
Frank W. Pickett
Cartographic Technician

49. NOTES FOR THE HYDROGRAPHER:

THE EIGHTEEN PHOTO-HYDRO STATIONS SHOWN ON THIS MANUSCRIPT ARE LISTED BELOW. THESE WERE IDENTIFIED BY THE FIELD PARTY AND LOCATED BY THE KELSH INSTRUMENT DURING COMPILATION.

<u>No.</u>	<u>DESCRIPTION</u>	<u>FIELD PHOTO No.</u>
2801	SW CORNER STONE WALL	61 W 987
2802	SOUTH 1 OF 3 SMALL LEDGE PROJECTIONS	61 W 978
2803	SOUTH END LOG	"
2804	E. POINT OF LEDGE	"
2805	CENTER LARGE BLDR.	"
2806	LARGE BLACK BLDR.	"
2807	SE POINT PROJECTING LEDGE	61 W 979
2808	NE POINT OF LEDGE	"
2809	SMALL ROCK KNOLL	"
2810	HIGHEST PART ROCK OUTCROP	"
2811	3' BLDR. IN GRASSY AREA	"
2812	CENTER 1 OF 3 TREES	61 W 980
2813	FENCE CORNER	62 W 1954
2814	MOST WESTERLY BUSH	62 W 1955
2815	POINT 25' WHITE ROCK	62 W 1949
2816	12 POINTED BLACK ROCK	62 W 1947
2817	6' x 6' BLDR. AT STORMLINE	62 W 1948
2818	8' x 8' x 4' BLDR.	"

THERE ARE NO OFFSHORE FEATURES WITHIN THE LIMITS OF THIS MANUSCRIPT REQUIRING INVESTIGATION BY THE HYDROGRAPHER.

C&GS FORM 1002
(11-13-61)U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

PHOTOGRAMMETRIC OFFICE REVIEW

T-10043 11828

1. PROJECTION AND GRIDS ✓	2. TITLE ✓	3. MANUSCRIPT NUMBERS ✓	4. MANUSCRIPT SIZE ✓
CONTROL STATIONS			
5. HORIZONTAL CONTROL STATIONS OF THIRD-ORDER OR HIGHER ACCURACY ✓	6. RECOVERABLE HORIZONTAL STATIONS OF LESS THAN THIRD-ORDER ACCURACY (Topographic stations) None		7. PHOTO HYDRO STATIONS ✓
8. BENCH MARKS None	9. PLOTTING OF SEXTANT FIXES None	10. PHOTOGRAMMETRIC PLOT REPORT ✓	11. DETAIL POINTS None
ALONGSHORE AREAS (Nautical Chart Data)			
12. SHORELINE ✓	13. LOW-WATER LINE None	14. ROCKS, SHOALS, ETC. ✓	15. BRIDGES ✓
16. AIDS TO NAVIGATION None	17. LANDMARKS None	18. OTHER ALONGSHORE PHYSICAL FEATURES ✓	19. OTHER ALONGSHORE CULTURAL FEATURES ✓
PHYSICAL FEATURES			
20. WATER FEATURES ✓	21. NATURAL GROUND COVER ✓		22. PLANETABLE CONTOURS Not Applicable
23. STEREOSCOPIC INSTRUMENT CONTOURS Not Applicable	24. CONTOURS IN GENERAL Not Applicable	25. SPOT ELEVATIONS None	26. OTHER PHYSICAL FEATURES ✓
CULTURAL FEATURES			
27. ROADS ✓	28. BUILDINGS ✓	29. RAILROADS None	30. OTHER CULTURAL FEATURES ✓
BOUNDARIES			
31. BOUNDARY LINES None		32. PUBLIC LAND LINES None	
MISCELLANEOUS			
33. GEOGRAPHIC NAMES ✓	34. JUNCTIONS ✓		35. LEGIBILITY OF THE MANUSCRIPT ✓
36. DISCREPANCY OVERLAY None	37. DESCRIPTIVE REPORT ✓	38. FIELD INSPECTION PHOTOGRAPHS ✓	39. FORMS ✓
40. REVIEWER James L. Harris		SUPERVISOR, REVIEW SECTION OR UNIT Leo F. Beugnet	
41. REMARKS (See attached sheet)			
FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT			
42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.			
COMPILER C.C. Harris		SUPERVISOR Leo F. Beugnet	
43. REMARKS			

REVIEW REPORT T-11828

SHORELINE

SEPTEMBER 25, 1970

61. GENERAL STATEMENT:

See Summary, which is page 6 of the Descriptive Report.

