

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1001
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

Form 526
 (11-8-55)

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

R

NAME OF STATION: **A**
 ESTABLISHED BY: **O.B.F.** YEAR: **1910** STATE: **Hawaii**
 RECOVERED BY: **D.M. Whipp** YEAR: **1965** COUNTY: **Kauai**
 Island: **Kauai**

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

Station was identified by angle from stations KAI and HOKUNUI and is still in place. It is a fairly prominent rock point at about 1300 feet elevation, 2270 feet east-southeast of station KAI and about 1/4 mile northwest from sea. There is a hole through the rock about 50 feet below the top.

* 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.

Comm-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **A**
 STATE: **HAWAII** YEAR: **1910** THIRD ORDER

SOURCE: **G-SP156**
NO OBSERVATION CHECK ON THIS POSITION

| | |
|---|-------------------------|
| GEODETIC LATITUDE: 21° 55' 49.73 | ELEVATION: _____ METERS |
| GEODETIC LONGITUDE: 159 22 37.73 | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------------------------|
| STATE & ZONE | CODE | X | Y | θ OR Δ OR ANGLE* |
| HI 4 | 5104 | 541,641.32 | 35,306.48 | + 0° 02' 45" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ OR Δ OR ANGLE FORMULA NEGLECTING THE SECOND TERM.

| STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|-------------------|----------------------------------|--------------------------------|------|
| | | | |

QI 060

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1002
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

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.

Form 528
 (11-8-55)

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

R

NAME OF STATION: Ahukini Light
 ESTABLISHED BY: C.L.G. YEAR: 1927 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

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

plement 1153. Station was identified by angle at station MAULU 1927 and recovered, in good condition, although abandoned and the light removed from the top.

Station is a grey, concrete tower 20 feet tall. It is 6 feet square at the base and 18 inches square at the top. Located on outer end of the breakwater at entrance to Hanamaulu Bay, about 1 mile east of Hanamaulu.



* 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 may be used when recovered. Comm-DC 34814

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: AHUKINI LIGHT
 STATE: HAWAII YEAR: 1927 THIRD ORDER

SOURCE: G-SP156

| | | | |
|---------------------|----------------|------------|--------|
| GEODETIC LATITUDE: | 21° 59' 49.347 | ELEVATION: | METERS |
| GEODETIC LONGITUDE: | 159 20 06.452 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|-------------------------------|
| STATE & ZONE | CODE | X | Y | β OR Δ OR ANGLE* |
| HI 4 | 5104 | 555,858.69 | 59,498.92 | + 0 03' 42" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β OR Δ OR FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| | | | |

QI 078

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1003
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

FORM 526
 (11-8-66)

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

R

NAME OF STATION: AL
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

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

SOURCE: G-SP156

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

The point on which station was located was identified by check angle but no mark was found. It was located on a small but quite noticeable bedrock mound about 10 feet in diameter and rising about 4 feet above general ridge line at the west end of a low, flat mesa, about 80 feet above the sea immediately below, and is about 2 miles southeast of the Koloa Sugar Mill and 1-1/2 miles northeast of Makahuena Point.

It is possible that the mound was used as a hydro signal, or else a pole may have been placed on the mound.

| | | | |
|---------------------|----------------|------------|--------|
| GEODETIC LATITUDE: | 21° 53' 05.38" | ELEVATION: | METERS |
| GEODETIC LONGITUDE: | 159 25 28.58 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|------------------|
| STATE & ZONE | CODE | X | Y | β OR Δ β ANGLE ° |
| HI 4 | 5104 | 525,563.30 | 18,712.15 | + 0° 01' 41" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β OR Δ β FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

* 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.

CGSD-DC 34314

QI 254

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211551 STATION 1004
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

Form 526
 (11-8-65)

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

R

NAME OF STATION: B
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai
 Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:

Station was identified by angle at station
 KAI. It is a rather insignificant bump on a rock bluff at about 350
 feet elevation, 0.2 mile northwest from sea and 2159 feet southeast
 of station KAI.

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

G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

| | |
|----------------------------------|-------------------|
| GEODETIC LATITUDE: 21° 55' 43.83 | ELEVATION: METERS |
| GEODETIC LONGITUDE: 159 22 41.91 | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------------|
| STATE & ZONE | CODE | X | Y | g IOR Δ g1 ANGLE * |
| HI 4 | 5104 | 541,248.23 | 34,710.82 | + 0° 02' 44" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE g IOR Δ g1 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

* 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. COM-DC 34314

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1005
 HAWAII
 LATITUDE 21 ° 30' TO 22 ° 00'
 LONGITUDE 159 ° 00' TO 159 ° 30'
 DIAGRAM NF 4-6 KAUAI

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 5 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.

Form 326
 (11-8-85)

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

NAME OF STATION: **FLAT**
 ESTABLISHED BY: **O.B.F.** YEAR: **1910** STATE: **Hawaii**
 RECOVERED BY: **H.O.F.** YEAR: **1958** COUNTY: **Kauai**

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

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.

Form 526
 (11-8-85)

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

NAME OF STATION: **Flat**
 ESTABLISHED BY: **O.B.F.** YEAR: **1910** STATE: **Hawaii**
 RECOVERED BY: **D.M. Whipp** YEAR: **1965** COUNTY: **Kauai**
 Island: **Kauai**

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

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.

* 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.

COM-DC 349 14

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **FLAT**

STATE: **HAWAII**

YEAR: **1910**

THIRD

ORDER

SOURCE: **G-SP156**
NO OBSERVATION CHECK ON THIS POSITION

| | | | | |
|---------------------|-----------------|-----------|---|--------|
| GEODETIC LATITUDE: | 21 ° 58 ' 44.02 | ELEVATION | 1 | METERS |
| GEODETIC LONGITUDE: | 159 20 07.96 | SCALED | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--|
| STATE & ZONE | CODE | X | Y | β 10R Δ β 1 ANGLE * |
| HI 4 | 5104 | 555,723.86 | 52,906.78 | + 0 ° 03 ' 42 " |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β 10R Δ β 1 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QI 070

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1006
 HAWAII
 LATITUDE 21 ° 30' TO 22 ° 00'
 LONGITUDE 159 ° 00' TO 159 ° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

Form 526
 (11-8-55)

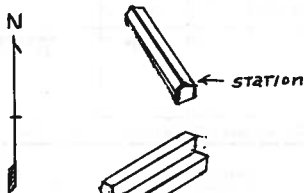
U. S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
 RECOVERY NOTE, TRIANGULATION STATION
 INTERSECTION

R

NAME OF STATION: Hanamaulu Warehouse SE Gable
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

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

Station was recovered. Located on the bluff above the abandoned wharf at Hanamaulu 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.



