

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1001  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

Ana (Kauai Island, F. G. Engle, 1927).—On eastern coast of Kauai, about ¼ mile southeast of Anahola. Reached by a dirt road which branches east from the main highway at a point about 1½ miles south of Anahola and runs along the north bank of Kamalomaloo stream to a group of plantation buildings. Turn north here on a road through the cane to where it branches and crosses a ditch. The station will be found in a triangular clearing between two branches of an irrigation ditch and amid a large pile of boulders. Marked by a standard disk in boulder, note 4. Reference mark is a standard reference disk in a boulder, note 12c, on the north side of culvert over ditch. It is 5.520 meters (18.11 feet) from station in azimuth 290° 41'.

(11-8-85)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: ANA  
ESTABLISHED BY: F.G.E. 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 mark was recovered in good condition. A search by distance and angle was made for the reference mark; it has been destroyed by cultivation. No new reference marks were established since the station is in a small plot of land protected by the plantation company and there is no suitable location nearby. A complete description follows:

Station is located about 1 mile south-southeast of Anahola post office and 0.35 mile west of State Highway 56, in a sugar-cane field, along the east side of an irrigation canal.

To reach station from the post office in Anahola, go south for 0.05 mile; turn right and go south on State Highway 56 for 1.65 mile to cross-road; turn right and go west on main field road for 0.45 mile to canal crossing. Turn back sharp left, just after crossing small bridge, and go 55 yards to station on left.

Station mark is a standard disk stamped "ANA 1927", cemented in a drill hole in a boulder that projects 8 inches above ground. It is in a small triangular plot, 10 yards on a side, bounded by the canal on the west side, and small field ditches on other two sides. Station is midway between 2 floodgates about 50 feet apart in the canal, and is 16 feet east of the canal. An old Type A signal, built by the Hawaii Territorial Survey in 1930, has collapsed and only the west wall is standing. The remaining boulders are in a pile surrounding the station mark.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: ANA

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 07 ' 59.708	ELEVATION	73	METERS
GEODETIC LONGITUDE:	159 18 40.190	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 10R Δ 01 ANGLE *
HI 4	5104	563,915.55	108,989.92	+ 0 04 16 "

\* 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 050

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1002  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

Caddie (Kauai Island, C. L. Garner, 1927).—On the eastern shore of Kauai, half way between Hanamaulu and Wailua. Reached from the main highway by passing through the gateway of the golf links, across the links, and southeast over the sand dunes. Station is on a high sand dune next to the beach. Marked according to note 1a, standard disk in concrete post, while two reference marks, similar to the center mark (note 1a) were placed on adjacent sand dunes, at the following distances and azimuths from the station: No. 1, 13.176 meters (43.23 feet), 1° 04'; No. 2, 8.150 meters (26.74 feet), 88° 07'. These sand dunes all have some grass on them.

(11-8-55)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: CADDIE  
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 the two R.M.s were searched for but not found. Recent development done by the golf course probably covered or destroyed the marks.

Form 528  
(11-8-55)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: CADDIE  
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 searched for but not found and is believed destroyed. The original point was determined by setting on the old check angles with a theodolite. This area is now lower than that surrounding and there are no longer sand dunes; it was apparently leveled during construction of the golf course.

\* 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-5C 948 14

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: CADDIE

STATE: HAWAII

YEAR: 1927

THIRD

—ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 01' 46.101	ELEVATION:	6	METERS
GEODETIC LONGITUDE:	159 20 30.894	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ $\theta$ 1 ANGLE "
HI 4	5104	553,546.27	71,277.88	+ 0° 03' 34"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE  $\theta$  OR  $\Delta$   $\theta$  1 FORMULA NEGLECTING THE SECOND TERM.

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

QI 045

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1003  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

Cam (Kauai Island, F. G. Engle, 1927).—On north coast of Kauai, eastern side of Hanalei Bay, on a point called Puu Poa about 1 mile north of the village of Hanalei. Station is about 140 feet above high water, the ground dropping off abruptly to the water. Approached to within a half mile by a road which branches off from the government highway about 1 mile east of the village of Hanalei, or it may be reached by following up the coast from the mouth of the Hanalei River. Marked according to note 4, a standard disk in bowlder. Two reference marks were set, note 12c, standard reference disks in bowlders, at the following distances and azimuths from the station: No. 1, 4.07 meters (13.4 feet), 69° 44'; No. 2, 4.29 meters (14.1 feet), 188° 27'.

Form 528  
(11-8-65)

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

R

NAME OF STATION: CAM  
ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii  
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai

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

Station is destroyed. The entire flat ridge-top has been recently cleared off by bulldozer, and cultivated. The only mark found was reference mark number 1. The boulder in which it was set was found laying on a pile of debris along rim of ridge. The disk was removed.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: CAM

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 13 ' 32.887	ELEVATION	43	METERS
GEODETIC LONGITUDE:	159 29 55.934	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 10R Δ §1 ANGLE *
HI 4	5104	500,382.03	142,571.19	+ 0 ° 00 ' 02 "

\* 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

\* 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

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1004  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

Form 528  
(11-8-56)

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

NAME OF STATION: Church spire  
ESTABLISHED BY: F.G.E. 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 in fair condition.  
Located about 4 miles east-southeast of Kilauea and 1 mile west of  
Moloaa Bay, in a grove of large trees on northeast side of State High-  
way 56, by a small cemetery, at the first crossroad after coming up out  
of Moloaa Stream canyon.

Station is the small spire on southwest end of a small, tan,  
church building.

NOTE: The church has been abandoned for a long time and appears  
as if it would collapse at any 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.

