HORIZONTAL CONTROL DATA

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: MINII

Description, including sketch of object:

Station is located on the south-east point of Lanai Island about ½ mile west of Kameiki Pt. and 2.5 miles north-east of Manele Bay. From station MINII PHPH. It is located on the farthest east point visible and is 20 meters inland and about 13 meters in elevation. Station is a NOS disk stamped MINII 1976. It was reached by helicopter and access by road was not visible. Access by boat possible only in calm seas.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MINII
STATE: HAWAII
YEAR: 1976
THIRD ORDER

Source:

G-15610

<table>
<thead>
<tr>
<th>GEOGRAPHIC LATITUDE</th>
<th>GEOGRAPHIC LONGITUDE</th>
<th>ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>20°15'59.839&quot;N</td>
<td>156°50'41.149&quot;W</td>
<td>92 meters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>P (deg)</th>
<th>A (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>439,154.20</td>
<td>155,383.35</td>
<td>-0 08 47</td>
<td></td>
</tr>
</tbody>
</table>

* Plane Azimuth has been computed by the p cient A formula neglecting the second term.

These data obtained from adjustment of Oct 1979.

RL 014
Molokini (Molokini Island, Hawaiian Government Survey, 1883; J. F. Pratt, 1905)—On Molokini Island, between Maui and Kahoolawe, on the highest point of the island, very near the edge of the bluff, and 266 meters from the northwest point of the island. Marked by an iron bar set in the rock with melted lead. In 1928 the Lighthouse Service found an iron bar reduced in section by corrosion to 3/4-inch square, but is was set in sulphur, not lead. Over it was placed a concrete block, 14 inches square and 12 inches high, with 1-inch threaded brass rod centered over iron bar. Top of brass rod projects 3 inches above concrete and is 15 inches above top of iron bar. A new wooden light tower is 17.2 feet from station in azimuth 221° 24'.

This station was recovered plan or minus 5 inches. The original station, consisting of an iron bar and a cement block, was destroyed by artillery and bombing practice during World War number two. The distance and direction was taken to two fragments of sulphur which were found in the fractured rock. A new station, consisting of a standard disk, stamped 1950, was established in a drill hole 4,000 feet west northwest of the original station. See new description for station MOLOKINI 2.

---

### HORIZONTAL CONTROL DATA

**NAME OF STATION:** MOLOKINI  
**SOURCE:** 6-9311  
**NO OBSERVATION CHECK ON THIS POSITION**

<table>
<thead>
<tr>
<th>State Coordinate (flo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE: HI</td>
</tr>
<tr>
<td>CODE: 5102</td>
</tr>
<tr>
<td>X: 556.07514</td>
</tr>
<tr>
<td>Y: 105.17519</td>
</tr>
<tr>
<td>Z: 0.03 31</td>
</tr>
</tbody>
</table>

*PLANE AZIMUTH HAS BEEN COMPUTED BY THE 2 OR 3 FORMULA, NEGLECTING THE SECOND TERM.*

**POSITION DETERMINED BY TRAVERSE FROM STATION MOLOKINI 2**
HORIZONTAL CONTROL DATA

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: MOLOKINI 2
STATE: HAWAII
COUNTY: Maui

CHIEF OF PARTY: G.T. Insley
YEAR: 1950

NOTES:
- MARKS OF TRIGONOMETRIC STATION BASE 1.77
- MARKS OF LIGHT HOUSE STATION BASE 1.77

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>MEASURING</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KALMA</td>
<td>E</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Molokini Lighthouse (Center)</td>
<td>E</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Molokini (HS) 1956</td>
<td>E</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Kiawe Point Lighthouse</td>
<td>E</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Kiawe Point Lighthouse</td>
<td>W</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The station is located on the highest part of the island of Molokini. It is 19.407 feet southwest of the center of the lighthouse tower and 5 feet north of the cliff.

The station is best reached by boat from the village of Kime on the island of Maui. The best landing is at the southwest end of the island.

The station is a standard disk, stamped MOLOKINI 1950, set into a drill hole in the corroding sandstone.

Reference mark number 1 is a standard disk, stamped MOLOKINI NO 1 1950, set into a drill hole in the concrete foundation of the lighthouse base. It is 1.94 meters lower than the station.

Reference mark number 2 is a standard disk, stamped MOLOKINI NO 2 1950, set into a drill hole in the concrete slab which is flush with the surface of the surrounding rock.

The lighthouse is a wooden structure 9.28 meters to the center of the light and rests on a concrete slab which is about 8 feet square.

The iron bar and concrete post which marked MOLOKINI (HS) 1950 was destroyed by gun fire and bombing during world war number two. The distance and direction was taken to some fragments of sulphur which was found in the fractured rock.

U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOLOKINI 2
ESTABLISHED BY: G.T. Insley
YEAR: 1950
STATE: Hawaii
RECOVERED BY: E.J. Seaborg
YEAR: 1963
COUNTY: Maui

Detailed statement of the status of the original description; including marks found, stamplings, changes made, and other pertinent facts:

The Station and reference marks were recovered in good condition as described by G.T. Insley in 1950. The distances and directions to the reference marks were verified. The previous description is adequate and complete.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOLOKINI 2
STATE: HAWAII
YEAR: 1950

Source: G-9211

GEODETIC COORDINATES (HYD.)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>556,865.15</td>
<td>105,134.05</td>
</tr>
</tbody>
</table>

PLAN ABDOMEN HAS BEEN COMPUTED BY THE E-510 DI FORMULA ING THE SECOND TERM.

STATE COORDINATES (HYD.)

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEODETIC COORDINATE (FROM HYD.)</th>
<th>PLANE COORDINATE (FROM HYD.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAMOA</td>
<td>207° 04' 30.5</td>
<td>207° 00' 59'</td>
</tr>
</tbody>
</table>

QE 320

U.S. DEPARTMENT OF COMMERCE - NATIONAL OCEAN SURVEY - NATIONAL GEODETIC SURVEY

JUN 1978
HORIZONTAL CONTROL DATA

QUAD 202164  STATION 1104
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
DIAGRAM MAU

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOLOKINI LIGHTHOUSE
STATE: HAWAII
YEAR: 1950

M.O. 9311
NO OBSERVATION CHECK ON THIS POSITION

DEGREES: 20° 38' 01.595
ELEVATION: 56.7
EDEG: 1950

DEGREES: 156° 30' 01.991

EDEG: 1950

STATE COORDINATES (DEG)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X (FT)</th>
<th>Y (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>556,884.55</td>
<td>109,148.01</td>
</tr>
</tbody>
</table>

*PLANE ADJUSMT HAS BEEN COMPUTED BY T. 204.5 FORMULA NEGLECTING THE SECOND TERM.

POSITION DETERMINED BY TRAVERSE FROM STATION MOLOKINI 2

GE 427
**HORIZONTAL CONTROL DATA**

**QUAD 201564**  
**STATION 1105**  
**HAWAI**  
**LATITUDE 20° 30' TO 21° 00'**  
**LONGITUDE 156° 30' TO 157° 00'**  
**DIAGRAM NF 416 MAUI**

**DESCRIPTION OF TRIANGULATION STATION**

**NAME OF STATION:** MUNRO  
**STATE:** Hawaii  
**COUNTY:** Maui  
**ISLANDS:** Lanai

**CHIEF OF PARTY:** Harold J. Seaborg  
**YEAR:** 1962  
**DESIGNATED:**

- **HEIGHT OF TELESCOPE ABOVE DATA SITE:** 1.51 feet
- **HEIGHT OF LEVELING STATION MARK:** 1.51 feet
- **HEIGHT OF INDEX MARK:** 1.51 feet

**DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION:**

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>MEASURED DISTANCE (ft)</th>
<th>MEASURED DIRECTION</th>
<th>TRUE DISTANCE (ft)</th>
<th>TRUE DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>POHOUILA (HG6) 1879-1962</td>
<td>00 00 00.0</td>
<td>E 00° 00' 00&quot;</td>
<td>60.992</td>
<td>E 00° 00' 00&quot;</td>
</tr>
<tr>
<td>R.M. No. 2</td>
<td>26.944</td>
<td>E 00° 00' 00&quot;</td>
<td>25.35 52&quot;</td>
<td>E 00° 00' 00&quot;</td>
</tr>
<tr>
<td>R.M. No. 1</td>
<td>30.34</td>
<td>E 00° 00' 00&quot;</td>
<td>29.16 33&quot;</td>
<td>E 00° 00' 00&quot;</td>
</tr>
</tbody>
</table>

Station is located about 1.5 miles south of point Dina, in the southeast corner of the large salt marsh, which is about 1.5 miles north of the Waiuku River. To reach station from the post office, go northeast on county road, then turn left at the intersection, then follow the road for 0.5 miles to the next intersection. Continue on the highway for 0.5 miles to the second intersection. Take the next right turn, then follow the road for 0.5 miles to the next intersection. Take the next right turn, then follow the road for 0.5 miles to the next intersection. Take the next right turn, then follow the road for 0.5 miles to the next intersection.

**ADJUSTED HORIZONTAL CONTROL DATA**

**NAME OF STATION:** MUNRO  
**STATE:** Hawaii  
**YEAR:** 1962  
**SECOND ORDER**

**SOURCE:** G-13114

**GEOGRAPHIC LATITUDE:** 20° 30' 44.4201"  
**GEOGRAPHIC LONGITUDE:** 156° 54' 37.346"  
**ELEVATION:** 657.7 Meters  
**ELEVATION:** 2138 Feet

**STATE COORDINATES (feet):**

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>H</th>
<th>ZINC. H. ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>415,630.7</td>
<td>146,116.3</td>
<td>0° 05' 02&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PLANE AZIMUTH HAS BEEN COMPUTED USING THE Z-H A-H FORMULA REFLECTING THE SECOND ORDER.**

**TO STATION OR OBJECT:**

<table>
<thead>
<tr>
<th>STATION OR OBJECT</th>
<th>AZIMUTH (FROM STATION)</th>
<th>PLANE AZIMUTH (FROM STATION)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>POHOUILA</td>
<td>97 02 52.0</td>
<td>97 07 58.47</td>
<td>5102</td>
</tr>
</tbody>
</table>

**EFFECTS TO BE CONSIDERED:**

- **Altitude:** 20° 30' 44.4201"  
- **Latitude:** 156° 54' 37.346"  
- **Elevation:** 657.7 Meters  
- **Elevation:** 2138 Feet

**Notes:**

- **DATE OF SURVEY:** June 15, 1970
- **U.S. DEPARTMENT OF COMMERCE:**
- **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION:**
- **NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY**

**Ref: 960**
HORIZNONTAL CONTROL DATA

Nana (Lanai Island, F. C. Engle, 1927).—About 5 miles north of Kaumalapau Harbor, on highest point of westernmost (outermost) needle rock in Honopu Bay, west coast of Lanai. Marked according to note 3, standard disk in concrete in outcropping bedrock. Reference mark is standard reference disk (note 126), stamped "Nana," and set in concrete in bedrock. Distance and azimuth from station to reference mark not known.

RECOVERY NOTE. TRIANGULATION STATION

NAME OF STATION: NANA
Established by: P.O.S. Year: 1927 State: Hawaii
Recovered by: "H.J.S." Year: 1964 County: Maui Island: Lanai

Detailed statement as to the fitness of the original description: Including marks found, stampings, changes made, and other pertinent facts:
Station was recovered and found in good condition. A complete description follows:
Station is located about 5-3/4 miles air-line west of Lanai City and 2-3/4 miles north of the wharf at Kaumalapau Harbor, on the westernmost one of three rock spires that project from the ocean. At low tide a rock bridge, or reef is exposed, that appears to connect all 3 spires with the island, however there are 3 narrow channels cutting through the reef that make it impossible to walk to the station. Station is best reached by small boat.
Station mark is a standard disk stamped "Nana 1927," cemented in a drill hole about 2 feet lower than highest point of pinnacles.
Reference mark is 5.75 meters west-southwest of station mark, and projects about 5 inches above surrounding rock. It is a standard disk stamped "Nana 1927," cemented in a drill hole in bedrock.

NAME OF STATION: NANA
Established by: P.O.S. Year: 1927 State: Hawaii
Recovered by: "H.J.S." Year: 1964 County: Maui Island: Lanai

Detailed statement as to the fitness of the original description: Including marks found, stampings, changes made, and other pertinent facts:
Station recovered as described in good condition.
**ADJUSTED HORIZONTAL CONTROL DATA**

**NAME OF STATION:** NOON  
**STATE:** HAWAII  
**YEAR:** 1904

**OBSERVATION CHECK ON THE POSITION**

<table>
<thead>
<tr>
<th>GEOGRAPHIC LATITUDE:</th>
<th>20°34'46.55&quot;N</th>
<th>ELEVATION: Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOGRAPHIC LONGITUDE:</td>
<td>156°32'31.28&quot;W</td>
<td></td>
</tr>
</tbody>
</table>

**STATE COORDINATES (Field)**

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Δ-GRD</th>
<th>Δ-ANG</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>542,634.58</td>
<td>85,457.09</td>
<td>+0 02'38&quot;</td>
<td></td>
</tr>
</tbody>
</table>

*Planes azimuth has been computed by the 2 GRD A FORMULA NEGLECTING THE SECOND TERM.*

**TO STATION OR OBJECT**

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEOGRAPHIC AZIMUTH</th>
<th>PLANE AZIMUTH</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### HORIZONTAL CONTROL DATA

**QUAD:** 20156
**STATION:** 1103
**HAWAII**
**LATITUDE:** 20° 30' TO 21° 30'
**LONGITUDE:** 156° 30' TO 157° 00'
**DIAGRAM:** HP 416 MAUI

### ADJUSTED HORIZONTAL CONTROL DATA

**NAME OF STATION:** DAR
**STATE:** HAWAII
**YEAR:** 1904
**THIRD ORDER**

**SOURCE:** C-SP156

<table>
<thead>
<tr>
<th>Geodetic Latitude</th>
<th>Geodetic Longitude</th>
<th>Elevation (Meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20° 34' 10.790</td>
<td>156° 38' 44.472</td>
<td></td>
</tr>
</tbody>
</table>

#### State Coordinates (Grid)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Φ</th>
<th>ΔΦ</th>
<th>EMBRACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>597,770.00</td>
<td>85,833.50</td>
<td>+0 00 27</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Plane Azimuth has been computed by the azimuth formula neglecting the second term.*

<table>
<thead>
<tr>
<th>To Station or Object</th>
<th>Geodetic Azimuth (From North)</th>
<th>Plane Azimuth* (From North)</th>
<th>Code</th>
</tr>
</thead>
</table>

GO 212
NO ORIGINAL TEXT

Olai (Maui Island, J. F. Pratt, 1905; J. C. Gauger, 1912).—On northeast coast of West Maui, in Kaanapali District, on summit of Puu Olai, a prominent hill about 1 1/2 miles southeast of Kahakuloa village. Marked by standard bronze disk in top of concrete block flush with surface of ground. Reference mark is cross chiseled in native rock; it is 7.98 meters (26.2 feet) from station, in azimuth 181° 59'.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Olai
ESTABLISHED BY: J. F. Pratt
YEAR: 1905
STATE: Hawaii
RECOVERED BY: G. T. Hunsberger
YEAR: 1905
COUNTY: Maui

Detailed statement as to the form of the original description, including marks found, stencils, changes made, and other pertinent facts.