* 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. COM-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-SP156

| | |
|------------------------------------|-------------------|
| GEODETIC LATITUDE: 21 ° 59' 40.094 | ELEVATION: METERS |
| GEODETIC LONGITUDE: 159 20 03.982 | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|-------------------------------|
| STATE & ZONE | CODE | X | Y | β OR Δ OR ANGLE* |
| HI 4 | 5104 | 556,092.15 | 58,565.47 | + 0 03 43 |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β OR Δ OR FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| | | | |

QI 076

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1007
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUI

NO ORIGINAL TEXT

Hokunui (Kauai Island, O. B. French, 1910; C. L. Garner, 1927).—In south-eastern Kauai, on a very sharp conical peak on the ridge 2½ miles southwest of Nawiliwili, called Hokunui or Cone Peak. Station is at the center of sharp grassy summit, and is approached by a trail which leads up across the saddle to 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 2-inch gas pipe and "ahu" (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, 2.560 meters (8.40 feet), 156° 40'; No. 2, 4.415 meters (14.48 feet), 238° 44'.

COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HOKUNUI
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.5 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

| DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION | | | | |
|--|---------|----------|--------|------------|
| OBJECT | BEARING | DISTANCE | | DIRECTION |
| | | FEET | METERS | |
| KEOPAWEO 1927 | | | | 00 00 00.0 |
| RM No. 2 | NE | 14.518 | 4.425 | 06 52 21 |
| RM No. 1 | NW | 8.450 | 2.576 | 284 40 22 |

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 1930. 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 Puhī, 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 east up steep hill and along ridge top about ¾ 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 ¾ mile to station. A 2-1/2-hour pack.

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-northeast 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 THIRD ORDER
 SOURCE: G-SP156

| | |
|-----------------------------------|-------------------------|
| GEODETIC LATITUDE: 21° 56' 09.834 | ELEVATION: 490.0 METERS |
| GEODETIC LONGITUDE: 159 22 34.611 | 1608 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|-----------------|
| STATE & ZONE | CODE | X | Y | § OR Δ ± ANGLE* |
| HI 4 | 5104 | 541,933.35 | 37,335.35 | + 0° 02' 46" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE § OR Δ ± FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| KEOPAWEO | 231 49 56.0 | 231 47 10 | 5104 |

QI 044

*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.

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211591 STATION 1009
HAWAII
LATITUDE 21 ° 30' TO 22 ° 00'
LONGITUDE 159 ° 00' TO 159 ° 30'
DIAGRAM NF 4-6 KAUAI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KALANI PUU
STATE: HAWAII YEAR: 1910 THIRD ORDER

SOURCE: G-SP156

| | | | |
|---------------------|----------------|------------|--------|
| GEODETIC LATITUDE: | 21 ° 56' 52.30 | ELEVATION: | METERS |
| GEODETIC LONGITUDE: | 159 21 25.29 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------------|
| STATE & ZONE | CODE | X | Y | # 10R Δ 01 ANGLE ° |
| H1 4 | 5104 | 548,455.93 | 41,626.13 | + 0° 03' 12" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE # 10R Δ 01 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|--------|
| | | | Q1 062 |

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1010
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

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 1½ 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 34.9 feet from station, in azimuth 357° 12'. No. 2 is bottle set in line of fence with 2 inches of neck projecting, 27.0 feet from station, in azimuth 204° 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, 1932)
 --Station is in SE Kauai, about 2 mi. W of Lihue, 1 mi. N of Koloa road, 1/2 mi. W of the A. Wilcox residence, and on the new (1933) boundary between the Grove Farm and Lihue plantations. Found the original subsurface mark, a 20 d. 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 (piers of rubble masonry) 6-1/2 ft. high, over a bronze disk set in a concrete-filled 4-in. iron pipe (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.

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: **KAUAI NORTH BASE**
 ESTABLISHED BY: **O.B.F.** YEAR: **1910** STATE: **HAWAII**
 RECOVERED BY: **H.O.F.** YEAR: **1958** COUNTY: **KAUAI**

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

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 1.95 miles west along the main highway to Fihu; turn right at the edge of a pineapple field and go 0.4 northwest; turn right and go 0.4 mile northeast, following along irrigation ditch to station.

* 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 *

...if every station recovered.

Coast-D' 1314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAUAI NORTH BASE**
 STATE: **HAWAII** YEAR: **1910** SECOND ORDER
 SOURCE: **G-SP156**

| | |
|-----------------------------------|-------------------------|
| GEODETIC LATITUDE: 21° 58' 43.545 | ELEVATION: 126.0 METERS |
| GEODETIC LONGITUDE: 159 24 18.025 | 413 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------------|
| STATE & ZONE | CODE | X | Y | § 10R Δ #1 ANGLE * |
| HI 4 | 5104 | 532,187.30 | 52,838.91 | + 0° 02' 08" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE § 10R Δ #1 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QI 007

(continued on next page)

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

HORIZONTAL CONTROL DATA

QUAD 211591

STATION 1010

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

KAUAI NORTH BASE (continued)

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

Form 525
(11-9-65)

R

NAME OF STATION: KAUAI NORTH BASE
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
Island: Kauai

Detailed statement as to the fitness 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 3/4 mile northwest of Puhi, 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 1.0 mile; take right fork and follow straight, graveled road for 0.9 mile; take left fork, following up along north edge of cane field, for 0.6 mile to station on right, 115 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 5 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 1932, is centered over the station mark. The concrete platform of the signal is 6 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

R

NAME OF STATION: KAUAI NORTH BASE
ESTABLISHED BY: O.B.F. YEAR: 1970 STATE: HAWAII BENCH MARK(S) ALSO
RECOVERED BY: E. PURSEL, JR. YEAR: 1969 COUNTY: KAUAI
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 2.1 MILES WEST OF LIHUE

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

THIS STATION WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1011
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

Kauai south base (Kauai Island, O. B. French, 1910).—In southeastern Kauai, in a pasture about 2 miles southwest of Nawiliwili and 1/2 mile north of the Huleia River, at top of a steep grassy slope running back from the river, 2 1/4 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 1/4-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 1/4 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.F., 1910;
 Hawaiian Territorial Survey, 1932)

--Station is in SE Kauai, at the edge of a cane field, about 2-1/2 mi. SW of Nawiliwili, 1/2 mi. N of Huleia River, and at the top of a steep wooded slope running back from the river.

