

11964

11964

FORM C&amp;GS-504

U.S. DEPARTMENT OF COMMERCE  
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION  
COAST AND GEODETIC SURVEY

## DESCRIPTIVE REPORT

Type of Survey Shoreline (Photogrammetric)Field No. \_\_\_\_\_ Office No. T-11964

## LOCALITY

State HawaiiGeneral locality MolokaiLocality Pauwalu1960-672

## CHIEF OF PARTY

H. J. Seaborg, Honolulu District Officer  
M. J. Tonkel, Baltimore District Officer

## LIBRARY &amp; ARCHIVES

DATE \_\_\_\_\_

## DESCRIPTIVE REPORT - DATA RECORD

T- 11964

|                                                                                                                                                                                                                                        |                                                              |                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJECT NO. (II):<br><br>PH-6201                                                                                                                                                                                                       |                                                              |                                                                                                                                                                                                                                  |
| FIELD OFFICE (III):<br><br>Honolulu District Office                                                                                                                                                                                    |                                                              | CHIEF OF PARTY<br><br>H. J. Seaborg                                                                                                                                                                                              |
| PHOTOGRAMMETRIC OFFICE (III):<br><br>Baltimore District Office                                                                                                                                                                         |                                                              | OFFICER-IN-CHARGE<br><br>Miller J. Tonkel                                                                                                                                                                                        |
| INSTRUCTIONS DATED (II) (III):<br><br>II April 25, 1962<br>III May 31, 1962<br>III December 14, 1962 Amendment I                                                                                                                       |                                                              |                                                                                                                                                                                                                                  |
| METHOD OF COMPILATION (III):<br><br>Kelsh Plotter                                                                                                                                                                                      |                                                              |                                                                                                                                                                                                                                  |
| MANUSCRIPT SCALE (III):<br><br>1:5,000                                                                                                                                                                                                 | STEREOSCOPIC PLOTTING INSTRUMENT SCALE (III):<br><br>1:5,000 |                                                                                                                                                                                                                                  |
| DATE RECEIVED IN WASHINGTON OFFICE (IV):                                                                                                                                                                                               | DATE REPORTED TO NAUTICAL CHART BRANCH (IV):                 |                                                                                                                                                                                                                                  |
| APPLIED TO CHART NO.                                                                                                                                                                                                                   | DATE:                                                        | DATE REGISTERED (IV):                                                                                                                                                                                                            |
| GEOGRAPHIC DATUM (III):<br><br>Old Hawaiian Datum                                                                                                                                                                                      |                                                              | VERTICAL DATUM (III):<br>High Water<br>MEAN SEA LEVEL EXCEPT AS FOLLOWS:<br>Elevations shown as (25) refer to mean high water<br>Elevations shown as (5) refer to sounding datum<br>i.e., mean low water or mean lower low water |
| REFERENCE STATION (III):<br><br>HONOMUNI, 1925                                                                                                                                                                                         |                                                              |                                                                                                                                                                                                                                  |
| LAT.:                                                                                                                                                                                                                                  | LONG.:                                                       | <input checked="" type="checkbox"/> ADJUSTED<br><input type="checkbox"/> UNADJUSTED                                                                                                                                              |
| PLANE COORDINATES (IV):<br><br>y = 273,625.96 ft.      x = 462,022.74 ft.                                                                                                                                                              |                                                              | STATE<br><br>Hawaii                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                        |                                                              | ZONE<br><br>2                                                                                                                                                                                                                    |
| NUMERALS INDICATE WHETHER THE ITEM IS TO BE ENTERED BY (II) FIELD PARTY, (III) PHOTOGRAMMETRIC OFFICE, OR (IV) WASHINGTON OFFICE.<br>WHEN ENTERING NAMES OF PERSONNEL ON THIS RECORD GIVE THE SURNAME AND INITIALS, NOT INITIALS ONLY. |                                                              |                                                                                                                                                                                                                                  |