The original station was not recovered. An army lookout house now occupies the position of the original station. A new station, stamped Olai 2 1949, was established about 8 feet north of the army lookout house.

*Please remove all shortages. The officer who actually visited the station should sign his name at the end of the recovery note.*
HORIZONTAL CONTROL DATA
by the National Ocean Survey
OLD HAWAIIAN DATUM

DEPARTMENT OF COMMERCE
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY - NATIONAL GEODETIC SURVEY

DESCRIPTIO N OF TE I LATION STATION

NAME OF STATION: OLAI 2
STATE: Hawaii
COUNTY: Maui

STATION LOCATION:
OSI 1912
Makalele Point Lighthouse

DIMENSIONS AND DESCRIPTION OF GEOGRA NTH RIG A
DISTANCES AND DIRECTIONS TO ADJACENT MARKS, REFERENCE MARKS AND PROMINENT OBJECTS

OBJECT
HALE
HALE
HALE

DISTANCE
6.0
6.0
5.5

167.24
166.11
224.56

666.65
666.65
56.49

30.20
30.20
56.49

DIRECTION
00 00 00
130 31 11
01 13 09

110.09
110.09
7.737

The station is located on the summit of Puu Ola'i and lies about 7.0 miles northwest of Kahului, about 1.75 miles southeast of the village of Kahuku, about 0.6 mile west of the sea, about 0.1 mile north of a graded road and 5 feet west of a steep cliff.

To reach the post office at Kahului, go southwest toward Wailea, for 0.6 mile; turn right and go northwest for 0.8 mile; turn right, as per the sign reading Paukehe, and continue northwesterly for 1.6 miles; take the right hand fork, as per the sign reading Wahee, and go northwesterly for 0.3 mile; take the right fork, as per the sign reading Wahee Valley and go northwesterly, on the main traveled road, for 0.5 miles to the end of the triangulation station and the end of truck travel. From this point north for about 200 yards to the high ground and the station.

The station is a standard disk, stamped OLAI 2 1949, set into a drill hole in a boulder which projects about 1 foot.

Reference mark number 1 is a standard disk, stamped OLAI 2 1949, set into a drill hole in a boulder which projects about 1 foot. It is located about 5 feet west of the edge of the cliff and about 5 feet lower than the station.

Reference mark number 2 is a standard disk, stamped OLAI 2 1949, set into a drill hole in a boulder which projects about 2 feet. It is located about 10 feet north-east of the crest of the ridge and about 6 feet lower than the station.

ADJUSTED HORIZONTAL CONTROL DATA

STATE: Hawaii
YEAR: 1910

SOURCE: G-9311

STATE & ZONE
HI 2
ELEVATION: 156 33 13.842
GEODETIC LATITUDE: 20 58 49.008
GEODETIC LONGITUDE: 156 33 13.842
EL. M. 0.0: 598 FEET

STATE CORRELATION TABLE

TO STATION OR OBJECT

GEODETIC AZIMUTH
PLANE AZIMUTH

HI 2
5102
344°174.75
234°988.47
0 02 47

PLAN A ZIMUTH HAS BEEN COMPUTED BY THE ( m) M. R. M. FORAMIA NEGLIGIBLE THE FSECOND TERM

KAHOKULOA
156 33 13.842

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: OLAI 2
ESTABLISHED BY: C.T.M.
YEAR: 1950
COUNTY: Maui
RECOVERED BY: W.R.P.
YEAR: 1960

Detailed statement as to the status of the original description; including marks found, stampings, changes made, and other pertinent facts:
The station and both reference marks were recovered in good condition as described. 1960 observations to reference marks follow:

Makalele Point Light 1950
Ref. Mk 2
Ref. Mk 1

(continued on next page)
HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY

OLAI 2 (continued)

NAME OF STATION: OLAI 2
ESTABLISHED BY: C.T. Hasegawa
YEAR: 1950
STATE: Hawaii
COUNTY: Maui
ISLAND: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.49 METERS
HEIGHT OF LIGHT ABOVE STATION MARK: 1.44 METERS

DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROBLEM OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION.

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>Bearing</th>
<th>Distance</th>
<th>Feet</th>
<th>Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAHAKULOA (OGS) 1982</td>
<td>ESE</td>
<td>25.165</td>
<td>7.671</td>
<td>135</td>
</tr>
<tr>
<td>S.W. No. 1</td>
<td></td>
<td>135</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Hakolele Point Light, 1950</td>
<td></td>
<td>337</td>
<td>53</td>
<td>19.5</td>
</tr>
<tr>
<td>N.W. No. 2</td>
<td></td>
<td>359</td>
<td>59</td>
<td>43</td>
</tr>
</tbody>
</table>

Station was recovered and all marks found in good condition. Discrepancies were noted in distance to both BHs in the 1950 description, but the distances listed in the 1960 description were found to be correct. A complete description follows:

Station is located about 6-1/2 miles north-northwest of Wailuku, 4 miles north of Maluhia Camp, and 300 feet northeast of State Highway 33, on the summit of Puu Olai, a prominent, round-topped hill of about 998 feet elevation.

To reach station from the intersection of Main and Market Streets in Wailuku, go north on Market Street for 0.5 mile to crossroad in Happy Valley; continue ahead on State Highway 33, for 1.8 miles to junction with State Highway 31; continue ahead on State Highway 33 for 4.1 miles to Maluhia Camp Road. Continue ahead on the highway for 3.1 miles to end of truck travel at base of hill on right. Pack up hill about 200 yards to station.

Station mark is a standard disk stamped "OLAI 1 1949", cemented in a drill hole in a 16-inch boulder projecting 9 inches from ground. It is 7 feet northeast of the edge of an old army observation hut.

Reference mark number one is a standard disk stamped "OLAI 2 1949", cemented in a drill hole in an 18-inch boulder outcrop that projects 6 inches from ground. It is along edge of hill, 2-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "OLAI 2 1949", cemented in a drill hole in a bedrock knob that projects 16 inches from ground. It is on a sloping bedrock area, 5.2 feet lower than station mark.

NOTE - One of these forms must be used for every station recovered.

11601-04 GE 3779-75
HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OLOALULU
STATE: HAWAII
YEAR: 1950
FIRST ORDER
SOURCE: G-5211

GEODETIC LATITUDE: 40° 48' 42.33''
GEODETIC LONGITUDE: 156° 37' 34.11''
ELEVATION: 1.42 Meters
6.3 Feet

STATE COORDINATES / UNIT

STATE ZONE CODE U T
HI 2 9102 913,835.81 173,723.57 + 0 00 52

- PLANE AZIMUTH HAS BEEN COMPUTED BY THE 2-ORDER FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT GEODETIC AZIMUTH PLANE AZIMUTH CODE
LAHAINA SE BASE 139° 58' 17.8'' 139° 57' 26'' 5102

(continued on next page)
HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD MAUIAN DATUM

OLOWALU (continued)

NAME OF STATION: OLLOWALU
ESTABLISHED BY: C.T. Huenemeyer YEAR: 1930 STATE: Hawaii
RECOVERED BY: R.H. Munson YEAR: 1939 COUNTY: Maui
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.56 METERS
HEIGHT OF LIGHT ABOVE STATION MARK: 3 METERS
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION:

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>Bearing</th>
<th>Distance</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lahaina Southeast Base</td>
<td>NE</td>
<td>43.680</td>
<td>13.314</td>
</tr>
<tr>
<td>Bench Mark (USGS)</td>
<td>NE</td>
<td>43.680</td>
<td>13.314</td>
</tr>
<tr>
<td>Tidal BM 1, 1925 (R.M. No. 2)</td>
<td>ENE</td>
<td>13.303</td>
<td>40.03</td>
</tr>
<tr>
<td>R.M. No. 3</td>
<td>SNE</td>
<td>9.697</td>
<td>34.10</td>
</tr>
</tbody>
</table>

Station mark and R.M. No. 2 were recovered in good condition. R.M. No. 1 has been destroyed, and a new R.M. No. 3 was established. A complete description follows:

Station is located about 6 miles southeast of Lahaina and 1000 feet south-southwest of Oldowaluu, on the end of the old Oldowaluu wharf.

To reach station from the post office in Wailuku, go south on State Highway 30 for 5.5 miles to junction with State Highway 31; continue on Highway 30 for 6.3 miles to Oldowaluu. Turn left and go 0.1 mile to end of road by house on right. Walk south along wide trail about 125 yards to wharf, then about 85 yards out onto wharf and station.

Station mark is a standard disk stamped "OLLOWALU 1950," cemented in a drill hole in the center of a 9 x 10-foot, concrete slab that projects 1 foot above ground. It is 33.5 feet northeast of the rounded wall at southeast end of the wharf, and 12.7 feet northeast of the center of 3 concrete blocks which are the foundations of the old Hydrographic Survey Tidal BM 1, 1925 (R.M. No. 2) is a standard disk (bench mark disk), very faintly stamped "1 1925," cemented in a drill hole in the smooth, concrete bulkhead along the northeast edge of the wharf, 30 feet northwest of end of bulkhead, 15.4 feet northeast of the northwest 1 of 2 concrete blocks, and about 12 inches lower than station mark.

Reference mark number three is a standard disk stamped "OLLOWALU 1950 NO 3 1969," cemented in a drill hole in the rough rock and concrete top of the curved section of wharf bulkhead, 4 feet north of sea edge of the wall, and at same elevation as station mark.

*Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.

NOTE: One of these forms must be used for every station recovered.

U.S. DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY RECOVERY NOTE, TRIANGULATION STATION

QUAD 203564 STATION 1111

LATITUDE ° ' " TO ° ' "

LONGITUDE ° ' " TO ° ' "
HORIZONTAL CONTROL DATA

QUAD 201564  STATION 1112
HAWAII
LATITUDE  20° 30' TO 21° 00'
LONGITUDE  156° 50' TO 157° 00'
DIAGRAM NF 416 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OLO'alu mill flagstaff
STATE: HAWAII  YEAR: 1912  THIRD ORDER
SOURCE: G-SPI56

DEGREES LATITUDE: 20° 47' 29"  ELEVATION: 156 37 32.64  METERS
DEGREES LONGITUDE: 156° 37' 32.64"

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (in feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>513,976.00</td>
<td>174,264.12</td>
<td>0° 30' 51&quot;</td>
</tr>
</tbody>
</table>

*PLANE AZIMUTH HAS BEEN COMPUTED BY THE S.IN.A. FORMULA NEGLECTING THE SECOND TERM.

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEODETIC AZIMUTH (FROM NORTH)</th>
<th>PLANE AZIMUTH (FROM NORTH)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>00 0.0</td>
</tr>
</tbody>
</table>
HORIZONTAL CONTROL DATA
by the
National Ocean Survey
OLD HAWAIIAN DATUM

DEPARTMENT OF COMMERCE
U.S. DEPARTMENT OF COMMERCE
OFFICE OF THE CHIEF COMMISSIONER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: OLOWALU Tidal B.M. 1
ESTABLISHED BY: C.T.H.
YEAR: 1950
STATE: Hawaii
COUNTY: Maui

Detailed statement as to the status of the original description, including marks found, stencils, changes made, and other pertinent facts:

(Prom letter of H. O. Fortin 3/22/55)

In conference with Mr. Fanchenre, it was decided that the mark designated as Bench Mark (USBM) 13.134 meters from triangulation station OLOWALU is OLOWALU Tidal Bench Mark 1. The U. S. Geological Survey has no bench marks in that immediate vicinity.

The bench mark is described in Tidal Bench Mark records as a standard disk, stenciled 1 1955, set horizontally flush with the top of the concrete landing face of the wharf, near the northernly derrick post. Elevation 5.88 feet above mean lower low water.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OLOWALU Tidal B.M. 1
STATE: Hawaii
YEAR: 1950
SECOND ORDER

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 20.48° 42.539
GEODETIC LONGITUDE: 156.37° 33.712
ELEVATION: 6

STATE & ZONE CODE X Y \(x + \Delta X\) \(y + \Delta Y\)
MI 2 5102 515.678.23 173.784.76 + 00 00 52

* Plane azimuth has been computed by the \(2 \times \delta \times N\) formula reflecting the second term.