Found the original mark, a 1/2-in. brass bolt with a cross in top set in a block of concrete which was moulded 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 continue to the surface. No reference marks were found.

Built a standard Type A station monument (piers of rubble masonry), 8 ft. high, over the original mark.

Station is approached by walking through a cane field from the intersection of the Malumalu-Huleia Government roads.

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAUAI SOUTH BASE
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: H.O.F. YEAR: 1958 COUNTY: Kauai

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

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 S.W. along the old paved road through a scenic ravine; 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.

* 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.
 Norm.—One of these forms must be used for every station recovered.

COAS-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAUAI SOUTH BASE

STATE: HAWAII

YEAR: 1910

SECOND

-ORDER

SOURCE: G-SP156

| | | | |
|----------------------|----------------|------------|-------------|
| GEODETTIC LATITUDE: | 21° 57' 12.889 | ELEVATION: | 70.0 METERS |
| GEODETTIC LONGITUDE: | 159 22 55.615 | | 250 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|---------------------|
| STATE & ZONE | CODE | X | Y | ϕ IOR Δ ρ I ANGLE * |
| HI 4 | 5104 | 539,950.93 | 43,696.47 | + 0° 02' 39" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ϕ IOR Δ ρ I FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETTIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|-----------------------------------|---------------------------------|------|
| | | | |

QI 006

(continued on next page)

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 211591 STATION 1011

LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

KAUAI SOUTH BASE (continued)

Form 526
(11-6-59)

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

R

NAME OF STATION: KAUAI SOUTH BASE
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
Island: Kauai

Detailed statement as to the fitness of the original description; including marks found, stampings, 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, 1-3/4 miles west-southwest of Nawiliwili, 0.3 mile north of the Huleia River and 0.1 mile south of Hulemalu 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 Halehaka 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

R

NAME OF STATION: KAUAI SOUTH BASE
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: HAWAII BENCH MARK(S) ALSO
RECOVERED BY: E. PURSEL JR. YEAR: 1969 COUNTY: KAUAI
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 1.7 MILES SOUTHEAST OF NAWILIWILI

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

THIS STATION WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1012
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

Kawelikoa (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 Lae Kawelikoa. 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.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAWELIKOA

STATE: HAWAII

YEAR: 1910

SECOND

ORDER

SOURCE: G-SP156

| | | | |
|---------------------|----------------|------------|--------------|
| GEODETIC LATITUDE: | 21° 54' 25.884 | ELEVATION: | 211.0 METERS |
| GEODETIC LONGITUDE: | 159 23 37.122 | | 692 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|-------------------|
| STATE & ZONE | CODE | X | Y | # OR Δ #1 ANGLE * |
| HI 4 | 5104 | 536,055.20 | 26,841.70 | + 0° 02' 23" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE # OR Δ #1 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From zenith) | PLANE AZIMUTH * (From zenith) | CODE |
|----------------------|-----------------------------------|----------------------------------|------|
| KAI | 200 34 44.2 | 200 32 21 | 5104 |

QI 043

(continued on next page)

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 211591

STATION 1012

LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

KAWELIKOA (continued)

FORM 526a
(9-16-69)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KAWELIKOA
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
Island: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.35 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.

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

| OBJECT | BEARING | DISTANCE | | DIRECTION |
|----------|---------|----------|--------|------------|
| | | FEET | METERS | |
| KAI 1910 | | | | 00 00 00.0 |
| RM No. 1 | ENE | 13.290 | 4.052 | 68 51 51 |
| RM No. 2 | ESE | 43.960 | 13.400 | 83 00 56 |
| RM No. 3 | SW | 23.535 | 7.173 | 223 24 57 |

Station mark and three reference marks were recovered in good condition, however only two reference marks were mentioned in original description. The published distance and azimuth to the two reference marks were found to be greatly in error. A complete description follows:

Station is located on the southeast coast of Kauai, about 5 miles southwest of Lihue and 1/4-mile west of Kawelikoa Point, on a prominent hill of about 691 feet elevation on the ridge running down to southeast from Puu Pihakapu, and immediately above the cove and long, sand beach to north.

To reach station from the post office in Puhi, go west on State Highway 50 for 1.2 miles; turn left and follow Kipu Road, a paved road, for 1.5 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 2.3 miles, going up over mountain pass, to ranch buildings. From gate in front of houses go southerly for 0.25 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. Pack southeast up hill to station. A 45-minute pack. NOTE: 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 lava 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 forms must be used for every station recovered.

USCOMM-DE 37173-P

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1013
 HAWAII
 LATITUDE 21 ° 30' TO 22 ° 00'
 LONGITUDE 159 ° 00' TO 159 ° 30'
 DIAGRAM NF 4-6 KAUAI

Keopaweo (Kauai Island, L. G. Simmons, 1927).—Near eastern coast of Kauai Island, on hill of same name, about 2¼ miles south of Lihue, and ½ mile directly south of point where Huleia River enters Nawiliwili Bay. A good trail leads from the mouth of the river up to the saddle of the ridge between Kalanipuu 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 Nawiliwili 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 Aahoaka, and 4.95 meters (16.2 feet) from station; No. 2 on north edge of ridge west of station, and distant therefrom 12.72 meters (41.7 feet).

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **KEOPAWEO**
 ESTABLISHED BY: **L.G.S.** YEAR: **1927** STATE: **Hawaii**
 RECOVERED BY: **H.O.F.** YEAR: **1958** COUNTY: **Kauai**

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

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.

* 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.

COMB-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KEOPAWEO**

STATE: **HAWAII**

YEAR: **1927**

SECOND

ORDER

SOURCE: **G-SPI 56**

| | | | |
|---------------------|-------------------------|------------|---------------------|
| GEODETIC LATITUDE: | 21 ° 56 ' 38.837 | ELEVATION: | 356.0 METERS |
| GEODETIC LONGITUDE: | 159 21 55.060 | | 1168 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|-------------|-------------------|------------------|---------------------|
| STATE & ZONE | CODE | X | Y | ϕ 10R Δ ρ1 ANGLE* |
| HI 4 | 5104 | 545,654.50 | 40,265.09 | + 0° 03' 01" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ϕ 10R Δ ρ1 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH (From south) | CODE |
|----------------------|----------------------------------|-------------------------------|-------------|
| KILOHANA | 129 35 31.1 | 129 32 30 | 5104 |

Q1 002

(continued on next page)

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1013

LATITUDE ° ' TO ° '
 LONGITUDE ° ' TO ° '
 DIAGRAM

KEOPAWEO (continued)

FORM 326a
 (8-18-65)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

R

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KEOPAWEO
 ESTABLISHED BY: L.G. Simmons YEAR: 1927 STATE: Hawaii
 RECOVERED BY: C.A. Burroughs YEAR: 1962 COUNTY: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.90 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.

| OBJECT | BEARING | DISTANCE | | DIRECTION |
|-----------------------------------|----------|--|----------|--------------------------|
| | | FEET | METERS | |
| | | DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION | | |
| KILOHANA (HGS) 1910 R.M. 1 | N | (16.59) | (5.057) | 0 00 00.0 41 45 26 |
| Nawiliwili Harbor Light R.M. 2 | ENE W | Approx. 2 miles (42.25) | (12.878) | 111 03 15.8 311 16 35 |

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 Nawiliwili Bay.