Comm-DC 34814

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: CHURCH SPIRE

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 11 ' 52.424	ELEVATION:	METERS
GEODETIC LONGITUDE:	159 21 02.104		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 10R Δ #1 ANGLE *
HI 4	5104	550,549.70	132,458.37	+ 0 ° 03 ' 23 "

\* 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
	0 ° ' "	0 ° ' "	

QI 122

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1005  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

Crest (Kauai Island, F. G. Engle, 1927).—On the north coast of Kauai, on the west side of Kalihiwai Bay, about 1 mile northwest of the village of Kalihiwai. Station is about 200 feet above high water on brow of hill with grass covered top. Approached by a paved road which leaves the main highway on the west side of the bay and parallels the coast. Marked by a standard station disk cemented in a 1½-inch pipe driven flush with the ground. Three reference marks, note 12c, standard reference disks in boulders, were set at the following distances and azimuths from the station: No. 1, 13.13 meters (43.1 feet), 121° 18'; No. 2, 8.05 meters (26.4 feet), 74° 47'; No. 3, 11.37 meters (37.3 feet), 193° 28'.

COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: CREST

ESTABLISHED BY: F.G.E.

RECOVERED BY: D.M. Whipp

YEAR: 1927

YEAR: 1965

STATE: Hawaii

COUNTY: Kauai

Island: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.63 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	
POOKU 1910-1927 (Hanalei Latitude Station)				
RM No. 2	WSW	26.308	8.019	17 09 46
RM No. 1	WNW	42.949	13.092	63 22 14
RM No. 3	NNE	37.278	11.362	135 47 45

Station was recovered and all marks found in good condition. There is now a house about 150 yards northwest from station, on a terrace on point of ridge, about 50 feet lower than station. A complete description follows:

Station is located about 2 miles west-northwest of Kilauea, along north coast of Kauai, on the point on west side of Kalihiwai Bay, at about 200 feet elevation.

To reach station from main intersection in Kilauea, go westerly on State Highway 56 for 2.3 miles; turn right on paved side road and go 0.3 mile; take left fork at sign "ANINI BEACH" and follow coast road west for

0.8 mile; go left up steep side road for 0.15 mile to house; continue up grade for 0.1 mile to station just after reaching top of mesa. NOTE: station may also be reached by a track road beginning opposite the northeast end of the Hanalei Plantation Airstrip, about 3/4 mile south.

Station mark is a standard disk stamped "CREST 1927", cemented in the top of a 1½-inch iron pipe that projects 1 inch from the ground. It is at extreme north tip of the mesa, in a grassy area of otherwise brush-covered mesa, 15 yards west of track road and 47 feet south of a cutbank.

Reference mark number one is a standard disk stamped "CREST 1 1927", cemented in a drill hole in the east end of a 3 x 3 x 8-foot boulder, which is the north 1 of 2 similar boulders, hidden by lantana brush. It is 4.6 feet lower than station mark. The arrow on the disk points off about 15 feet north from station mark.

Reference mark number two is a standard disk stamped "CREST 2 1927", cemented in a drill hole in the east end of a 2 x 4-foot boulder that projects 1½ feet above ground. It is 1.4 feet lower than station mark and is hidden by grass and brush.

Reference mark number three is a standard disk stamped "CREST 3 1927", cemented in a drill hole in a 2½ x 5-foot boulder that projects 1 foot above ground. It is on the north slope of the mesa, 10 feet south from edge of cutbank and 5.9 feet lower than station mark.

\*Name of chief of party should be inserted here. If of the recovery note.

NOTE - One of these to-

ally visited the station about sign in name at the end

recovered.

USC&MS-DC 2717a-22a.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: CREST

STATE: HAWAII

YEAR: 1927

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 13 29.421	ELEVATION:	61.0 METERS
GEODETIC LONGITUDE:	159 26 25.608		200 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	S OR Δ S1 ANGLE
HI 4	5104	520,144.00	142,225.39	+ 0 01 21

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE S OR Δ S1 FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POOKU	57 40 07.5	57 38 47	5104

QI 126

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1006  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

Cut (Kauai Island, O. B. French, 1910).—At top of bluff where the road enters the deep cut at the top of the hill east of Kalihiwai Bay. Center marked by stone 8 inches square with cross in top. This is one of the old boundary monuments.

Form 528  
(11-6-65)

U. S. DEPARTMENT OF COMMERCE - LAND AND NAVIGATION SURVEY  
RECOVERY NOTE, TRIANGULATION STATION  
INTERSECTION

R

NAME OF STATION: Cut  
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 status 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.

The hill has been leveled off and has a paved street along the top, with houses built on both sides of the street.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: CUT

STATE: HAWAII

YEAR: 1910

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 13 ' 23.288	ELEVATION:	53	METERS
GEODETIC LONGITUDE:	159 25 40.100	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ 10R $\Delta$ 01 ANGLE *
HI 4	5104	524,420.17	141,608.37	+ 0 ° 01 ' 38 "

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE  $\theta$  10R  $\Delta$  01 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.

Comm-DC 343 14

QUAD 221592 STATION 1007  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

**Dln** (Kauai Island, O. B. French, 1910).—On the east coast of Kauai, 2 miles southeast of Nonou, 50 meters back from and 20 feet above high-water mark, and at the outer end of the most northerly of four large piles of stones which extend out from a stone wall in front of a cane field. Marked by cross in 1 foot cube of rock.

Form 528  
(11-8-85)

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

RECOVERY NOTE, TRIANGULATION STATION  
INTERSECTION

NAME OF STATION: Din  
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii  
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai  
Island: 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 not found and is believed destroyed. The approximate location was determined by angle check on 3 surrounding triangulation stations. There is no longer a stone wall in the vicinity.

\*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 run.  
NOTE.—One of these forms must be used for every station recovered.