POSITION DETERMINED BY TRAVERSE FROM STATION OLOWALU

GEODETIC AZIMUTH: (From North)
PLANE AZIMUTH: (Plane North)

TO STATION OR OBJECT CODE

GEODETIC AZIMUTH:
PLANE AZIMUTH:

Q 434
**NO ORIGINAL TEXT**

**DEPARTMENT OF COMMERCE**  
**RECOVERY NOTE, TRIANGULATION STATION**  
**NAME OF STATION:** Lahaina Wireless Pole  
**STATE:** Hawaii  
**COUNTY:** Maui  
**YEAR:** 1914  
**LOCALITY:** Lahaina  
**RECOVERED BY:** C. B. Switzer  
**YEAR:** 1951

*Detailed statement as to the source of the original description:

Station not visited. Signal plainly visible and in good condition.*

**ADJUSTED HORIZONTAL CONTROL DATA**

<table>
<thead>
<tr>
<th>STATE COORDINATES (FEET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE &amp; ZONE</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>HI 2</td>
</tr>
</tbody>
</table>

*Plane azimuth has been computed by the Φ or Δ N formula neglecting the second term.*

**TO STATION OR OBJECT**

<table>
<thead>
<tr>
<th>DEGREES AZIMUTH (FROM POINT)</th>
<th>PLANE AZIMUTH (FROM NORTH)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>00 018</td>
</tr>
</tbody>
</table>

**HORIZONTAL CONTROL DATA**

**STATE:** HAWAII  
**YEAR:** 1914  
**THIRD ORDER**

**SOURCE:** G-SP156

**DEGREES LATITUDE:** 20° 53' 37.81"

**DEGREES LONGITUDE:** 156° 41' 23.085"
HORIZONTAL CONTROL DATA

by the National Ocean Survey
OLD HAWAIIAN DATUM

HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
DIAGRAM NF 4-16 MALE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PALOA POINT LIGHT
STATE: HAWAII
YEAR: 1962
THIRD ORDER

SOURCE: G-13124

<table>
<thead>
<tr>
<th>Geodetic Latitude</th>
<th>20° 30' 07.601</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geodetic Longitude</td>
<td>156° 58' 03.562</td>
</tr>
<tr>
<td>Elevation (M)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

STATE COORDINATES (Foot)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>f (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>977,151.31</td>
<td>146,160.62</td>
<td>0 00 24</td>
</tr>
</tbody>
</table>

*Plane Azimuth has been computed by the S-W-P. FORMULA, NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT | GEODETIC AZIMUTH | PLANE AZIMUTH | CODE
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SATELLITE SERVICES ADMINISTRATION
CIVIL ENGINEERING SURVEY

JUN 1978
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY; NATIONAL GEOGRAPHIC SURVEY

DEPARTMENT OF COMMERCE
L.S. BRYAN AND J. R. BRYAN

NAME OF STATION: PALOA POINT LIGHT
YEAR: 1962
STATE: HAWAII
COUNTY: Maui
Island: Lanai

CHIEF OF PARTY: H.J. Seaborg

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

Station is a white-painted, square, wooden skeleton structure that is 8 feet square at the base and tapering to a 4 feet square on top, which is 41 feet above the foundation. A 10-inch light glass is mounted on top of the tower. The tower sets on an 8-foot-square, concrete foundation. It is located on Paloa Point, at the southeast corner of Lanai Island, on shoreline bluff at east edge of Kuleana Bay, and about 150 yards west-southwest of station IKA (0118) 1914.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PALOA POINT LIGHT
ESTABLISHED BY: H.J.S.
YEAR: 1962
STATE: HAWAII
COUNTY: MAULI
Island: Lanai

RECOVERED BY: C.K. TOWZENK
YEAR: 1976
COUNTY: MAULI
Island: Lanai

7.5 miles south west of Lanai City.

Detailed statement as to the nature of the original description, including marks based, surveys made, changes made, and other pertinent facts. Station was recovered in good condition as described in 1962.

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SATELLITE SERVICES ADMINISTRATION
CIVIL ENGINEERING SURVEY

FORM 669-526 08-69
ISO9000-DC 88-06-24

OF 385
HORIZONTAL CONTROL DATA

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: P.A.
STATE: Hawaii
COUNTY: Maui
NAME OF PARCEL: A.L. Craig
YEAR: 1962
Describer: R.F.L.

<table>
<thead>
<tr>
<th>OBJECT DESCRIPTION</th>
<th>MEANING</th>
<th>DISTANCE (feet)</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kokei Radio Station WVAH mast, 1950</td>
<td>E</td>
<td>00 00 00.0</td>
<td>E 00 00 01.0</td>
</tr>
<tr>
<td>K (U.S.E.)</td>
<td>S</td>
<td>22 00 31.6</td>
<td>S 22 00 31.6</td>
</tr>
<tr>
<td>Molokai Lighthouse, 1950</td>
<td>S</td>
<td>67 08 30.6</td>
<td>S 67 08 30.6</td>
</tr>
<tr>
<td>Hydrographic signal, 1950</td>
<td>N</td>
<td>195 27 34.6</td>
<td>N 195 27 34.6</td>
</tr>
</tbody>
</table>

The station is located on Maui Island, on Papahana Point at the southwest side of Mailea Bay. To reach from the General Store and Service Station in Mailea village, go south and west for 2.2 miles on State Highway 30 to the middle of a small cul just before the highway turns north, and the station on the left.

Station mark is 136 feet east of the end of a guard rail, 57.4 feet south of the westernline of Highway 30, and 22 feet south of the top of the cul, a standard disk set in a square concrete post flush with the surface of the ground.

(continued on next page)
HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1116
LATITUDE ° TO °
LONGITUDE ° TO °
DIAGRAM

PAP (continued)

RECOVERY NOTE, TRIANGULATION STATION
NAME OF STATION: PAP
ESTABLISHED BY: A.L. Wardwell YEAR: 1962 STATE: Hawaii
RECOVERED BY: R.G. Kuneau YEAR: 1968 COUNTY: Maui
Island: Maui
HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.5 METERS
HEIGHT OF LIGHT ABOVE STATION MARK: METER
DISTANCES AND DIRECTIONS TO ADEQUATE MARKS, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN
FROM THE GROUND AT THE STATION

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>BEARING</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAIKOI 1950</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUN O KALO (HGS) 1899</td>
<td>SE</td>
<td>37.050</td>
<td>11.305</td>
</tr>
<tr>
<td>KAMOA 1950</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.M. No. 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Molokini Lighthouse 1950</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.M. No. 1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Station mark was recovered in good condition, however, because of the
planned construction of a scenic observation point by the State Highway
Dept, it was necessary to remove the mark. Before construction began
the station was referenced by distance and angle to 3 points out of the way of
planned construction. Upon completion of the construction, which lowered
the station's level about 12 feet, the station was replaced at the same
point from the reference points. Two reference marks were also estab-
lished. A complete description follows:

Station is located about 5 miles west of the Kihel post office and
2-1/2 miles southwest of Haalea, at Papawai Point, on south side of high-
way, in a bare dirt area at the west end of a macadam parking area.

To reach station from the post office at Kihel, go northwest on State
Highway 31 for 3.7 miles; go left, on State Highway 30, and go south 6.0
miles to station on left.

Station mark is a standard disk stamped "PAP 1962 1968", set in the
top of a 10-inch-diameter, concrete monument flush with ground. It is
57.0 feet south of center line of highway, 31 feet west of west end of the
macadam parking area, 55.0 feet southwest of a highway "Stop" sign, and
11 feet west of the northern end of the pipe railing bordering the macadam.

Reference mark number one is a standard disk stamped "PAP 1962 NO 1
1968", set in concrete in a 5-inch-square hole in the macadam surface, and
flush with the surface. It is at west end of the parking area, 5.2 feet
south of north end of pipe railing and 1 foot lower than station mark.

Reference mark number two is a standard disk stamped "PAP 1962 NO 2
1968", set in concrete in a 5-inch-square hole in the macadam surface, and
flush with the surface. It is in southwest corner of the parking area, 1-1/2
feet northeast of the corner post of the pipe railing and about 1-1/2
feet lower than station mark.

*Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end
of the recovery note.

NOTE - One of these forms must be used for every station recovered.
HORIZONTAL CONTROL DATA

JUN 1978
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY · NATIONAL GEODETIC SURVEY

DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
0.7. GOOGLES-EYED PAPER
0.7. JULY 10, 1978

NAME OF STATION: PAPAWAI
STATE: Hawaii County/Maui

Chief of Party: O.T. Hugueny
Year: 1950

Description by: G.B.G.

NOTE: Height of telescope above station base 1.53 meters; height of light above station base 1.33 meters.

A Table of Station Data

Station: RICE
Object: R.H. No.1

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Distance</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENE</td>
<td>20.77</td>
<td>6.335</td>
</tr>
<tr>
<td>NS</td>
<td>69.67</td>
<td>6.335</td>
</tr>
</tbody>
</table>

Station: MVH Antenna
Object: R.H. No.2

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Distance</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>8 miles</td>
<td>107.13</td>
</tr>
<tr>
<td>SE</td>
<td>17.81</td>
<td>5.426</td>
</tr>
</tbody>
</table>

Station: R.H. No.2
Object: MVH Antenna

<table>
<thead>
<tr>
<th>Bearing</th>
<th>Distance</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>142.46</td>
<td>40.53</td>
</tr>
<tr>
<td>NE</td>
<td>46.30</td>
<td>142.46</td>
</tr>
</tbody>
</table>

Located on the south shore of West Maui, Wailuku District, about 5 miles west of Kime Post Office, about 0.5 miles west of McGregor Point and about 0.3 miles north of the east highway, at the southwest edge of a small grassy flat. Station is a standard disk set in a boulder projecting 8 inches. Stamped PAPAWAI 1949.

Reference mark No.1 is southeast of the station. A standard disk set in a boulder flush with the ground, stamped PAPAWAI No.1 1949.

To reach from the Post Office at Wailuku, go south and west on Lahaina Highway for 9.0 miles. Turn right onto track road and go northwest up grade for 0.1 mile to an old army observation post. From here, park northerly for about 0.3 miles to top of ridge and station at west and of flat.

G.S. DEPARTMENT OF COMMERCE · COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF Station: PAPAWAI
STATE: Hawaii
Year: 1950

Established by: O.T.H.
Year: 1950
County: Maui

Recovered by: G.B.G.
Year: 1961
County: Maui

Detailed statement as to the fitness of the original description, including marks found, stampings, changes made, and other pertinent facts:

The station and both reference marks were recovered in good condition as described. The directions for reaching the station are adequate except that no observation post or road leading to it were found. Park on Highway 10 and park northerly to top of hill and station. A ten foot 2x2 pole was found over the station.

(continued on next page)
**HORIZONTAL CONTROL DATA**

*by the*

NATIONAL GEODETIC SURVEY

OLD HAWAIIAN DATUM UMI

---

**PAPAWAI (continued)**

---

**RECOVERY NOTE, TRIANGULATION STATION**

**NAME OF STATION:** PAPAWAI

**ESTABLISHED BY:** C.T. Husaymeyar

**RECOVERED BY:** R.G. Munson

**YEAR:** 1969

**STATE:** Hawaii

**COUNTY:** Maui

---

**HEIGHT OF TELESCOPE ABOVE STATION BASE**: 1.17 Meters

**HEIGHT OF LIGHT ABOVE STATION BASE**: Meters

**DISTANCES AND DIRECTIONS TO AZIMUTH MARKS, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION**

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>Bearing</th>
<th>Distance (Feet)</th>
<th>Height (Meters)</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.M. No. 1</td>
<td>NE</td>
<td>20.77</td>
<td>6.333</td>
<td>ENE 00 00' 00.0'</td>
</tr>
<tr>
<td>R.M. No. 2</td>
<td>SE</td>
<td>17.81</td>
<td>5.428</td>
<td>142 45 30'</td>
</tr>
<tr>
<td>R.M. No. 1</td>
<td>NE</td>
<td>20.808</td>
<td>6.343</td>
<td>69 57 10'</td>
</tr>
<tr>
<td>R.M. No. 2</td>
<td>SE</td>
<td>17.805</td>
<td>5.428</td>
<td>142 46 14'</td>
</tr>
<tr>
<td>Molokini Lighthouse 1950</td>
<td>SSE</td>
<td>171</td>
<td>45</td>
<td>01.6'</td>
</tr>
</tbody>
</table>

---

Station was recovered and all marks found in good condition. A complete description follows:

Station is located about 8 miles southwest of Wailuku and 2 miles west-southwest of Wailahu Harbor and 1700 feet north-northwest of the scenic observatory point, where the highway rounds Pampuau Point. It is up on the slopes of the steep hillside, about 381 feet elevation, on the south edge of a large flat area several acres in size.

To reach station from the post office in Wailuku, go south on State Highway 30 for 1.23 miles to Junction with State Highway 31; continue ahead on Highway 30 for 3.05 miles to the scenic overlook on left; continue ahead for 0.35 mile to end of truck travel on right; at a culvert and a highway sign "DO NOT PASS." Pack northerly, up steep hillside, about 300 yards to station.

Station mark is a standard disk stamped "PAPAWAI 1969," cemented in a drill hole in a 30-inch-diameter, round-topped, bedrock outcrop that projects about 6 inches from ground. It is 5 feet north of a large cairn. Reference mark number one is a standard disk stamped "PAPAWAI NO 1 1969," cemented in a drill hole in a 2 x 3-foot bedrock outcrop that projects 2 inches from ground. It is 0.3 foot lower than station mark. Reference mark number two is a standard disk stamped "PAPAWAI NO 2 1969," cemented in a drill hole in a 3 x 1-foot, red rock outcrop that projects 2 feet from ground. It is 2 feet higher than station mark.

---

*Note of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.*

**NOTE:** One of these forms must be used for every station recovered.

---

*USCG-DO 87-729-P3*
DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PAU
STATE: HAWAII
COUNTY: Maui
Island: Maui
Latitude: 20° 30' N
Longitude: 156° 30' W
DATE: 1962

CRUISE: H-13124
YEAR: 1962

Table:

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAAPA 1962</td>
<td>10.212'</td>
<td>00 00 00 0.0'</td>
</tr>
<tr>
<td>R.M. No. 2</td>
<td>11.009'</td>
<td>00 47 40 0.7'</td>
</tr>
<tr>
<td>R.M. No. 1</td>
<td>5.3 mile</td>
<td>326 32 45 8.8'</td>
</tr>
</tbody>
</table>

Station is located about 5 miles south-southeast of Lanai City and 1/2 mile west of the wharf at Kealakekua Bay, about 450 feet elevation. It is on the west side of a power line which runs along a grassy ridge, and on a rocky point at the west edge of the grassy slopes which run west south toward the coast from the power line.

To reach from the junction of Highway 44 and 411, go 1/2 miles on a road along Highway 44 to 3.5 miles to the west of the road, then turn left at a small road to the right, at a hydrant, and go 0.5 miles to fork. Take left fork and follow a road along edge of field for 0.5 mile. Take right fork and follow a road along edge of field for 0.5 mile.

Reaching the Lanai VOR installation, turn right and go 0.1 mile across flat top of hill to fork. Take right fork and follow a road along edge of field for 0.1 mile before reaching the station.

REFERENCE MARK: STATION PAU 1962, cemented in a 10-inch-diameter, bedrock cutup load that projects 2 inches above ground. It is 7.0 feet east-southeast of the white witness post.

REFERENCE MARK NUMBER ONE: STATION PAU 1962, cemented in a 10-inch-diameter, bedrock cutup load that projects 2 inches above ground. It is 7.0 feet east-southeast of the white witness post.

REFERENCE MARK NUMBER TWO: STATION PAU 1962, cemented in a 10-inch-diameter, bedrock cutup load that projects 6 inches above ground. It is 7.0 feet east-southeast of the white witness post.