To reach the station from the Nawiliwili Bay Coast Guard Station go southwesterly around the bay to a point where the Huleia River enters the bay and the end of truck travel. A boat is needed to cross the river. Cross the river and land on the south bank just east of a wire and board fence that goes south up hill. From here pack along the east side of the fence for 50 yards to a trail. Turn easterly on the trail and follow it to a powerline going up hill to a red clearance light. There is a fork in the trail, take the one southerly up hill just west of the powerline to a saddle of the ridge between Kalanipuu Hill (with light) and KEOPAWEO station. Here turn right, west, and proceed up to the station along the backbone of the ridge. The station is on the first prominent summit along this ridge. It shows up from Nawiliwili Harbor as a distinct conical peak on the summit of the ridge. It is a 2 hour pack. Arrangements were made to use the Coast Guard boat.

The station mark is a standard disk, stamping unknown, cemented in a drill hole in outcropping bedrock. A type B monument is over the station mark.

Reference mark 1 is a standard disk, stamped KEOPAWEO NO 1, cemented in a drill hole in outcropping bedrock. It is 8 feet lower than the station mark and can not be seen from the station at the height of the instrument.

Reference mark 2 is a standard disk, stamped KEOPAWEO NO 2, cemented in a drill hole in outcropping bedrock. It is 6 feet lower than the station mark.

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

R

NAME OF STATION: KEOPAWEO
 ESTABLISHED BY: L.G.S. YEAR: 1927 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.79 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.

| OBJECT | BEARING | DISTANCE | | DIRECTION |
|--|---------|--|-----------------|-------------------------------------|
| | | FEET | METERS | |
| | | DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION | | |
| KILOHANA 1910-1928 RM No. 1 RM No. 2 | N W | 16.605 42.258 | 5.062 12.881 | 00 00 00.0 41 45 44 311 18 32 |

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 Nawiliwili and 1 mile southwest of the inshore end of the Nawiliwili Bay breakwater, on a hill of about 1167 feet elevation, known as Keopaweo, 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, to point of brushy ridge where power line may be seen running uphill. Pack uphill through brush to first power pole then follow good trail up along power line to saddle, then go right along ridge line to first sharp peak and station. About a 2-hour pack.

Station mark is a standard disk stamped "KEOPAWEO 1927", 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 Hawaii Territorial Survey.

Reference mark number one is a standard disk stamped "KEOPAWEO NO 1", cemented in a drill hole in a 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 "KEOPAWEO NO 2", cemented in a drill hole in a large, rounded, rock outcrop on west end of hilltop, where there are several similar outcrops. The mark is about 4 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.

USCGM-DC 2717B-P89

*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.

USCGM-DC 2717B-P89

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1014
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

Kilohana (Kauai Island, O. B. French, 1910; L. G. Simons, 1928).—In southwest Kauai, on the west rim of Kilohana Crater, about 4 miles west-northwest of Lihue, and about ¼ mile 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 trail to Eisenberg's house reported as usable for cars. The old mark (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. Its azimuth from the station is 51° 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: 13.28 meters (43.6 feet), 329° 09'; 12.88 meters (42.3 feet), 102° 41'.

FORM 526a
 (11-18-58)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KILOHANA
 ESTABLISHED BY: O.B. French YEAR: 1910 STATE: Hawaii
 RECOVERED BY: C.A. Burroughs YEAR: 1962 COUNTY: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.99 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.
 DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

| OBJECT | BEARING | DISTANCE | | DIRECTION |
|-------------------------|---------|---------------|--------|-------------|
| | | FEET | METERS | |
| KEOPAWEO 1927 | | | | 0 00 06.0 |
| Lihue, Airport Beacon | E | Approx. 5 | miles | 328 24 08.7 |
| Nawiliwili Harbor Light | ESE | Approx. 6 1/2 | miles | 344 08 45.4 |

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, 4 miles west northwest of Lihue, 3/4 mile west of a mountain house 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 Puhi, 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 north-easterly between the cane fields and continue 3.3 miles 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, stamping unknown, with a type B monument over the mark. The mark is 18 feet east of the center of the bladed road and 12 feet west of the edge of the crater.

FORM 526
 (11-8-58)

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KILOHANA
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: W.R.P. YEAR: 1963 COUNTY: Kauai

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

Station recovered in good condition as described in 1962. Recovery note by C.A.B. except for the following change. The 3.3 miles mentioned in the to reach description should be 2.3 miles.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KILOHANA
 STATE: HAWAII YEAR: 1910 SECOND ORDER
 SOURCE: G-SP156

| | |
|-----------------------------------|--------------------------|
| GEODETIC LATITUDE: 21° 59' 50.667 | ELEVATION: 345.44 METERS |
| GEODETIC LONGITUDE: 159 26 03.829 | 1135.3 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|------------------|
| STATE & ZONE | CODE | X | Y | ϕ OR Δ OR ANGLE* |
| HI 4 | 5104 | 522,225.93 | 59,606.78 | + 0° 01' 29" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ϕ OR Δ OR FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| NONOU | 226 54 21.3 | 226 52 52 | 5104 |

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 211591 STATION 1014

LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

KILOHANA (continued)

FORM 52a
(2-15-65)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

R

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KILOHANA
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
Island: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.83 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

| OBJECT | BEARING | DISTANCE | | DIRECTION |
|--------------------------------|---------|----------|--------|------------|
| | | FEET | METERS | |
| NONOU 1910-1927 | | | | 00 00 00.0 |
| Lihue, County Bldg., flagstaff | ESE | | | 60 50 17 |
| RM No. 3 | SSW | 44.722 | 13.631 | 151 42 01 |
| RM No. 4 | W | 52.125 | 15.888 | 231 40 58 |

Station mark was recovered in good condition. Both reference marks have been destroyed by grading and road construction. Two new reference marks, numbers 3 & 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, bladed road along the top.

