

11965

11965

FORM C&GS-504	
U.S. DEPARTMENT OF COMMERCE ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION COAST AND GEODETIC SURVEY	
DESCRIPTIVE REPORT	
Type of Survey <u>Shoreline (Photogrammetric)</u>	
Field No.	Office No. <u>T-11965</u>
LOCALITY	
State <u>Hawaii</u>	
General locality <u>Molokai</u>	
Locality <u>Honouliwai Bay</u>	
<u>1967-682</u>	
CHIEF OF PARTY H. J. Seaborg, Honolulu District Officer M. J. Tonkel, Baltimore District Officer	
LIBRARY & ARCHIVES	
DATE	

DESCRIPTIVE REPORT - DATA RECORD

T - 11965

PROJECT NO. (II):

PH-6201

FIELD OFFICE (II):

Honolulu District Office

CHIEF OF PARTY

H. J. Seaborg

PHOTOGRAMMETRIC OFFICE (III):

Baltimore District Office

OFFICER-IN-CHARGE

Miller J. Tonkel

INSTRUCTIONS DATED (II) (III):

II April 25, 1962
III May 31, 1962
III December 14, 1962 Amendment I

METHOD OF COMPILATION (III):

Kelsh Plotter

MANUSCRIPT SCALE (III):

1:10,000

STEREOSCOPIC PLOTTING INSTRUMENT SCALE (III):

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 Datum

VERTICAL DATUM (III):

~~MEAN SEA LEVEL~~ EXCEPT AS FOLLOWS:

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):

KUMIMI 2, 1962

LAT.:

LONG.:

☒ ADJUSTED☐ UNADJUSTED

PLANE COORDINATES (IV):

STATE

ZONE

y = 282,534.87 ft. x = 472,459.76 ft.

Hawaii

2

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.

FORM C&GS-181b
(3-66)U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT - DATA RECORD

FIELD INSPECTION BY (II):		DATE:
Leonard F. Van Scoy		Jan. Oct. 1962
MEAN HIGH WATER LOCATION (III) (STATE DATE AND METHOD OF LOCATION):		
1961 Photography with shoreline inspection.		
PROJECTION AND GRIDS RULED BY (IV):		DATE
F. E. Buck		July, 1962
PROJECTION AND GRIDS CHECKED BY (IV):		DATE
W. Masula		July, 1962
CONTROL PLOTTED BY (III):		DATE
H. R. Rudolph		July, 1962
CONTROL CHECKED BY (III):		DATE
J. Steinberg		July, 1962
RADIAL PLOT OR STEREOSCOPIC CONTROL EXTENSION BY (III):		DATE
E. H. Ramey		July, 1962
STEREOSCOPIC INSTRUMENT COMPILATION (III):	PLANIMETRY	DATE
	J. C. Richter	July, 1962

DESCRIPTIVE REPORT - DATA RECORD

CAMERA (KIND OR SOURCE) (III):

W. Camera

PHOTOGRAPHS (III)

NUMBER	DATE	TIME	SCALE	STAGE OF TIDE
61W987 - 990	24 Sept. 1961	1146	1:15,000	0.9 ft. above MLLW
62W(C)2440-2445	1 Feb. 1962	1518	1:10,000	0.5 ft. above MLLW

TIDE (III)

Diurnal

	RATIO OF RANGES	MEAN RANGE	SPRING RANGE
REFERENCE STATION: Honolulu		1.2	1.8
SUBORDINATE STATION: Pukoo Harbor		1.4	2.1
SUBORDINATE STATION: Kamalo Harbor		1.4	2.1

WASHINGTON OFFICE REVIEW BY (IV): Leo F. Beugnet, Atlantic Marine Center

DATE: Nov. 1970

PROOF EDIT BY (IV):

DATE:

NUMBER OF TRIANGULATION STATIONS SEARCHED FOR (II): 2	RECOVERED: 2	IDENTIFIED: 2
NUMBER OF BM(S) SEARCHED FOR (II): 0	RECOVERED: 0	IDENTIFIED: 0