ADJUSTED HORIZONTAL CONTROL DATA

COOK: 151 03 34.2 151 10 26 5102

OF 375
Station was recovered in good condition.
A new description follows:

The station is located on the east—westerly summit of Puapua which lies about 3 miles east—southeast of Lahaina. The station hill is marked by a large tree which has been cut into the brush. Higher ground lies to the east of the station.

From the courthouse in the city of Lahaina: go westerly for 1 mile to the block to the Shell Oil Company service station; turn right and go northeast for 0.3 mile; cross over the railroad tracks, turn right, and head between two long coconut trees and follow the main traveled road northeastly, up a steep grade for 2.6 miles to the end of the road and the end of truck travel from this point, cross over the irrigation ditch and follow the well worn trail, northerly for about 0.6 mile to the end of the trail and the station.

The station is a standard NGS Survey concrete disk: unmarked, set in the top of a square concrete post which is flush with the surface of the ground. A stone and concrete platform 6 feet square and 5 feet high has been built over this station.

Station was recovered in good condition. Located about 2-1/2 miles east—northeast of Lahaina, on the west, and lower, rounded hill of Puapua Hill, at about 2261 feet elevation, near the grave of David Malo. To reach station from the post office in Lahaina, go northeast on Papalaua St. for 0.2 mile; turn right and go 0.3 mile to crossroad. Turn left, on Dickenson St., and follow main cane road upgrade for 2.8 miles to corner of cane field at stock-loading chute. Park northerly, following old trail, for about 1/2-mile to station.

Station mark is an NTS disk, unmarked, set in the top of a 12-inch square, concrete monument flush with ground. A type-A signal is centered over the mark, with the 6-foot—square concrete platform 4 feet above ground. A metal target extends about 7 feet above platform. Station is 30 feet east of the David Malo Memorial and grave, and 33 feet northeast of a large, green, metal box on a pipe.
HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

RADJED HORIZONTAL CONTROL DATA

NAME OF STATION: PAUPAU
STATE: HAWAII
YEAR: 1079
FIRST

SOURCE: G-9311

DESCRIPTIVE LATITUDE
20°33'28.081"N
DESCRIPTIVE LONGITUDE
156°38'32.952"W
ELEVATION
687.2 METERS
2255 FEET

STATE COORDINATES (ESTS)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>500</td>
<td>508,253.85</td>
<td>232,592.25</td>
<td>+300031</td>
</tr>
</tbody>
</table>

*PLAN CHECK HAS BEEN COMPUTED BY THE D HDOC FORMULA, NEGLECTING THE SECOND ORDER TERMS.*

TO STATION OR OBJECT

DESCRIPTIVE AZIMUTH

<table>
<thead>
<tr>
<th>F (degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
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</table>

<table>
<thead>
<tr>
<th>PLAN ARMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q 365</td>
</tr>
</tbody>
</table>

DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PAUPAU
STATE: HAWAII
COUNTY: Maui
ESTABLISHED BY: H.Q.S.
YEAR: 1079
LOCALITY: Lahaina
RECOVERED BY: G.W. Smith
YEAR: 1051

Detailed statement as to the causes of the original description:
Original description by W.D. Alexander in 1900.

Original mark replaced by the U.S. Coast and Geodetic Survey — being a
2-1/2" pipe bearing the legend H.P. T.H. This mark was found to be in
very good condition.

New Mark: Standard bronze tablet set in concrete pier, 3 inches
above ground. Over this mark was built a Type A U.S. Coast and
Geodetic Survey Triangulation Station Monument.

Note: Hawaii Forest Reserve Monument pipe was cemented in the wall
of new monument with the legend H.P. T.H. Set within a few inches of
the standard bronze tablet, which is both the new station mark, and
the new Forest Reserve mark.

DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PAUPAU
STATE: HAWAII
COUNTY: Maui
ESTABLISHED BY: H.Q.S.
YEAR: 1079
LOCALITY: Lahaina
RECOVERED BY: G.W. Smith
YEAR: 1051

Detailed statement as to the causes of the original description:
Station was not visited, but signal was plainly visible. Terr. Govt. has evidently
built a concrete observing platform and signal over station mark.

(continued on next page)
HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PIILANI
STATE: HAWAII
COUNTY: MAUI
ISLAND: MAUI

Table: Distances and Directions to Levelling Mark

<table>
<thead>
<tr>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Station is located about 7 miles southeast of Lanai City and 5-1/2 miles due north of the old village of Keomuk, on the prominent black rock point that lies about 1/4 mile southwest of Haua Gulch and the southwest end of Highway 44.

To reach station from the post office in Lanai City, go north on Highway 44 for 8.5 miles to end of paved road. Continue on dirt road, Highway 44, for 6.5 miles to old Keomuk Village. Continue on the road for 1.0 mile to fork. Take left fork and follow road along shoreline for 6.4 miles to fishing shack and sign "NO 130" on right. Continue ahead about 50 yards to end of road. Park southwest along sandy beach for about 1/4 mile to prominent rock point and station.

Station mark is a standard disk stamped "PIILANI 1962," cemented in a drill hole in a 6 x 8-foot bedrock ledge that extends eastward out onto the large half-round ledge that comprises the main and prominent part of the point. The station mark is about 12 feet east of west edge of main ledge and about 2-1/2 feet higher, and is about 4 feet above sea level.

Reference mark number one is a standard disk stamped "PIILANI NO 1 1962," cemented in a drill hole in a 3-foot boulder at the north edge of the main ledge. It extends about 4 feet above the general ground line and is about 6 inches lower than the station.

Reference mark number two is a standard disk stamped "PIILANI NO 2 1962," cemented in a drill hole in the main ledge, which extends about 5 feet above ground at this point. The mark is about 2 feet lower than the station marks.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PIILANI
ESTABLISHED BY H.J.S.
YEAR 1962
RECOVERED BY C.K. Tumble
YEAR 1976
COUNTY: MAUI
ISLAND: MAUI

7 miles southeast of Lanai City.

Detailed statement as to the fitness of the original description; including marks found, excepts, changes made, and other pertinent facts:

Station and reference marks were recovered and distances to reference checked with the 1962 description. Station is in good condition. Station was reached by helicopter.

ADJUSTED HORIZONTAL CONTROL DATA

STATE: HAWAII
YEAR: 1962
SECOND ORDER

STATION 1120
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 30'
DIAGRAM 0-4-16 MAUI

STATE COORDINATES (feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ml 2</td>
<td>5102</td>
<td>443,783.64</td>
<td>160,018.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.63 30&quot;</td>
<td></td>
</tr>
</tbody>
</table>

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE "S INDI" FORMULA NEGLECTING THE SECOND TERM

FORM C50-163 2953
U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

JUN 1978
QUAD 201564
STATION 1120
HAWAII
LATTITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 30'
DIAGRAM 0-4-16 MAUI

STATE COORDINATES (feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
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<td>5102</td>
<td>443,783.64</td>
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</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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FORM C50-163 2953
U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

JUN 1978
QUAD 201564
STATION 1120
HAWAII
LATTITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 30'
DIAGRAM 0-4-16 MAUI

STATE COORDINATES (feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ml 2</td>
<td>5102</td>
<td>443,783.64</td>
<td>160,018.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.63 30&quot;</td>
<td></td>
</tr>
</tbody>
</table>

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE "S INDI" FORMULA NEGLECTING THE SECOND TERM

FORM C50-163 2953
U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

JUN 1978
QUAD 201564
STATION 1120
HAWAII
LATTITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 30'
DIAGRAM 0-4-16 MAUI
Station is located about 0.5 miles airborne southeast of Lanai City and 25 miles north-northeast of Manele Bay on a ridge to the south of the hill top called Puu Manu.

To reach station from junction of Highways 40 and 41 at the south edge of Lanai City, go south on Highway 40 for 1.7 miles to a paved fork. Take the left fork and go 1.15 miles to end of paved road. Continue ahead on graded road for 0.2 miles to T-road left. Turn left and go 0.5 miles to crossroad at edge of pineapple field. Continue ahead on narrow, graded road up brushy area and up along hillside, southwesterly, for 1.8 miles to fork at edge of pineapple fields on top of mesa. Take right fork and go along edge of field for 0.35 mile to crossroad. Turn right and follow graded road for 0.25 mile to dim right fork at bottom of grade and just before fence. Take right fork and follow dim tracks up side of hill and along crest 0.25 mile to high point and station Puu Manu. Continue on dim tracks down ridge to the south for 0.3 mile to a bare wash on the ridge. Turn left (east) 200 feet to the crest of the ridge and station.

Station mark is a standard traverse disk stamped PINE 1965, cemented in the top of a 2 inch galvanized pipe driven into the ground and projecting 1 foot.

Reference mark is a standard disk stamped PINE No.1 1965, cemented in a drill hole in the top of a 1 foot boulder that projects about 3 inches above the ground. It is in a group to the south of the washout in the ridge and at about the same elevation as the station.
### Adjusted Horizontal Control Data

**Name of Station:** Pomonola  
**State:** Hawaii  
**Year:** 1912  
**Third Order**

**Survey:** G-SP156  
**Observation Check on this Position**

<table>
<thead>
<tr>
<th>Geodetic Latitude:</th>
<th>Elevation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>20° 57' 46.57&quot; N</td>
<td>168° 150.94' + 31' 31&quot;</td>
</tr>
<tr>
<td>Geodetic Longitude:</td>
<td>196° 32' 56.24&quot; W</td>
</tr>
</tbody>
</table>

**State Coordinates (ft):**

<table>
<thead>
<tr>
<th>State &amp; Zone</th>
<th>Code</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>540,203.92</td>
<td>168,150.94</td>
</tr>
</tbody>
</table>

*Plane Azimuth has been computed by the \( \pm D_0 \\cdot 8 \) formula neglecting the second term.

<table>
<thead>
<tr>
<th>To Station or Object</th>
<th>Geodetic Azimuth (from pole)</th>
<th>Plane Azimuth (from north)</th>
</tr>
</thead>
<tbody>
<tr>
<td>QU 005</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**NO ORIGINAL TEXT**

Pohoula (Lanai Island, Hawaiian Government Survey, 1879; F. G. Engle, 1927)—In the central part of Lanai, District of Paomai, Land of Paomai, on the summit of a red bluff about 1,700 meters north of Koel Ranch. Reached by road turning northeast near house of Mr. Gibson, and running back to cemetery on top of bluff. Station is 300 meters southwest of cemetery. Marked by drill hole surrounded by triangle in top of stone. Reference marks (1927) are drill holes in stones which project several inches above ground. They are at the following distances and azimuths from the station: No. 1, 12.228 meters (40.12 feet), 225° 56'; No. 2, 9.570 meters (31.40 feet), 355° 57'.

**RECOVERY NOTE, TRIANGULATION STATION**

**NAME OF STATION:** Pohoula  
**ESTABLISHED BY:** HGS  
**YEAR:** 1879  
**STATE:** Hawaii  
**RECOVERED BY:** H.J. Semberg  
**YEAR:** 1962  
**COUNTY:** Maui  
**HEIGHT OF TELESCOPE ABOVE STATION MARK:** 1.62 meters  
**HEIGHT OF LIGHT ABOVE STATION MARK:** 0.00 meters  
**DISTANCES AND DIRECTIONS TO ADJACENT MARKS, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION**

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>BEARING</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanespu (HGS) 1879 1962</td>
<td>N 40° 13'</td>
<td>12.228</td>
<td>107° 18° 20'</td>
</tr>
<tr>
<td>R.M. No. 1</td>
<td>E 31° 42'</td>
<td>9.570</td>
<td>242° 19° 13'</td>
</tr>
<tr>
<td>R.M. No. 2</td>
<td>E 31° 42'</td>
<td>9.570</td>
<td>242° 19° 13'</td>
</tr>
</tbody>
</table>

Station was recovered and all marks found to be in good condition. Original station mark was a 1-1/2-inch diameter hole, drilled 1-1/2 inches deep in the top of a 12-inch boulder. A new station disk was established. A complete description follows:

Station is located about 1-1/2 miles north of Lanai City, on a heavily timbered hill, 50 yards southwest of a cemetery boundary fence.

To reach station from the post office in Lanai City, go northwest on Lanai Avenue for 0.75 mile to left curve of highway, by golf course on right. Go left on highway for 0.15 mile to dirt road side road. Turn right and follow graded road along left side of gravel drain. Cross farm road up side of hill for 0.7 mile to cemetery gate on left. Continue ahead, passing around fence corner, bear left and go southwest along right side of fence and continue ahead to edge of hill, a distance of 0.1 mile; then bear left along edge of hill for 50 yards to station.

Station mark is a standard disk stamped "Pohoula 1879 1962", cemented in the original station hole, in the top of a 12-inch-diameter boulder that projects 3 inches above ground. There is a wide, 6-inch circle painted the mark.

Reference mark number one is a standard disk stamped "Pohoula 1 1927", cemented in a drill hole in the top of a 6 x 6-inch boulder that projects about 3 inches above ground. It is about 1 foot lower than the station.

Reference mark number two is a standard disk stamped "Pohoula 2 1927", cemented in a drill hole in a 6 x 6-inch boulder that projects about 3 inches above ground. It is about 2 feet higher than the station.

**ADJUSTED HORIZONTAL CONTROL DATA**

**STATE:** Hawaii  
**YEAR:** 1879  
**SECOND ORDER**  
**SOURCE:** G-13124  
**ELEVATION:** 607.6 meters  
**COORDINATE SYSTEM:** 1929 North American  
**STATE & ZONE:** 1929 North American  
**ELEVATION:** 2026 feet

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>V</th>
<th>V</th>
<th>( \Delta X = \Delta Y = 0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 2</td>
<td>5102</td>
<td>413.090.84</td>
<td>187.055.60</td>
<td>0 05 30</td>
</tr>
</tbody>
</table>

**NOTE:** Out of three faces must be used for every station recovered.
Pond (Maui Island, J. C. Gauger, 1912)—On northwest coast of Maui, in south side of Wailea Creek, about 65 meters back from the beach. Marked by surface of ground. Pipe is filled with concrete and is centered with a standard bronze disk.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: POND
ESTABLISHED BY: J.C. Gauger
YEAR: 1912
STATE: Hawaii
RECOVERED BY: R.C. Huxson
YEAR: 1968
COUNTY: Maui
ISLAND: Maui
HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.35 Meters
HEIGHT OF LIGHT ABOVE STATION MARK: 1.35 Meters

DISTANCES AND DIRECTIONS TO ADJACENT MARKS, REFERENCE MARKS AND PRINCIPAL OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>HAY 1912</th>
<th>R.M. No. 1</th>
<th>R.M. No. 2</th>
<th>OALI 2 1930</th>
<th>Beak, 1960</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meters</td>
<td>Feet</td>
<td>Meters</td>
<td>Feet</td>
<td>Meters</td>
</tr>
<tr>
<td>Recked</td>
<td>16.667</td>
<td>54.44</td>
<td>38.725</td>
<td>128.54</td>
<td>334.05</td>
</tr>
<tr>
<td>Dist. to station</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
<td>00.00</td>
</tr>
</tbody>
</table>

Station mark was recovered in good condition, in a dense kiaa thicket. Two reference marks were established, a witness post was set and lines were cleared. A complete description follows:

Station is located about 1 mile north of Wailea Village and 3/4 mile north-northwest of the Wailea Dairies, on the slope of the northeast end of the hill at Wailea Point, and at about 65 feet elevation, in the southeast edge of a very dense kiaa thicket.