To reach station from the post office in Puhī, 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 gradual grade for 2.0 miles to fork. Take right fork, up around point of hill, for 0.3 mile; take left fork for 0.05 mile to station on right.

Station mark is a U.S. Geological Survey disk, stamped "1134", 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 46.7 feet northeast of a fence corner and 9 feet east of edge of road.

Reference mark number three is a standard disk stamped "KILOHANA 1910 1928 NO 3 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, 8 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 1928 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.

*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.

USCGM-DC 2717b-P-69

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1015
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KOLOA

STATE: HAWAII

YEAR: 1887

SECOND

ORDER

SOURCE: G-SP15c

| | | | | |
|---------------------|---------------|-----------|---|--------|
| GEODETIC LATITUDE: | 21° 52' 57.45 | ELEVATION | 8 | METERS |
| GEODETIC LONGITUDE: | 159 28 15.14 | SCALED | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--|
| STATE & ZONE | CODE | X | Y | θ 10R Δ θ 1 ANGLE * |
| HI 4 | 5104 | 509,876.24 | 17,906.63 | + 0° 00' 39" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ 10R Δ θ 1 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QO 397

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211591 STATION 1016
HAWAII
LATITUDE 21 ° 30' TO 22 ° 00'
LONGITUDE 159 ° 00' TO 159 ° 30'
DIAGRAM NF 4-6 KAUI

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.

Form 526
(11-8-66)

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

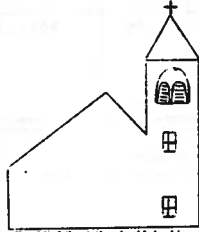
R

NAME OF STATION: Koloa Church Spire
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
Island: Kauai

Detailed statement as to the fitness of the original description; including marks found, stampings, 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,
tan-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.



* 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. COMS-DC 34916

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KOLOA CHURCH SPIRE

STATE: HAWAII

YEAR: 1910

THIRD

—ORDER

SOURCE: G-SP156
NO OBSERVATION CHECK ON THIS POSITION

| | |
|-----------------------------------|-------------------|
| GEODETIC LATITUDE: 21 ° 53' 50.40 | ELEVATION: METERS |
| GEODETIC LONGITUDE: 159 27 37.37 | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|---------------------------------|
| STATE & ZONE | CODE | X | Y | θ (OR Δ) ANGLE * |
| HI 4 | 5104 | 513,432.25 | 23,250.40 | + 0° 00' 53" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ (OR Δ) FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QI 249

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1017
 HAWAII
 LATITUDE 21 ° 30' TO 22 ° 00'
 LONGITUDE 159 ° 00' TO 155 ° 30'
 DIAGRAM NF 46 | KAUAI

Kukii Point Light (Kauai Island, F. G. Engle, 1927).—On southeast coast of Kauai, at the north side of the entrance to Nawiliwili Harbor; a pyramidal white concrete tower, about 22 feet in height.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: **Kukii Point Light**
 ESTABLISHED BY: **F.G.E.** YEAR: **1927** STATE: **Hawaii** BENCH MARK(S) ALSO
 RECOVERED BY: **D.M. Whipp** YEAR: **1965** COUNTY: **Kauai; Island: Kauai**
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: **At Nawiliwili**

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

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

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: **Kukii Point Light**
 ESTABLISHED BY: **F.G.E.** YEAR: **1927** STATE: **Hawaii** BENCH MARK(S) ALSO
 RECOVERED BY: **D.M. Whipp** YEAR: **1966** COUNTY: **Kauai**
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: **Island: Kauai**

Detailed statement as to the fitness of the original description; including marks found, stampings, 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 Nawiliwili Harbor.

FORM C&GS-525 (1-65)
 USCOMM-DC 18809-P&S

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KUKII POINT LIGHT**
 STATE: **HAWAII** YEAR: **1927** THIRD ORDER

SOURCE: **G-SP156**

| | | | |
|--------------------|-----------------|------------|--------|
| GEODETIC LATITUDE | 21 ° 57' 35.268 | ELEVATION: | METERS |
| GEODETIC LONGITUDE | 159 21 02.703 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------------|
| STATE & ZONE | CODE | X | Y | θ 10R Δ 01 ANGLE * |
| HI 4 | 5104 | 550,578.10 | 45,963.93 | + 0 ° 03' 21 " |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ 10R Δ 01 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1018
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

Laaukahi (Kauai Island, O. B. French, 1910).—In southern Kauai, about 2½ miles north of Koloa, 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 13 meters from station in azimuth 44° 07'; No. 2, stake, 5 meters distant in azimuth 164° 34'; No. 3, stake, 4 meters distant, in azimuth 277° 01'.

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: LAUKAHI
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

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

Station was recovered in good condition. This station was re-marked and a Type B-1 signal built, by the Hawaii Territorial Survey in 1930. No reference marks were set. A complete description follows:

Station is located about 2 miles north of Koloa and 1 mile southeast 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 hut on the peak near station.

To reach station from the post office in Koloa, 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.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-SP156

| | | | |
|---------------------|----------------|------------|--------------|
| GEODETIC LATITUDE: | 21° 56' 32.906 | ELEVATION: | 423.0 METERS |
| GEODETIC LONGITUDE: | 159 27 42.504 | | 1368 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|---------------------|
| STATE & ZONE | CODE | X | Y | § 10R Δ § 1 ANGLE * |
| HI 4 | 5104 | 512,944.65 | 39,648.16 | + 0° 00' 51" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE § 10R Δ § 1 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QI 041

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1019
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

Lihue mill chimney (Kauai Island, C. L. Garner, 1927).—In southeastern part of Kauai, in Lihue; the yellow brick chimney of the Lihue sugar mill.

FORM 526
 (11-8-55)

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

R

NAME OF STATION: LIHUE MILL CHIMNEY
 ESTABLISHED BY: C.L.G. YEAR: 1927 STATE: Hawaii
 RECOVERED BY:* H.O.F. YEAR: 1958 COUNTY: Kauai

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

Recovered as described in 1927, except stack is now black. There are two stacks in this vicinity. The old brick one is just north of the newer steel stack.

Form 526
 (11-8-55)

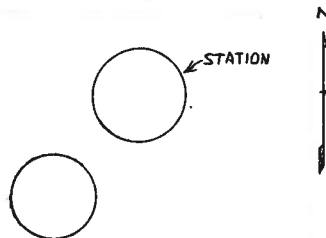
U. S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
 RECOVERY NOTE, TRIANGULATION STATION
 INTERSECTION

R

NAME OF STATION: Lihue mill chimney
 ESTABLISHED BY: C.L.G. YEAR: 1927 STATE: Hawaii
 RECOVERED BY:* D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

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

Station was recovered. It is the northeast i 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.



