HORIZONTAL CONTROL DATA
QUAD 211591
STATION 1001
HAWAII
LATITUDE 21° 30' TO 22° 00'
LONGITUDE 159° 00' TO 159° 30'

NO ORIGINAL TEXT

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

ADJUSTED HORIZONTAL CONTROL DATA
NAME OF STATION: A
STATE: HAWAII
YEAR: 1910
THIRD ORDER

ADJUSTED OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 21° 55' 49.73
GEODETIC LONGITUDE: 159° 22' 37.73
ELEVATION: 300.48

STATE COORDINATES (FWM)

<table>
<thead>
<tr>
<th>STATE &amp; CODE</th>
<th>X (m)</th>
<th>Y (m)</th>
<th>Z (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>541,441.32</td>
<td>35,330.48</td>
</tr>
</tbody>
</table>

* Plane altitude has been computed by the G. Spy. H. formula neglecting the second term.

Q1 060
Ahukini Light (Kauai Island, C. L. Garner, 1927).—On eastern shore of Kauai, at the north end of breakwater at entrance to Hanamaulu Bay, an unwatched concrete lighthouse.

**HORIZONTAL CONTROL DATA**

**NAME OF STATION:** Ahukini Light  
**STATE:** Hawaii  
**YEAR:** 1927  
**QUAD:** 211591  
**STATION:** 1002  
**LATITUDE:** 21° 30' TO 22° 00'  
**LONGITUDE:** 159° 00' TO 159° 30'  
**DIAGRAM NF 4-4 KAUAI**

**ADJUSTED HORIZONTAL CONTROL DATA**

**NAME OF STATION:** Ahukini Light  
**STATE:** Hawaii  
**YEAR:** 1927  
**THIRD ORDER**

**SOURCE:** G-Sp156

**DEGREES LATITUDE:** 21° 30' 46.347  
**DEGREES LONGITUDE:** 159° 20' 06.432  
**ELEVATION:** METERS  
**FNT 03 42**

**STATE COORDINATES (E+)**

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>555,858.69</td>
<td>59,498.92</td>
<td>+ 0 03 42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PLANES AZIMUTH HAS BEEN COMPUTED BY THE 2-1967 FORMULA NEGLECTING THE SECOND TERMS**

**TO STATION OR OBJECT**

<table>
<thead>
<tr>
<th>DEGREES AZIMUTH (From North)</th>
<th>PLANES AZIMUTH (From North)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 376</td>
<td></td>
</tr>
</tbody>
</table>

*Name of ship or party should be inserted here. The pilot who actually visited the station should sign his name at the end of the memory note.*
NO ORIGINAL TEXT

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211591
HAWAI'I
LATITUDE 21° 30' TO 22° 00'
LONGITUDE 159° 00' TO 159° 30'
DIAGRAM NO. 46
KAUAI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: AL
STATE: HAWAI'I
YEAR: 1910
THIRD ORDER

SOURCE: G-SP196

NAME OF STATION: AL
STATE: HAWAI'I
YEAR: 1910

ELEVATION
METERS
FEET

STATE COORDINATES (TMS)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (in ft. + angle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>525,563.30</td>
<td>18,712.15</td>
<td>+ 0 01 41</td>
</tr>
</tbody>
</table>

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

TO STATION OR OBJECT

<table>
<thead>
<tr>
<th>GEOGRAPHIC AZIMUTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(From north)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLAN AZIMUTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(From north)</td>
</tr>
</tbody>
</table>

NAME OF STATION: AL
STATE: HAWAI'I
YEAR: 1910

ELEVATION
METERS
FEET

STATE COORDINATES (TMS)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (in ft. + angle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>525,563.30</td>
<td>18,712.15</td>
<td>+ 0 01 41</td>
</tr>
</tbody>
</table>

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

TO STATION OR OBJECT

<table>
<thead>
<tr>
<th>GEOGRAPHIC AZIMUTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(From north)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLAN AZIMUTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(From north)</td>
</tr>
</tbody>
</table>

NAME OF STATION: AL
STATE: HAWAI'I
YEAR: 1910

ELEVATION
METERS
FEET

STATE COORDINATES (TMS)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (in ft. + angle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>525,563.30</td>
<td>18,712.15</td>
<td>+ 0 01 41</td>
</tr>
</tbody>
</table>

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

TO STATION OR OBJECT

<table>
<thead>
<tr>
<th>GEOGRAPHIC AZIMUTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(From north)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLAN AZIMUTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(From north)</td>
</tr>
</tbody>
</table>
HORIZONTAL CONTROL DATA

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: B
STATE: HAWAII
YEAR: 1910
THIRD ORDER

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 21°55'43.83"
GEODETIC LONGITUDE: 159°22'41.91"
ELEVATION: METERS

STATE COORDINATES (Feet):

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>X</th>
<th>Y</th>
<th>Z (deg, min, sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>541,248.23</td>
<td>34,710.82</td>
</tr>
</tbody>
</table>

*PLANE AZIMUTH HAS BEEN COMPUTED BY THE Z-HOR. A- FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT

GEODETIC AZIMUTH (From north)

PLANE AZIMUTH (From north)

CODE

QI 059
HORIZONTAL CONTROL DATA

FLAT (Kauai Island, O. B. French, 1910).—On east coast of Kauai, about 1 mile south of point on south side of entrance to Hanamaulu Bay, 10 meters back from and about 25 feet above high-water mark. Station is in middle of top of flat rock 6 by 12 feet and 3 feet high, and is marked by a drill hole in middle of cross. Reference mark is cross cut in triangular flat topped rock 20 feet to the west.

Three hours was spent looking for the station but it was not recovered. A garbage dump is in the vicinity of the station and it is possible the station has either been covered or destroyed.

Station was searched for but not found and is believed destroyed. There has been some erosion along the beach by storm waves. There is a heavy growth of ironwood trees inland a few yards from the water and it is not possible to pinpoint the location by angle.

G-SP156
NO OBSERVATION CHECK ON THIS POSITION

<table>
<thead>
<tr>
<th>STATE COORDINATES (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE &amp; ZONE</td>
</tr>
<tr>
<td>HI-4</td>
</tr>
</tbody>
</table>

"Plane Azimuth has been computed by the 2 ORD. By Formula Neglecting the Second Term."

QI 079
HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

NO ORIGINAL TEXT

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

Name of Station: Hanamalu Warehouse SE Gable
Reestablished by: O.B.F. Year: 1910 State: Hawaii
Recovered by: D.M. Whipp Year: 1965 County: Kauai

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

Station was recovered, located on the bluff above the abandoned wharf at Hanamalu Bay, about 2-1/2 miles northeast of Lihue. It is the southeast end of the gabled roof of a large, corrugated iron warehouse 200 feet long and 50 feet wide, which sets at right angles to, and 90 feet northwest of, a large, double-roofed warehouse.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HANAMALU WAREHOUSE SE GABLE
STATE: HAWAII
YEAR: 1910
THIRD ORDER

SOURCE: G-SP156

DESCRIPTIVE LATITUDE: 21° 59' 40.394"
DESCRIPTIVE LONGITUDE: 159° 20' 03.482"

ELEVATION: METERS FEET

STATE COORDINATES (Feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>φ &quot;D. &amp; A. Angle&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>556,092.15</td>
<td>58,565.47</td>
<td>+ 0 03 43</td>
</tr>
</tbody>
</table>

*Plane azimuth was computed by the φ "D. & A. Angle" formula neglecting the second term.

TO STATION OR OBJECT

GEODETIC AZIMUTH (true north) PLANE AZIMUTH (true north)

CODE

Q1 076
HORIZONTAL CONTROL DATA

by the National Ocean Survey

OLD HAWAIIAN DATUM

NO ORIGINAL TEXT

Hokunui (Kauai Island, O. B. French, 1910; C. L. Garner, 1927)—In southeastern Kauai, on a very sharp conical peak on the ridge 234 miles southwest of Nawiliwili, called Hokunui or Cone Peak. Station is at the center of sharp green宣传 area, and is approached by a trail which leads up across the slope of the ridge from the mouth of Huleia River. This trail crosses another spur and then goes up the east side of the ridge to the top and along the top to Hokunui. Station marked in 1910 by a 3-inch gas pipe and "abu" (cairn); in 1927 a standard disk station mark was set in this pipe. The 1910 reference mark lost. In 1927 standard reference disks were set in rock outcrop at the following distances and azimuths from the station: No. 1, 3,680 meters (80.4 feet), 158° 40'; No. 2, 4,418 meters (145.4 feet), 228° 44'.