CONFIDENTIAL

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

NAME OF STATION: DIN

STATE HAWAII

YEAR: 1910

THIRD

## ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 02' 24.660	ELEVATION:	METERS
GEODETIC LONGITUDE:	159 20 19.830		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta \theta$ ANGLE °
HI 4	5104	554,583.16	75,169.88	+ 0° 03' 38"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
	O    F    M	O    F    M	

QI 086

QI 086



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1008  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

**Drift (Kauai Island, C. L. Garner, 1927).**—On the eastern shore of Kauai between Kahala Lighthouse and Kealia. It is reached by a dirt road which goes along the northern bank of the Kamalomaloo stream, leaving the main road at a point 1 1/4 miles south of Anahola, and leading to the sea. When railroad track is reached follow it north for about 1/4 mile, when station will be found on a large rock outcrop between two spurs of track. Marked according to note 2, a standard disk in outcropping bedrock. Three reference marks, note 12a, standard reference disks in outcropping bedrock, were set at the following distances and azimuths from the station: No. 1, 5.450 meters (17.88 feet), 57° 07'; No. 2, 5.195 meters (17.04 feet), 301° 00'; and No. 3, 11.570 meters (37.96 feet), 175° 21'.

(11-8-65)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: DRIFT  
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 and all marks found in good condition. Station is now in the center of a dense grove of ironwood trees about 40 feet tall and is totally obstructed. A complete description follows:

Station is located about 1-3/4 miles southeast of Anahola and 2 miles north-northeast of Kealia, on a slight rise on timbered slope, about 300 feet west from shoreline, about midway between Pohakuloa Point and Anapalau Point, and between the shoreline cane-haul road and the uphill, main field road.

To reach station from the post office in Anahola, go south for 0.05 mile; turn right and go south on State Highway 56 for 1.65 mile to crossroad. Turn left and go 0.7 mile to station on left, 0.1 mile before reaching junction with shoreline road.

Station mark is a standard disk stamped "DRIFT 1927", cemented in a drill hole in a 3-foot, triangular-shaped boulder that projects 1 foot above ground. It is 75 feet east, downslope, from the road, 5 feet northeast of a 1-inch diameter drill hole 6 inches deep in the top of a large boulder, and sets among a group of large boulders.

Reference mark number one is a standard disk stamped "DRIFT 1 1927", cemented in a drill hole in a triangular boulder that projects 16 inches above ground and is at same elevation as station. It is 5.448 m (17.873 ft.) from station in azimuth 57° 07'.

Reference mark number two is a standard disk stamped "DRIFT 2 1927", cemented in a drill hole in the makai side of a large, 4 x 6-foot rock that projects 10 inches above ground and is 2-1/2 feet lower than station mark. It is 5.128 m (16.822 ft.) from station azimuth 301° 00'.

Reference mark number three is a standard disk stamped "DRIFT RM 3 1927", cemented in a drill hole in the 1 x 2-foot top of a rock flush with ground and about 8 inches lower than station mark. It is 11.571 m (37.961 ft.) from station in azimuth 175° 21'. The mark is usually covered with a layer of pine needles.

NOTE: The discrepancy in distance to R.M. 2 was noted and checked in the field and the new distance is correct. The present slope distance to the mark coincides with the old distance, so it is believed that it was measured that way in 1927.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: DRIFT

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 07' 44.436	ELEVATION:	18	METERS
GEODETIC LONGITUDE:	159 17 47.727	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ 10R Δ ρ1 ANGLE *
HI 4	5104	568,850.18	107,455.19	+ 0° 04' 36"

\* 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

QI 049



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 221592 STATION 1009  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

### RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Eeyrie  
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:

Station is seaward (makai) one of two very sharp peaks, and is slightly lower. It is on the ridge that rises abruptly up to the south from station HIHIMANU and is about 1 mile south of that station. Elevation of the peak is about 2350 feet; it lies about 2 miles air-line southeast of Hanalei village.

FORM C&GS-526 (11-65)  
USCOMM-DC 18508-PSS

U. S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: EEEYRIE

STATE: HAWAII

YEAR: 1910

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 10' 32.800	ELEVATION:	METERS
GEODETIC LONGITUDE:	159° 29' 14.259		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\phi$ OR $\Delta$ $\phi$ ANGLE *
HI-4	5104	504,299.26	124,398.82	+ 0° 00' 17"

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

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

Q1 128

QI 100



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1012  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 155° 00' TO 155° 30'  
DIAGRAM NF 4-6 KAUAI

**Hanahanapuni (Kauai Island, O. B. French, 1910).**—On a low rounded heavily wooded hill of the same name, 4 miles north of Kilohana Crater. Station is on southeast rim of large shallow crater. The station mark is a forest reserve monument of the Territorial government. It consists of a 3-inch gas pipe set in the ground and projecting 1½ feet. Fitting over this is a 4-inch pipe, 4 feet long, painted white.

(11-3-55)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: HANAHANAPUNI

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. It is now marked by a Hawaii Territory Survey disk which was set in 1930, replacing the original 3-inch pipe, and has a Type B-1 signal centered over it, also built in 1930 by the Hawaii Territorial Survey. A complete description follows:

Station is located about 6-1/2 miles northwest of Lihue and 7 miles west-southwest of Kapaa, on a low, rounded, heavily-wooded hill of about 910 feet elevation, which is not too prominent because it rises only about 250 feet above the surrounding cane-fields. There is a high-tension line running over the lower, east side of the hill.

To reach station from the junction of State Highways 50 and 56 in Lihue, go north on State Highway 56 for 0.5 mile; turn left on Ehiku St. and go 0.25 mile to edge of town; continue ahead on paved cane-field road northwest for 1.7 miles to paved fork. Take left fork and go 1.1 miles to diagonal cross-road at Experimental Station. Continue ahead for 2.9 miles to high-tension line; follow main road north along the high-tension line for 0.9 mile to a cross-road. Go left, passing to south side of station hill, for 0.4 mile to to side road right. Turn right and go 0.35 mile to fork where cane fields separate. Take right fork, up along edge of field on hillside, for 0.25 mile to end of truck travel where road goes up over a small rise. Pack northerly up hill to top and station. NOTE: A very difficult pack because of very dense ferns and brush.