NUMBER OF RECOVERABLE PHOTO STATIONS ESTABLISHED (III): 0

NUMBER OF TEMPORARY PHOTO HYDRO STATIONS ESTABLISHED (III): 6

REMARKS:

T-11965

COMPILATION RECORD	COMPLETION DATE	REMARKS
Alongshore area for hydro	July 1963	
Final Review	Nov. 1970	

SUMMARY TO ACCOMPANY
DESCRIPTIVE REPORT T-11965

Shoreline survey T-11965 is one of twenty-five similar surveys in project PH-6201. The maps in this project cover the entire coast of Molokai. This survey covers that part in the vicinity of Honouliwai Bay. See page 5 of the Descriptive Report for the area within the project.

Field work preceded compilation. This consisted of identification of horizontal control, shoreline and field inspection, location of fixed aids to navigation, and selection of landmarks for charts.

Compilation was at 1:10,000 scale by Kelsh Plotter methods using the photography of 24 September 1961 supplemented by color photography obtained on 1 February 1962. Cronaflex copies of the manuscript along with ozalids and specially prepared photographs were provided for transfer of the shoreline to the boat sheet, location of photo-hydro signals and field edit use.

There is no field edit report or field edit sheet for this survey. It is believed that this was accomplished along with hydrography and no discrepancies noted.

The manuscript was a vinylite sheet 3 minutes 30 seconds in latitude by 4 minutes in longitude. The survey was scribed and reproduced on cronaflex. Final review was in the Atlantic Marine Center in November 1970. One cronaflex positive and a negative of the final reviewed survey are forwarded for record and registry.

FIELD INSPECTION REPORT

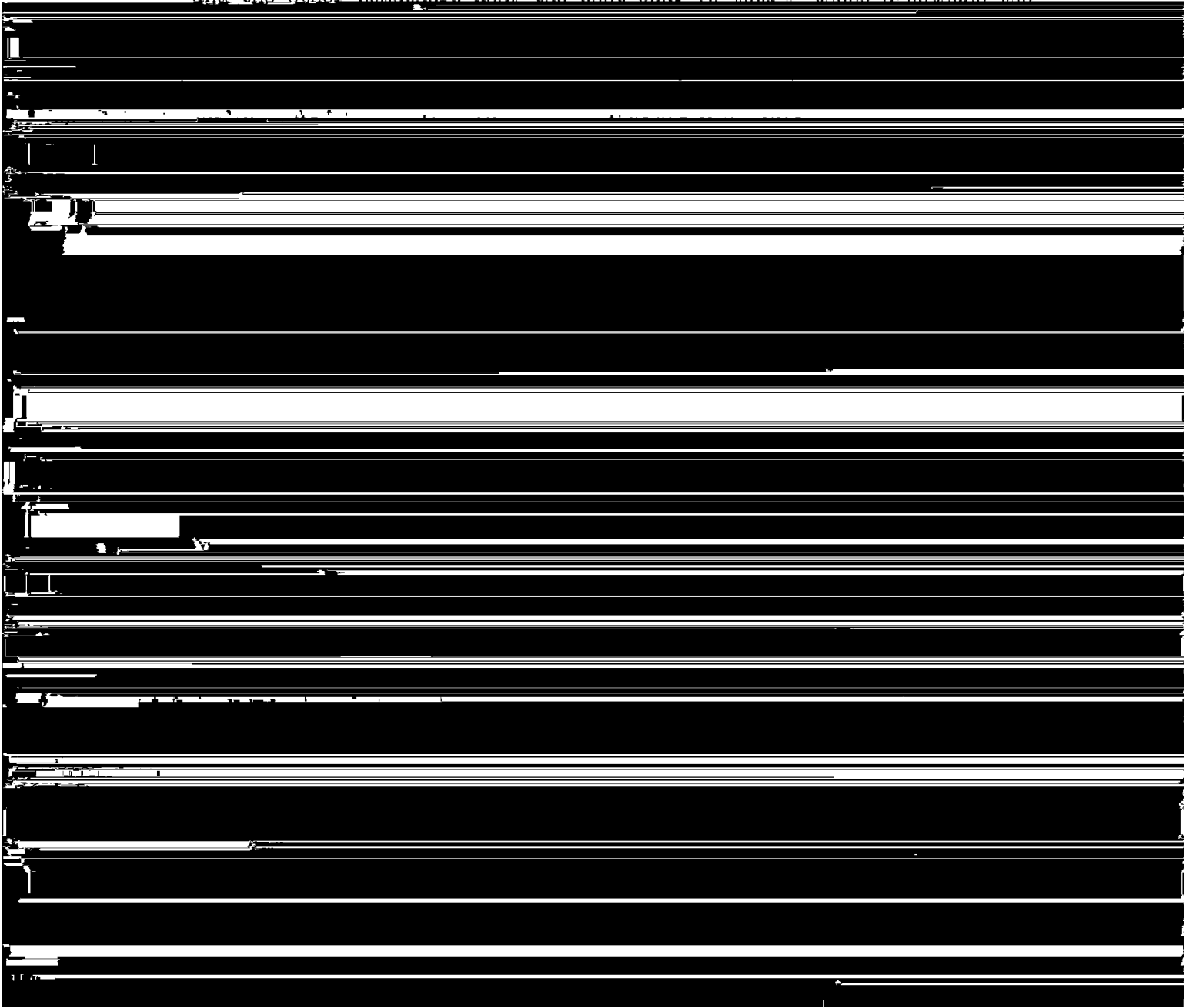
Map Manuscripts
T-11952 thru 11965
T-11818 thru 11828