NAME OF STATION: HOKUNUI
ESTABLISHED BY: O.B.F.          YEAR: 1910
RECOVERED BY: D.M. Whipp       YEAR: 1985
COUNTY: Kauai
STATE: Hawaii
HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.5 METER
HEIGHT OF GROUND ABOVE STATION MARK: METER

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>KEPOAMBO 1927</td>
<td>NE</td>
<td>14,518</td>
<td>00 00 00 00</td>
</tr>
<tr>
<td>RM No. 2</td>
<td>NE</td>
<td>4,425</td>
<td>06 52 21</td>
</tr>
<tr>
<td>RM No. 1</td>
<td>NW</td>
<td>8,450</td>
<td>2576 284 40 22</td>
</tr>
</tbody>
</table>

Station was recovered and all marks found in good condition. A Type B-1 signal was built over the station mark by the Hawaii Territorial Survey in 1920. A complete description follows:

Station is located about 3 miles south of Lihue, 2 miles southwest of Carter Point and 1 mile due south of the Menehune Fishpond, on a prominent, bare, sharp-tipped peak of about 1608 feet elevation on the ridge that lies on the south side of Huleia Stream.

To reach station from the post office in Pahi, go west on State Highway 50 for 1.2 miles; turn left and follow Kipu Road southerly for 1.5 miles to crossroad; continue ahead between 2 rows of large Norfolk Pines for 0.75 mile to fork about 50 yards beyond end of trees. Take left fork, passing row of ranch houses to right of road, and go straight along lane for 1.2 miles to fork. Take right fork, upgrade, and go 1.0 mile to summit of pass at gate. From here pack up steep hill and along ridge top about 3/4 mile to station KAI. Work around right side of this hill, where a dim trail may be found down below dense ferns. Follow trail east about 3/4 mile to station. A 2-1/2-hour pace.

Station mark is a standard disk stamped "HOKUNUI 1927", set in concrete 6 inches beneath the 6 x 6-foot, concrete platform of the Type B-1 signal.

REFERENCE MARK NUMBER ONE IS A STANDARD DISK STAMPED "NO. 1 1927", CEMENTED IN A DRILL HOLE IN A 3-FOOT, ROUND, FLAT-TOPPED ROCK OUTCROP ON NORTH EDGE OF PEAK. IT IS 1 FOOT LOWER THAN STATION MARK.

REFERENCE MARK NUMBER TWO IS A STANDARD DISK STAMPED "NO. 2 1927", CEMENTED IN A DRILL HOLE IN THE ROCK LEDGE ON EAST-SOUTH-EAST EDGE OF PEAK. IT IS 1 FOOT LOWER THAN STATION MARK.

NOTE: A 4-wheel-drive vehicle is required for last 1.0 mile.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HOKUNUI
STATE: Hawaii
YEAR: 1910
TOWN: THIRD ORDER

SOURCE: GSP1356

COORDINATES (Ft)

<table>
<thead>
<tr>
<th>STATE / COUNTY</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>3521.0</td>
<td>3873.35</td>
</tr>
</tbody>
</table>

NAME OF STATION: HOKUNUI

COORDINATE OF POINT: 3521.0 3873.35 31.335.35

TO STATION OR OBJECT

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>GEODETIC AZIMUTH (From north)</th>
<th>FLAME AZIMUTH (From north)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEPOAMBO</td>
<td>231 49 56.0</td>
<td>231 47 10</td>
<td>5104</td>
</tr>
</tbody>
</table>

* 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: Use of these terms must be used for every station recovered.
HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211591
STATION 1008
HAWAII
LATITUDE 21° 30' TO 22° 00'
LONGITUDE 159° 00' TO 159° 30'
DIAGRAM 46
KUAHI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAI
STATE: HAWAII
YEAR: 1910
SECOND ORDER

SOURCE: G-SP156

DESCRIPTIVE LATITUDE: 21° 55' 52.774
DESCRIPTIVE LONGITUDE: 159° 23' 00.951
ELEVATION: 508.0 METERS
1667 FEET

STATE COORDINATE (FRED)

STATE ZONE CODE X Y Z
HI 4 5104 539,454.51 35,914.66 + 0’02.37

NOTE ON STATION OR OBJECT

*Plane azimuth had been computed by the 2 OR A + 1 FORMULA neglecting the second term.

GI 005
HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KALANI FUU
STATE: HAWAII
YEAR: 1910

SOURCE: G-59156

<table>
<thead>
<tr>
<th>STATE &amp; CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>548,455.93</td>
<td>41,626.13</td>
</tr>
</tbody>
</table>

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE Z. V. G. K FORMULA NEGLECTING THE SECOND TERM.

<table>
<thead>
<tr>
<th>TO STATION OR OBJECT</th>
<th>GEODETIC AZIMUTH (From station)</th>
<th>PLANE AZIMUTH* (From station)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q1 042
Kauai north base (Kauai Island, O. B. French, 1910).—In southeast Kauai, about 2 miles west of Lihue, 1 mile north of the Koloa road, and ½ mile west of the residence of A. Wilcox. Marked as follows: Subsurface mark is 20d nail set in an 8 by 8 inch block of concrete. The surface mark is separated from the subsurface mark by ½ inches of soil. It consists of a ¼-inch brass bolt with cross in top set in a block of concrete molded in joint of 7 by 24 inch stovepipe. Pipe sets a little below surface of ground and is covered over with neat cement mortar. Reference marks were as follows: No. 1 is bottle in ground with 2 inches of neck projecting set in line of wire fence and near post; it is 54.9 feet from station, in azimuth 36° 10'. No. 2 is bottle set in line of fence with 2 inches of neck projecting, 27.0 feet from station, in azimuth 306° 31'. No. 3 similar to No. 2, 10.1 feet, in azimuth 54° 36'.

Kauai North Base (Kauai County, Hawaii, O.B.F., 1910; Hawaiian Territorial Survey, 1930).—Station is in SE Kauai, about 2 mi. W of Lihue, 1 mi. N of Koloa road, 1/2 ri. W of the A. Wilcox residence, and on the new (1930) boundary between the Grove Farm and Lihue plantations.

Found the original subsurface mark, a 20d nail set in an 8 by 8-in. block of concrete, 2-1/2 ft. below the ground surface. No reference marks were found.

Built a standard Type A station monument (pillars of rubble masonry) 6-1/2 ft. high, over a bronze disk set in concrete-filled 4-in. iron pipes (over the subsurface mark) embedded about 2 ft. in concrete (18 by 18-in.). The bronze disk (new surface mark) is separated from the subsurface mark by 3 in. of sand.

Station is accessible by car and is reached by taking a cane field road which leaves the Lihue-Koloa Government road about 1/4 mi. E of the A. Wilcox residence.

RECOVERY NOTE, TRIANGULATION STATION

The station was recovered in good condition as described in 1932 with the following additions: Station is about 300 feet southwest of the corner of the woods; on the boundary line between a sugar cane and a pineapple field, and at the east edge of an irrigation ditch.

To reach from the P.O. in Lihue, go 1.5 miles west along the main highway to Pilip; turn right at the edge of a pineapple field and go 0.4 southwest; turn right and go 0.4 mile northeast, following along irrigation ditch to station.

(continued on next page)
HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

KAUAI NORTH BASE
(continued)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAUAI NORTH BASE
Established by: O.B.F.
Year 1910
State: Hawaii
County: Kauai
Island: Kauai
Recovered by: D.M. Whipp
Year: 1965

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

Station mark was recovered in good condition. All surrounding fields are now planted in sugar cane. A complete description follows:

Station is located about 2 miles west of Lihue and 3 1/4 mile northwest of Pahoa, on the narrow strip between a 145-yard-long, north-south section of an irrigation ditch and field road, 115 yards south of tree line where the section begins and 30 yards north from where road begins gradual left turn.

To reach station from the post office in Lihue, go west on State Highway 50 for 1.6 mile; take right fork and follow straight, gravel road for 0.9 mile; take left fork, following up along north edge of cane field, for 0.6 mile to station on right, 111 yards after rounding sharp left turn.