To reach station from the intersection of Main and Market Streets in Wailea, go north on Market Street for 0.5 mile to crossroad in Happy Valley. Continue ahead, on Kaeleki Highway, for 1.0 mile to junction with Highway 34. Continue ahead, on Highway 33, for 1.25 miles to sign "Wailea Golf Course". Turn right and go 0.45 mile to fork; take left fork and go 0.35 mile to the Wailea Dairies buildings. Continue ahead, through gate, and follow track road right for 1.0 mile to board gate; pass through gate and continue for 0.1 mile to point of ridge. Pass left about 50 yards up slope on dirt trail to station.

Station mark is a standard disk, un stamped, set in the top of a concrete-filled, 8-inch-diameter, brown, sewer pipe projecting 8 inches from ground. It is about 100 yards north-northeast of a large, long ironwood tree, 22 feet west of a trail passing through the thicket, 100 feet west of the track road, 3.3 feet north of a white witness post, and about 100 yards north of the Wailea Dairies buildings.

Reference mark number one is a standard disk stamped "POND 1912 NO 1 1966", set in the top of a 2-inch iron pipe that is set in concrete and projects 8 inches from ground. It is in sand area, just south from edge of kiaa thicket.

Reference mark number two is a standard disk stamped "POND 1912 NO 2 1966", set in the top of a 10-inch-square, concrete monument that projects 6 inches from ground. It is set just outside the west edge of the thicket, 1-1/2 feet higher than station mark.

*Note: Chief of party should be Instructed here. The officer who actually visited the station should sign his name as the end of the recovery note.

NOTE: One of these forms must be used for every station recovered.
HORIZONTAL CONTROL DATA

Puu Hele (Mau Island, Hawaiian Government Survey).—In the southern part of Walluku District, on summit of Puu Hele, near a small cemetery, east of the road from Walluku to Maualena Landing, and 6,000 feet north of Maualena Bay. Marked by a concrete post.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Puu Hele
STATE: Hawaii
COUNTY: Maui
RECEIVED BY: E.A. Seward
YEAR: 1929

Detailed statement as to the status of the original description:

On the summit of a hill of the same name, near a small cemetery, east of the road from Walluku to Maualena Landing, and 6,000 feet north of Maualena Bay.

Original Mark:

1/2 inch hole drilled in top of rock. Flushed with ground. Buried 1 foot under this mark was a bottle in an upright position.

New Mark:

A standard Territory of Hawaii Bronze Tablet set in concrete pier. Over which was built a Type A Hawaii Territory Survey

Triangulation Station Monument.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Puu Hele
STATE: Hawaii
COUNTY: Maui
RECEIVED BY: R. A. Seward
YEAR: 1943

Detailed statement as to the status of the original description:

The concrete and masonry observatory platform, 30' high, has been erected over standard disc marker by the Territory of Hawaii, and target erected. This station is being encroached upon by borrow pit excavated and disturbed by blasting and should henceforth be regarded as uncertain. It will probably be destroyed in 1940. Before it was disturbed, a new station, Puu Hele, was established 4,784.660 feet distant, azimuth 94° 35.80', from Puu Hele.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Puu Hele
STATE: Hawaii
COUNTY: Maui
RECEIVED BY: F. H. H. Seward
YEAR: 1944

Detailed statement as to the status of the original description:

Letter of T. D. Patterson, Supervisor, Pacific District,
Honolulu, T.H., dated August 18, 1944:

Station has been destroyed by excavation of Puu Hele for surfacing material. It is recoverable on Aerial Photographs by resection from visible cultural features.
**HORIZONTAL CONTROL DATA**

**DESCRIPTION OF TRIANGULATION STATION**

**Name of Station:** Puu Hele 2  
**State:** Hawaii  
**County:** Maui  
**Established by:**  
**Year:** 1939

**Details:** On the summit of a hill of the same name, at a small cemetery, East of the road from Nalukau to Hanalea Landing, and 5000 feet North of Hanalea Bay.

**Mark:** A concrete post and tripod signal. Mark found: 1/8 inch hole drilled in top of rock flush with ground. Buried 1 foot under this mark was a bottle in an upright position.

**Recovery Note:** Standard Territory of Hawaii Bronze Tablet set in concrete pier. Over which was built a Type A Territory Survey Triangulation Station Lamina.

**RECOVERY NOTE, TRIANGULATION STATION**

**Name of Station:** Puu Hele 2  
**Established by:** H.G.S.  
**Year:** 1939  
**State:** Hawaii  
**County:** Maui

**Details:** The station was not found. The hill has been leveled by excavation, and in view of the letter by the Supervisor, Pacific District, dated 18 August 1948, it is recommended that the station be considered destroyed.

**RECOVERY NOTE, TRIANGULATION STATION**

**Name of Station:** Puu Hele 2  
**Established by:** H.G.S.  
**Year:** 1939  
**Recovered by:** R.C. Munson  
**Year:** 1948  
**State:** Hawaii  
**County:** Maui

**Details:** Station was destroyed long ago by excavation of a cinder quarry. There is now a large pit here.
HORIZONTAL CONTROL DATA

NAME OF STATION: Puu Nona
STATE: Hawaii
YEAR: 1943

DESCRIPTION OF TRIANGULATION STATION

- NAME OF STATION: Puu Nona
- STATE: Hawaii
- YEAR: 1943

In Haalaea District of southwest Maui, on a prominent knob on the ridge south of Pohana Gulch, 0.9 miles west of the junction of the Walluku-Haalaea road with the Kiai Road one mile north of Haalaea. The station is marked by a standard disc, cemented in a drill hole in ledge rock, and is on the east side of the summit of the knob, 36.7 feet east of a rock cairn marking an angle point in the Ukulehame Lava Grant boundary, but is not intended to identify this boundary.

RM 1 is a standard disc set in concrete, in rock, 50' on line with Puu Hele S, azimuth 91° 08' 23.0". RM 2 is a standard disc stamped "3000" feet true north, on the ridge north of Pohana Gulch.

RECOVERY NOTE, TRIANGULATION STATION

- NAME OF STATION: Puu Nona
- STATE: Hawaii
- YEAR: 1943

Detailed statement as to the sources of the original description, including marks found, stempings, changes made, and other pertinent facts:

Located on the south side of Puu Nona, Haalaea District, and about 5.6 miles south of Walluku Town and about 1.5 miles north of Haalaea Point. The ridge of which is almost white in appearance from a distance.

Station Mark is a standard disc set flush in a large flat rock about 1 foot high. Stamped Puu Nona, 1943. Reference Mark No. 1 is east of the station. A standard disk cemented into a 2 1/2 inch galvanized pipe projecting 1 foot. Stamped R.M. 1 1943. To reach from junction of main road to Lahaina, Walluku and Kiai, go 2 3/4 miles north of town for 100 miles and 100 feet beyond Telephone Pole 127 then turn right into field dirt road and follow for 0.20 mile then turn right along concrete drive for 0.10 mile. From here back westerly across field, through pasture with kiai growth to feet of hill then follow bare ridge to top of hill and station.

NOAA FORM 70-21
(2/16)
HORIZONTAL CONTROL DATA
by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: FUU HONA
ESTABLISHED BY: K. McLean
YEAR: 1943
STATE: Hawaii
COUNTY: Maui
HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.74 METERS
HEADING OF LIGHT ABOVE STATION MARK: 74

DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>MEASUREMENT</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUKE 1012</td>
<td>NE</td>
<td>00 00 00.0</td>
<td></td>
</tr>
<tr>
<td>Azimuth Mark</td>
<td>E</td>
<td>59 22 33.3</td>
<td></td>
</tr>
<tr>
<td>H.M. No. 1</td>
<td>50.06'</td>
<td>71 00 39</td>
<td></td>
</tr>
<tr>
<td>WAIKOA 1950</td>
<td>NW</td>
<td>10 038</td>
<td>315 00 27</td>
</tr>
</tbody>
</table>

Station mark and H.M. No. 1 were recovered in good condition. H.M. No. 2 was not searched for since it is in an isolated location which makes it almost unusable for an azimuth mark. A new reference mark and an azimuth mark were established. A complete description follows:

Station is located about 1-1/2 miles north-northwest of Wailuku, and 3-1/4 miles due west of the junction of State Highways 30 and 31, on a hill of about 905 feet elevation, about on line with the power line running up the ridge to west, and is about 150 yards east of the first power line poles on the ridge, and the lower end of a bulldozed road.

To reach station from the post office at Kilae, go northwest on State Highway 31 for 3.7 miles to junction with State Highway 30. Turn left and go south on Highway 30 for 0.55 mile; turn right, at culvert, and go up cane field road for 0.45 mile to Y-junction at canal and edge of field. Go right, along canal road; for 0.15 mile to end of truck travel just past log in canal. Pack west about 1/2 mile to station.

Station mark is a standard disk stamped "FUU HONA 1943", cemented in a drill hole in the west side of a flat, 10-foot-diameter boulder. The reference mark number one is a standard disk stamped "EM 1 1943", set into the top of a 2-inch pipe projecting 10 inches from ground. It is 25 feet south of the fence and 15 feet lower than station mark.

Reference mark number three is a standard disk stamped "FUU HONA 1943", cemented in a drill hole in a 3-foot boulder projecting 1 foot from ground. It is 6 feet south of the fence and about 1 foot higher than station mark.

Azimuth mark is a standard disk stamped "FUU HONA 1950", cemented in a drill hole in the north end of the west concrete bridge abutment of the highway bridge at Pohakea Gulch. The mark is 10 feet west of center line of highway, 6 feet west of the metal guard rail, 3 feet east of the west face of the abutment wall, 3 feet north of the 1937 inscribed in the west face of the abutment wall, and 10 inches above ground. To reach from junction concrete bridge rail, and 10 inches above ground. To reach from junction concrete bridge rail, and 10 inches above ground. To reach from junction concrete bridge rail, and 10 inches above ground.

*Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.

NOTE: Out of three faces must be used for every station recovered.
HORIZONTAL CONTROL DATA

by
the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU MANU
STATE: HAWAII
YEAR: 1879
SECOND ORDER

NAME OF STATION: PUU MANU
ESTABLISHED BY: HBS
YEAR: 1879
STATE: HAWAII
RECOVERED BY: H. J. Seaborg
YEAR: 1892
COUNTY: MAUI
ISLAND: MAUI

HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.16 METERS
HEIGHT OF LIGHT ABOVE STATION MARK: 0.67 METERS

DISTANCES AND DIRECTIONS TO ADJACENT MARK, REFERENCE MARKS AND PROXIMATE OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>DEPARTURE</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KANAO</td>
<td>6.5 miles</td>
<td>000.0</td>
<td>000.0</td>
</tr>
<tr>
<td>LAMAI, VOR (LNX)</td>
<td>26.344</td>
<td>0.962</td>
<td>47.33 23</td>
</tr>
<tr>
<td>R.M. No. 1</td>
<td>26.344</td>
<td>0.962</td>
<td>47.33 23</td>
</tr>
<tr>
<td>R.M. No. 2</td>
<td>23.544</td>
<td>0.779</td>
<td>12.43 15</td>
</tr>
<tr>
<td>R.M. No. 3</td>
<td>40.977</td>
<td>0.000</td>
<td>000.0</td>
</tr>
</tbody>
</table>

Station was recovered and all marks found in good condition. A complete description follows:

Station is located about 4-1/2 miles southeast of Lamanai City and 2-1/2
miles north-northeast of Maneele Bay, on the summit of a bare hill of 2072 feet
elevation that overlooks Lamanai Basin to the west, and is the highest of the group
of bare hills that separate the southern slopes of the higher range of Lamanai to
the north and east.

To reach station from the junction of highways 44 and 45 at the south edge
of Lamanai City, go southeast on Highway 44 for 1.7 miles to a paved fork. Take
right fork and go 1.15 miles to end of paved road. Continue ahead on graded road for 0.2
miles to t-road left. Take left fork and go 0.5 mile to crossroad at edge of pineapples
field. Continue ahead on narrow, graded road up brushy draw and up along hillside,
then to the top of the hill to the north. Take right fork and go along edge of field for 0.35 mile to crossroad. Turn right,
through gate, and follow graded road for 0.26 mile to the right fork at bottom of
grade. Take right fork and follow dirt track up side of hill and then along crest
of ridge for 0.35 mile to highest point of hill and station.

Station mark is a 6-inch-square, pre-cast, concrete post, with a large cross
on top, projecting 3 inches above ground. It is a boulder-strewn area, 13
feet northwest of center line of track road and 3.6 feet west-northwest of a
white-washed post.

Reference mark number one is a standard disk stamped "MANU 1 1927", cemented
in a drill hole in a 2-1/2-foot-square lava rock outcrop that projects 1 foot above
ground. It is about 1 foot lower than the station.

Reference mark number two is a standard disk stamped "MANU 2 1927", cemented
in a drill hole in the top of a 3-foot boulder that projects about 3 feet above
ground. It is 9 yards southeast of the center line of the track road and about
3 feet lower than the station.

Reference mark number three is a standard disk stamped "MANU 3 1927", cemented
in a drill hole in the top of a 3-foot-diameter boulder that projects 6 inches
above ground. It is 6 feet northwest of the center line of the road and about
2 feet lower than the station.

(continued on next page)

"Mr. ___ of party should be inserted here. The officers who actually visited the stations should sign his name at the end
of the recovery note.