DESCRIPTIVE REPORT - DATA RECORD

|                                                                                                                        |                                 |                             |
|------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------|
| FIELD INSPECTION BY (III):<br><br>Leonard F. Van Scoy                                                                  |                                 | DATE:<br><br>Jan. Oct. 1962 |
| MEAN HIGH WATER LOCATION (III) (STATE DATE AND METHOD OF LOCATION):<br><br>1961 Photography with shoreline inspection. |                                 |                             |
| PROJECTION AND GRIDS RULED BY (IV):<br><br>F. E. Buck                                                                  |                                 | DATE<br><br>July 1962       |
| PROJECTION AND GRIDS CHECKED BY (IV):<br><br>W. Masula                                                                 |                                 | DATE<br><br>July 1962       |
| CONTROL PLOTTED BY (III):<br><br>H. R. Rudolph                                                                         |                                 | DATE<br><br>July 1962       |
| CONTROL CHECKED BY (III):<br><br>J. Steinberg                                                                          |                                 | DATE<br><br>July 1962       |
| RADIAL PLOT OR STEREOSCOPIC CONTROL EXTENSION BY (III):<br><br>E. H. Ramey                                             |                                 | DATE<br><br>July 1962       |
| STEREOSCOPIC INSTRUMENT COMPILATION (III):                                                                             | PLANIMETRY<br><br>J. C. Richter | DATE<br><br>July 1962       |
|                                                                                                                        | CONTOURS                        | DATE                        |
| MANUSCRIPT DELINEATED BY (III):<br><br>C. Lipscomb                                                                     |                                 | DATE<br><br>July 1963       |
| SCRIBING BY (III):<br><br>J. L. Harris                                                                                 |                                 | DATE<br><br>March 1964      |
| PHOTOGRAMMETRIC OFFICE REVIEW BY (III):<br><br>C. C. Harris                                                            |                                 | DATE<br><br>March 1964      |
| REMARKS:                                                                                                               |                                 |                             |

|                                                                                   |               |                                                                                                           |                    |                    |
|-----------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------|--------------------|--------------------|
| FORM C&GS-181c<br>(3-66)                                                          |               | U.S. DEPARTMENT OF COMMERCE<br>ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION<br>COAST AND GEODETIC SURVEY |                    |                    |
| <b>DESCRIPTIVE REPORT - DATA RECORD</b>                                           |               |                                                                                                           |                    |                    |
| CAMERA (KIND OR SOURCE) (III):<br><div style="text-align: center;">W Camera</div> |               |                                                                                                           |                    |                    |
| <b>PHOTOGRAPHS (III)</b>                                                          |               |                                                                                                           |                    |                    |
| NUMBER                                                                            | DATE          | TIME                                                                                                      | SCALE              | STAGE OF TIDE      |
| 61W991 - 993                                                                      | 24 Sept. 1961 | 1147                                                                                                      | 1:15,000           | 0.8 ft. above MLLW |
| 62W(C)2435 - 2439                                                                 | 1 Feb. 1962   | 1518                                                                                                      | 1:10,000           | 0.5 ft. above MLLW |
| <b>TIDE (III)</b>                                                                 |               |                                                                                                           |                    |                    |
|                                                                                   |               |                                                                                                           | Diurnal            |                    |
|                                                                                   |               |                                                                                                           | RATIO OF<br>RANGES | MEAN<br>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): 3                             |               | RECOVERED: 3                                                                                              | IDENTIFIED: 1      |                    |
| 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:                                                                          |               |                                                                                                           |                    |                    |