Station mark is an unstamped Hawaii Territorial Survey disk, set in concrete in the top of a 3-1/2-inch iron pipe that projects 5 inches from the top of a 12-inch-square, concrete monument that is flush with ground. It is 3 feet west of edge of road and 3 feet east of edge of ditch. A Type A signal, built by the Hawaii Territorial Survey in 1934, is centered over the station mark. The concrete platform of the signal is 5 feet above ground, supported on east and west sides by stone and mortar walls. A red and white metal target extends about 8 feet above the platform. The irrigation ditch has been lined with concrete where it passes the station to prevent undermining of the west wall of the Type A signal.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAUAI NORTH BASE
Established by: O.B.F.
Year: 1910
State: Hawaii
County: Kauai
Island: Kauai
Recovered by: L. Purcell, Jr.
Year: 1969

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

THIS STATION WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.
Kauai south base (Kauai Island, O. B. French, 1910).—In southeastern Kauai, in a pasture about 2 miles southwest of Nawiliwili and ½ mile north of the Nue'eia River, at top of a steep grassy slope running back from the river, 2½ meters from wire fence between pasture and cane field, about 200 meters from road, and 300 meters from fork in road. Marked by subsurface mark consisting of a 20d nail set in a cylindrical block of concrete 8 by 8 inches molded in place. Top of concrete is about 2.4 feet below surface. Surface mark is a ¾-inch brass bolt with cross in top set in a block of concrete which was molded in a 7-inch by 2-foot joint of stovepipe. Top of pipe a little below surface, but mortar and cement continued to surface. Bolt projects ¾ inch. Reference marks were as follows: No. 1, five nails driven in a post, four as a square with fifth in center, 25 meters, 40° 20'; No. 2, five nails driven in fence post, 35 meters, 212° 10'.

KAUAI SOUTH BASE (Kauai County, Hawaii, O.B.P., 1910; Hawaiian Territorial Survey, 1932).

Station is in NE Kauai, at the edge of a cane field, about 2-1/2 mi. SW of Nawiliwili, 1/2 mi. N of Nue'eia River, and at the top of a steep wooded slope running back from the river. Found the original mark, a 1½-in. brass bolt with a cross in top set in a block of concrete which was molded in a 7-in. by 2-ft. joint of stovepipe. The top of the pipe was a little below the ground surface, but mortar and cement continued to the surface. No reference marks were found.

Built a standard type A station monument (pier of rubble masonry), 8 ft. high, over the original mark. Station is approached by walking through a cane field from the intersection of the Malamalu-Nue'eia Government roads.

RECOVERY NOTE. TRIANGULATION STATION.

The station was recovered in good condition as described in 1932 with the following additions: A car can now be driven to the station.

To reach from the P. O. in Lihue, go west along the main highway for 0.55 miles to the road junction; turn left and go 0.5 mile; turn right and go 1.5 miles 0.54, along the old paved road through a scenic valley; turn left on dirt road leading to Nawiliwili Harbor for 0.15 mile; turn right and go 0.1 mile on dirt road through sugar cane field to station at the edge of timber line.
HORIZONTAL CONTROL DATA
by the
NATIONAL GEOFISIC SURVEY
OLD HAWAIIAN DATUM

RECOVERY NOTE, TRIANGULATION STATION

KAHAI SOUTH BASE (continued)
U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY

Name of Station: KAIAI SOUTH BASE
Established by: O.B.P. Year: 1910 State: Hawaii
Recovered by: D.M. Whipp Year: 1965 County: Kauai
Island: Kauai

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

Station mark was recovered in good condition, however the west wall of the Type A signal was beginning to fall apart, so it was rebuilt with stones and concrete. None of the old temporary reference marks were recovered. A complete description follows:

Station is located about 2 miles south-southwest of Lihue; 1.3 miles west-southwest of Nawiliwili, 0.3 mile north of the Haleia River and 0.1 mile south of the Huleia Road, at about 230 feet elevation, along the east side of a cane-field road and in the southeast angle of the intersection of a side road with this road, and at the northwest corner of a grove of large trees at the head of a canyon running up from the river.

To reach station from the post office in Lihue, go west on State Highway 50 for 0.55 mile; turn left on State Highway 501 and go 0.5 mile; turn right and go south on Haleiwa Rd. for 1.5 miles to T-intersection. Turn left and go south on cane-field road for 0.1 mile to station on left.

Station mark is a 3/4-inch brass pin that projects 1/2-inch from the top of an 8-inch-diameter, concrete monument that projects 2 inches from ground. It is set on sloping ground between road and trees, 24 feet east of center-line of main field road and 6 feet southeast from edge of the side road.

The Type A signal, built in 1932 by the Hawaii Territorial Survey, has a 6-foot-square, concrete platform 8 feet above ground, supported by stone and mortar walls on the east and west sides. A red and white metal target extends about 8 feet above the platform.

RECOVERY NOTE, TRIANGULATION STATION

Name of Station: KAIAI SOUTH BASE
Established by: O.B.P. Year: 1910 State: Hawaii
Recovered by: L. Furssel Jr. Year: 1969 County: Kauai
Airline Distance and Direction from Nearest Town: 1.7 MILES SOUTHEAST OF NAWILIWILI

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

THIS STATION WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.
NO ORIGINAL TEXT

Kaweliako (Kauai Island, O. B. French, 1910; C. L. Garner, 1927)—On the southeast coast of Kauai, at the middle of the highest and "mauka" (landward) of the two peaks of the rocky promontory south of the land of Kipu Kai known as Loe Kaweliako. The point is quite bare and well defined. The mark, put in by the Hawaiian Government Survey, consists of a cross cut in the top of a stone 3 by 6 by 18 inches in size (approximately) which was set in the ground like a post. In 1910 the upper part of this stone was disturbed and broken, but was repaired and reset, it is believed, within 1 inch of its original position. Reference marks were crosses cut in rocks. No. 1 is 10 feet from the station in azimuth 64° 44′; No. 2 distant 15 feet in azimuth 270° 21′. In 1927 station and reference marks found as described. A standard disk station mark was set in the old station mark, and standard reference disks added to old reference marks.

(continued on next page)
HORIZONTAL CONTROL DATA
by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

KAWELIKOA (continued)

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>BEARING</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA-1910</td>
<td>EN</td>
<td>15.200</td>
<td>4.058</td>
</tr>
<tr>
<td>RM-1</td>
<td>EN</td>
<td>15.200</td>
<td>4.058</td>
</tr>
<tr>
<td>RM-2</td>
<td>ES</td>
<td>43.600</td>
<td>13.400</td>
</tr>
<tr>
<td>RM-3</td>
<td>SW</td>
<td>23.535</td>
<td>7.173</td>
</tr>
</tbody>
</table>

Station mark and three reference marks were recovered in good condition; however, only two reference marks were found to be greatly in error.

A complete description follows:

Station is located on the southeast coast of Kauai, about 8 miles southeast of Lihue and 1/4-miles west of Kawelikoa Point, on a prominent hill of about 901 feet elevation on the ridge running due southeast from Puu Piliakapu, and immediately above the cove and long, sand beach to north.

To reach station from the post office in Pili, go west on State Highway 50 for 1.2 miles; turn left and follow Kupa Road, a paved road, for 1.6 miles to crossroad; continue ahead between two rows of large Norfolk Pines for 0.7 mile to end of trees. Turn left and go east up lane through cattle ranch for 1.2 miles to fork. Take right fork and go 0.3 miles, going up over mountain pass, to reach buildings. From gate in front of houses go southerly for 0.55 mile to gate. Pass through gate and go 0.05 mile, turn left and go along lane for 0.1 mile; turn right, up lane, and go 0.5 mile to end of lane. Turn left and go southeast along right side of fence for 0.1 mile to end of truck travel at fence corner. Park southeast up hill to station. A 4-wheel drive vehicle is needed for the mountain pass road.

Station mark is a standard disk stamped "Kawelikoa 1927", cemented in a drill hole in rock outcrop projecting 1 inch, on highest point of hill.

Reference mark number one is a standard disk stamped "1 1927", cemented in a drill hole in a rounded lave rock outcrop that projects 8 inches. It is 6 inches lower than station mark.

Reference mark number two is a standard disk stamped "2 1927", cemented in a drill hole in the solid bedrock of the ridge line, 7.6 feet lower than station mark.

Reference mark number three is a standard disk stamped "3 1927", cemented in a drill hole in bedrock ledge composed of square sections of rock. It is 6 feet lower than station mark.

NOTE: One of these items must be used for every station recovered.
Keopaweo (Kauai Island, L. G. Simmons, 1927).—Near eastern coast of Kauai Island, on hill of same name, about 3/4 miles south of Lihue, and 3/4 mile directly south of point where Euleia River enters Nawiliwili Bay. A good trail leads from the mouth of the river up to the saddle of the ridge between Kahanapa hill (at eastern end of ridge) and Keopaweo. Turn west (to right) here and proceed up to station along backbone of ridge. Station is on first prominent summit reached along this ridge. It shows up from Nawiwili Harbor as a distinct conical peak on summit of ridge. First determined by party of C. L. Garner (1927) for hydrographic purposes and marked with "ahu" (cairn) of rocks. Redetermined in 1927 by L. G. Simmons in triangulation between Oahu and Kauai and marked according to note 2, a standard disk station mark in outcropping bedrock. Two standard reference disks, note 12a, were set as follows: No. 1 in bedrock on side of hill almost directly toward station Ahukoa, and 4.06 meters (13.2 feet) from station; No. 2 on north edge of ridge west of station, and distant therefrom 12.72 meters (41.3 feet).