*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.

Comm-DC 34914

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-SP156

| | |
|-----------------------------------|-------------------|
| GEODETIC LATITUDE: 21° 58' 39.648 | ELEVATION: METERS |
| GEODETIC LONGITUDE: 159 22 30.503 | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|-------------------|
| STATE & ZONE | CODE | X | Y | θ OR Δ or ANGLE ° |
| HI 4 | 5104 | 542,307.80 | 52,452.94 | + 0° 32' 48" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ OR Δ or FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QI 073

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1020
 HAWAII
 LATITUDE 21 ° 30' TO 22 ° 00'
 LONGITUDE 159 ° 00' TO 159 ° 30'
 DIAGRAM NF 4-6 KAUAI

Form 525b
 (11-8-55)

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: **Lihue, Radio Station KTOH, Mast**
 CHIEF OF PARTY: **C.A. Burroughs** YEAR: **1962** STATE: **Hawaii** COUNTY: **Kauai**

Description, including sketch of object:

The mast is 3/4 mile northeast of Lihue, in the southeastern part of Kauai. It is 50 feet west of the building and 180 feet south of the road going to the airport. The mast is 155 feet high and is a 4 legged steel tower with a 6 foot base. The mast is painted red and white and has a red clearance light on the top.
The point observed was the top center of the mast.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **LIHUE, RADIO STATION KTOH, MAST**
 ESTABLISHED BY: **C.A.B.** YEAR: **1962** STATE: **Hawaii** BENCH MARK(S) ALSO
 RECOVERED BY: **P.D.C.** YEAR: **1978** COUNTY: **Kauai**
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:
 The station was recovered as described in good condition. The name of the radio station has been changed to KIVM.

R

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: **G-12733**

| | |
|--|--------------------------------|
| GEODETIC LATITUDE: 21 ° 58 ' 59.970 GEODETIC LONGITUDE: 159 21 46.421 | ELEVATION: METERS FEET |
|--|--------------------------------|

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------------|
| STATE & ZONE | CODE | X | Y | § 10R Δ 01 ANGLE * |
| HI 4 | 5104 | 546,455.08 | 54,507.13 | + 0 03 05 " |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE § 10R Δ 01 FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QF 390

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1021
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUI

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 45 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 12, 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'; No. 2, 4.336 meters (14.23 feet), 178° 38'.

(11-3-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MAULU
 ESTABLISHED BY: C.L.G. YEAR: 1927 STATE: Hawaii
 RECOVERED BY: H.O.F. YEAR: 1958 COUNTY: Kauai

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

The station and R.M. #1 were found as described in 1927 and in very good condition. R.M. #2 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 N.E. 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 stonewall to end of road at Hanamaulu Bay. Station is about 165 feet S.E. of south end of stonewall. R.M. #1 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.

* 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.

COM-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAULU
 STATE: HAWAII YEAR: 1927 THIRD ORDER
 SOURCE: G-SP156

| | | | |
|---------------------|----------------|------------|-------------|
| GEODETIC LATITUDE: | 21° 59' 54.312 | ELEVATION: | 14.0 METERS |
| GEODETIC LONGITUDE: | 159 20 20.661 | | 46 FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|-----------------|
| STATE & ZONE | CODE | X | Y | g OR Δ RI ANGLE |
| HI 4 | 5104 | 554,520.95 | 59,998.50 | + 0° 03' 37" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE g OR Δ RI FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| HOKUNUI | 29 06 32.7 | 29 02 56 | 5104 |

QI 080

(continued on next page)

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 211591

STATION 1021

LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

MAULU (continued)

FORM 526a
(9-18-69)

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

R

NAME OF STATION: MAULU
ESTABLISHED BY: C.L.G. YEAR: 1927 STATE: Hawaii
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
Island: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.5 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.

| OBJECT | BEARING | DISTANCE | | DIRECTION |
|-------------------|---------|----------|--------|------------|
| | | FEET | METERS | |
| HOKUNUI 1910-1927 | | | | 00 00 00.0 |
| RM No. 1 | NW | 22.357 | 6.815 | 99 07 02 |
| RM No. 3 | NNE | 24.271 | 7.398 | 167 50 20 |

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 Hanamaulu, on point on north side of Hanamaulu 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 Hanamaulu, 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 5 feet in diameter and projecting 2-1/2 feet on the lower side. It is 147 feet southeast of end of rock wall and 12 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 1 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 6 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 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.

USCOMM-DC 27178-PSS

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1022
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 155° 30'
 DIAGRAM NF 4-6 KAUI

Form 325b
 (11-8-55)

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Nawiliwili Harbor Light
 CHIEF OF PARTY: G. A. Burroughs YEAR: 1962 STATE: Hawaii COUNTY: Kauai

Description, including sketch of object:

The lighthouse is 2 1/2 miles southeast of Lihue in the southeastern part of Kauai, on Ninini Point. The lighthouse is 86 feet high, built of reinforced concrete. The diameter at the base is 16 feet and was built in 1932. It is painted sun tan.

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 southwest of the lighthouse.

Reference mark 2 is a standard disk, stamped NO 2 1927, cemented 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 74 feet southeast of the lighthouse. Also inscribed in the same boulder is, U S 1911.

A 3/4 inch steel rod in the center of a 12 inch square concrete post projecting 14 inches. In the top of the concrete post is inscribed NININI PT. LIGHT OLD MAST. It is 10 feet east of the lighthouse. Described b

Form 325
 (11-8-55)

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

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Nawiliwili Harbor Light
 ESTABLISHED BY: C.A.B. YEAR: 1962 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, stampings, changes made, and other pertinent facts:

Station was recovered in good condition.

Located on Ninini 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, 86 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 "NININI 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 Ninini 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 Ninini Pt. Light Old Mast mark.