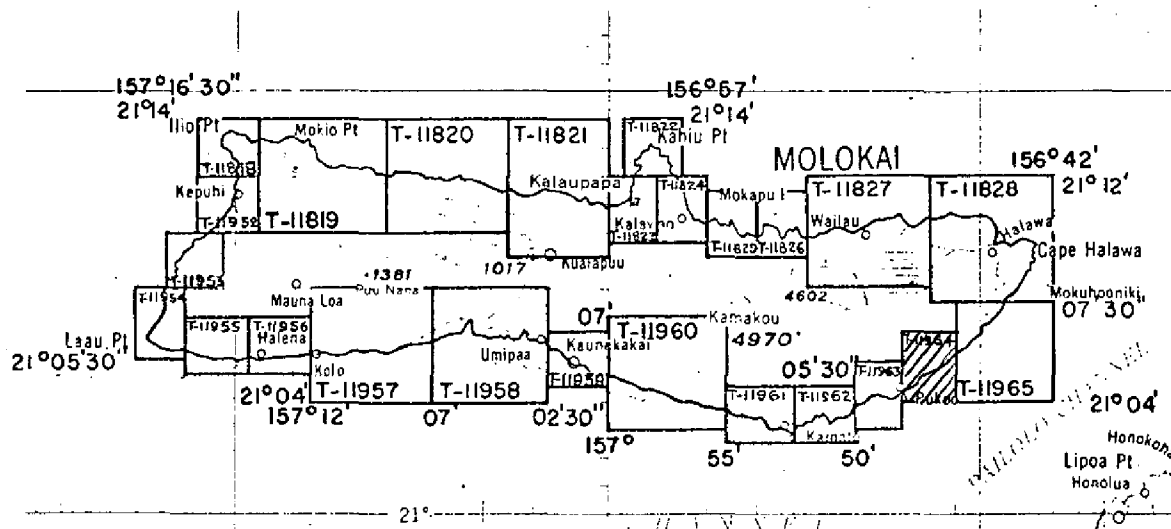
T-11965

| COMPILATION RECORD        | COMPLETION DATE | REMARKS |
|---------------------------|-----------------|---------|
| Alongshore area for hydro | July 1963       |         |
| Final Review              | Dec. 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<br>Lin. Mi. | Area<br>Sq. Mi. | Sheet No. | Shoreline<br>Lin. Mi. | Area<br>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                    |                 |

SUMMARY TO ACCOMPANY  
DESCRIPTIVE REPORT T-11964

Shoreline survey T-11964 is one of twenty-five similar surveys in project PH-6201. These surveys cover the entire coast of Molokai. This survey covers that part of the south coast extending from Pukoo Harbor northeastward to Pauwala Harbor. 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 nautical charts.

Compilation was at 1:5,000 scale by Kelsh Instrument methods using the photography of September 24, 1961. This photography was supplemented by color photography previously obtained in October 1960 and additional color photography obtained in February 1962. Cronaflex copies of the map manuscript along with ozalids and specially prepared photographs were provided for transfer of the shoreline to the boat sheets, 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 field edit was accomplished in conjunction with hydrography on boat sheets H-8829 and H-8835.

The manuscript was a vinylite sheet 2 minutes 30 seconds in latitude by 2 minutes in longitude. The manuscript was scribed and reproduced on cronaflex.

Final review was in the Atlantic Marine Center in December 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-11918 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 Kaunakakai Crater remains as evidence of this eruption. The highest peak is Kanakou 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 Hooilehua 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 dependant 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 Kalau-papa. 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 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 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.

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

Molokai VOR (MOK)  
 Puu 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) WAINILI 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 stations 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 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  
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.

x 13

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 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 MOLOKAI, HAWAII  
PH - 5201  
STRIP 1

THRU 61-W-993 TAKEN  
24 SEP 61 15

LIPEHI, 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

PULU MANO, 1915 (+3.6, -3.2)

HONOMUNI, 1925 (+0.7, -1.6)

92000

SUB B (-2.5, +5.9) MAPILEHU, 1925  
SUB A (-3.3, +3.3)

96000

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°02'00"

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

PUU O KAHANUI

16

16000

16000

HALEALI, 1962 SUB B (+12.4, +0.2)  
SUB A (+13.5, +15.5)

21000

ONINI, 1915 (+0.2, 0)

24000

27000

PUU PAPAI SUB A (+4.2, 0)

30000

RAYKAMA, 1961 SUB B (+31, -3.0)  
SUB A (+152, -4.0)

32000

21°02'45"

156°51'15"

HORIZONTAL CONTROL USED  
IN ADJUSTMENT

6 JULY 1962

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

KEANANUI, 1915

PH - 6201

STRIP 3

PHOTOGRAPHS 61-W-976  
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) PUNU 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)

KAPUNI POI, 1932

SCALE FACTOR 1.000

SCALE OF MAP 1:5,000.

PROJECT NO. PH-6201

[illegible]

1 FT. = .3048006 METER

COMPUTED BY: E. L. Williams

DATE 2/18/63

CHECKED BY: D. M. Brant

DATE 2/19/63

**M-2388-12**

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 and field identified photo-hydro signals was prepared and submitted for the use of the hydrographic party.