There is no Field Edit Report for this survey. Field Edit is believed to have been accomplished in conjunction with the hydrographic survey of the area.

62. COMPARISON WITH REGISTERED TOPOGRAPHIC SURVEYS:

Comparison was made with a copy of Registered Survey No. 3531, 1:20,000 scale, dated 1915. Considering the difference in scale, difference in datum and the passage of time the two surveys are in good general agreement. All differences have been indicated on the comparison print in blue.

Shoreline survey T-11828 supersedes the older survey for nautical chart construction purposes.

63. COMPARISON WITH MAPS OF OTHER AGENCIES:

Comparison was made with U.S.G.S. HALAWA, HAWAII, 7½ minutes quadrangle, 1:24,000 scale, edition of 1952. The two surveys are in good general agreement. Rocks shown on the U.S.G.S. quadrangle that are not visible on the photographs and the difference in the shoreline have been indicated on the comparison print in brown.

64. COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS:

Comparison was made with copies of boat sheet H-8895 (AR-20-4-68, sheet "gg") and smooth sheet H-8832 (PF-10-4-65). All differences between the surveys have been noted on the comparison print in purple.

Special attention is called to the rocks off Cape Halawa near latitude 21°09'38" longitude 156°42'38". The rocks shown on T-11828 were obtained from photographs 62W(C) 2754 and 2755. There is no rock visible on the photographs at the position of the rock shown on H-8832.

65. COMPARISON WITH NAUTICAL CHART:

Comparison was made with chart 4130, 6th edition, February 10, 1969. Because of the difference in scale only a visual comparison was feasible. The surveys appear to be in good general agreement.

66. ADEQUACY OF RESULTS AND FUTURE SURVEYS:

This survey complies with instructions and meets the National Standards of Map Accuracy.

Reviewed by:

Leo F. Beugnet
Leo F. Beugnet
Cartographer

Approved by:

Allen L. Powell
Allen L. Powell, RADM, NOAA
Director, Atlantic Marine Center

Approved by:

Charles Sherron *Jack E. Guth*
Chief, Photogrammetric Branch Chief, Photogrammetry Division

21° 11' 00"

Not visible on photos

Not on Boat
Sheet

Puahaunui Point

PUAHAUNUI

Kiokio

Purple from Boat sheet H-8995
AR-20-4-68, sheet "gg"

KIOKIO 1962

62 W 1946

Lelemako
Gulch

Piawai
Gulch

62 W 1948

21° 10' 00"

156° 46' 30"

156° 46' 00"

T-11828

PACIFIC

21° 11' 00"

No rocks visible on photos

No rock visible
on photos at
this location

only one rock visible on
photos at this location

Waialana
Gulch

Apuuiki
Gulch

62 W 1950

Lamalao
Gulch

Halawaiki

Brown from USGS quadrangle

Purple from Boat sheet H-8995

AR-20-4-68 sheet "39"

156° 45' 30"