Project PH-6201

January - October 1962

2. AERIAL FIELD INSPECTION

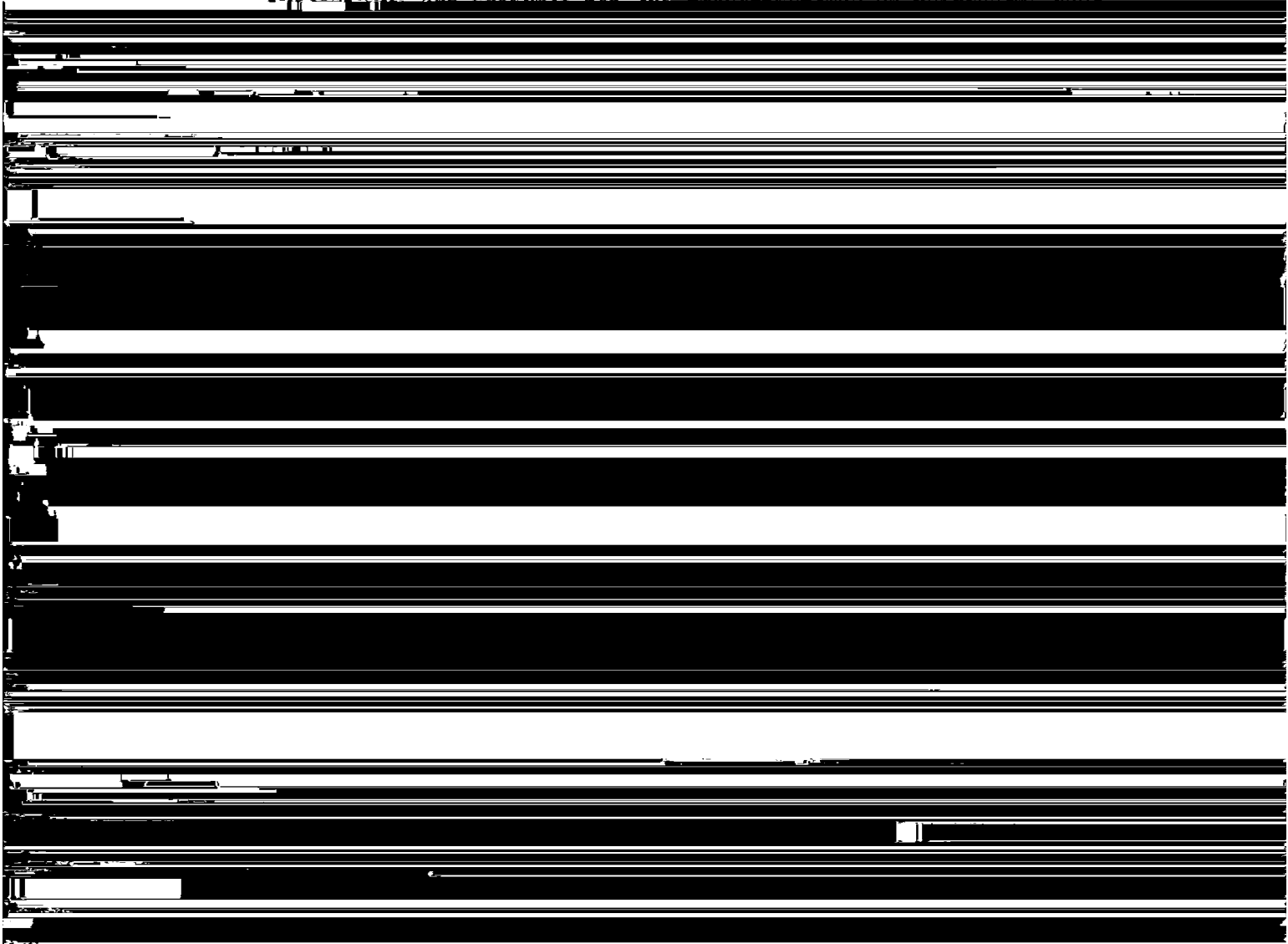
The area covered by this report encompasses the whole of the island of Molokai. This is the fifth largest of the group of islands that form the State of Hawaii. The island was originally formed by the eruption of two volcanos. One was located somewhere near the east end of the island and the other somewhere near the west end. Following these eruptions the



