DESCRIPTIVE REPORT

Type of Survey (Photogrammetric)

Field No. Office No. T-11952

LOCALITY

State Hawaii

General locality Molokai

Locality Papohaku Beach

1963-1967

CHIEF OF PARTY
H. J. Seaborg

P. A. Stark, Photogrammetric Office

LIBRARY & ARCHIVES

DATE
DESCRIPTIVE REPORT - DATA RECORD
T - 11952

PROJECT NO. (II):

PH-6201

FIELD OFFICE (III):
HONOLULU, HAWAII

PHOTOMETRIC OFFICE (III):
PORTLAND, OREGON

CHIEF OF PARTY
H. J. SEABORG

UNIT CHIEF
L. F. VAN SCOY

OFFICER-IN-CHARGE
P. A. STARK

INSTRUCTIONS DATED (III) :
APRIL 25, 1962
MAY 31, 1962

AMENDMENT I:
DECEMBER 14, 1962

AMENDMENT II:
FEBRUARY 20, 1963

AMENDMENT III:
JANUARY 8, 1964

METHOD OF COMPILATION (III):
KELISH INSTRUMENT

MANUSCRIPT SCALE (III):
1:5000

STEREOSCOPIC PLOTTING INSTRUMENT SCALE (III):
1:3000

PANTOGRAPH SCALE:
1:5000

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

REFERENCE STATION (III):
Puu O Kailua, 1925

LAT.: 21° 11' 03.903"

LONG.: 157° 15' 13.588"

VERITCAL DATUM (III):
MEAN LOWER WATER EXCEPT AS FOLLOWS:
Elevations shown as (25) refer to mean high water
Elevations shown as (3) refer to sounding datum
i.e., mean low water or mean lower low water

X ADJUSTED
UNADJUSTED

PLANE COORDINATES (IV):

Y = 309,487.31
X = 299,979.87

STATE:
HAWAII

ZONE:
2

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):**

L. F. van Scoy  

**DATE:**  

JANUARY - OCTOBER 1962

**MEAN HIGH WATER LOCATION (III) (STATE DATE AND METHOD OF LOCATION):**

SEPTEMBER 20, 1962 BY FIELD INSPECTION.  
Compilation by Kelsh Instrument.

**PROJECTION AND GRIDS RULED BY (IV):**

A. E. Roundtree  

**DATE:**  

1-7-64

**PROJECTION AND GRIDS CHECKED BY (IV):**

P. Silverman  

**DATE:**  

1-7-64

**CONTROL PLOTTED BY (III):**

D. N. Williams  

**DATE:**  

2-6-64

**CONTROL CHECKED BY (III):**

R. H. Meyer  

**DATE:**  

2-6-64

**RADIAL PLOT OR STEREOSCOPIC CONTROL EXTENSION BY (III):**

None received.

**STEREOSCOPIC INSTRUMENT COMPILATION (III):**

Planimetry  

R. H. Meyer  

**DATE:**  

2-26-64

**CONTOURS**

None

**MANUSCRIPT DELINEATED BY (III):**

Smooth Draft: J. L. Harris  

**DATE:**  

3-23-64

**SCRIBING BY (III):**

Stick-up: D. N. Williams  

**DATE:**  

5-19-64

**PHOTORECONSTRUCTION OF OFFICE REVIEW BY (III):**

Rough Draft: J. L. Harris  

**DATE:**  

3-6-64

**ADVANCE:**

J. L. Harris  

**DATE:**  

6-2-64

**REMARKS:**
**DESCRIPTIVE REPORT - DATA RECORD**

**CAMERA (KIND OR SOURCE) (III):**

C&GS SINGLE LENS "W"

**PHOTOGRAPHS (III):**

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<td>0.8' ABOVE M.L.L.W.</td>
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**WASHINGTON OFFICE REVIEW BY (IV):**

Leo F. Bagby, Atlantic Marine Center

**DATE:** Oct. 1970

**NUMBER OF TRIANGULATION STATIONS SEARCHED FOR (III):**

9

**RECOVERED:**

3

**IDENTIFIED:**

2

**NUMBER OF BM(S) SEARCHED FOR (III):**

None

**RECOVERED:**

Identified

**NUMBER OF RECOVERABLE PHOTO STATIONS ESTABLISHED (III):**

None

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

None

**REMARKS:**

None
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<td>Final Review</td>
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PROJECT PH-6201
SHORELINE MAPPING
1:5,000 AND 1:10,000 SCALES
MOLOKAI ISLAND HAWAII

Official Mileage for Cost Accounts

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SUMMARY TO ACCOMPANY

DESCRIPTIVE REPORT T-11952

Shoreline survey T-11952 is one of twenty-five similar surveys in Project PH-6201. The maps in this project cover the entire shoreline of Molokai. This map covers a part of the west coast extending from Papohaku Beach northward to Pohakumauiliuli. See page 5 for the area within the project.