NOTE - One of these forms must be used for every station recovered.
PUU MANU (continued)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU MANU
ESTABLISHED BY: U.S.G.S. YEAR: 1879 STATE: Hawaii
RECOVERED BY: C.K. Townsend YEAR: 1976 COUNTY: Maui
ISLAND: Lanai
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:
4.5 miles southeast of Lanai City

Detailed statement as to the traces of the original description, including marks found, staking, changes made, and other pertinent facts:
Station and reference marks were recovered as described in 1952.
No measurements were made to reference marks. Station was reached by helicopter.
HORIZONTAL CONTROL DATA

JUN 1978
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GECOETIC SURVEY

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD NO: 201564
STATION 1129
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
DIAGRAM NO 616
MAUI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU NENE
STATE: HAWAII
YEAR: 1962
SECOND ORDER

SOURCE: G-13124

STATE COORDINATES (first)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X (\text{EAST})</th>
<th>Y (\text{NORTH})</th>
<th>Z (\text{ELEV})</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>442,454,61</td>
<td>176,244,45</td>
<td>- 0° 02 36</td>
</tr>
</tbody>
</table>

FILE ADJACENT AND EXACT FORMULA INCLIDING THE SECOND TERM

<table>
<thead>
<tr>
<th>STATION OR OBJECT</th>
<th>GEOGRAPHIC ADJACENT (From north)</th>
<th>PLANE ADJACENT (From north)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAHEA</td>
<td>211 36 44 44</td>
<td>211 40 20</td>
<td>5102</td>
</tr>
</tbody>
</table>

NOTE: A small jeep is the only vehicle that can be driven up the washed-out track road.

*Entries in parentheses indicate interpolated or estimate values.
**Direction angles measured clockwise, referred to initial station.
*G.S. LAMBERT CONFORMAL CONIC: UNIVERSITY OF WASHINGTON

NOAA FORM 76-31
(11-78)
NO ORIGINAL TEXT

PUU PEHE (Maui County, Hawaii, 1914, 4 WMC, 1913)

Station is marked by a large

cliff of rocks, located on the top of the rocky bluff, on the Su

side of Manohe Bay. There is a rocky island called Puu Pehe rock

just offshore from the station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU PEHE

ELEVATION: 146.1

METERS

X 422,929.14

Y 147,556.82

Z 3.0646

STATE COORDINATES (Ft)

DIAMETER: 616 MAUI

ELEVATION: 36.2

METERS

STATE & CODE X Y Z

H 2 5102 422,929.14 147,556.82 3.0646

*PLANE ASTRUM HAS BEEN COMPUTED BY THE 2-2-3-3 FORMULA PROVING THE SECOND ORDER

TO STATION OR OBJECT

COORDINATE FROM GAUGE (Ft)

GEOGRAPHIC AXIephy (from gauge)

PLANE AXIEMY (from gauge)

CODE

KAA 87 29 42.1 87 34 31 5102

REFERENCE MARK NUMBER ONE IS A STANDARD DISK STAMPED "PUU PEHE NO 1 1914 1962", CEMENTED IN A DRILL HOLE IN A 2 X 3-FOOT BOULDER THAT PROJECTS 6 INCHES ABOVE GROUND. IT IS ABOUT 1 FOOT HIGHER THAN THE STATION.

REFERENCE MARK NUMBER TWO IS A STANDARD DISK STAMPED "PUU PEHE NO 2 1914 1962", CEMENTED IN A DRILL HOLE IN AN 18 X 30-FOOT BOULDER THAT PROJECTS 6 INCHES ABOVE GROUND. IT IS AT ABOUT THE SAME ELEVATION AS THE STATION MARK.

Station PUU MANU (BOG) 1879 1927 will serve as the azimuth mark.

(continued on next page)

NOTE - One of these forms must be used for every station recovered.

UCOEDAC 3570-P08

NOAA FORM 16-31
(11-76)
HORIZONTAL CONTROL DATA
by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

PUU PEHE (continued)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU PEHE
ESTABLISHED BY: J.B.M. YEAR: 1914
RECOVERED BY: C.K. VOGSIDE YEAR: 1976
STATE: HAWAII BENCH MARKS ALSO ☐
COUNTY: MAUI ISLAND
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

6.5 miles south-southeast of Lanai City

Detailed statement as to the source of the original description, including marks found, imprints, changes made, and other pertinent facts:

Station mark and reference marks were recovered in good condition. There was no evidence of a circle of red cinder boulders as described in the 1962 recovery note. Distances measured to RM 1 and RM 2 checked with distances in the recovery note. Reference mark RM 3 stamped PUU PEHE RM 3 1976 was established and is located 66.687 meters on an azimuth of 12° 32′ 57.9″ from the station. RM 3 is a USC disk stamped as a reference mark.
HORIZONTAL CONTROL DATA

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY • NATIONAL GEODETIC SURVEY

SEE STATION PUU PEHE

HAWAII

LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 20'

DIAGRAM NF 416 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

STATE: HAWAII
YEAR: 1976

SOURCE: G-15810

GEODETIC LATITUDE: 20° 49' 18.35122
GEODETIC LONGITUDE: 156° 55' 36.71498

ELEVATION: 55.3 METERS 116 FEET

STATE COORDINATES (ft)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>E OR Δ: ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>422,901.35</td>
<td>147,185.42</td>
<td>- 0 04 49'</td>
</tr>
</tbody>
</table>

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE Δ Ω FORMULA REJECTING THE SECOND TERM.

TO STATION OR OBJECT | GEODETIC AZIMUTH (FROM NAD) | PLANE AZIMUTH (FROM NAD) | CODE |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PAPAOK PT LIGHT</td>
<td>67° 36' 24.01</td>
<td>87° 41' 13'</td>
<td>5102</td>
</tr>
</tbody>
</table>

THESE DATA OBTAINED FROM ADJUSTMENT OF OCT 1979

RL 015
HORIZONTAL CONTROL DATA

by the National Ocean Survey
OLD MAUIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: Puukolli Central Power Co Stack
STATE: HAWAII
YEAR: 1950
THIRD ORDER

SOURCE: G-9311

GEODETIC LATITUDE: 20° 56' 24.826"
GEODETIC LONGITUDE: 156° 41' 31.215"

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (HOR. ANGLE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI 2</td>
<td>5102</td>
<td>491,1353.63</td>
<td>221,433.35</td>
<td>-    30.33</td>
</tr>
</tbody>
</table>

Station was recovered. Located about 3 miles north-northeast of Lahaina, 1 mile northeast of Puukolli Village, and 800 feet southeast of State Highway 30, opposite the south end of the Lahaina Airport.

Station is the center of the greyish, concrete stack, with fluted top, about 140 feet tall and 12 feet in diameter, at north end of the power plant building.
FUU PEHE RM 3 (Maui Island, Hawaii, C.K.T., 1976) Station is a
NOS disk stamped FUU PEHE RM 3 1976 used as a reference mark.
Station is located 66.687 meters on an azimuth of 12° 32' 57.9"
from station FUU PEHE.

HORIZONTAL CONTROL DATA

<table>
<thead>
<tr>
<th>QUAD</th>
<th>20154</th>
<th>STATION</th>
<th>1131</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAWAII</td>
<td>HAWAII</td>
<td>LAUHLEH</td>
<td>20° 30' 00&quot;</td>
</tr>
</tbody>
</table>
|       |       | LONGITUDE | 157° 00' 00"

ADJUSTED HORIZONTAL CONTROL DATA

<table>
<thead>
<tr>
<th>NAME OF STATION</th>
<th>FUU PEHE RM 3</th>
<th>OBS BY NGS</th>
<th>D.BY NGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE</td>
<td>HAWAII</td>
<td>YEAR</td>
<td>1976</td>
</tr>
</tbody>
</table>

SOURCE:
G-15810

| GEODETIC LATITUDE | 20° 44' 18.35" |
| GEODETIC LONGITUDE | 155° 58' 36.71" |
| ELEVATION | 35.8 METERS |
|            | 116 FEET |

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z OR G.H. ANGLE</th>
</tr>
</thead>
</table>
| HI 2         | 5102 | 422,401.33 | 147,183.42 | 0° 04' 49"

*PLAN AZIMUTH HAS BEEN COMPUTED BY THE Z OR G.H. FORMULA NEGLIGEING THE SECOND TERM

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEODETIC AZIMUTH (FROM STATION)</th>
<th>PLAN AZIMUTH (FROM STATION)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PALAPA PT LIGHT</td>
<td>87° 36' 44&quot; 01&quot;</td>
<td>87° 36' 44&quot; 01&quot;</td>
<td>5102</td>
</tr>
</tbody>
</table>

THESE DATA OBTAINED FROM ADJUSTMENT OF OCT 1979
HORIZONTAL CONTROL DATA

MAR 1981

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: HONO
STATE: HAWAII
COUNTY: Maui

YEAR: 1951
LOCALITY: N.W. Coast of Maui

DISTANCES AND DIRECTIONS TO REFERENCE MARKS AND PRINCIPAL FEATURES

DISTANCE (feet) DIRECTION

REFERENCES

Reference mark, Re
Reference mark, Re
Reference mark, Re
Reference mark, Re
Reference mark, Re

H I 2
5102
491,393.63
221,433.35
- 0' 00' 33"

PLAN AZIMUTH HAS BEEN COMPUTED BY THE \[ \phi = \arctan \left( \frac{V}{U} \right) \] FORMULA DEFLICTING THE SECOND TERM.

STATE N ZONE

COORDINATES (feet)

R

H031

GEOGRAPHIC LATITUDE: 20° 56' 36.326"
GEOGRAPHIC LONGITUDE: 156° 41' 31.219"

ELEVATION METERS

H1 2

165

149,433.35

- 0' 00' 33"

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HONO
STATE: HAWAII
YEAR: 1951

THIRD ORDER

SOURCE: G-9311

5102
491,393.63
221,433.35
- 0' 00' 33"

R

H031

GEOGRAPHIC LATITUDE: 20° 56' 36.326"
GEOGRAPHIC LONGITUDE: 156° 41' 31.219"

H031

ELEVATION METERS

165

149,433.35

- 0' 00' 33"

RECOVERY OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: HONO
POWER CO., STACK
STATE: Hawaii COUNTY: Maui

YEAR: 1950

CHIEF OF PARTY: O. T. Hunsley

Detailed statement as to the Stakes of the original description, including marks found, steps, changes made, and other pertinent facts:

The station is the top and center of a fluted concrete smoke stack which is located on the north side of the Central Power Company, number 8 in the village of Pahoa.

The stack is 205 feet in height, about 16 feet in diameter, and rests on a circular base which is flush with the surface of the ground.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HONO
HONOLULU CENTRAL POWER CO., STACK
STATE: Hawaii COUNTY: Maui

YEAR: 1951

CHIEF OF PARTY: O. T. Hunsley

Detailed statement as to the Stakes of the original description, including marks found, steps, changes made, and other pertinent facts:

The station was recovered in good condition as described. The stack is now painted black and is at the abandoned Pahoa Power Station on the east side of the highway.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HONO
STATE: Hawaii COUNTY: Maui

YEAR: 1969

CHIEF OF PARTY: O. T. Hunsley

Detailed statement as to the Stakes of the original description, including marks found, steps, changes made, and other pertinent facts:

Station was recovered; it is the same as Pahoa Power Co. Stack. Located about 3 miles north-northwest of Lahaina, 1 mile northwest of Pukonori Village, and 800 feet southeast of State Highway 30, opposite south end of the Lahaina Airport. Station is a greyish, concrete stack, with fluted top, about 140 feet tall, at north end of power plant building.
HORIZONTAL CONTROL DATA

by the National Ocean Survey
OLD MAUIAN DATUM

SEE STATION KAHAU

QUAD 20156+ STATION 1133
MAUII
LATTITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
DIAGRAM NO. 4-16
MAUI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION KAINIKAP 24 N COR
STATE MAUII YEAR 1962 THIRD ORDER

POINT S-15124 NO OBSERVATION CHECK ON THIS POSITION

BIDENOTH LATITUDE 20° 36' 00.384
BIDENOTH LONGITUDE 156° 30' 02.191
ELEVATION METERS

STATE COORDINATES (FAR)

STATE & Zone COOR x y \( \begin{array}{c} H1 \ 5102 \\ \end{array} \)

0.77068 205,021.59 - 3 05 43

* PLAIN ADJUTCH AS SEEN CURT BY THE 2. triangles. FORMULA NELCING THE SECOND TERM

TO STATION OR OBJECT BIDENOTH ADJUTCH (from metro) PLAIN ADJUTCH (from metro)

POSITION DETERMINED BY TRAVERSE FROM STATION KAHAU

OF 387
HORIZONTAL CONTROL DATA

QUAD 201264  STATION 1134
HAWAII  LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION  RAW  STATE  YEAR  THIRD
HAWAII             1914  THIRD

G-SP156 OBSERVATION CHECK ON THIS POSITION

<table>
<thead>
<tr>
<th>DEGREES</th>
<th>MINUTES</th>
<th>FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>20° 34'</td>
<td>28.75'</td>
<td></td>
</tr>
<tr>
<td>156° 41'</td>
<td>21.55'</td>
<td></td>
</tr>
</tbody>
</table>

STATE COORDINATES (Int.)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Y'</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>662,268.33</td>
<td>208,731.33</td>
<td>- 00' 24&quot;</td>
</tr>
</tbody>
</table>

* Planes azimuths have been computed by the z - ord. p. formula neglecting the second term.