Located on the Makenalua Peninsula is the small settlement of Kalau-papa. The settlement is maintained by the State of Hawaii, Department of Health for the treatment of Hansen's Disease (Leper~~sey~~^{sy}). 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 break-water 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 cont-



Kolokai VOR (MMK)
 Pua Apalu, Tank
 Ilio Pt., Coast Guard Loran Mast
 Waiahewahewa, Aero Beacon Red Light
 Laau 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) WAIHELI 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 Pukoo, 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

- (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, Kanaloa, 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
- Waiahewahewa, 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
- Laau 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 Hoolahua Homestead area in the central section of the island. A small airport for use by small aircraft is located on the Makanalua 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:

OCT 30 1962

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

Respectfully submitted:

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

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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 HONOLULU, HAWAII
PH - 6201
STRIP 1

THRU 61-W-998 TAKEN
24 SEP 61 15

LUPEHI, 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

PUL MAND, 1915 (+3.6, -3.2)



HONOMUNI, 1925 (+0.7, -1.6)

92000

N



SUB B (-2.5, +3.5) MAPULEHI, 1925

156°50'00"
21°03'30"

96000

ISLAND OF MOLOKAI, HAWAII

PH - 6201

STRIP 2

PHOTOGRAPHS 61-W-715

THRU 61-W-733 TAKEN

23 SEP 61

157°04'30"

17°00'00"

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

PUN & KAHANDI

16

16000

16000

HALEALI, 1962 SUB B (+17.4, +0.2)
SUB A (+15.5, +5.5)

21000

ONINI, 1915 (+0.2, 0)

24000

27000

PUN PAPAI SUB A (+4.2, 0)

30000

21°00'45"

151°15"

0110-11-1051-700A

PH - 6201
STRIP 3
PHOTOGRAPHS 61-W-776
THRU 61-W-980 TAKEN
24 SEP 61

17

LUPEHU, 1915

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

88310 - TIE PT. TO STRIP 1
(-5.5, -0.2)