RECOVERY NOTE, TRIANGULATION STATION

Although the station was not visited a signal was observed standing on top of the peak. The County Engineers said they had recently visited the station and that the mark was still there.
HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

KEOPAWEKE (continued)

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KEOPAWEKE
ESTABLISHED BY: L.G.S. SIMMONS
RECOVERED BY: C.A. BURROWS
YEAR: 1927
STATE: HAWAII
COUNTY: KAUAI

HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.00 METER
HEIGHT OF LIGHT ABOVE STATION MARK: 0.00 METER

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>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KILOLANA (N.M.) 1910</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>N.M. 1</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>N.M. 2</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The station mark and reference marks 1 and 2 were recovered and found to be in good condition. A new description follows:

The station is near the eastern coast of Kauai Island, on a hill of the same name, 2 1/2 miles south of Lihue and 1/2 mile directly south of the point where the Huleia River enters Wailua River.

To reach the station from the Wailua River Lighthouse, take the road south of Kauai Island, then turn right, west, and proceed to the station along the banks of the river. The station is on the first prominent peak along this ridge. It shows up from the Wailua River as a distinct summit peak on the summit of the ridge. It is a 2-hour walk. Arrangements were made to use the Coast Station mark.

The station mark is a standard disk, standing on a mound, cemented in a drill hole in outcropping bedrock. A type 2 monument is over the station mark.

Reference mark 1 is a standard disk, marked KEOPAWEKE NO 1, cemented in a drill hole in outcropping bedrock. It is 5 feet lower than the station mark.

Reference mark 2 is a standard disk, marked KEOPAWEKE NO 2, cemented in a drill hole in outcropping bedrock. It is 5 feet lower than the station mark.

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

Station is located about 1 1/2 miles south-southwest of Wailua River and 1 mile southwest of the inshore end of the Wailua Bay breakwater, on a hill of about 1157 feet elevation, known as Keoaweke, on the ridge that lies along the south side of Huleia Stream. The hill is conical in appearance and quite prominent.

To reach station, cross mouth of Huleia Stream by boat, then proceed through brush pole and brush to current pole. From there, proceed up the ridge to the summit of the ridge. It is about 2-hour walk. A 2-hour walk. Arrangements were made to use the Coast Station mark.

A station mark is a standard disk, stamped "KEOPAWEKE 1910", cemented in a drill hole in bedrock, 6 inches beneath the 6 x 6-foot concrete platform, which is flush with ground, of the Type B-1 signal built by the Hawaiian Territory Survey.

Reference mark number one is a standard disk, stamped "KEOPAWEKE NO 1", cemented in a drill hole in small bedrock outcrop on steep sidehill under edge of small, pale-green tree and 5 feet lower than station mark.

Reference mark number two is a standard disk, stamped "KEOPAWEKE NO 2", cemented in a drill hole in a large, rounded, rock outcrop on west end of hilltop, where there is an outcrop on the south side of the ridge. It is about 5 feet lower 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.

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KEOPAWEKE
ESTABLISHED BY: L.G.S. SIMMONS
RECOVERED BY: D.M. WHIPP
YEAR: 1927
STATE: HAWAII
COUNTY: KAUAI

HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.00 METER
HEIGHT OF LIGHT ABOVE STATION MARK: 0.00 METER

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>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>KILOLANA 1920-1928</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>N.M. 1</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>N.M. 2</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

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

Station is located about 1 1/2 miles south-southwest of Wailua River and 1 mile southwest of the inshore end of the Wailua Bay breakwater, on a hill of about 1157 feet elevation, known as Keoaweke, on the ridge that lies along the south side of Huleia Stream. The hill is conical in appearance and quite prominent.

To reach station, cross mouth of Huleia Stream by boat, then proceed through brush pole and brush to current pole. From there, proceed up the ridge to the summit of the ridge. It is about 2-hour walk. A 2-hour walk. Arrangements were made to use the Coast Station mark.

A station mark is a standard disk, stamped "KEOPAWEKE 1910", cemented in a drill hole in bedrock, 6 inches beneath the 6 x 6-foot concrete platform, which is flush with ground, of the Type B-1 signal built by the Hawaiian Territory Survey.

Reference mark number one is a standard disk, stamped "KEOPAWEKE NO 1", cemented in a drill hole in small bedrock outcrop on steep sidehill under edge of small, pale-green tree and 5 feet lower than station mark.

Reference mark number two is a standard disk, stamped "KEOPAWEKE NO 2", cemented in a drill hole in a large, rounded, rock outcrop on west end of hilltop, where there is an outcrop on the south side of the ridge. It is about 5 feet lower 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.

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY
NO ORIGINAL TEXT

Kilohana (Kauai Island, O. B. French, 1910; L. G. Simmonds, 1928). - In southwest Kauai, on the west rim of Kilohana Crater, about 6 miles west-northwest of Lihue, and about 31/4 miles west of Eisenberg's "Mountain House." Station is on highest part of rim, and at top of steep slope. Reached from Lihue by road leading up to and past the "Mountain House," and from Koloa by road leaving main road about 1 mile east of "Half Way Bridge." In 1928 old track to Eisenberg's house reported as usable for cars. The old track (gas pipe) of the Hawaiian Government Survey was replaced in 1910 by a standard bronze bench mark disk of the United States Geological Survey set in a 10-inch concrete cylinder projecting 1 inch above the ground. In 1928 the only 1910 reference mark remaining was a group of 5 nails driven in a blaze in a 10-inch tree, 40 meters west of station. The azimuth from the station is 81° 08'. Two other reference marks were placed in 1927, consisting of standard disk reference marks in bowlders at the following distances and azimuths from the station: 13.26 meters (43.6 feet), 329° 06'; 12.56 meters (41.2 feet), 102° 41'.

The station mark was recovered and found to be in good condition. The reference marks were searched for but not found. It is believed that they were knocked out when the road was put in by the station. A new description follows:

The station is in southwest Kauai, 3/4 miles west of Lihue and on the southwest rim of Kilohana Crater. The station is on the highest part of the rim.

To reach the station from the post office in Lihue, go westerly on State Highway 50 for 2.2 miles to a Y-Fork. Turn right on a gravel road and passing to the west of a pond, continue northwesterly for 0.4 mile to a side road right. Turn right northerly between the cane fields and continue 3/4 mile to a Y-Fork. Take the left fork up hill and around the fence corner for 50 yards to the station on the right side of the road.

The station mark is a U.S. Geological Survey bench mark disk, stamped unknown, with a type B monument over the mark. The mark is 10 feet east of the center of the bladed road and 12 feet west of the edge of the crater.

HORIZONTAL CONTROL DATA

by the National Ocean Survey
OLD HAWAIIAN DATED

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KILohana
STATE: HAWAIi
YEAR: 1910
SECOND ORDER

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KILohana

HEIGHT OF TELESCOPE ABOVE STATION MARK: 1.27 METER
HEIGHT OF LIGHT ABOVE STATION MARK: METER

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>RELATION</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lihue Airport Station</td>
<td>E</td>
<td>Approx. 5 miles</td>
<td>0° 00' 00.0'</td>
</tr>
<tr>
<td>Nawiliwili Harbor Light</td>
<td>NE</td>
<td>Approx. 0.12 miles</td>
<td>344° 05' 45.4'</td>
</tr>
</tbody>
</table>

The station mark was recovered and found to be in good condition. The reference marks were searched for and not found. It is believed that they were knocked out when the road was put in by the station. A new description follows:

The station is in southwest Kauai, 3/4 miles west of Lihue and on the southwest rim of Kilohana Crater. The station is on the highest part of the rim.

To reach the station from the post office in Lihue, go west on State Highway 50 for 2.2 miles to a Y-Fork. Turn right on a gravel road and passing to the west of a pond, continue northwesterly for 0.4 mile to a side road right. Turn right northerly between the cane fields and continue 3/4 mile to a Y-Fork. Take the left fork up hill and around the fence corner for 50 yards to the station on the right side of the road.

The station mark is a U.S. Geological Survey bench mark disk, stamped unknown, with a type B monument over the mark. The mark is 10 feet east of the center of the bladed road and 12 feet west of the edge of the crater.