Field work preceding compilation consisted of identification of horizontal control and shoreline and field inspection.

Compilation was at 1:5,000 scale by Kelsh instrument, using the photography of October 2, 1960, and September 27, 1961. Cronaflex copies of the map 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.

The manuscript was a vinylite sheet 2 minutes in latitude by 2 minutes 30 seconds in longitude. After field edit, which was accomplished during the 1967 field season, the manuscript was scribed and reproduced on cronaflex. Final review was in the Atlantic Marine Center in September 1970. One cronaflex positive and a negative of the final reviewed survey are forwarded for record and registry.
FIELD INSPECTION REPORT

Manuscripts
T-11952 thru 11965
T-11318 thru 11628

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 Mahanalua Peninsula on the north central coast. The Kaumalo 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 Hooluana 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 Kaunaloa area. It was later abandoned and since that time has been partially destroyed by fire. The wharf located at Kauo 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 Hāleohan 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 Lahaina. A small private airstrip is located along the easterly breakwater.
Located on the Makanalua Peninsula is the small settlement of Kalaulapapa. 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 an the mean high water noted on the field photographs. The shoreline along the north coast except for the Makanalua 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 kauai 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
- Waikolu, Aero Beacon Red Light
- Kaulapuu, Aero Beacon Red Light
Holokai VOR (HIQ)
Puu Apalu, Tank
Ilio Pt., Coast Guard Loran Mast
Waiahevaheva, Aero Beacon Red Light
Lacu 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) WAILEI 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 isand 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 Puuko, 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 Klaw 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 Koomomi 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, Kamehameha, 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.

3. 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 507, 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
- Waikamoiwa, 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 (MKR)

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
- Leau 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 Makalawena Peninsula. A small private airstrip is located at Haleoloe 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
Capt., C & G S
Honolulu District Officer

Respectfully submitted:

Leonard F. Van Scoy
Supervisory Survey Technician
Unit Chief, C & G S
21. **Area Covered**

This report covers T-Sheets 11818, 11819, 11952 thru 11954, along the western shore of the Island of Molokai, Hawaii.

22. **Method**

A fourteen model bridge was run on the C-8 to provide control for compilation, using photographs 61-W-1236 thru 61-W-1250. The adjustment on the IBM-650 utilized five control stations with their companion stations as checks.

23. **Adequacy of Control**

The horizontal control provided complied with the project instructions and was adequate. Closures to control are shown on attached aerotriangulation sketch.

24. **Photography**

Adequate as to coverage, overlap and definition.

---

Report submitted by

[Signature]

Robert B. Kelly

Affirmed and forwarded by

[Signature]

Henry P. Eichert

Chief, Aerotriangulation Section
Aerotriangulation Sketch
Holokai Island, Hawaii
Strip No. 9
August 1963

△ Horizontal Control used in adjustment
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31. **Delineation:**

   Planimetry was compiled by the Kelsh instrument as field inspected.

32. **Control:**

   Adequate supplementary control, based on identified horizontal control, was established by aerotriangulation.

33. **Supplemental Data:**

   None.

34. **Contours and Drainage:**

   Contours are not applicable.

   The drainage was compiled by the Kelsh operator after comparison with the U.S.G.S. quadrangle of the area.

35. **Shoreline and Alongshore Details:**

   Data furnished by the field unit was adequate for the compilation of the mean high water line. The character of the foreshore area has been indicated, but no low water line was field inspected or delineated.

36. **Offshore Details:**

   None.

37. **Landmarks and Aids:**

   None.
38. Control for Future Surveys:
   None.

39. Junctions:
   Satisfactory junction was made with T-11953 to the South. The
   Pacific Ocean is on the west. There are no contemporary surveys to
   the North or to the East.

40. Horizontal and Vertical Accuracy:

46. Comparison with Existing Maps:
   Comparison was made with the U.S.G.S. 7 1/2 minute, Ilio Point,
   Hawaii, quadrangle, scale 1:24,000, edition 1952.

47. Comparison with Nautical Charts:
   Comparison was made with the following nautical charts:

   Nautical Chart 4121, scale 1:5000, Sept. 17, 1951
   Nautical Chart 4120, scale 1:80,000 at Lat. 21° 01',

   Items to be Applied to Nautical Charts Immediately:
   None.

   Items to be Carried Forward:
   None.