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 | " "            | "    |

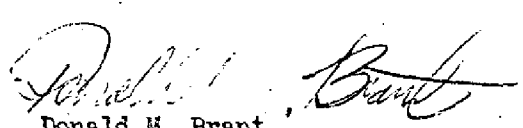
47. COMPARISON WITH NAUTICAL CHARTS

|                |          |              |                 |
|----------------|----------|--------------|-----------------|
| 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. C. & G. S.  
Baltimore District Office

September 11, 1970

GEOGRAPHIC NAMES

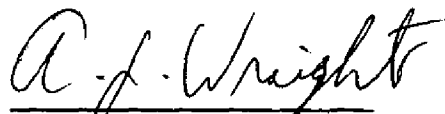
FINAL NAME SHEET

PH-6201 (Molokai Island, Hawaii)

T-11964

Kapukapuahakea  
Kawaikapu Gulch  
Kihaloko Fishpond  
Kulaalamihi Fishpond  
Kupeke Fishpond  
Pailolo Channel  
Pauwalu (village)  
Pauwalu Harbor  
Pukoo (village)  
Pukoo Harbor  
Puniuohualiilii Gulch  
Puniuohuanui Gulch  
Uluwini Gulch  
Waihilahila Fishpond  
Molokai

Approved by:



A. Joseph Wright  
Chief Geographer

Prepared by:



Frank W. Pickett  
Cartographic Technician

FORM C&GS-1002  
(9-66)U.S. DEPARTMENT OF COMMERCE  
ESSA  
COAST AND GEODETIC SURVEY

## PHOTOGRAMMETRIC OFFICE REVIEW

T-11964

|                                                                                                                                                                           |                                                                                                                |                                                    |                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------|
| 1. PROJECTION AND GRIDS<br>DMB                                                                                                                                            | 2. TITLE<br>DMB                                                                                                | 3. MANUSCRIPT NUMBERS<br>DMB                       | 4. MANUSCRIPT SIZE<br>DMB                     |
| <b>CONTROL STATIONS</b>                                                                                                                                                   |                                                                                                                |                                                    |                                               |
| 5. HORIZONTAL CONTROL STATIONS OF THIRD-ORDER OR HIGHER ACCURACY<br>DMB                                                                                                   | 6. RECOVERABLE HORIZONTAL STATIONS OF LESS THAN THIRD-ORDER ACCURACY<br>( <i>Topographic stations</i> )<br>DMB |                                                    | 7. PHOTO HYDRO STATIONS<br>DMB                |
| 8. BENCH MARKS<br>DMB                                                                                                                                                     | 9. PLOTTING OF SEXTANT FIXES<br>XX                                                                             | 10. PHOTOGRAMMETRIC PLOT REPORT<br>DMB             | 11. DETAIL POINTS<br>DMB                      |
| <b>ALONGSHORE AREAS (<i>Nautical Chart Data</i>)</b>                                                                                                                      |                                                                                                                |                                                    |                                               |
| 12. SHORELINE<br>DMB                                                                                                                                                      | 13. LOW-WATER LINE<br>DMB                                                                                      | 14. ROCKS, SHOALS, ETC.<br>DMB                     | 15. BRIDGES<br>XX                             |
| 16. AIDS TO NAVIGATION<br>DMB                                                                                                                                             | 17. LANDMARKS<br>DMB                                                                                           | 18. OTHER ALONGSHORE PHYSICAL FEATURES<br>DMB      | 19. OTHER ALONGSHORE CULTURAL FEATURES<br>DMB |
| <b>PHYSICAL FEATURES</b>                                                                                                                                                  |                                                                                                                |                                                    |                                               |
| 20. WATER FEATURES<br>DMB                                                                                                                                                 |                                                                                                                | 21. NATURAL GROUND COVER<br>DMB                    | 22. PLANETABLE CONTOURS<br>XX                 |
| 23. STEREOSCOPIC INSTRUMENT CONTOURS<br>XX                                                                                                                                | 24. CONTOURS IN GENERAL<br>XX                                                                                  | 25. SPOT ELEVATIONS<br>XX                          | 26. OTHER PHYSICAL FEATURES<br>DMB            |
| <b>CULTURAL FEATURES</b>                                                                                                                                                  |                                                                                                                |                                                    |                                               |
| 27. ROADS<br>DMB                                                                                                                                                          | 28. BUILDINGS<br>DMB                                                                                           | 29. RAILROADS<br>XX                                | 30. OTHER CULTURAL FEATURES<br>DMB            |
| <b>BOUNDARIES</b>                                                                                                                                                         |                                                                                                                |                                                    |                                               |
| 31. BOUNDARY LINES<br>XX                                                                                                                                                  |                                                                                                                | 32. PUBLIC LAND LINES<br>XX                        |                                               |
| <b>MISCELLANEOUS</b>                                                                                                                                                      |                                                                                                                |                                                    |                                               |
| 33. GEOGRAPHIC NAMES<br>DMB                                                                                                                                               |                                                                                                                | 34. JUNCTIONS<br>DMB                               | 35. LEGIBILITY OF THE MANUSCRIPT<br>DMB       |
| 36. DISCREPANCY OVERLAY<br>DMB                                                                                                                                            | 37. DESCRIPTIVE REPORT<br>DMB                                                                                  | 38. FIELD INSPECTION PHOTOGRAPHS<br>DMB            | 39. FORMS<br>DMB                              |
| 40. REVIEWER<br>D. M. Brant                                                                                                                                               |                                                                                                                | SUPERVISOR, REVIEW SECTION OR UNIT<br>J. Steinberg |                                               |
| 41. REMARKS ( <i>See attached sheet</i> )                                                                                                                                 |                                                                                                                |                                                    |                                               |
| 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-11964