Hawaiian Datum

NO ORIGINAL TEXT

Kilohana (Kauai Island, O. B. French, 1910; L. G. Simmonds, 1928). - In southwest Kauai, on the west rim of Kilohana Crater, about 6 miles west-northwest of Lihue, and about 31/4 miles west of Eisenberg's "Mountain House." Station is on highest part of rim, and at top of steep slope. Reached from Lihue by road leading up to and past the "Mountain House," and from Koloa by road leaving main road about 1 mile east of "Half Way Bridge." In 1928 old track to Eisenberg's house reported as usable for cars. The old track (gas pipe) of the Hawaiian Government Survey was replaced in 1910 by a standard bronze bench mark disk of the United States Geological Survey set in a 10-inch concrete cylinder projecting 1 inch above the ground. In 1928 the only 1910 reference mark remaining was a group of 5 nails driven in a blaze in a 10-inch tree, 40 meters west of station. The azimuth from the station is 81° 08'. Two other reference marks were placed in 1927, consisting of standard disk reference marks in bowlders at the following distances and azimuths from the station: 13.26 meters (43.6 feet), 329° 06'; 12.56 meters (41.2 feet), 102° 41'.

The station mark was recovered and found to be in good condition. The reference marks were searched for but not found. It is believed that they were knocked out when the road was put in by the station. A new description follows:

The station is in southwest Kauai, 3/4 miles west of Lihue and on the southwest rim of Kilohana Crater. The station is on the highest part of the rim.

To reach the station from the post office in Lihue, go west on State Highway 50 for 2.2 miles to a Y-Fork. Turn right on a gravel road and passing to the west of a pond, continue northwesterly for 0.4 mile to a side road right. Turn right northerly between the cane fields and continue 3/4 mile to a Y-Fork. Take the left fork up hill and around the fence corner for 50 yards to the station on the right side of the road.

The station mark is a U.S. Geological Survey bench mark disk, stamped unknown, with a type B monument over the mark. The mark is 10 feet east of the center of the bladed road and 12 feet west of the edge of the crater.
KILOHANA (continued)

**U.S. DEPARTMENT OF COMMERCE**
**COAST AND GEODESY SURVEY**

**HORIZONTAL CONTROL DATA**

by the
**NATIONAL GEODETIC SURVEY**

OLD HAWAIIAN DATUM

---

<table>
<thead>
<tr>
<th>NAME OF STATION</th>
<th>KILOHANA</th>
<th>ESTABLISHED BY</th>
<th>D.M. Whipp</th>
<th>YEAR: 1910</th>
<th>STATE: Hawaii</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECOVERED BY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECOVERY NOTE, TRIANGULATION STATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAME OF STATION</td>
<td>KILOHANA</td>
<td>EL'IPELE</td>
<td>XI</td>
<td>YEAR: 1965</td>
<td>COUNTY: Kauai</td>
</tr>
<tr>
<td>NAME OF STATION</td>
<td>KILOHANA</td>
<td>EL'IPELE</td>
<td>XI</td>
<td>YEAR: 1965</td>
<td>COUNTY: Kauai</td>
</tr>
</tbody>
</table>

**HEIGHT OF TELESCOPE ABOVE STATION**: 3.83 METER

**HEIGHT OF LIGHT ABOVE STATION**: 3.83 METER

**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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FEET</td>
<td>METERS</td>
</tr>
<tr>
<td>NOKOU 1910-1927</td>
<td>00 00</td>
<td>00.0</td>
</tr>
<tr>
<td>Lihue, County Bldg., Flagstaff</td>
<td>00 00</td>
<td>00.0</td>
</tr>
<tr>
<td>RH No. 3</td>
<td>SSW</td>
<td>44.722</td>
</tr>
<tr>
<td>RH No. 4</td>
<td>W</td>
<td>52.128</td>
</tr>
</tbody>
</table>

Station mark was recovered in good condition. Both reference marks have been destroyed by grading and road construction. Two new reference marks, numbers 3 and 4, were established. A complete description follows:

Station is located about 4 miles west-northwest of Lihue, on the south end of the ridge, or rim, bordering the west side of Kilohana Crater. The ridge is bare and has a wide, graded road along the top. To reach station from the post office in Pahoa, go west on State Highway 50 for 2.3 miles to fork. Take right fork, gravel road, and go 0.1 mile, cross drain below dam and continue for 0.3 mile; take right fork and follow main cane-field road up graded grade for 2.0 miles to fork. Take right fork, up around point of hill, for 0.3 mile; take left fork for 0.23 miles to station on right.

Station mark is a U.S. Geological Survey disk, stamped "K1134", set in concrete 6 inches below the 6-foot-square, concrete platform of the Type B-1 signal built in 1930 by the Hawaii Territorial Survey. Access to the mark is had through a small hand-tunnel passing beneath the center, concrete pedestal of the signal. Station is 45.7 feet northeast of a fence corner and 2 feet east of edge of road.

Reference mark number three is a standard disk stamped "KILOHANA 1910 1920 NO 5 1965", set in the top of a 12-inch-square, concrete monument that projects 4 inches. It is 2 feet north of the fence corner, 2 feet west of edge of road and 4.2 feet lower than station mark.

Reference mark number four is a standard disk stamped "KILOHANA 1910 1920 NO 4 1965", set in the top of a 12-inch-square, concrete monument that projects 6 inches. It is 8 inches east of fence line, 12 feet west of edge of road and 1 foot higher than station mark.

*Note* - 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.
NO TEXT
**NO ORIGINAL TEXT**

Koloa church spire (Kauai Island, O. B. French, 1910; C. L. Garner, 1926).—In the southern part of Kauai, in the town of Koloa. Locally known as the Philippine Church.

**RECOVERY NOTE, TRIANGULATION STATION INTERSECTION**

_NAME OF STATION:_ Koloa Church Spire

_Established by:_ O.B.P. Year: 1910 South: Hawaii

_Recovered by:_ D.M. Whipp Year: 1965 Country: Kauai

_Island:_ Kauai

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

Station was recovered.

Located about 1 mile southeast of center of Koloa and 1 mile west-southwest of the Koloa sugar mill.

Station is the spire located at northeast corner of a large, rectangular, tar-colored building that has a red shingled roof. Spire has a red, peaked roof and a small, wooden cross mounted on top. Top of spire is 50 feet above ground.

---

**HORIZONTAL CONTROL DATA**

**QUAD:** 211591 **STATION:** 1016

_HAWAII_

_LATITUDE:_ 21° 30′ T4 22° 00′

_LONGITUDE:_ 159° 00′ TO 159° 30′

_DIAGRAM:_ NF 44 _KAUAI_

**ADJUSTED HORIZONTAL CONTROL DATA**

_NAME OF STATION:_ Koloa Church Spire

_STATE:_ HAWAII

_YEAR:_ 1910

_THIRD ORDER_

**NO OBSERVATION CHECK ON THIS POSITION**

_DESERTIC LATITUDE:_ 21° 53′ 50′.40

_DESERTIC LONGITUDE:_ 159° 27′ 37.37

_ELEVATION:_ Meters

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>F (or D, R) ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>513,432.23</td>
<td>23,250.40</td>
<td>0° 00′ 53″</td>
</tr>
</tbody>
</table>

*Plane azimuth has been computed by the f (or d, r) formula neglecting the second term.

**STATE COORDINATES (NAD)**

**平面坐标**

**TO STATION OR OBJECT**

<table>
<thead>
<tr>
<th>DEGRETIC AZIMUTH (true north)</th>
<th>PLANE AZIMUTH (true north)</th>
<th>CODE</th>
</tr>
</thead>
</table>

_Q1 245_
Kukui Point Light (Kauai Island, P. G. Engle, 1927).—On southeast coast of Kauai, at the north side of the entrance to Nawiliwilli Harbor; a pyramidal white concrete tower, about 22 feet in height.

RECOVERY NOTE, TRIANGULATION STATION
NAME OF STATION: Kukui Point Light
ESTABLISHED BY: P.G.E. YEAR: 1927 STATE: Hawaii BENCH MARKS ALSO
RECOVERED BY: D.M. Whipp YEAR: 1966 COUNTY: Kauai; Island: Kauai
AERIAL DISTANCE AND DIRECTION FROM NEAREST TOWN: At Nawiliwilli

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

Station was recovered as described in 1927. It is located on north side of Nawiliwilli Bay, opposite offshore end of breakwater, on Kukui Point; a pyramidal, white, concrete tower about 22 feet tall.

RECOVERY NOTE, TRIANGULATION STATION
INTERSECTION
NAME OF STATION: Kukui Point Light
ESTABLISHED BY: P.G.E. YEAR: 1927 STATE: Hawaii BENCH MARKS ALSO
RECOVERED BY: D.M. Whipp YEAR: 1966 COUNTY: Kauai
AERIAL DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Kauai

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

Station was recovered. It is a white, pyramidal, concrete tower, 22 feet tall, located on point on north side of entrance to Nawiliwilli Harbor.
HORIZONTAL CONTROL DATA

by the
National Ocean Survey

OLD HAWAIIAN DATUM

LAUKAKI (Kauai Island, O. B. French, 1910).—In southern Kauai, about 2 1/4 miles north of Kalao, on the highest peak at a sharp turn in the ridge. Station is near center of top of peak and is marked by a 3-inch gas pipe projecting 1.5 feet with an old 2 by 4 inch post alongside. These marks were set by the Hawaiian Government Survey. Reference marks are as follows: No. 1, stake with nail in top, about 10 meters from station in azimuth $44^\circ07'$; No. 2, stake, 8 meters distant in azimuth $164^\circ34'$; No. 3, stake, 4 meters distant, in azimuth $277^\circ01'$.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LAUKAKI

Established by: O.S.P. Year: 1910 State: Hawaii

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

Station was in good condition. This station was re-marked and a Type B-1 signal built, by the Hawaii Territorial Survey in 1910. No reference marks were set.