Station mark is an unstamped HTS disk set in concrete 6 inches beneath the 6-foot-square, concrete platform of the Type B-1 signal, on highest point of the narrow-topped hill.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HANAHANAPUNI

STATE: HAWAII

YEAR: 1910

SECOND

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 03' 24.091	ELEVATION:	277.0 METERS
GEODETIC LONGITUDE:	159° 25' 42.600		909 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE
HI 4	5104	524,213.70	81,143.81	+ 0° 01' 37"

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

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

Q1-008

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1013  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

Hanalei (Kauai Island, O. B. French, 1910; F. G. Engle, 1927).—On the north coast of Kauai, on a rounding grassy point about 2 miles northeast of Hanalei, and 2 miles north-northwest of the stables at the top of Hanalei Hill. Point is at the end of a gulch or small ravine through which a ditch has been cut, and which is crossed by a fence about 1/4 mile above station. Station is identical with Hawaiian Government Survey station and was marked in 1910 by a 2-inch gas pipe driven in the ground; in 1927 a standard disk station mark was set in this pipe and a mound of rocks cemented around it. The 1910 reference marks were not recovered in 1927, but two new reference marks were set; they are standard reference disks and were set in out-cropping bedrock, as follows: No. 1, in the slope of the hill, 11.51 meters (37.8 feet) from station in azimuth 115° 45'; No. 2, near the bluff line and path leading to the station, 73.36 meters (240.7 feet) from the station in azimuth 290° 16'.

COAST AND GEODETIC SURVEY

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HANAIEI  
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 1.75 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	
KILAUEA 1910-1927				
RM No. 2	ENE	240.029	(73.161)	00 00 00.0
RM No. 1	WNW	37.537	11.442	201 47 30

Station was recovered and all marks found in good condition. A complete description follows:  
Station is located about 2 miles north-northeast of Hanalei and 1/2 mile west of Kaweonui Point, along the north coast of Kauai, on a small point of 151 feet elevation, isolated by deep ravines.

To reach station from the post office in Hanalei, go easterly on State Highway 56 for 2.5 miles to side road left at sign "HANAIEI PLANTATION HOTEL". Turn left and go 0.1 mile to metal gate on right. Pass through gate and follow track road 0.2 mile to old slaughter house. Pass to left of building and go 0.2 mile to a gate. Pass through gate and go

northwest across pasture on dim road for 0.5 mile to another gate. Pass through gate, bear right, and follow along fence for 0.1 mile to gate. Pass through gate and go 0.5 mile across pasture to end of mesa. Pack north, down across deep ravine and up hill to top and station. A 5-minute pack.

Station mark is a standard disk stamped "HANAIEI 1927", set in concrete beneath a Type B-1 signal constructed by the Hawaii Territorial Survey. Access to the mark is had through a small hand-tunnel passing beneath the center concrete pedestal. Station is 14 feet south from cliff edge and 10 feet southwest of the easternmost ironwood tree of the group of trees on the point.

Reference mark number one is a standard disk stamped "HANAIEI 1 1927", cemented in a drill hole in bedrock on west side of hill. It is 10 feet southwest of a large ironwood and 8.1 feet lower than station mark.

Reference mark number two is a standard disk stamped "HANAIEI 2 1927", cemented in a drill in red bedrock of cliff edge. Located in slight saddle to east of station, 2 feet south from cliff, 60 feet west of a fence line and 13.9 feet lower than station mark.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HANAIEI

STATE: HAWAII

YEAR: 1910

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 13' 56.239	ELEVATION:	46.0 METERS
GEODETIC LONGITUDE:	159° 25' 15.815		151 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\delta$ OR $\Delta$ OR ANGLE
HI 4	5104	504,151.34	144,927.81	+ 0° 00' 17"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
KILAUEA	273 57 57.5	273 57 41	5104

QI 017

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1014  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

Har (Kauai Island, O. B. French, 1910).—On the east coast of Kauai, on a high point of shore line ¼ mile north of Wailua River, and 200 meters east of north end of coconut grove. It is in a pasture and about 20 meters back from and 20 feet above high-water mark. Marked by a cross cut in a flat rock. Reference mark 5 nails driven into top of fence post 34 meters northeast.

(11-B-55)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: Har  
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:

Identity not certain. A one inch drill hole was found in the center of a cross-cut in the top of a 2' x 3' pyramid shaped boulder. Natives say the northend of an old coconut grove was about 200 meters west of the mark. The mark is now 153 feet east of the center line of an old paved road, about 70 feet back from and 20 feet above high-water line, and 5 feet north of the center line of a lane, belonging to the Territory, and leading down to the small cove. The mark is now surrounded by private homes. The R.M. was not found.

To reach from the bridge across Wailua River, go 0.4 mile north along the main highway; turn right and go 0.15 mile along old paved road to the Territorial lane on right, leading down to the beach.

Form 528  
(11-B-55)

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

R

NAME OF STATION: Har  
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. A drill hole in a large rock was found in a lane in vicinity of station. Subsequent investigation at the Hawaii State Survey Office proved this to be a survey point called "PAPALOA" established by the Territorial Survey long ago on the 10-foot-wide, beach access strip. The distance and azimuth of Har from this mark were computed and a search was made but no mark found. The point falls in the back yard lawn of a home.