Approved:

P. A. Stark, CDR, C&GS
Portland Field Officer

Submitted:

James L. Harris
Cartographer
GEOGRAPHIC NAMES

FINAL NAME SHEET

PH-6201 (Molokai Island, Hawaii)

T-11952

Kakaako Gulch
Kepuhi (Village)
Pacific Ocean
Papohaku (Village)
Papohaku Beach
Papohaku Gulch
Papohaku Roadstead
Pohakumauliuli
Pohalumauliuli Gulch
Puu o Kaiaka

Approved by: Prepared by:

A. Joseph Wraight
Chief Geographer

Frank W. Pickett
Cartographic Technician
49. **Notes for the Hydrographer:**

None.
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| Photogrammetric Office Review T-11952 |

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<tr>
<td>21. Natural Ground Cover</td>
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<tr>
<td>22. Planetable Contours</td>
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<thead>
<tr>
<th>Cultural Features</th>
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<tbody>
<tr>
<td>23. Stereoscopic Instrument Contours</td>
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<tr>
<td>24. Contours in General</td>
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<td>25. Spot Elevations</td>
</tr>
<tr>
<td>26. Other Physical Features</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Miscellaneous</th>
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<tbody>
<tr>
<td>33. Geographic Names</td>
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<td>34. Juncions</td>
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<tr>
<td>35. Legibility of the Manuscript</td>
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<tr>
<th>Discrepancy Overlay</th>
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<tr>
<td>36. Discrepancy Overlay</td>
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<tr>
<th>Descriptive Report</th>
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<td>37. Descriptive Report</td>
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<tr>
<th>Field Inspection Photographs</th>
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<td>38. Field Inspection Photographs</td>
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<th>Forms</th>
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<td>39. Forms</td>
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<tr>
<th>Reviewer</th>
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<tbody>
<tr>
<td>James L. Harris</td>
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<thead>
<tr>
<th>Supervisor, Review Section or Unit</th>
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<tbody>
<tr>
<td>Leo F. Beugnet</td>
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<tr>
<th>Remarks (See attached sheet)</th>
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<tr>
<th>Field Completion Additions and Corrections to the Manuscript</th>
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<tbody>
<tr>
<td>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.</td>
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<tr>
<th>Compiler</th>
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<tr>
<td>L. Harris</td>
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<th>Supervisor</th>
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Field Edit Report  
To Accompany T 11952

USC&GSS McARTHUR  
Ronald L. Newsom  
CDR, USESSA  
Commanding Officer

51 METHODS
Advanced manuscript T 11952 was field edited by personnel aboard the USC&GSS McARTHUR in conjunction with hydrography on boatsheet AR 5-4-67 H 8972. The shoreline was inspected from Launches and Skiffs. Constant heavy swell made it impossible to determine the MLLW line.

Field edit information was shown on one (1) field contact print 61WL241 and indexed on the Discrepancy Sheet, an ozalid copy of advance manuscript T 11952.

52 ADEQUACY OF COMPILATION
Manuscript T 11952 was completely adequate for a hydrographic survey. The inshore area was not field edited.

54 RECOMMENDATIONS
None
61. **GENERAL STATEMENT**

   See Summary, which is page 5 of the Descriptive Report.

62. **COMPARISON WITH REGISTERED TOPOGRAPHIC SURVEYS**

   The area south of latitude 21°10'30" was compared with Survey No. 3526, 1:20,000 scale, dated 1915. The two surveys were in good general agreement. No prior registered survey was available for comparison purposes at the time of final review to the north.

   Shoreline survey T-11952 supersedes the older survey for nautical chart construction purposes.

63. **COMPARISON WITH MAPS OF OTHER AGENCIES**

   Comparison was made with U.S.G.S. ILIO POINT, HAWAII, 8.5 x 7.5 minute quadrangle, 1:24,000 scale, edition of 1952. Because of the difference in scale, only a visual comparison was feasible. The two surveys appear to be in good general agreement with the following exception: The rocks in the area of Puu O Kaiaka and Kepuhi are not visible on the photographs of the area.

64. **COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS**

   Comparison was made with a copy of boat sheet H-8972 (AR-5-4-67 "bb"). The two surveys are in good agreement; there are no conflicts.
65. **COMPARISON WITH NAUTICAL CHARTS**

Comparison was made with Charts 4120, 3rd edition, dated October 14, 1968, and 4121, 6th edition, dated September 30, 1968. The surveys appear to be in good general agreement. The rocks shown on Chart 4121 between latitudes 21°11'00" and 21°11'30" are not visible on the photographs as individual rocks. The areas appear only as foul areas mixed with rocks and ledges and have been delineated as such.

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
Cartographer

Approved by:

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

Approved by:

Chief, Photogrammetric Branch 56A

Chief, Photogrammetry Division