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

COAS-17

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NAWILIWILI HARBOR LIGHT
 STATE: HAWAII YEAR: 1962 ORDER: THIRD

SOURCE: G-12733

| | | |
|--|------------|--------|
| GEODETIC LATITUDE: <u>21° 57' 29.258</u> | ELEVATION: | METERS |
| GEODETIC LONGITUDE: <u>159 20 18.947</u> | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|---------------------|
| STATE & ZONE | CODE | X | Y | θ IOR Δ θ I ANGLE ° |
| HI 4 | 5104 | 554,097.69 | 45,361.66 | + 0 03 37 |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ IOR Δ θ I FORMULA NEGLECTING THE SECOND TERM

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From mark) | PLANE AZIMUTH (From mark) | CODE |
|----------------------|---------------------------------|------------------------------|------|
| | | | |

QF 392

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1023
 HAWAII
 LATITUDE 21 ° 30' TO 22 ° 00'
 LONGITUDE 159 ° 00' TO 159 ° 30'
 DIAGRAM NF 4-6 KAUAI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 535 b

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

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

Description, including sketch of object: **Station is on Ninini Point, about 2.5 mi. SE of Lihue and near E entrance of Nawiliwili Bay.**
Station is the center of the revolving light on the top of the light-house approximately 86 ft. above the ground.

NOTE: This station is noted in the 1932 recovery note for NININI 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(S) ALSO
 RECOVERED BY: **P.D.C.** YEAR: 1978 COUNTY: **Kauai**

R

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

2.5 mi. S.E. of Lihue

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

The station was recovered as described in good condition.

NOAA FORM 76-165
 (12-72)
 (OLD C&GS 528)

U. S. G. P. O. 1973-769-566/563 REG. #6

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **NAWILIWILI HARBOR LIGHTHOUSE** OBS BY **USGS**
 STATE: **HAWAII** YEAR: **1962** **THIRD** -ORDER

SOURCE: **G-12992**

| | | | |
|---------------------|------------------------|------------|---------------|
| GEODETIC LATITUDE: | 21 ° 57' 29.259 | ELEVATION: | METERS |
| GEODETIC LONGITUDE: | 159 20 18.956 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|-------------|-------------------|------------------|-----------------------------------|
| STATE & ZONE | CODE | X | Y | ϕ OR Δ ϕ ANGLE ° |
| HI 4 | 5104 | 554,696.84 | 45,361.76 | + 0° 03' 37" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ϕ OR Δ ϕ FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| | | | |

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

QF 251

ATAO HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1024
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 155° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

Ninini Point Light (Kauai Island, C. L. Garner, 1927;
 F. G. Engle, 1927).—On Ninini Point, at 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, C.L.G., 1927;
 U.S.L.H.S., 1932) --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 ref-
 erence 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 eccentrically in 1927, and 2 reference marks were estab-
 lished. There is no description of the eccentric station or the
 reference marks, but the cross is probably the eccentric station.
 The following information is given in the list of directions.

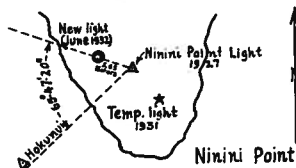
| Station NININI ECC: | OBJECT | DISTANCE | DIRECTION |
|---------------------|--------------|----------|-----------|
| | HOKUNUI | meters | 0°00'00" |
| | R.M. 1 | 10.48 | 59 13 42 |
| | NININI POINT | | |
| | LIGHTHOUSE | 11.02 | 217 03 20 |
| | R.M. 2 | 26.47 | 264 33 50 |

(C.K.G., 1932)--The white mast has been sawed off 3 ft. from
 the ground (1931), a nail in the center of an 8- by 8-in. solid
 stump marks the station at present, but it will be remarked by the
 Lighthouse Service engineer by June 1932. The position of the
 station will not be changed, and the mark will be a small rod set
 in a concrete block, 1-ft. square on top, and projecting about 1
 ft. above ground, inscription will be "NININI PT LT OLD MAST."

The cabin and the temporary light tower (1931) will be re-
 moved 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 eccentric
 station occupied in 1927. Two standard reference-mark disks,
 stamped "NO 1 and NO 2 1927" point to the vicinity of the destroy-
 ed 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.

| OBJECT | DISTANCE | DIRECTION |
|---|----------|-----------|
| HOKUNUI | meters | 0°00'00" |
| Center of permanent concrete light tower | 5.63 | 65 47 20 |



(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NININI POINT LIGHT
 STATE: HAWAII YEAR: 1927 THIRD ORDER

SOURCE: G-SP156

| | | | |
|---------------------|----------------|------------|--------|
| GEODETIC LATITUDE: | 21° 57' 29.157 | ELEVATION: | METERS |
| GEODETIC LONGITUDE: | 159 20 18.793 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|------------------|
| STATE & ZONE | CODE | X | Y | θ (OR Δ) ANGLE * |
| HI 4 | 5104 | 554,712.20 | 45,351.48 | + 0° 03' 37" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ (OR Δ) ANGLE FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QI 066

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

NININI POINT LIGHT (continued)

Form 32b
(11-8-55)

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: Hawaii
RECOVERED BY: H.O.F. YEAR: 1958 COUNTY: Kauai

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

The station and R.M.s were all found in good condition as described in 1932 with the following additions.

R.M. #1 is 44.7 feet N.W. of the center of the lighthouse, cemented in the top of a truncated block of concrete. R.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 1932 and distance was found to be correct.

Form 325b
(11-8-55)

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

RECOVERY
DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Ninini Point Light
Established By: C.L. Garner YEAR: 1927 STATE: Hawaii COUNTRY: Kauai
CHIEF OF PARTY: C.A. Burroughs YEAR: 1962

Description, including sketch of object:

The lighthouse was replaced by another lighthouse in approximately the same location in 1932. Two standard reference mark disks were found. Reference mark 1 a standard disk, stamped NO 1 1927, set in the top of a 12 inch square concrete post projecting 14 inches and southwest of the lighthouse. Reference mark 2 a standard disk, stamped NO 2 1927, cemented in a drill hole in a large boulder. It is southeast of the lighthouse.

Form 528
(11-8-55)

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: HAWAII
RECOVERED BY: H.O.F. YEAR: 1963 COUNTY: KAUAI

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

This station was recovered as described by information given C.K.G. in 1932 recovery note and by 1962 recovery note by C.A.B. The work mentioned by C.K.G. in 1932 was completed by the U.S.L.H.S. The line to reference mark no. 1, is blocked by the lighthouse.

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 211591 STATION 1024

LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

Form 528
(11-8-55)

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

NAME OF STATION: Ninini Point Light
ESTABLISHED BY: C.L.G. YEAR: 1927 STATE: Hawaii
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
Island: Kauai

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

The old light mast 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, at north side of entrance to Nawiliwili Bay, 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 southwest of edge of road, 12 feet northeast of edge of bluff and 44 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.