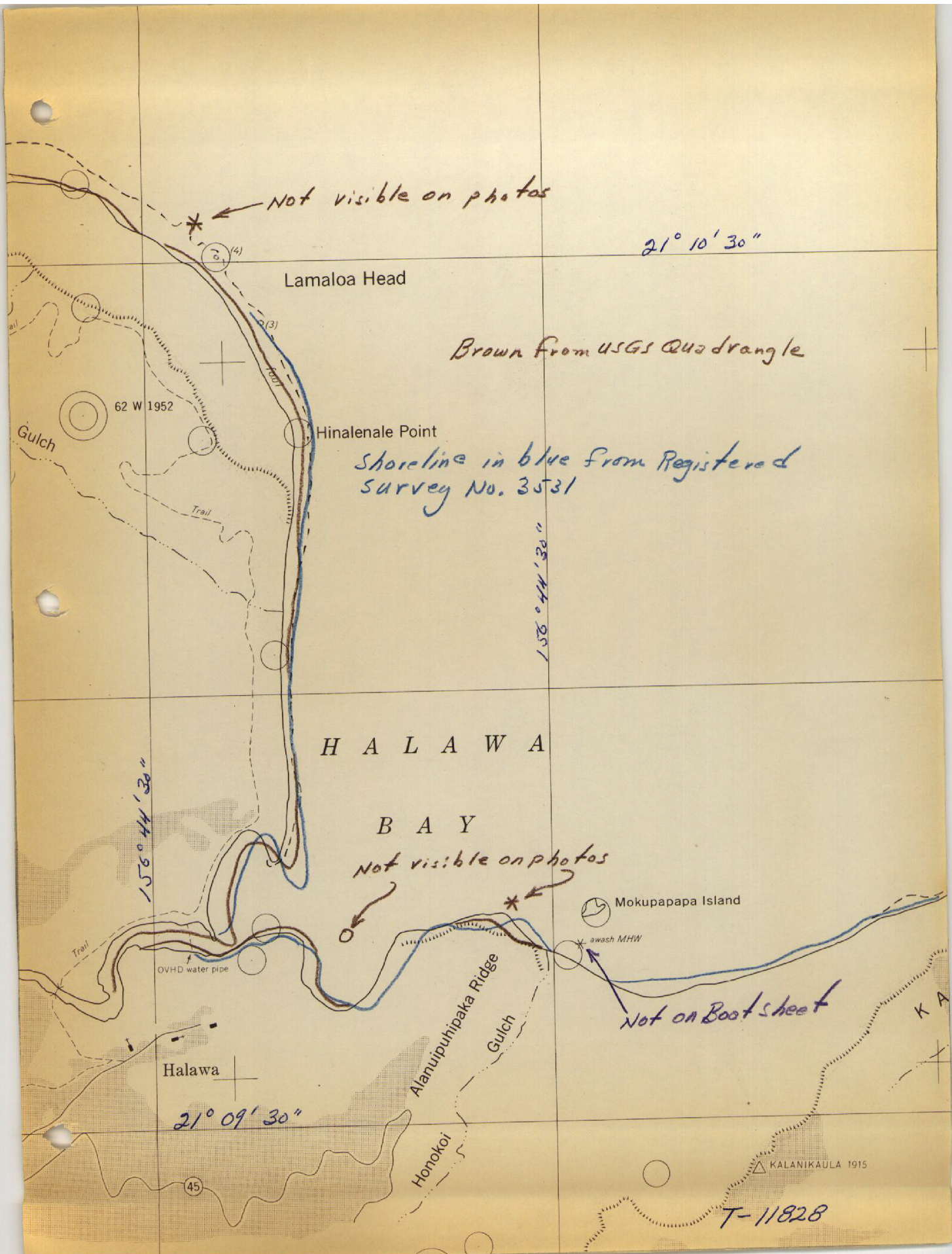
156° 45' 00"

21° 10' 00"