\* 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: HAR

STATE: HAWAII

YEAR: 1910

THIRD

ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 22 ° 03' 15.26	ELEVATION: 6 METERS
GEODETIC LONGITUDE: 159 20 07.10	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 10R Δ § 1 ANGLE *
HI 4	5104	555,775.31	80,277.11	+ 0 ° 03' 43"

\* 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

Q1 089

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1015  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

**Hihimanu** (Kauai Island, O. B. French, 1910).—On the lower Hihimanu (Kaukaopua), about 2 miles southeast of the village of Hanalei. The station is on the west point of a double summit which appears as a single one from below on account of trees and brush, and is identical with the Hawaiian Government Survey station, the original mark, a 1½-inch gas pipe, remaining in place. It projects about 1 foot above the ground. Approached by a trail leading up a spur to the northeast; this trail leaves the Hanalei valley road about ¼ mile above the Chinese temple. Reference marks are as follows: No. 1, bottle set in ground with neck projecting 2 inches, distant 27.4 feet, in azimuth 187° 15'; No. 2, bottle set in ground, with 3 inches of neck projecting, distant 20.1 feet, in azimuth 278° 41'; No. 3, bottle set in ground with 3 inches of neck projecting, distant 13.6 feet, in azimuth 58° 25'. It is near an 18-inch lihue tree.

(11-8-55)

## RECOVERY NOTE, TRIANGULATION STATION

**R**

NAME OF STATION: **HIHIMANU**  
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 found in good condition. Two of the bottle reference marks, numbers 2 and 3, were recovered in good condition. Number 1 was not found and is believed lost due erosion of edge of hill. A complete description follows:

Station is located about 1-1/2 miles southeast of Hanalei and 1 mile north-northeast of Hihimanu Peak, on the west point of a double-tipped summit of about 1272 feet elevation on the ridge running northerly down from Hihimanu Peak and terminating in the east end of Hanalei Valley. The summit is densely covered with very high ferns, brush, and a few small trees. The ridge leading up to the station is also covered with dense ferns and the station is difficult to reach as trail must be cleared.

To reach station from the post office in Hanalei, go east on State Highway 56 for 1.5 miles to paved fork. Take right fork, just before crossing highway bridge, and go 0.5 mile; take dim track side road right, and go 0.7 mile to top of grade at a power-line tower on crest of ridge, and end of road. Pack southerly along crest of ridge for about 1 mile to station. NOTE: A 4-wheel-drive vehicle is required for the last 0.7 mile.

Station mark is a 1-1/2-inch, iron pipe that projects 1-1/2 feet above ground. It is near west edge of the west point and hidden by dense ferns and brush.

Reference mark number 2 is a green bottle set in the ground, with 2 inches of the neck projecting above ground. It is 6.108 m, (20.036 ft.), from station in azimuth 278° 41'.

Reference mark number 3 is a brown bottle set in the ground, with 3 inches of the neck projecting above ground. It is 4.204 m, (13.790 ft.), from station in azimuth 58° 25'.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **HIHIMANU**

STATE: **HAWAII**

YEAR: **1910**

SECOND

ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE:	22° 11' 17.510	ELEVATION	388	METERS
GEODETIC LONGITUDE:	159° 28' 56.918	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 108 Δ 81 ANGLE
HI 4	5104	505,928.64	128,910.65	+ 0° 00' 24"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE § 108 Δ 81 FORMULA NEGLECTING THE SECOND TERM.

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



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1016  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

**Honono (Kauai Island, F. G. Engle, 1927).**—On the north coast of Kauai, about midway between Kalihiwai and Hanalei Bays, on a promontory near the sea named Ka lae Honono. The top is covered with brush and is about 190 feet above high water. Station approached by a paved road which leaves the main highway on the west side of Kalihiwai Bay and parallels the coast. Station is approximately 1/4 mile west of church. Marked according to note 4, a standard disk in bowlder. Reference mark No. 1, a standard reference disk in concrete block, note 11a, is 2.09 meters (6.9 feet) from station in azimuth 19° 24'. Reference mark No. 2 is a standard disk cemented in a 1 1/4-inch gas pipe driven flush with ground. It is 3.55 meters (11.6 feet) from station in azimuth 221° 27'.

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: HONONO  
ESTABLISHED BY: F.G.E. YEAR: 1927 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 has been destroyed. There is a concrete pillbox, probably built during WW-II, on the hill. An angle check, using stations KAMOKU, KILAUEA, and ROAN indicate that the station was at the point occupied by the pillbox. The reference marks could not be found and are believed to have been destroyed by excavation.

\* 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.

CGM-DC 34814

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HONONO

STATE: HAWAII

YEAR: 1927

THIRD

—ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 13' 39.138	ELEVATION:	52	METERS
GEODETIC LONGITUDE:	159 27 27.210	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 4	5104	514,355.67	143,203.99	+ 0° 00' 58"

\* 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 140

QI 111

## HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1018  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

### NO ORIGINAL TEXT

**Kalepa (Kauai Island, O. B. French, 1910; L. G. Simons, 1927).**—On peak at south end of a ridge along east coast of Kauai, 1½ miles northwest of Hanamaulu Bay, and just above the village of Hanamaulu. The station is in the middle of a very distinct peak which is quite rocky, but has lantana on top and grass on its sides. It is identical with the Hawaiian Government Survey station of same name. The original mark (gas pipe) was replaced in 1910 with a standard United States Geological Survey bench mark plate, set in cement. Signal pole was placed over mark and supported by "ahu" (cairn). Reference marks set in 1910 were as follows: No. 1, five nails driven in brace of post of wire fence about 100 feet distant, in azimuth 199° 07'; No. 2, cross cut in rock which projects from ground distant 9.675 meters (31.74 feet) in azimuth 347° 11'; No. 3, United States Geological Survey bench mark "706" on stone 20 feet distant in azimuth 329° 51'. This bench mark consists of a ¼-inch nodule on top of stone projecting above surface; it has ring of white paint around it and is marked with letters "U. S. B. M." In 1927 reference mark No. 1 described above was not found. Two standard disk reference marks were set in 1927. One in the cross in stone of R. M. No. 2 (1910); the other in rock outcrop 4.163 meters (13.66 feet) from station in azimuth 8° 05'. Both were stamped "1927."