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

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 pas-
sing the Koloa Mill and following it through the cane fields along
(near) the W side of a hill to the saddle, between the two round-
ed 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 307D

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1025
 HAWAII
 LATITUDE 21 ° 30' TO 22 ° 00'
 LONGITUDE 159 ° 00' TO 159 ° 30'
 DIAGRAM NF 46 KAUAI

Paa (Kauai Island, O. B. French, 1910).—In southern part of Kauai, about 2 miles southeast of Koloa, on a conspicuous round-topped hill. Identical 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 the steel irrigation pipe line running up its north side. Station is in the lantana near the east edge of the rounding 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 4 by 6 inch post set in ground and projecting about 1 foot. Reference marks are stakes at the following azimuths: 133° 00'; 200° 27'; and 242° 54'.

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: PAA
 ESTABLISHED BY: OBF YEAR: 1910 STATE: Hawaii
 RECOVERED BY: REA YEAR: 1961 COUNTY: Kauai

Detailed statement as to the fitness of the original description; including marks found, stampings, 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 HGS, but is not in the same location as the original one.

FORM 528
 (11-8-55)

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

R

NAME OF STATION: PAA
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

Detailed statement as to the fitness of the original description; including marks found, stampings, 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.

* 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.

CGO-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAA

STATE: HAWAII

YEAR: 1910

SECOND

—ORDER

SOURCE: G-SP156

| | | | | |
|---------------------|---------------|------------|-----|--------|
| GEODETIC LATITUDE: | 21 53' 38.012 | ELEVATION: | 105 | METERS |
| GEODETIC LONGITUDE: | 159 26 34.327 | SCALED | | FEET |

| STATE COORDINATES (FWS) | | | | |
|-------------------------|------|------------|-----------|-----------------------------|
| STATE & ZONE | CODE | X | Y | θ OR Δ ANGLE* |
| HI 4 | 5104 | 519,369.79 | 22,002.24 | + 0 01 17 |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ OR Δ FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From north) | PLANE AZIMUTH* (From north) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| | | | |

QI 042

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

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 NF 4-6 KAUAI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

Form 526
 (11-8-65)

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

R

NAME OF STATION: Pihakapu
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

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

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.

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

SOURCE: G-SP156

| | | | |
|--------------------|---------------|------------|--------|
| GEODETIC LATITUDE | 21° 54' 35.15 | ELEVATION: | METERS |
| GEODETIC LONGITUDE | 159 24 05.14 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------------------------------|
| STATE & ZONE | CODE | X | Y | θ OR Δ θ ANGLE* |
| HI 4 | 5104 | 533,416.18 | 27,774.54 | + 0° 02' 12" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ OR Δ θ FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| | | | |

* 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. COMB-DC 34314

QI 055

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1027
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

Form 526
 (11-8-66)

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

R

NAME OF STATION: Point
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii
 RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai
 Island: Kauai

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

Station was identified by angle at station
 KAI. It is a prominent, rounded rock knob on the point at southwest
 side of Nohiu Cove, and is at about 570 feet elevation.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POINT

STATE: HAWAII

YEAR: 1910

THIRD

-ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

| | | | |
|---------------------|----------------|------------|--------|
| GEODETIC LATITUDE: | 21° 56' 07.6" | ELEVATION: | METERS |
| GEODETIC LONGITUDE: | 159° 21' 31.4" | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|-------------------------------|
| STATE & ZONE | CODE | X | Y | β OR Δ OR ANGLE* |
| HI 4 | 5104 | 547,884.87 | 57,115.06 | + 0° 03' 10" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β OR Δ OR α FORMULA NEGLECTING THE SECOND TERM

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| | | | |

* 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.

COGS-DC 34314

Q1 061

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1028
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 46 KAUAI

Form 525b
 (11-8-55)

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Poipu, Loran Transmitter Station, Mast

CHIEF OF PARTY: C. A. Burroughs YEAR: 1962 STATE: Hawaii COUNTY: Kauai

Description, including sketch of object:

The mast is east of Poipu and 3 miles south southeast of Koloa in the southern part of Kauai. It is a U.S. Coast Guard installation. The mast is 280 feet high, 3 legged with a point support at the base and guyed with 1 set of 3 guy wires. It is painted red and white and has red clearance lights. The point observed was the top center of the mast.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POIPU LORAN TRANSM STA MAST

STATE: HAWAII YEAR: 1962 THIRD ORDER

SOURCE: G-12753

| | | | |
|---------------------|----------------|------------|--------|
| GEODETIC LATITUDE: | 21° 52' 20.560 | ELEVATION: | METERS |
| GEODETIC LONGITUDE: | 159 26 48.014 | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--|
| STATE & ZONE | CODE | X | Y | θ HOR Δ θ ANGLE * |
| HI 4 | 5104 | 518,083.49 | 14,186.41 | + 0° 01' 12" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ HOR Δ θ FORMULA NEGLECTING THE SECOND TERM.

Com-DC 34813

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH * (From south) | CODE |
|----------------------|----------------------------------|---------------------------------|------|
| | | | |

QF 385

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211591 STATION 1029
 HAWAII
 LATITUDE 21° 30' TO 22° 00'
 LONGITUDE 159° 00' TO 159° 30'
 DIAGRAM NF 4-6 KAUI

NO ORIGINAL TEXT

Post (Kauai Island, O. B. French, 1910; C. L. Garner, 1926).—On the south coast of Kauai, on a rocky point 1 mile west of Koloa 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.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Post
 ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: D.M. Whipp YEAR: 1966 COUNTY: Kauai
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Kauai

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

A mark consisting of a 2-inch pipe in the center of an 8-inch square copper plate set in concrete was found by inverse from a trial point established nearby and is believed to be the station. It is in the south end of a large lawn of a home on Ka Lae Kiki Point, 18 feet north of end of lawn and 18 feet northeast of a large, stone-and-mortar box. Located about 2 miles southwest of Koloa and 1/2-mile west of the Kuhio Hotel.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

| | | | | |
|---------------------|-----------------|------------|---|--------|
| GEODETIC LATITUDE: | 21° 53' 05.10" | ELEVATION: | 1 | METERS |
| GEODETIC LONGITUDE: | 159° 29' 05.86" | SCALED | | FEET |

| STATE COORDINATES (Feet) | | | | |
|--------------------------|------|------------|-----------|--------------|
| STATE & ZONE | CODE | X | Y | ANGLE* |
| HI 4 | 5104 | 505,099.10 | 18,677.87 | + 0° 00' 20" |

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\theta = \Delta \theta$ FORMULA NEGLECTING THE SECOND TERM.

| TO STATION OR OBJECT | GEODETIC AZIMUTH (From south) | PLANE AZIMUTH* (From south) | CODE |
|----------------------|----------------------------------|--------------------------------|------|
| | | | |