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) PUU O HOKU, 1915

78000

79000

HORIZONTAL CONTROL USED
IN ADJUSTMENT

19 JULY 1962

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

KAPUU PAI 2, 1962

SCALE FACTOR 1.000

SCALE FACTOR 1.000

March 4, 1963

OF PUBLIC WORKS

71-88

PROJECT 21044 (PH-6201)

Preliminary Compilation Report
Surveys T-11959 thru T-11965

31. DELINEATION

Stereoscopic instrument (Kelsh Plotter) methods were used for compilation with photography taken in 1961.
Interior details are incomplete.

32. CONTROL

The identification, density and placement of horizontal control was adequate.

33. SUPPLEMENTAL DATA

None

34. CONTOURS AND DRAINAGE

Contours - Inapplicable
Drainage was delineated by stereoscopic methods.

35. SHORELINE AND ALONGSHORE DETAILS

Shoreline inspection was adequate. The highwater line was delineated using the reference distances from prominent objects where they were recorded on the field inspection photographs.

The low water line (where shown) was delineated from office interpretation of the photographs.

36. OFFSHORE DETAILS

Offshore details (reef lines, etc.) were delineated from office interpretation of the photographs. The color photography was used as an aid for compiling the offshore details.

37. LANDMARKS AND AIDS

Landmarks and aids for surveys T-11959 thru T-11965 are reported on Forms 567. Copies of these forms are a part of this report.

38. CONTROL FOR FUTURE SURVEYS

There are no recoverable topographic stations on this group of surveys.

An incomplete copy of these surveys showing the shoreline and offshore details along with a set of ratio photographs with pass points

39. JUNCTIONS

Junctions for surveys T-11959 thru T-11965 are in agreement.

40. HORIZONTAL AND VERTICAL ACCURACY

See Item 23 of the Aerotriangulation Report bound with this report.

46. COMPARISON WITH EXISTING MAPS

Comparison was made with the following U.S.G.S. Quadrangles:

Kamalo, Hawaii	1:24,000 Scale	1952
Halawa, Hawaii	" "	"
Kaunakai, Hawaii	" "	"

47. COMPARISON WITH NAUTICAL CHARTS

Chart No. 4130	1:80,000	3rd Ed. 1936	Revised 6/2/58
Chart No. 4120	1:80,000	1st Ed. 1942	Revised 8/1/60
Chart No. 4121	1:5,000	1st Ed. 1928	Revised 9/17/57

Items to be applied to Nautical Charts immediately: None

Items to be carried forward: None

Respectfully submitted,
22 January 1964


Donald M. Brant
Carto. (Photo.)

Approved and Forwarded


Miller J. Tonkel
CDR. U.S. Navy
Baltimore District Office

September 11, 1970

GEOGRAPHIC NAMES

FINAL NAME SHEET

PH-6201 (Molokai Island, Hawaii)

T-11965

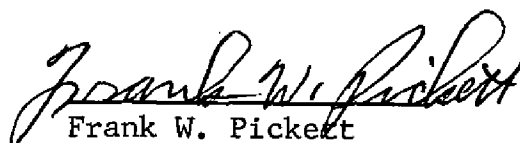
Hano
Honoulimaloo Bay
Honoulimaloo Landing
Honoulimaloo Stream
Honouliwai (village)
Honouliwai Bay
Honouliwai Stream
Kaalaea
Kaipukaulua Gulch
Kahinapohaku
Kalaekapu
Kanaha ~~Rock~~
Kumimi
Moanui Stream
Paenapalaua Gulch
Pailolo Channel
Palalupi
Pohakuloa
Pohauhonu Gulch
Pualanalana
Puali Gulch
Waialua (village)

Approved by:



A. Joseph Wraight
Chief Geographer

Prepared by:



Frank W. Pickett
Cartographic Technician

PHOTOGRAMMETRIC OFFICE REVIEW
T. 11965

1. PROJECTION AND GRIDS DMB	2. TITLE DMB	3. MANUSCRIPT NUMBERS DMB	4. MANUSCRIPT SIZE DMB
CONTROL STATIONS			
5. HORIZONTAL CONTROL STATIONS OF THIRD-ORDER OR HIGHER ACCURACY DMB	6. RECOVERABLE HORIZONTAL STATIONS OF LESS THAN THIRD-ORDER ACCURACY (Topographic stations) DMB		7. PHOTO HYDRO STATIONS DMB
8. BENCH MARKS DMB	9. PLOTTING OF SEXTANT FIXES XX	10. PHOTOGRAMMETRIC PLOT REPORT DMB	11. DETAIL POINTS DMB
ALONGSHORE AREAS (Nautical Chart Data)			
12. SHORELINE DMB	13. LOW-WATER LINE DMB	14. ROCKS, SHOALS, ETC. DMB	15. BRIDGES XX
16. AIDS TO NAVIGATION DMB	17. LANDMARKS DMB	18. OTHER ALONGSHORE PHYSICAL FEATURES DMB	19. OTHER ALONGSHORE CULTURAL FEATURES DMB
PHYSICAL FEATURES			
20. WATER FEATURES DMB	21. NATURAL GROUND COVER DMB		22. PLANETABLE CONTOURS XX
23. STEREOSCOPIC INSTRUMENT CONTOURS XX	24. CONTOURS IN GENERAL XX	25. SPOT ELEVATIONS XX	26. OTHER PHYSICAL FEATURES DMB
CULTURAL FEATURES			
27. ROADS DMB	28. BUILDINGS DMB	29. RAILROADS XX	30. OTHER CULTURAL FEATURES DMB
BOUNDARIES			
31. BOUNDARY LINES XX		32. PUBLIC LAND LINES XX	
MISCELLANEOUS			
33. GEOGRAPHIC NAMES DMB	34. JUNCTIONS DMB		35. LEGIBILITY OF THE MANUSCRIPT DMB
36. DISCREPANCY OVERLAY DMB	37. DESCRIPTIVE REPORT DMB	38. FIELD INSPECTION PHOTOGRAPHS DMB	39. FORMS DMB
40. REVIEWER D. M. Brant		SUPERVISOR, REVIEW SECTION OR UNIT J. Steinberg	
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		SUPERVISOR	
43. REMARKS			

REVIEW REPORT T-11965

SHORELINE

NOVEMBER 24, 1970

61. GENERAL STATEMENT:

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

62. COMPARISON WITH REGISTERED TOPOGRAPHIC SURVEYS:

Comparison was made with a copy of registered survey No. 3531, 1:20,000 scale, dated 1915. The passage of time has made that survey obsolete. It is superseded by T-11965 for nautical chart construction purposes.

63. COMPARISON WITH MAPS OF OTHER AGENCIES:

Comparison was made with U.S.G.S. HALAWA, HAWAII, 7.5 minute quadrangle, 1:24,000 scale, edition of 1952. The shoreline of the two surveys is in good agreement.

Two rocks, located at latitude $21^{\circ}07'10''$ longitude $156^{\circ}44'11''$ and $21^{\circ}05'57''$ - $156^{\circ}45'14''$ respectively, on the U.S.G.S. quadrangle are not visible on the photographs. All other rocks shown on the quadrangle fall within the limits of the coral reefs.

64. COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS:

Comparison was made with copies of boat sheets H-8832, PF-10-4-65 and H-8835, PF-10-3-65. The surveys are in good agreement with the following exception:

A rock on boat sheet H-8835 at latitude $21^{\circ}05'57''$ longitude $156^{\circ}45'18''$ is not discernible on the photographs that cover the area.

65. COMPARISON WITH NAUTICAL CHARTS:

A visual comparison was made with chart 4130, 6th edition, February 10, 1969. The two surveys are in good general agreement considering the difference in scale.

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 L. Hanner *Jack E. Guth*
Chief, Photogrammetric Branch Chief, Photogrammetry Division