(11-8-55)

#### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **KALEPA**  
ESTABLISHED BY: **O.B.F.** YEAR: **1910** STATE: **HAWAII**  
RECOVERED BY: **H.O.P.** 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 the two R.M.s were recovered as described in 1927, in good condition. All measurements were checked and found correct. The U.S.G.S. bench mark "706" was recovered but no trace of the white paint was found. A 6'x6' B type platform had been built over the mark.

To reach from the P. O. in Lihue, go 2.1 miles N.E. along the main highway to the village of Hanamaulu; turn left on dirt road and follow around the base of Kalepa Ridge (west side) for 1.65 miles; turn right and follow dirt road to top of ridge and then S.W. along top of ridge for 1.0 mile to station. A jeep should be used to climb the ridge.

#### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **Kalepa**  
ESTABLISHED BY: **O.B.F.** YEAR: **1910** STATE: **Hawaii** BENCH MARK(S) ALSO ☐  
RECOVERED BY: **U.S.G.S.** YEAR: **1962** COUNTY: **Kauai**  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: **1½ mi. NW of Hanamaulu Bay**

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

Station and reference marks found in good condition. Located near the E coast of Kauai, about one mil W of Hanamaulu Bay, 0.5 mi. W of Hawaii St. Hwy 56, on the highest point of S end of Kalepa Ridge overlooking the town of Hanamaulu.

To reach from Hanamaulu P.O., travel N on St. Hwy 56 for 0.2 mi. to intersection of narrow paved road left; turn W on narrow road and continue across intersection of cane road and past cemetery 0.2 mi. to road fork. During wet weather a four-wheel drive vehicle may be necessary from this point on. Take right fork (N) on dirt road passing below house 0.1 mi. to locked chain (obtain key at Hawaiian Tel Co. in Lihue); continue 0.3 mi. to end of road. Station is on the S end of ridge on the highest point above a green shack.

Station mark is a USGS tablet set in concrete at center of an HTS type B-1 superstructure and stamping was so faint it could not be read.

R.M. 1 is a USC&GS reference mark tablet stamped RM NO 1 1927 cemented in rock 31.80 feet from station mark in azimuth 347°10'06".

FORM C&GS-528 (11-55)  
USC&GS-DC 18009-PS

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

(continued on next page)

#### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KALEPA**

STATE: **HAWAII**

YEAR: **1910**

SECOND

ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE:	22° 00' 11.936	ELEVATION:	216.16 METERS
GEODETIC LONGITUDE:	159 21 39.799		709.2 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ °OR Δ ° ANGLE °
HI 4	5104	547,071.74	61,769.60	+ 0 03 07

\* 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
NONOU	182 59 03.4	182 55 56	5104

Q1 003

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1018  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

KALEPA (continued)

R.M. 2 is a USC&GS reference mark tablet stamped RM NO 2 1927 cemented in rock, 13.81 feet from station in azimuth 7°32'49"1.

FORM 526a  
(9-18-69)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KALEPA  
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
RM No. 1	SSE	31.856	9.709	164 10 56
RM No. 2	S	13.825	4.214	184 28 43
Antenna pole, Tallest (center)	NNW	22.750	6.934	343 29 34

Station mark and both reference marks were recovered in good condition. USGS Bench Mark "706" was not found. A complete description follows:

Station is located about 0.4 mile northwest of Hanamaulu, on a hill of 709 feet elevation on the extreme south end of Kalepa Ridge. There are 3 wooden antenna poles on the hill, near the station, and a telephone company building about 200 yards north along ridge from station.

To reach station from the post office in Hanamaulu, go north on State Highway 56 for 0.2 mile; turn left on narrow, paved road and go 0.2 mile;

cross cane-haul road and continue ahead, upgrade, for 0.25 mile; take right fork, graveled road, and go 0.1 mile to locked chain gate. Pass through gate and continue upgrade for 0.5 mile to top of ridge. Turn right and go 0.05 mile to station just beyond end of road. NOTE: Key for locked gate may be obtained from telephone company office in Lihue.

Station mark is a U.S. Geological Survey disk, with no stamping discernible, set in concrete 6 inches beneath the 6 x 6-foot, concrete platform of the Type B-1 signal built by the Hawaii Territorial Survey in 1930. Access to the mark is had through a small hand-tunnel passing beneath the center, concrete pedestal of the signal. Station is 14 feet northwest of a short, wooden, antenna pole and 22.75 feet south-southeast of the tallest pole on the hill.

Reference mark number one is a standard disk stamped "NO 1 1927", cemented in a drill hole in a 3-foot bedrock outcrop that projects 2 feet on the downhill side. It is located in brush on the steep slope, 20 feet south of the short antenna pole and 7.9 feet lower than station.

Reference mark number two is a standard disk stamped "NO 2 1927", cemented in a drill hole in a 10-inch bedrock outcrop that projects 1 inch. It is 2.4 feet lower than station mark.

Tallest Antenna pole is about 35 feet tall and 1 foot in diameter at the base, with 2 vertical whip antennas mounted on 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.

USCOMMA-DC 87178-P88

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KALEPA  
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii BENCH MARK(S) ALSO ☐  
RECOVERED BY: P.D.C. YEAR: 1978 COUNTY: Kauai  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:  
1.5 mi. N.W. of Hanamaulu Bay

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

The station mark and R.M. 1 & 2 were recovered as described in good condition.