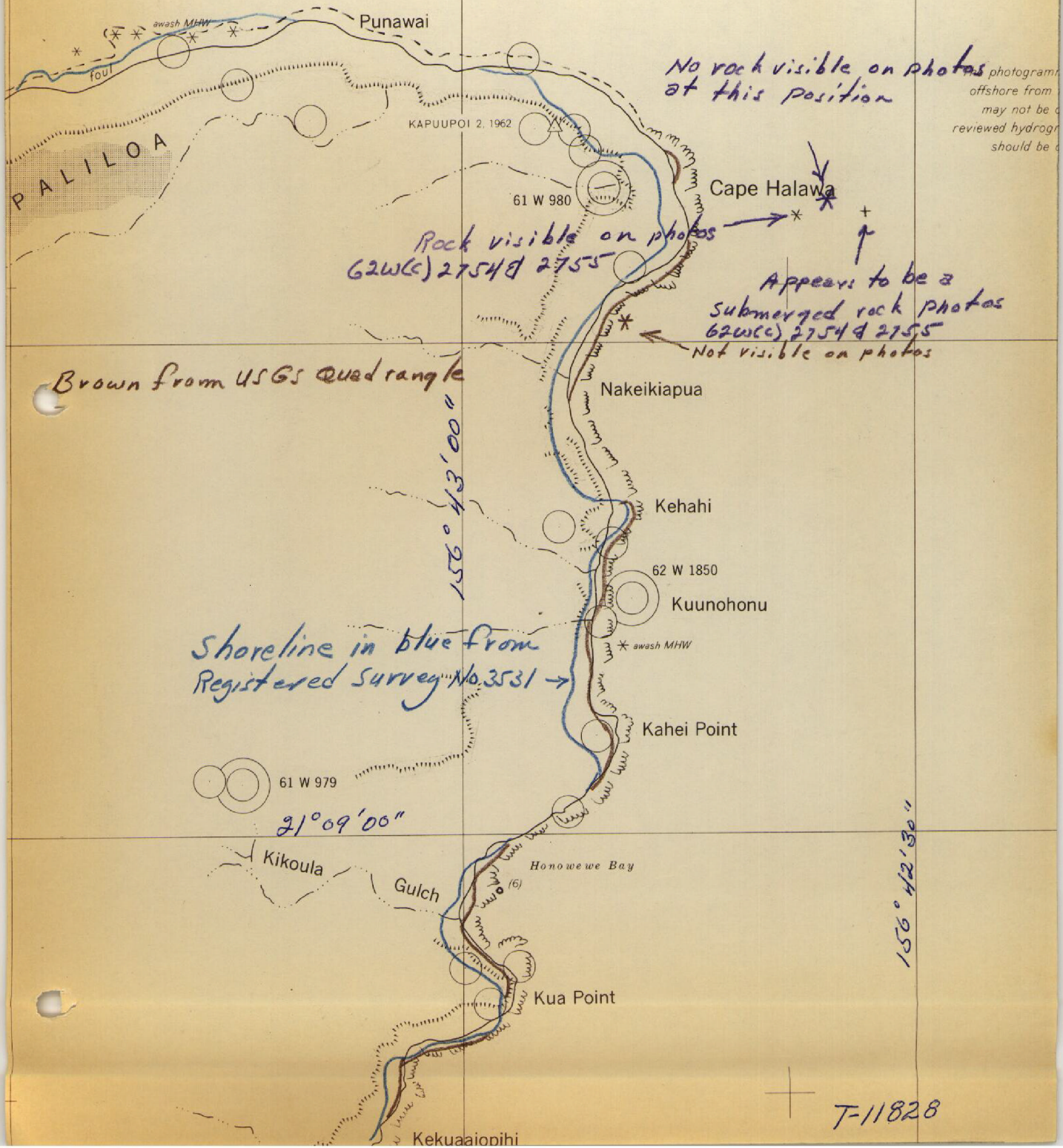


KAWAIKAPU 2, 1962

T-11828



21° 10' 00"



21° 08' 30"

61 W 978

△ PUU O HOKU 1915

Shoreline in blue from
Registered Survey No 3531

Kaluaahole

Kunaka

Keanakapua

← Not on Boat sheet

Kapahulo

No rocks visible on photos
at these locations

Papaloa

Brown from USGS Quadrangle

Wailoku

Gulch

Pohakupili

Gulch

61 W 977

Kepuhi

Punolohi

Haunakea

Keana Bay

Stone wall

PRIVATE ROAD

21° 07' 30"

x = 480,000 FT 43' 30"

T-11828

156° 43'

NOTE: Unlabeled circles are photogrammetric
plot points; not map features

LEGEND

Woodland

Paved road

- △ Recoverable horizontal control station of third-order
The heavy shoreline defines the approximate mean
State route
Compiled by photogrammetric methods, from aerial
Date of Photography Sept. 1961, Jan. and Feb.
Date of Field Inspection May and Aug. 1962
Date of Field Edit See Review Report
Date of Final Review Sept. 1970