## SHORELINE

DECEMBER 1, 1970

61. GENERAL STATEMENT:

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

62. COMPARISON WITH REGISTERED TOPOGRAPHIC SURVEYS:

Comparison was made with copies of registered topographic surveys Nos. 3531, 1:20,000 scale, dated 1915 and 4112, 1:5,000 scale, dated April 1925. The shoreline of the surveys is in fair agreement. The wharf shown on both of the older survey at Pukoo Harbor is now in ruins and not visible on the photographs of the area.

Surveys No. 3531 and 4112 are superseded by T-11964 for nautical chart construction purposes.

63. COMPARISON WITH MAPS OF OTHER AGENCIES:

Comparison was made with U.S.G.S. HALAWA, HAWAII, 7½ minute quadrangle, 1:24,000 scale, edition of 1952. The two surveys are in good general agreement.

64. COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS:

Comparison was made with copies of boat sheets H-8829, PF-5-2-65 and H-8835, PF-10-3-65. The surveys are in good agreement with the following exceptions:

The wharf ruins in Pukoo Harbor is not evident on the photographs.

None of the rocks in Pukoo Harbor shown on the boat sheet are visible on the photographs.

A few sounding lines traverse the reef from its outer limits to the mean high water line.

65. COMPARISON WITH NAUTICAL CHARTS:

Comparison was made with charts 4121, 6th edition, September 30, 1968 and 4130, 6th edition, February 10, 1969. Neither the wharf ruins or the rocks in Pukoo Harbor are visible on the photographs. The differences between Chart 4121 and this survey have been indicated on the comparison print in red.

66. ADEQUACY OF RESULTS AND FUTURE SURVEYS:

This survey complies with instructions and meets the National Standard 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 Hanna*      *Jack E. Guth*  
Chief, Photogrammetric Branch      Chief, Photogrammetry Division

y=270,000 FT

Community Building

Irwin Health Center (State)

Pukoo

04°30"

KUPEKE 1890

21°04'20"

Shoreline from Chart 4121

sand and coral

Not visible on photos

y=268,000 FT

04°15"

Rocks not visible on photographs

PUKOO  
HARBOR

21°04'00"

156°48'00"

21°04'00"

156°47'45" x=456,000 FT

T-11964

**STRIKE OUT ONE**

## NONTECHNICAL AIDS OR LANDMARKS FOR CHARTS

Molokai Island, Hawaii Jan. 25 1963

I recommend that the following objects which have ~~(b)(7)(C), (b)(7)(D)~~ been inspected from seaward to determine their value as landmarks be charted on ~~(b)(7)(C), (b)(7)(D)~~ the charts indicated.

The positions given have been checked after listing by E. L. Williams

Miller J. Tonkel

Chief of Party.

[illegible]

This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and *nonfloating aids* to navigation, if redetermined, shall be reported on this form. The data should be considered for the charts of the area and not by