NOAA FORM 76-145  
(12-72)  
GOLD CODE 8281

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

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

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1019  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

Kamoku (Kauai Island, O. B. French, 1910; C. L. Garner, 1927).—Near the northeast coast of Kauai, on a low but conspicuous round-topped hill in the land of Pila, about 1 mile south of the main road and 2½ miles south-southeast of Kilauea. The hill is clear except for a group of trees on top surrounding the grave of Christian H. Bertelman. The 1910 description gives the station mark as a 2-inch iron pipe projecting 1 foot above surface of ground. The 1927 description states that the station is marked by a United States Geological Survey station mark. Reference marks set in 1910 and recovered in 1927 were crosses in small stones at the following distances and azimuths from the station: 3.0 feet, 56°; 3.1 feet, 183°; and 3.1 feet, 208°. In 1927 the first two of these were found split, and a standard reference disk was set in the third mark. In 1927 a standard reference disk was set in the corner of the stone fence surrounding the Bertelman grave; it is 9.731 meters (31.93 feet) from the station in azimuth 237° 27'. The marble monument over the Bertelman grave is 8.782 meters (32.09 feet) from the station, in azimuth 207° 51'.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAMOKU

STATE: HAWAII

YEAR: 1910

SECOND

—ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 11 ' 25.157	ELEVATION:	252.0 METERS
GEODETIC LONGITUDE:	159 22 52.103		761 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	Bearing or Angle *
HI 4	5104	540,214.50	129,697.72	+ 0 02 42 "

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE BEARING FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH *	CODE
KILAUEA	156 44 04.5	156 41 22	5104

Q1 015

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 221592

STATION 1019

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

KAMOKU (continued)

FORM 526a  
(8-18-68)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

R

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAMOKU  
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		1.82 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			
KILAUEA -----1927 DISTANCE and DIRECTION-----							
Bertelman Headstone			32.09	9.782		00	00 00.0
RM No. 2			31.93	9.731		51	07
RM No. 1			3.1			80	43
-----1965 DISTANCE and DIRECTION-----						141	16
RM No. 3		NNE	33.296	10.149		42	36 45
Bertelman Headstone		NE	32.267	9.835		50	57 54
RM No. 2		NE	30.681	9.351		60	47 50
RM No. 1		SE	3.100	0.945		140	58 19

Station was recovered and all marks found in good condition, although RM No. 2 is now 6 inches beneath ground level. One new reference mark, number 3, was established. A complete description follows:

Station is located 2-1/2 miles southeast of Kilauea and 1 mile south of State Highway 56, on the summit of a prominent, lone hill of 761 feet elevation that is bare except for a few large ironwood trees on top. The

grave of Christian Bertelman, an early pioneer, is on this hill.

NOTE: The discrepancies in distance and direction to RM No. 2 were noted and checked and the new values are correct. A 1962 recovery description by the U.S. Geological Survey closely approximates these new values.

To reach station from the main intersection in Kilauea, go east on State Highway 56 for 2.0 miles to crossroad; turn right and go south for 1.0 mile; take left fork and go 0.1 mile to wire gate on right. Pass through gate and go through pasture for 0.2 mile to fence corner on left, and end of truck travel. Pack southerly up steep hill to top. A 5-minute pack.

Station mark is a U.S. Geological Survey disk, unstamped, set 6 inches below the concrete platform (which is flush with ground) of the Type B-1 signal which was built by the Hawaii Territorial Survey in 1930.

Reference mark number one is a standard disk stamped "KAMOKU 1 1927", cemented in a drill hole in a small rock. It is flush with the concrete platform which was built around it and is 4 inches in from southeast side.

Reference mark number two is a standard disk stamped "KAMOKU 2 1927", cemented in a drill hole in granite block wall around grave, by an iron post at southeast corner of wall, and at same elevation as station mark.

Reference mark number three is a standard disk stamped "KAMOKU 1910 1927 NO 3 1965", cemented in a drill hole in granite block wall around grave 2 feet north-northeast of an iron post near southwest corner of wall.

It is at same elevation as station mark, and projects 4 inches above ground. Bertelman Grave Headstone is a white marble monument 1 foot square and 4 feet tall, at south end of 12 x 14-foot granite block wall flush with ground on east side and projecting 4 inches on west side.

\*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.

USCOMMA-DC 27178-P68



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 221592 STATION 1020  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 888  
Rev. Aug. 1963

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KAWAIKINI (USGS) STATE: Hawaii COUNTY: Kauai

CHIEF OF PARTY: USGS

YEAR: 1962

Described by:

NOTE:	HEIGHT OF TELESCOPE ABOVE STATION MARK		METERS.1		HEIGHT OF LIGHT ABOVE STATION MARK		METERS.	
desc	none	Surface-station mark, Underground-station mark	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:1		
				feet	meters			
		KALEPA 1910				0	00 00.0	
desc		RM 1	W	13.47	( 4.106 )	146	21 49 -	
desc		RM 2	E	4.93	( 1.503 )	340	55 32 -	

Station is located in the center of the island on the highest mountain on Kauai in the vicinity of the highest point and on the E-W ridge where the ridge drops abruptly off to the S. It is about 12 mi. NE of Hanapepe and 10 mi. NW of Lihue.

Station was reached by helicopter  
Station mark is a USGS disk stamped "KAWAIKINI 1962", cemented in a drillhole in bedrock.

Reference mark 1 is a chiseled cross in a rock outcrop and W of the station.

Reference mark 2 is a chiseled cross in a rock outcrop and E of the station.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAWAIKINI USGS

OBS BY USGS

STATE: HAWAII

YEAR: 1962

THIRD

-ORDER

SOURCE: G-12992

GEODETIC LATITUDE:	22° 03' 34.319	ELEVATION:	1587.0 METERS
GEODETIC LONGITUDE:	159° 29' 58.251		5207 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	S FOR Δ S ANGLE *
HI 4	5104	500,164.52	82,170.22	+ 0° 00' 01"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE S FOR Δ S FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH *	CODE
KALEPA	293 30 18.2	293 30 17	5104

QF 252



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1021  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

Kea (Kauai Island, C. L. Garner, 1927).—Near eastern coast of Kauai, several meters west of the town limits of Kealia, and 2 meters south of the macadam road between Kealia and Halaula. Marked according to note 4, a standard disk in boulder. A reference mark, note 12c, standard reference disk in boulder, is 6.022 meters (19.76 feet) from station in azimuth 309° 11'.