A complete description follows:

Station is located about 2 miles north of Kalao and 1 mile southwest of the junction of State Highways 50 and 52, on a sharp peak of about 1388 feet elevation, which is the highest point on the ridge. There is a radio antenna mast and small, silver-colored, metal, instrument box on the peak near station.

To reach station from the post office in Kalao, go southwest on State Highway 53 for 0.2 mile; turn right and go north on State Highway 52 for 1.2 miles; take right fork and follow main cane-field road northeast for 0.6 mile to crossroad; turn right and go 0.05 mile; cross canal and then go left along canal for 0.3 mile; take left fork ahead, crossing brush strip between cane fields, then take right fork along upper side of small cane patch and go 0.15 mile; turn sharp right, uphill, and go 0.3 mile to end of old road at power pole. From here pack up ridge along power line to top and station, about a 20-minute pack.

Station mark is an unstamped Hawaii Territorial Survey disk, set in concrete about 6 inches beneath the 6 x 6-foot, concrete platform of the Type B-1 signal. The platform is flush with ground and a red and white metal target extends about 8 feet above it. Station is 6.75 feet east of center of radio mast and 20.75 feet southeast of center of flat top of the instrument hut.

Radio mast is a 3-legged, skeleton-steel structure 50 feet tall, 2 feet wide at the base, tapering slightly to the top, and is painted alternate red and white.

NOTE: A 4-wheel-drive vehicle is required for the last 0.3 mile.
HORIZONTAL CONTROL DATA

by the National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211591 STATION 1019
HAWAII
LATTITUDE 21° 30' TB 22° 00'
LONGITUDE 159° 00' TO 159° 30'
DIAGRAM NF 46 KAUAI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION LIHUE MILL CHIMNEY STATE HAWAII YEAR 1927 THIRD ORDER

NAME OF STATION: LIHUE MILL CHIMNEY
ESTABLISHED BY: G.L.G. YEAR: 1927 STATE: HAWAII
RECOVERED BY: D.W. Whipp YEAR: 1958 COUNTY: Kauai

Station was recovered. It is the northeast 1 of the 2 stacks at the sugar mill in Lihue. Both stacks are about the same height, but station stack is slightly larger in diameter. Both stacks are painted black.

Recovery Note, triangulation station R

Recovery Note, triangulation station R

G-SP156

SOURCE:

STATE COORDINATES (foot)

<table>
<thead>
<tr>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (ANG. 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5104</td>
<td>6891307.80</td>
<td>52,452.94</td>
</tr>
</tbody>
</table>

*Plane azimuth has been computed by the 3-3-3 formula neglecting the second term.

To Station or Object

GEOGRAPHIC AZIMUTH (from north)

PLANE AZIMUTH (from north)

CODE

QI 073
HORIZONTAL CONTROL DATA

QUAD 211591
STATION 1020
HAWAII
LATITUDE 21° 30' TO 22° 00'
LONGITUDE 156° 00' TO 159° 30'
DIAGRAM H-6 KAUAI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LIHUE RADIO STATION KTOH MAST
STATE: HAWAII
YEAR: 1962
THIRD ORDER

SOURCE: G-12733

DESCRIPTIVE LATITUDE: 21° 58' 59.570
DESCRIPTIVE LONGITUDE: 159° 21' 46.421
ELEVATION: 3 METERS

STATE COORDINATES (FWS)

STATE & ZONE CODE X Y Z
HI 4 5104 546,455.08 54,507.13 + 0° 03' 05"

PLANE AZIMUTH HAS BEEN COMPUTED BY THE + X Y FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT "GEOGRAPHIC AZIMUTH FROM MAST"
"PLANE AZIMUTH FROM MAST"
CODE

R 1

NOAA FORM 76-155
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY
MAULU (Kauai Island, C. L. Garner, 1927).—On eastern coast of Kauai, on northeast point of entrance to Hanamaulu Bay. It is on a large flat rock outcrop about 3 feet back from bluff line, about 3 feet above sea level, and 30 feet north of shore line. Reached by truck from Hanamaulu by going east along road past grammar school to the end at a railroad cut on north side of Hanamaulu Bay; a path continues east to a stone wall on northeast point of bay. The station is about 100 yards east of this wall and near a grove of trees. Marked according to note 2, a standard disk in outcropping bedrock. Reference marks set according to note 2, standard reference disks, were in large rock outcrops several feet above the surrounding ground. They are at the following distances and azimuths from the station: No. 1, 6.815 meters (22.36 feet), 127° 59' 59"; No. 2, 4.336 meters (14.23 feet), 178° 38'.

RECOVERY NOTE. TRIANGULATION STATION

Detailed statement as to the Status of the original description: including marks found, stenciling, changes made, and other pertinent facts.

The station and R.H. S1 were found as described in 1927 and in good condition. R.H. S2 was probably destroyed by the erection of a lookout tower during World War II.

To reach from the P. O. in Lihue, go 2.1 miles E.NE. along the main highway to the village of Hanamaulu; continue 0.6 mile on main highway; turn right and go 0.6 mile, then bear to left and go 0.4 mile to tree line along beach; turn right and go 0.45 mile along east side of sugar cane field and stone wall to end of road at Hanamaulu Bay. Station is about 155 feet S.E. of south end of stone wall. R.H. S1 is at the edge of the ironwood tree line and in the top of a large four foot boulder. The entire beach line is now lined with Ironwood trees.

* Plans of transfer should be handled here. The officer who actually transfer the station should sign his name at the end of the transfer note.

# 1021

HAWAI

LATITUDE 21° 33' TD 22° 00'

LONGITUDE 159° 00' TO 159° 30'

DIAGRAM NO 45 KAUAI

DEGREES 1978 NAWA

MAULU

YEAK: 1927

STATE: HAWAI

YEAR: 1927

STATE & CODE: HI 4

X: 5104

Y: 554,520.95

Z: 59,988.50

PLANE AZIMUTH HAS BEEN COMPUTED BY THE 3-DEC. FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT

GEOGRAPHIC AZIMUTH (From north)

PLANE AZIMUTH (From north)

COO

HOKUNUI

29 06 32.7

29 02 56

5104

01 080
Station mark and RM No. 1 were recovered in good condition. RM No. 2 has been destroyed. A new reference mark, number three, was established. A complete description follows:

Station is located about 1 mile east of Hanamalu, on point on north side of Hanamalu Bay, 1/4 mile west-northwest of the outer end of the breakwater at entrance to the bay, on slope, about 47 feet above sea level, on makai side of grove of ironwood trees, in small area covered with tall grass.

To reach station from the post office in Hanamalu, go north on State Highway 56 for 0.6 mile to crossroad. Turn right and go 0.6 mile; take left fork and go 0.4 mile to T-junction at edge of trees. Turn right and go southerly along edge of trees on cane-field road for 0.45 mile to south end of rock wall at sharp right turn of road, and end of truck travel.

Walk southeast down through trees for about 50 yards to station.

Station mark is a standard disk stamped "MAULU 1927", cemented in a drill hole in a bedrock ledge about 6 feet in diameter and projecting 2-1/2 feet on the lower side. It is 147 feet southeast of end of rock wall and 15 feet east of some large slabs of concrete that are the remains of an old military installation.

Reference mark number one is a standard disk stamped "MAULU 1927", cemented in a drill hole in a prominent bedrock ledge about 10 feet long and projecting 3 feet on the lower side. It is at the edge of the ironwood trees and 8 feet higher than station mark.

Reference mark number three is a standard disk stamped "MAULU 1927 No 3 1965", cemented in a drill hole in a grey bedrock ledge that projects 2 feet on the lower side. It is at the edge of the ironwood trees and 3-1/2 feet higher than station mark.
NAME OF STATION: NaWiliwili Harbor Light
YEAR: 1962
STATE: Hawaii
COUNTY: Kauai

Description:
The Lighthouse is 2 1/2 miles southeast of Lihue in the southeastern part of Kauai, on Minini Point. The Lighthouse is 66 feet high, built of reinforced concrete. The diameter at the base is 15 feet and was built in 1932. It is painted green.