<table>
<thead>
<tr>
<th>STATION OF OBJECT</th>
<th>DEGREES</th>
<th>MINUTES</th>
<th>PLANE AZIMUTH</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>00 023</td>
</tr>
</tbody>
</table>
RED (Kahoolawe Island, J. F. Pratt, 1904).—In the western part of Kahoolawe, on a bare red hill overlooking a portion of the northern shore line, distant about 1 mile from the nearest shore line, and about 300 meters from the shallow opening at the northwest end of a large depression. Marked by flagpole driven into ground with small stones piled around its base.
# Horizontal Control Data

**State:** Hawaii  
**Year:** 1934  
**Source:** G-SP156

### Geodetic Coordinates

<table>
<thead>
<tr>
<th>Geodetic Latitude</th>
<th>Geodetic Longitude</th>
<th>Elevation (meters)</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>20°33'25.840&quot;</td>
<td>156°40'45.296&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### State Coordinates (EPS30)

<table>
<thead>
<tr>
<th>State &amp; Zone</th>
<th>Code</th>
<th>X</th>
<th>Y</th>
<th>E (km)</th>
<th>H (m)</th>
<th>A (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>495,695.66</td>
<td>81,701.86</td>
<td></td>
<td></td>
<td>0°00'16&quot;</td>
</tr>
</tbody>
</table>

*Plane Azimuth has been computed by the E W H D H formula neglecting the second term.*

### To Station of Object

<table>
<thead>
<tr>
<th>To Station of Object</th>
<th>Geodetic Azimuth (From Site)</th>
<th>Plane Azimuth&quot; (From Site)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**NO ORIGINAL TEXT**

**RECOVERY NOTE, TRIANGULATION STATION**

**REFERENCE MARK 3**

<table>
<thead>
<tr>
<th>NAME OF STATION</th>
<th>ESTABLISHED BY</th>
<th>YEAR</th>
<th>STATE</th>
<th>COUNTY</th>
<th>ISLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>R.C. Munson</td>
<td>1968</td>
<td>Hawaii</td>
<td>Maui</td>
<td>Maui</td>
</tr>
</tbody>
</table>

**RECOVERED BY:**

- R.C. Munson

**DETAILS OF STATION:**

- **Lat/Long:** 20° 30' 30.612, 156° 30' 50.424
- **Elevation Scaled:** 69
- **Measurements:**
  - **X:** 552,133.30
  - **Y:** 178,657.82
  - **Z:** 0° 05' 15"

**ADJUSTED HORIZONTAL CONTROL DATA**

**REFERENCE MARK 3**

- **NAME:** R

**SOURCE:** G-5335

---

A trial point was established in the vicinity by triangulation from stations WAIKOA, PUU HORA and Radio Station WWV7, west 1950; a search was made at the distance and angle determined by inverse from this point but no mark was found. The point falls in the roadway of the cane-field boundary road of Field No. 97 of the Waiaku Sugar Company, and since this road and canal were constructed prior to 1920 the mark was apparently located on the roadway, and is believed to have been knocked by road graders.
HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

JUN 1978

HORIZONTAL CONTROL DATA

by the National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1138
HAWAII

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: RICE
STATE: HAWAI'I
YEAR: 1950
FIRST ORDER

SOURCE  G- 9311

GEODETIC LATITUDE: 19° 47' 38.522"
GEODETIC LONGITUDE: 156° 32' 31.389"

ELEVATION: 364.1 FEET

STATE COORDINATES (FT)

<table>
<thead>
<tr>
<th>STATE A ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z H D M.</th>
<th>ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>547,964.39</td>
<td>157,340.74</td>
<td>+ 0 02' 30&quot;</td>
<td></td>
</tr>
</tbody>
</table>

TO STATION OR OBJECT

<table>
<thead>
<tr>
<th>DISTANCE</th>
<th>GEODETIC AZIMUTH</th>
<th>PLANE AZIMUTH</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>353</td>
<td>51 44.5</td>
<td>353 49 05</td>
<td>5102</td>
</tr>
</tbody>
</table>

R

DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: RICE
ESTABLISHED BY: C.T.C. YEAR: 1950 STATE: HAWAI'I
RECOVERED BY: R.J.B. YEAR: 1963 COUNTY: MAUI

Detailed statement as to the fitness of the original description; including marks found, stamplings, changes made, and other pertinent facts:

The station and both reference marks were recovered in good condition. A ten foot 2x2 pole was found over the station. The description is adequate.

(continued on next page)
HORIZONTAL CONTROL DATA
by the
NATIONAL GEOGRAPHIC SURVEY

RICE (continued)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: RICE
ESTABLISHED BY: C.T. Hanseley YEAR: 1950
RECOVERED BY: R.C. Hannon YEAR: 1969
STATE: Hawaii
COUNTY: Maui
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.35 METER
HEIGHT OF LIGHT ABOVE STATION MARK: METER

DISTANCE AND DIRECTIONS TO ADJACENT MARKS, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

| OBJECT | BEARING | DISTANCE
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PAPAWAI -1950</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAPAWAI 1969</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.M. No. 1</td>
<td>W</td>
<td>15.72</td>
</tr>
<tr>
<td>R.M. No. 2</td>
<td>W</td>
<td>29.21</td>
</tr>
<tr>
<td>R.M. No. 3</td>
<td>W</td>
<td>39.05</td>
</tr>
<tr>
<td>R.M. No. 4</td>
<td>SE</td>
<td>12.11</td>
</tr>
</tbody>
</table>

Station was recovered and all marks found in good condition. A complete description follows:

Station is located about 7 miles southwest of Wailuku, 1-3/4 miles west of Makapu'u Harbor, and 1 mile north-northeast of Papawai Point, on a sloping ridge, at about 1155 feet elevation, along the east side of Manawaii Gulch, 1800 feet due south of a concrete water trough.

To reach station from the post office in Wailuku, go south on State Highway 30 for 7.0 miles to Makapu'u Harbor; continue one the highway for 0.9 mile to board gate on right. Pass through gate and go up old track road for 1.85 mile to flat area, 0.15 mile before reaching concrete water trough. Go left, picking way down rocky slopes, for 0.35 mile to edge of gully on right, at about same elevation as station. Pack west- erly, across gully and around side of slope, for about 225 yards to station.

NOTE: A 4-wheel-drive vehicle is needed.

Reference mark number one is a standard disk stamped "RICE 1949", cemented in a drill hole in a flat boulder projecting 1 foot from ground. It is 60 feet east of rim of deep gulch. There is a cairn and signal over the mark.

Reference mark number two is a standard disk stamped "RICE NO 1 1949", cemented in a drill hole in a 15-inch bedrock outcrop that projects 2 inches from ground, and is 2 feet lower than station mark.

Reference mark number two is a standard disk stamped "RICE NO 2 1949", cemented in a drill hole in a 30-inch-diameter, bedrock outcrop that projects 8 inches from ground, and is 1 foot lower than station mark.

*Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.

NOTE: Out of these items must be used for every station recovered.
**HORIZONTAL CONTROL DATA**

**DESCRIPTION OF TRIANGULATION STATION**

- **NAME OF STATION:** 5  
- **STATE:** HAWAI I  
- **YEAR:** 1950  
- **FIRST ORDER**

Located on the north coast of West Maui, Kahekili District, on the land of Kahakuloa, about 3 mile southeast of the village of Kahakuloa, on the point of a low brush-covered ridge, and about 0.5 miles west of the road where it makes a U curve around a deep canyon. Station recovered was a 2 inch garrisoned iron pipe projecting about 1 foot and surrounded by mound of large rocks. This was replaced with a standard disk set in a buried boulder projecting about 6 inches. Stamped S 1949.

Reference mark No. 1 is south of the station. A standard disk set in a buried boulder flush with the ground. Stamped S NO 1 1949.

Reference mark No. 2 is west of the station. A standard disk set in a buried boulder flush with the ground. Stamped S NO 2 1949.

To reach from the Post Office in Kahului go northeast on coast road toward Kahakuloa for 13.6 miles to a small green house on left. Turn left into yard then on trail through brush for about 0.3 miles to foot of ridge and E. From here march westerly along ridge for about 0.5 miles to second point and station.

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>DEPENDENT</th>
<th>DEPENDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H.R. No.1</td>
<td>5</td>
<td>16.38</td>
</tr>
<tr>
<td>H.R. No.2</td>
<td>5</td>
<td>21.29</td>
</tr>
<tr>
<td>Light House, Kahakuloa Pt.</td>
<td>4 miles</td>
<td>367</td>
</tr>
</tbody>
</table>

(continued on next page)
RECOVERY NOTE, TRIANGULATION STATION

Station was recovered and all marks found in good condition. A
complete description follows:

Station is located about 7 miles north-northwest of Wailuku and 1
mile south of Kahakuloa Village, on the northeast edge of a brushy hill,
at about 1133 feet elevation, along Kaukini Ridge, and is just 10 feet
inside the brush from bare northeastern side of the hill. An old, washed-
out, jeep road passes just below the station.

To reach station from the junction of Main and Market Streets in
Wailuku, go north on Market Street, continuing on State Highway 31, for
3.6 miles to Waihee Village; continue on the highway for 8.9 miles to a
wire gate on left, at sharp left curve of road, and power pole No. 31.
Pass through gate and go up pasture slope for 0.3 mile to end of road at
a power line. Park up washed-out jeep road about 1/2-mile to station.

Station mark is a standard disk stamped "S 1945", cemented in a drill
hole in the top of an 8 x 10-inch boulder that projects 8 inches from
ground. A large pile of grey boulders is built up over the mark, and may
be seen from outside the brush line by peering through the underbrush.

Reference mark number one is a standard disk stamped "S NO 1 1945",
cemented in a drill hole in a boulder flush with ground. It is 14 inches
higher than station mark and usually covered with dirt and leaves.

Reference mark number two is a standard disk stamped "S NO 2 1949",
cemented in a drill hole in a 12-inch boulder top flush with ground. It
is 0.15 foot lower than station mark and usually covered with dirt and
leaves.
**HORIZONTAL CONTROL DATA**

**NAME OF STATION:** SEE 2  
**STATE:** Hawaii  
**COUNTY:** Nani  
**Island:** Kahoolawe  
**YEAR:** 1963  
**SEDAR:** R.L.O.  
**HEIGHT OF LIGHT ABOVE STATION BASE:** 0.00  
**HEIGHT OF LIGHT ABOVE STATION BASE:** 0.00

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>DISTANCES AND DIRECTIONS TO ADJACENT MARKS AND PROMINENT OBJECTS</th>
<th>METER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERR 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.H. No. 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>36.16 11.020 199 09 07.4</td>
<td></td>
</tr>
<tr>
<td>R.H. No. 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>82.60 20.203 299 12 06.6</td>
<td></td>
</tr>
</tbody>
</table>

Station is located near the west end of Kahoolawe Island about 2 miles northeast of Kamakahi Point and 0.8 mile south of Honokaa Bay near the western edge of a grass covered hill about 440 feet in elevation.

Station is best reached by making a skiff landing in Honokaa Bay and packing southwardly about 0.8 mile to the station.

Station mark is a standard triangulation disk stamped "ERR 2 1963", cemented in a drill hole in a 1 x 1-foot exposed section of bedrock flush with the ground. It is 50 feet east of a large cutout of bedrock that projects 5 feet and about 10 feet west of a 3 x 4 board driven in the ground with rocks piled around it.

Reference mark number one is a standard disk stamped "ERR 2 NO 1 1963", cemented in a drill hole in a rock 10 inches in diameter that projects about 6 inches and is at about the same elevation as the station mark.

Reference mark number two is a standard disk stamped "ERR 2 NO 2 1963", cemented in a drill hole in the top of the west end of a 4-foot-diameter boulder that projects about 1 foot and is at about the same elevation as the station mark.

---

**ADJUSTED HORIZONTAL CONTROL DATA**

**NAME OF STATION:** SEE 2  
**STATE:** Hawaii  
**YEAR:** 1963  
**SECOND ORDER**

**SOURCE:** 0-83245

**GEODETIC LATITUDE:** 20°37'35.3660°  
**GEODETIC LONGITUDE:** 156°50'37.8908°

**ELEVATION:** 136.7 Meters

**STATE COORDINATES (CLM):**

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>456,402.91</td>
<td>76,206.87</td>
<td>0 30.13</td>
</tr>
</tbody>
</table>

**PLANE ADEWTH IS BEEN COMPUTED BY THE 0-1989, R FORMULA REJECTING THE SECOND TERM**

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEODETIC AZIMUTH (From object)</th>
<th>PLANE AZIMUTH (From object)</th>
<th>COIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERR 2</td>
<td>51°11'45.8</td>
<td>51°11'59</td>
<td>5102</td>
</tr>
</tbody>
</table>
HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SHED

STATE: HAWAII

YEAR: 1900

THIRD ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

<table>
<thead>
<tr>
<th>GEOGRAPHIC LATITUDE</th>
<th>GEOGRAPHIC LONGITUDE</th>
<th>ELEVATION</th>
<th>METERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>20° 30' 45.28&quot;</td>
<td>156° 32' 28.38&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

STATE COORDINATES (feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z-UP-Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI 2</td>
<td>5102</td>
<td>542,854.36</td>
<td>161,969.35</td>
<td>+ 3 02'40&quot;</td>
</tr>
</tbody>
</table>

* PLANE AZIMUTH has been computed by the Z-UP-Angle formula neglecting the second term.

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEOGRAPHIC AZIMUTH (From NOrth)</th>
<th>PLANE AZIMUTH* (From NOrth)</th>
<th>CODE</th>
</tr>
</thead>
</table>

GO 118
NO TEXT
HORIZONTAL CONTROL DATA

NO TEXT
HORIZONTAL CONTROL DATA

NAME OF STATION: SOUTH CRATER 2
STATE: HAWAI'I
COUNTY: Kauai
CHIEF OF PARTY: H. J. Seaborg
YEAR: 1963
DEPICTED BY: R. P. Hanson

NOTE: 1. DEPICTION IN TELESCOPE ABOVE STATION MARK. 2. LÖHLEIS, RECORD OF HEIGHT ABOVE STATION MARK.

DISTANCES AND DIRECTIONS TO ADJACENT MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION MARK.

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>MEASURING</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLACK 2</td>
<td>SSW</td>
<td>16,950</td>
<td>00 00 00 00</td>
</tr>
<tr>
<td></td>
<td>NW</td>
<td>16,243</td>
<td>117 49 37</td>
</tr>
</tbody>
</table>

Station is located about 1-1/2 miles airline north-northeast of Kauai Bay, at about the center of Kauai Island, at the west end and highest point of a red, rocky hill of about 110 feet elevation and known as Puu Mäli.

Station is best reached by making a skiff landing in Hanalei Bay, about midway along the north shoreline of the island, and packing southeast up along brushy ridge between Hanalei and Hanapōlū Gulches for about 2-3/4 miles to top of red ridge and station.

Station mark is a standard disk stamped "SOUTH CRATER 2 1963", cemented in a drill hole in red bedrock flush with the ground. It is about 90 yards southwest of, and above, a heavy growth of large keawe trees.

Reference mark number one is a standard disk stamped "SOUTH CRATER 2 NO 1 1963", cemented in a drill hole in the southwest end of a bedrock ledge that projects 3 feet. It is 15 yards southeast of crest of ridge and about 3-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "SOUTH CRATER 2 NO 2 1963", cemented in a drill hole in a 15-foot-diameter, flat, bedrock outcrop that projects about 2 feet. It is about 4-1/2 feet lower than station mark.