The point observed was the center of the light.

The following marks were also found near the Lighthouse. Information could not be found for these marks:
- Reference mark 1 is a standard disk, stamped NO 1 1927, set in the top of a 12 inch square concrete post projecting 16 inches. The arrow is pointing to the approximate center of the new Lighthouse. The mark is about the same elevation as the base and 44 feet southeast of the Lighthouse.
- Reference mark 2 is a standard disk, stamped NO 2 1927, set in a drill hole in a large boulder, flush with the top of the boulder. The arrow points just to the south of the present light house. The mark is 4 feet lower than the base and 76 feet southeast of the Lighthouse. Also inscribed in the same boulder is, JF J 911.
- A 3/4 inch steel rod in the center of a 12 inch square concrete post projecting 16 inches. In the top of the concrete post is inscribed MININI Pt. LIGHT OLD MAST. It is 10 feet east of the Lighthouse.

Station was recovered in good condition.

Located on Minini Point, at north side of entrance to NaWiliwili Bay, at the U.S. Coast Guard Station, about 2-1/2 miles southwest of Lihue. A round, concrete tower, 66 feet high and 16 feet in diameter at the base, painted light tan; constructed in 1932.

A marker, consisting of a 1/2-inch brass pin set in the top of a 12-inch-square concrete monument projecting 14 inches and with the words MININI PT LIGHT OLD MAST inscribed in the concrete, is 5.63 meters southeast from the center of the tower, and marks the location of the old 1927 Minini Point Light, which was removed when this new tower was constructed.

Two old reference marks, with arrows pointing towards old eccentric point (destroyed during construction of present tower) which was used to position the old light, are still in good condition.

RM No. 1 is 44 feet west of edge of tower, set in a concrete monument.
RM No. 2 is 74.5 feet south of edge of tower, set in the top of a large flat boulder on rocky point.

NOTE: The tower was positioned in 1932 by occupying the Minini Pt. Light Old Mast mark.
### HORIZONTAL CONTROL DATA

**NAME OF STATION:** NAWILIWILI HARBOR LIGHTHOUSE  
**STATE:** Hawaii  
**YEAR:** 1962  
**COUNTY:** Kauai  
**ELEVATION:** Meters  
**COORDS:**  
- **X:** 5104  
- **Y:** 554,856.84  
- **Z:** 45,361.76  
- **LAT-NGD:** N 00° 03' 37"  

**STATE COORDINATE SYSTEM (Hawaii):**

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>ORDER</th>
<th>COORD</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>LAT-NGD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>3</td>
<td>5104</td>
<td>554,856.84</td>
<td>45,361.76</td>
<td>N 00° 03' 37&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**PLAN DISTANCE HAS BEEN COMPUTED BY THE Eqs. of K. H. FORMULA, NEGLCETING THE SECOND TERM.**

**TO STATION OR OBJECT | GEOGRAPHIC AZIMUTH (FROM NORTH) | PLANE AZIMUTH* (FROM NORTH) | CODE**

**POSITION DETERMINED BY TRAVERSE FROM STATION NININI POINT LT. AND CHECKED BY ADDITIONAL OBSERVATIONS.**

**OBS BY USGS**  
**ADJUSTED HORIZONTAL CONTROL DATA**

**NAME OF STATION:** NAWILIWILI HARBOR LIGHTHOUSE  
**STATE:** Hawaii  
**YEAR:** 1962  
**COUNTY:** Kauai  
**LATITUDE:** 21° 57' 29.259"  
**LONGITUDE:** 159° 20' 18.956"  
**DIAGRAM:** No. 44 KAUAI  
**SOURCE:** G-12922  

**DESCRIPTION OF TRIGONOMETRY INTERSECTION STATION**

**NAME OF STATION:** NAWILIWILI HARBOR LIGHTHOUSE  
**STATE:** Hawaii  
**YEAR:** 1962  
**COUNTY:** Kauai

**CHIEF OF PARTY:** USGS

**NOTE:** This station is noted in the 1932 recovery note for MININI POINT LIGHT 1927 and tied to this station by traverse.

**RECOVERY NOTE, TRIANGULATION STATION**

**NAME OF STATION:** NAWILIWILI HARBOR LIGHTHOUSE  
**ESTABLISHED BY:** C.A.B.  
**YEAR:** 1962  
**STATE:** Hawaii  
**BENCH MARK:** ALAD  
**RECOVERED BY:** P.D.C.  
**YEAR:** 1979  
**COUNTY:** Kauai

**AERIAL DISTANCE AND DIRECTION FROM NEAREST TERM:**  
2.5 mi. S.E. of Lihue

**NOTE:** This station is noted in the 1932 recovery note for MININI POINT LIGHT 1927 and tied to this station by traverse.

**THE STATION WAS RECOVERED AS DESCRIBED IN GOOD CONDITION.**
NO ORIGINAL TEXT

Ninini Point Light (Kauai Island, C. L. Garret, 1927; F. G. Engle, 1927) — On Ninini Point, north side of entrance to Nawiliwili Bay, east coast of Kauai, a white mast about 30 feet high with cabin at base.

NININI POINT LIGHT (Kauai County, Hawaii, L.G.O., 1927;
U.S.L.H.S., 1935) — Letter from the Supt. of Lighthouses, February 16, 1932, states that a concrete tower, 72 ft. high, will be built and that 2 marks have been found on the reservation: a cross cut on a stone, and a reference mark pointing to the cross. Ground will be graded after the tower is built and marks will have to be lowered.

An examination of the records shows that the Lighthouse was occupied easterly in 1927, and 2 reference marks were established. There is no description of the easterly station or the reference marks, but the cross is probably the easterly station. The following information is given in the list of directions.

Station NININI BOAT

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
</table>
| KOKONUI | 10.48 | 59°13'48"
| R.M. 1 | 10.48 | 59°13'48"
| NININI POINT | 11.06 | 217°03'20"
| LIGHTHOUSE | 26.47 | 264°33'50"

(G.K.G., 1932) — The white mast has been sawed off 3 ft. from the ground (1931), a nail in the center of a 6- by 6-in. solid stump shows the station at present, but it will be marked by the Lighthouse Service engineer by June 1932. The position of the station will not be changed, and the nail will be a small rod set in a concrete block, 1-ft. square on top, and projecting about 1 ft. above ground, inscriptions will be "NININI PT IN OLD MAST."

The cabin and the temporary light tower (1931) will be removed upon the completion of the permanent concrete light tower, which is 16 ft. in diameter at the base (under construction March 1932, to be in operation June 1932). A cross, cut in a rock outcrop, has been destroyed in the construction of the new light. This probably marked an easterly station occupied in 1927. Two standard reference-mark disks, stamped "NO 1 and NO 2 1927" point to the vicinity of the destroyed cross. Reference mark 1 is W of the station, and will probably be destroyed in the grading of the point. Reference mark 2 is about 50 m. S of the station. Both of these reference marks are obstructed from view from the station by construction work (March 1932) and their azimuths and distances are not known.

<table>
<thead>
<tr>
<th>OBJECT</th>
<th>DISTANCE</th>
<th>DIRECTION</th>
</tr>
</thead>
</table>
| KOKONUI | meters | 0°00'00"
| Center of permanent concrete light tower | 5.63 | 65°47'20"

(continued on next page)
HORIZONTAL CONTROL DATA
by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 211591  STATION 1024

LATITUDE  ° / ° TO °
LONGITUDE ° / ° TO °
DIAGRAM R

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

NAME OF STATION: NININI POINT LIGHT
ESTABLISHED BY: C.L.G. YEAR: 1927 STATE: HAWAI'I
RECOVERED BY: H.O.F. YEAR: 1958 COUNTY: KAUAI

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

The station and N.M.'s were all found in good condition as described in 1922 with the following additions:

N.M. #1 is 447.7 feet N.M. of the center of the lighthouse, cemented in the top of a truncated block of concrete. N.M. #2 is 75.2 feet S.W. of the center of the lighthouse, cemented in the top of a large boulder, about 3 feet lower than station. The old mast, now described as "Ninini Pt. Old Mast" was recovered as described in 1922 and distance was found to be correct.

The light station was removed and a new light tower built in 1932, however the location of the old mast was permanently marked by the U.S. Coast Guard with a 1/2-inch brass pin set in the top of a 12-inch square concrete monument that projects 14 inches. Inscribed in the concrete are the words "NININI PT LIGHT OLD MAST".

Located on NININI POINT LIGHT, at north side of entrance to NAWILIWI HAY, on southeast side of the new light tower, 5.63 meters from it's center.

In 1927 the old mast was positioned by occupying an eccentric point, a cross in rock, which was destroyed during construction of the new light tower. The reference marks established at that time to reference the eccentric point are still in good condition.

Reference mark number one is a standard disk stamped "NO 1 1927", set in the top of a tapering, 12-inch square, concrete monument that projects 14 inches. It is 16 feet southeast of edge of bluff and 14 feet west of edge of light tower.

Reference mark number two is a standard disk stamped "NO 2 1927", cemented in a drill hole in the top of a flat boulder 8 feet in diameter. It is on the edge of the rocky point and 74.5 feet south of edge of new light tower.

NOTES: The arrows on both reference mark points towards the destroyed eccentric point and not towards the monument marking the old light mast, and line-of-sight from the monument to BM No. 1 is blocked by the new light tower.

NOTE: The above text was recovered as described by correspondence given C.L.G. in 1932 recovery note and by 1960 recovery note by C.L.G. In 1932 was completed by the U.S.L.H.S. The line to reference mark no. 1, is blocked by the boulder.

*NOTE: The above text should be considered as the control point should be used at the end of the recovery note.*

Chief of Survey, C.L.G.

Comment: NININI POINT LIGHT, 1958.

C. L. G. July 10, 1970

11-2-58

END
PAA (Kauai Island, Ter. of Hawaii, Hawaiian Government Survey, Hawaiian Territorial Survey, 1930)--Station is 2 mi. SE of Koloa post office, on a low rounded hill.

Found a 2-1/2-in. pipe. Angles as per H.T.S. data checked (see page 1 of Field Book 1216).

Built a concrete monument and cemented an H.T.S. bronze disk in the 2-1/2-in. pipe. Superstructure, Type B1 (6- by 6-ft.), was built on a 6- by 6-ft. stone foundation (concreted together) 2-1/2 ft. above the natural ground surface.

Station is accessible by car and is reached by the road passing the Koloa Mill and following it through the cane fields along (near) the W side of a hill to the saddle, between the two rounded hills. Station is on the S most one of the two hills.

NOTE--Not to be confused with PAA (O.B. French, 1910).

See HTS Plat 3070
Paa (Kauai Island, O. B. French, 1910).—In southern part of Kauai, about 2 miles southeast of Kolos, on a conspicuous round-topped hill. Identified with a Hawaiian Government Survey station, but not with their station Paa, which is on lower ground about 1 mile to the south. Hill is identified by a metal car pipe line running up its north side. Station is in the liquid near the east edge of the crowding summit, and near the rim of a small crater. Approached by road to stables at foot of hill, thence by trail along pipe line. Marked by a 4 by 6-inch post set in ground and projecting about 1 foot. Reference marks are stakes at the following azimuth: 183° 30'; 200° 27'; and 242° 54'.

RECOVERY NOTE, TRIANGULATION STATION

PAA

Established by: O.B.P.
Year: 1910 State: Hawaii
Recovery by: Kauai

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

The original station has been destroyed by sugar cane operations. A new station with the same name has been established by the USG, but is not in the same location as the original one.

RECOVERY NOTE, TRIANGULATION STATION

PAA

Established by: O.B.P.
Year: 1910 State: Hawaii
Recovery by: J.K. Whipp Year: 1965 County: Kauai

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

Station is gone, apparently destroyed long ago. The Hawaii Territorial Survey established a new station in 1930 within a few feet of the original point, but could not find the old station mark at that time.

---

HORIZONTAL CONTROL DATA

QUAD 111561
STATION 1025
HAWAII
LATITUDE 21° 30' 0" TO 22° 00' 0"
LONGITUDE 156° 40' 0" TO 156° 39'
DIAGRAM NO 46 KAUAI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAA
STATE: HAWAII
YEAR: 1910
SECOND ORDER

SOURCES: G-SP156

GEOGRAPHIC LATITUDE: 21° 53' 38.012
GEOGRAPHIC LONGITUDE: 159° 26' 34.327
ELEVATION: SCALED 105 FEET

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>X 01.17</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>519,369.75</td>
<td>22,002.24</td>
<td>+ 0.017</td>
</tr>
</tbody>
</table>

* Plane adjustment made by the 0.100000 formula reflecting the 2nd order.
NO ORIGINAL TEXT

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

JUN 1976

HORIZONTAL CONTROL DATA

by the National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211591 STATION 1026
HAWAII LATITUDE 21° 30' TO 22° 00'
LONGITUDE 159° 00' TO 159° 30'
DIAGRAM NO. 46 KAUAI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION PHAKAPU
STATE HAWAII YEAR 1910 THIRD ORDER

DETAILS OF STATION

Name of Station: Phakapu
Established by: O.B.F. Year 1910 State: Hawaii
Recovered by: D.M. Whipp Year 1965 County: Kauai
Island: Kauai

Station was identified by angle at station KAI. It is a sharp-tipped peak of about 733 feet elevation, and lies about 1/2 mile west-northwest from station KAWELIKOA on the same ridge.

ELEVATION: METERS FEET

STATE COORDINATES (FOOT)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>ORG H. M. ROLL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>533,416.18</td>
<td>27,774.94</td>
<td>+0°00'12&quot;</td>
<td></td>
</tr>
</tbody>
</table>

*Plane azimuth has been computed by the B. CHORD FORMULA neglecting the second term.

TO STATION OR OBJECT GEOgraphic AZIMUTH (FROM RECK) Plane Azimuth (FROM RECK) CODE

Q1 055
HORIZONTAL CONTROL DATA
by the
National Ocean Survey
OLD HAWAIIAN DATUM
NO ORIGINAL TEXT
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

NO ADJUSTED HORIZONTAL CONTROL DATA
NAME OF STATION: POINT
STATE: HAWAII
YEAR: 1910
THIRD ORDER

SOURCE: GSP156
NO OBSERVATION CHECK ON THIS POSITION

STATE COORDINATES (FOOT)

<table>
<thead>
<tr>
<th>STATE &amp; Zone</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>Z (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5136</td>
<td>547,884.87</td>
<td>57,115.06</td>
<td>+0.000</td>
</tr>
</tbody>
</table>

*Plane Azimuth has been computed by the 2 COORD FORMULA neglecting the second term

TO STATION OR OBJECT

GEODETIC AZIMUTH

PLANE AZIMUTH

CODE

Q1 361
**HORIZONTAL CONTROL DATA**

**by the National Ocean Survey**

**OLD HAWAIIAN DATUM**

**HAWAII**

**LATITUDE:** 21° 30' TO 22° 00'

**LONGITUDE:** 159° 00' TO 159° 30'

**DIAGRAM NF 46**

**KAUAI**

**ADJUSTED HORIZONTAL CONTROL DATA**

**NAME OF STATION:** POIPU LORAN TRANSM ST MAST

**STATE:** HAWAII

**YEAR:** 1962

**THIRD ORDER**

**SOLDIER:** G-12733

**Geodetic Latitude:** 21° 52' 20.560

**Geodetic Longitude:** 159° 26' 48.014

**Elevation:** 280 (feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X</th>
<th>Y</th>
<th>D(1) A(2) A(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>3104</td>
<td>116,083.59</td>
<td>14,186.41</td>
<td>+ 0 01 17</td>
</tr>
</tbody>
</table>

**PLANE ADJUSTMENT WAS COMPUTED BY THE Z FORMULA INFLUENCING THE THIRD ORDER.**

**TO STATION OR OBJECT**

<table>
<thead>
<tr>
<th>GEOGRAPHIC ADJUSTMENT (From north)</th>
<th>PLANAR ADJUSTMENT (From north)</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OF 365
NO ORIGINAL TEXT

Post (Kauai Island, O. B. French, 1910; C. L. Garner, 1928).—On the south coast of Kauai, on a rocky point 1 mile west of Kolos Landing, and just inside high-water mark. Marked in 1910 by an old 6 by 6 inch post. In 1926 a plane table traverse was run to this station from station Horn and a mark found consisting of a badly corroded 4-inch iron pipe set in concrete and projecting about 2 feet. It was believed to be a re-marking of the original station by a local survey.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POST
STATE: HAWAI I
YEAR: 1910
THIRD ORDER

G-SP158
NO OBSERVATION CHECK ON THIS POSITION

CENSUS LATITUDE 21° 53' 05.10
CENSUS LONGITUDE 159° 24' 03.86

STATE COORDINATES (feet)

<table>
<thead>
<tr>
<th>STATE &amp; ZONE</th>
<th>CODE</th>
<th>X (feet)</th>
<th>Y (feet)</th>
<th>Z (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI 4</td>
<td>5104</td>
<td>505,099.10</td>
<td>18,677.87</td>
<td>0 00 20</td>
</tr>
</tbody>
</table>

NOTE: PLANES ARE NOT HARMED BY THE ADORNED AT NO HARM TO NATURE TO THE SECOND ORDER.