STATE COORDINATES (FEET)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>E, W OF THE 0° ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>519,889.32</td>
<td>77,108.73</td>
<td>0 01 14'</td>
</tr>
</tbody>
</table>

*Refer to notes in margins of triangulation and state publications or triangulation. Directions given are measured clockwise, referenced to initial station.

HAWAI'I DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SURVEY • NATIONAL GEODENTIC SURVEY
JUN 1978
QUAD 201564 STATION 1144
HAWAI'I
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
DIAGRAM 1416 516 MALE
HORIZONTAL CONTROL DATA

TRaverse
DESCRIPTION OF SOUTH HILL 2 Station

NAME OF STATION: SOUTH HILL 2  
STATE: Hawaii  
COUNTY: Kauai  
Island: Lihue  
RESERVOIR:  
RESERVOIR NAME:  
RESERVOIR NO.:  

CHIEF OF PARTY: E.K.S.  
YEAR: 1963  

HEIGHT OF TALL AROE BASE: 1.67  
HEIGHT OF LIGHT AROE BASE:  
METRES:  

No. 2  
2.2.  

E.C.  
120  

SOUTH CRATER 2  

R.N. No. 2  

D.  
120  

E.C.  

SOUTH CRATER 2  

R.M. No. 1  

D.  
120  

E.C.  


Station is located on a small hill which is about 2 miles from Smuggler Cove and 1 mile northwest from the head of Waipoo Bay. The hill is covered with large boulders.

Station is best reached by making a skiff landing in Smuggler Cove at the west end of Kauai Island then paddling east about 2 miles to the old road which runs northeast. Follow the old road 1 mile then turn east across-country 1 mile to the hill and the station.

Station mark is a standard triangulation disk stamped SOUTH HILL 2 1963 cemented in a drill hole in a 7 x 5-foot exposed section of bedrock that projects 18 feet above the ground.

Reference mark number one is a standard disk stamped SOUTH HILL 2 1963 cemented in a drill hole in a boulder which is 5 feet in diameter. It is about 2 feet below the elevation of the station.

Reference mark number two is a standard disk stamped SOUTH HILL 2 1963 cemented in a drill hole in a 9 x 6-foot boulder which projects 6 inches above the ground and is 5 feet below the elevation of the station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SOUTH HILL 2  
STATE: Hawaii  
YEAR: 1963  
SECOND "  

SOURCE: G-13246  

GEODISICAL LATITUDE: 42°31'18.3324"  
GEODISICAL LONGITUDE: 156°39'08.3505"  
ELAVATION: 162.0 M  

STATE COORDINATES (feet):

<table>
<thead>
<tr>
<th>STATE &amp; CODE</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>504890.26</td>
<td>88434.46</td>
</tr>
</tbody>
</table>

*Plane azimuth has been computed by the 2nd order formula neglecting the second term.*

STATE LOCATION OR OBJECT: SOUTH CRATER 2

<table>
<thead>
<tr>
<th>STATE LOCATION OR OBJECT</th>
<th>GEODISICAL AZIMUTH (FEET)</th>
<th>PLAN AZIMUTH (FEET)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTH CRATER 2</td>
<td>239 56 54</td>
<td>239 56 36</td>
<td>5102</td>
</tr>
</tbody>
</table>

QF 400
HORIZONTAL CONTROL DATA

NAME OF STATION: STACK
STATE: HAWAII
YEAR: 1900
THIRD ORDER

NO OBSERVATION CHECK ON THIS POSITION

DESCRIPTIVE LATITUDE: 20° 52' 27.39"
DESCRIPTIVE LONGITUDE: 156° 40' 17.28"
ELEVATION: METERS: 3" FEET: 100"

STATE COORDINATES (feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>θ (deg. - min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>456,361.33</td>
<td>196,438.19</td>
<td>0° 00' 00&quot;</td>
</tr>
</tbody>
</table>

* PLANES AZIMUTH HAS BEEN COMPUTED BY THE θ FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT | GEOGRAPHIC AZIMUTH (From North) | PLANES AZIMUTH (From North) | CODE |
|---------------------|--------------------------------|-----------------------------|------|
**HORIZONTAL CONTROL DATA**

**NAME OF STATION:** SURVEY MARK NR WAIKULU 2  
**STATE:** HAWAII  
**YEAR:** 1990  
**SECOND ORDER**

**ADJUSTED HORIZONTAL CONTROL DATA**

**COORDINATE CHECK ON THIS POSITION**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>HI 2</td>
<td>5102</td>
<td>510,432.48</td>
<td>230,233.79</td>
<td>+ 0° 00’ 35’</td>
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</tr>
</tbody>
</table>

* Plan azimuth has been computed by the A. U.H.O. A. formula neglecting the second term.

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEOGRAPHIC AZIMUTH (FROM🕛)</th>
<th>PLANE AZIMUTH* (FROM🕛)</th>
<th>CODE</th>
</tr>
</thead>
</table>

**POSITION DETERMINED BY TRAVERSE FROM STATION WAIKULU 2**

---

**Diagram:**

- Diagram number: 426
- Survey Method: S-9311
- Observation Check: Done
## HORIZONTAL CONTROL DATA

**By the National Ocean Survey, National Geodetic Survey**

**Station:** 1148  
**Quad:** 201504  
**Hawaii**  
**Latitude:** 20°30' to 21°00'  
**Longitude:** 156°30' to 157°00'  
**Diagram:** NP 446  
**Maui**

### ADJUSTED HORIZONTAL CONTROL DATA

**Name of Station:** T

**State:** Hawaii

**Year:** 1912

**Third Order**

**Source:** G-SP156

<table>
<thead>
<tr>
<th>DEGREES LATITUDE</th>
<th>DEGREES LONGITUDE</th>
<th>SCALING</th>
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</thead>
<tbody>
<tr>
<td>20°58'48.93</td>
<td>156°32'13.90</td>
<td>204</td>
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</table>

<table>
<thead>
<tr>
<th>DEGREE COORDINATES (FERN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE &amp; ZONE</td>
</tr>
<tr>
<td>HI 2</td>
</tr>
</tbody>
</table>

*Plane Azimuth has been computed by the A2-OP, 0 formula neglecting the second term.*

<table>
<thead>
<tr>
<th>TORSION OR OBJECT</th>
<th>GEODETIC AZIMUTH (Ferm angles)</th>
<th>PLANE AZIMUTH* (Plane angles)</th>
<th>CODE</th>
</tr>
</thead>
</table>

**Code:** QQ 007
### Description of Triangulation Station

**NAME OF STATION:** Thirty  
**STATE:** Hawaii  
**COUNTY:** Maui  
**CHRONOLOGY:** 1950  
**HORNO:**  
**DESCRIPTION:** The station is located in sloping pasture land which lies about 9 miles east-southeast of Lahaina, about 7.6 miles west-southwest of Aiea, about 4 miles northwest of Lougheed Point, about 0.5 mile east of the Lahaina and Kahului District boundary line, about 0.5 mile south of the forest reserve fence and about 0.2 mile east of the rim of Ohiaheo Gulch. Higher ground is to the north of the station. The station site is covered with boulders which project as high as 4 feet.  
**METHODS:** To reach the post office at Lahaina go west for one block, turn left, as per the sign reading "Lahaina" and go south and west for 1.6 miles; turn right, pass a locked gate (keys for this gate may be obtained from the foreman of the Kula Ranch who lives in the village of Kula) and go south for 2.5 miles on a steep grade, for 2 miles to a concrete water trough; bear to the right and follow the graded road northerly, cross over a steep grade, bear left up the long, grass-covered ridge for 2.7 miles; pass to the left of the hill of the kula and follow the dink track road northerly, for 0.7 mile; pass through the gate in the forest reserve fence and follow the dink track road north and west for 0.5 miles to the edge of the canyon rim and the end of track travel. From this point go southwest for about 0.8 miles; pass through a gate in the forest reserve fence and follow the canyon rim, southerly, for about 0.5 mile to an iron pipe; bear left and follow the gentle slope down hill, keeping above the heads of several small glissades, for about 0.4 mile to the rocky ground and the station.  
**THE STATION IS A STANDARD DIAK, STAMPED THIRTY 1949, SET INTO A DRILL HOLE IN A LARGE FLAT BOULDER WHICH PROJECTS ABOUT 1 FOOT.**  
**REFERENCE MARK NUMBER 1 IS A STANDARD DIK, STAMPED THIRTY NO 1 1949, SET INTO A DRILL HOLE IN A BOULDER WHICH PROJECTS ABOUT 3 FEET. IT IS LOCATED ABOUT 4 FEET HIGHER THAN THE STATION.**  
**REFERENCE MARK NUMBER 2 IS A STANDARD DIK, STAMPED THIRTY NO 2 1949, SET INTO A DRILL HOLE IN A BOULDER WHICH PROJECTS ABOUT 1 FOOT. IT IS LOCATED ABOUT 3 FEET LOWER THAN THE STATION.**

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>MEASURED DIRECTION</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued on next page)
Station was recovered and all marks found in good condition. Discrepancies were noted in the distance to both BMs; they were double-checked, and the 1969 distances are correct. A complete description follows:

Station is located about 6 miles southwest of Waialua and 4 miles east-northeast of Olomalu, on a sloping, brushy ridge in pasture land about 1/4-mile north of a large power line, on the east side of Ukonahame Gulch and bounded on the east by Papalua Gulch. Station is at about 3224 feet elevation and is 100 yards west of a track road.

To reach station from the post office in Waialua, go south on State Highway 30 for 7.0 miles to Haleiwa Harbor; continue on the Highway for 0.9 mile to board gate on right. Pass through gate and go up old track road for 4.4 miles to base of Puu Anu; continue on the road for 0.8 mile to wire gate. Pass through gate and go ahead for 0.2 mile; keep ahead, on right fork, for 0.25 mile to fork; take right fork and go along rim and up grade for 0.15 mile to site road left. Go left down along ridge for 0.4 mile; go right, leaving the road just before dropping down onto last bench where power line is, and go west across brush area for 100 yards to station. NOTE: A 4-wheel-drive vehicle is required.

Station mark is a standard disk stamped "THIRTY 1949", cemented in a drill hole in the center of a flat, 4 x 5-foot boulder that projects 1 foot from ground.

Reference mark number one is a standard disk stamped "THIRTY 1949", cemented in a drill hole in a 3-foot boulder that projects 3 feet from ground. It is 1 foot higher than station mark.

Reference mark number two is a standard disk stamped "THIRTY 1949", cemented in a drill hole in a 3 x 4-foot boulder that projects 16 inches from ground, and is 3-1/2 feet lower than station mark.

---

<table>
<thead>
<tr>
<th>Object</th>
<th>Bearing</th>
<th>Feet</th>
<th>Distance Meters</th>
<th>Direction</th>
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</thead>
<tbody>
<tr>
<td>ANU</td>
<td></td>
<td></td>
<td></td>
<td>00 00 00.0</td>
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<tr>
<td>R.M. No. 2</td>
<td>SW</td>
<td>20.758</td>
<td>6.330</td>
<td>55 37 19</td>
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<tr>
<td>R.M. No. 3</td>
<td>SSW</td>
<td>14.375</td>
<td>4.302</td>
<td>297 22 24</td>
</tr>
<tr>
<td>ANU 1950</td>
<td></td>
<td></td>
<td></td>
<td>00 00 00.0</td>
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<tr>
<td>R.M. No. 2</td>
<td>SW</td>
<td>20.710</td>
<td>6.313</td>
<td>55 37 16</td>
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<tr>
<td>R.M. No. 1</td>
<td>SSW</td>
<td>14.250</td>
<td>4.344</td>
<td>297 22 12</td>
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</tbody>
</table>

"Note of chief of party should be inserted here. The officer who actually claimed the station should sign his name at the end of the recovery note.

NOTE: One of these forms must be used for every station recovered."
# HORIZONTAL CONTROL DATA

**QUAD 201504**
**STATION 1150**
**HAWAI'I**
**LATITUDE** 20° 30' TO 21° 00'
**LONGITUDE** 156° 30' TO 157° 00'
**DIAGRAM** NF 416

## ADJUSTED HORIZONTAL CONTROL DATA

<table>
<thead>
<tr>
<th>NAME OF STATION</th>
<th>TRAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE</td>
<td>HAWAI'I</td>
</tr>
<tr>
<td>YEAR</td>
<td>1504</td>
</tr>
<tr>
<td>THIRD ORDER</td>
<td></td>
</tr>
<tr>
<td>SOURCE</td>
<td>G-SP156</td>
</tr>
</tbody>
</table>

| GEOGRAPHIC LATITUDE: | 20° 33' 51.562 |
| GEOGRAPHIC LONGITUDE: | 156° 39' 44.245 |
| ELEVATION: | Meters |
| FEET |

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>W</th>
<th>V</th>
<th>H</th>
<th>M</th>
<th>N</th>
<th>H</th>
<th>M</th>
<th>N</th>
<th>H</th>
<th>M</th>
<th>N</th>
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<tbody>
<tr>
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<td>+ 0° 00' 00&quot;</td>
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<td></td>
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</tr>
</tbody>
</table>

*PLANE AZIMUTH HAS BEEN COMPUTED BY THE 2 OR Δ Z FORMULA, NOT INCLUDING THE SECOND TERM*

<table>
<thead>
<tr>
<th>STATION OR OBJECT</th>
<th>GEOGRAPHIC AZIMUTH (FROM NORTH)</th>
<th>PLANE AZIMUTH (FROM NORTH)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>QG 211</td>
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</table>
## Adjusted Horizontal Control Data

### Station Details
- **Name of Station:** Tree
- **State:** Hawaii
- **Year:** 1900
- **Third Order

### Geographic Coordinates
- **Geodetic Latitude:** 20° 53' 37.47"
- **Geodetic Longitude:** 156° 39' 46.55"

### State Coordinates (First)

| State & Zone | Code | 501 + 37.37 | 203 + 338.51 | 5° 30' 35"
|--------------|------|-------------|--------------|----------------
| HI 2         | 5102 |             |              |                |

*Plane azimuth has been computed by the S and G. H. formula neglecting the second term.*

### Table of Azimuths

<table>
<thead>
<tr>
<th>Station or Object</th>
<th>Geodetic Azimuth</th>
<th>Plane Azimuth</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Quad 020 |