FORM  
NO-19-B

U. S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KEA  
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 1.29 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
RM No. 1	SE	19.709	6.008	264 33 59
RM No. 2	SW	4.678	1.426	342 15 04

Station mark and reference mark were recovered in good condition. A new reference mark, number 2, was established. A complete description follows:

Station is located about 1/2-mile north of the Kealia post office, on road right-of-way along southwest side of old paved road, 140 feet northwest of a road fork.

To reach station from the post office in Kealia, go northerly on old paved road upgrade for 0.5 mile to fork at top of grade; go 140 feet on left fork to station on left.

Station mark is a standard disk stamped "KEA 1927", cemented in a

drill hole in the top of a 3 x 6-foot, red boulder that projects 18 inches above ground. It is 140 feet northwest of road fork intersection, 70 feet west-northwest of driveway to home across road from station, 102.5 feet west-northwest of a power-line guywire pole that sets in road fork by a stop sign, 16.5 feet southwest of center line of road and 1 foot northeast of fence line. Station is hidden by koa brush which grows very densely along entire right-of-way.

Reference mark number one is a standard disk stamped "KEA R 1 1927", cemented in a drill hole in a 12-inch, black rock projecting 2 inches above ground. It is on road right-of-way, 15 feet southwest of center line of road, 2-1/2 feet northeast of fence line and 1 foot lower than station mark.

Reference mark number two is a standard disk stamped "KEA 1927 NO 2 1965", cemented in a drill hole in a 3-foot boulder projecting 1 foot above ground. It is in brush-filled pasture, 3.5 feet southwest of fence line and 1-1/2 feet lower than station mark.

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

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

USCOMDA-DC 89178-P88

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KEA

STATE: HAWAII

YEAR: 1927

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 22° 06' 31.298	ELEVATION: 37.0 METERS
GEODETIC LONGITUDE: 159 18 38.038	121 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10R Δ θ 1 ANGLE *
HI 4	5104	564,128.98	100,068.79	+ 0° 04' 17"

\* 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
NONOU	44 41 34.8	44 37 18	5104

QI 048

QUAD 221592 STATION 1022  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 30' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

### ADJUSTED HORIZONTAL CONTROL DATA

## SECOND

711-8-66)

## R

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. The point was determined by traverse from station KEA 1927 and some digging done but nothing found. The point is near to a roadside ditch and it is possible that it was destroyed by construction. This vicinity is now covered with large trees.

GEODETIC LATITUDE:	22°06'37.239	ELEVATION:	43	METERS
GEODETIC LONGITUDE:	159 18 51.464	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ FOR $\Delta$ O: ANGLE °
HI 4	5104	562,865.72	100,666.73	+ 0° 04' 12"

<sup>a</sup> PLANE AZIMUTH HAS BEEN COMPUTED BY THE  $\theta = \Delta \sin \delta$  FORMULA NEGLECTING THE SECOND TERM

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

QI 011

01 011

\* 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.

CONF-DC 34314

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1023  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 155 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

**Kikoo** (Kauai Island, O. B. French, 1910; L. G. Simmons, 1927).—In northeast Kauai, on a rounding peak of the same name, near the east end of the Anahola Mountains, and about 500 yards west of Konanao, the "Conical Peak." Station is in the highest part of a small, triangular, gently sloping area on summit. In 1910 summit was covered with heavy growth of lantana. Approached by a very short and comparatively easy but quite steep trail leading up one of the spurs running off to the northeast. Station marked by cross in brass rod in cylindrical concrete post 6 by 24 inches set flush with surface of ground and wedged in with stones. Three reference marks set in 1910 were as follows: No. 1, black bottle set in ground with neck projecting 1 inch and protected by three stakes; it is 35.4 feet south of the station, there being a thatch shack between it and the station. No. 2, a black bottle set in ground with neck projecting 1 inch and protected by three stakes; it is 21.9 feet west of station. No. 3, a cross cut in top of a sharp stone projecting 6 inches above ground; it is 9.9 feet north of station. Two reference marks set in 1927 consisted of bronze disk reference marks set in field bowlders at the following distances and azimuths from the station: 5.692 meters (18.67 feet), 169° 00'; 4.062 meters (13.33 feet), 60° 38'.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KIKOO  
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 and all marks found in good condition. Station is now marked by a Hawaii Territorial Survey disk which was probably set when the Type B-1 signal was built in 1930. The old station mark, a brass rod in 6-inch concrete cylinder 2 feet long, was found laying by R.M. 2. A complete description follows:  
Station is located about 1-1/4 miles northwest of Anahola, on a hill of about 1488 feet elevation at the east end of the Anahola Mtns. It is 1/4-mile northwest of the "Hole-in-the-Mountain".  
To reach station from the post office in Anahola, go north for 0.05 mile; go left and follow State Highway 56 north for 0.4 mile to top of grade; turn left and follow road westerly through pineapple field for 0.6 mile to edge of trees. Go right, crossing gully, for 0.1 mile to end of truck travel. Pack west up through large trees, heading towards the left one of the two small, steep, bare ridges that can be seen while driving across pineapple field. Go up this ridge to crest of main ridge, then left along ridge to station. A 1-1/2-hour pack.  
Station mark is an unstamped HTS bronze disk, set 6 inches beneath the 5-foot-square, concrete platform (which is flush with ground) of the Type B-1 signal. Access to the mark is had through a small hand-tunnel passing beneath the center, concrete pedestal of the signal. The hill is covered with a dense growth of lantana brush up to 6 feet high and has some trees 10 to 20 feet tall on the west and north side.  
Reference mark number one is a standard disk, unstamped, cemented in a drill hole in a small boulder flush with ground, about 1 foot lower than station mark. It is 3.983 m (13.065 ft.) from station in azimuth 60° 38'.

Reference mark number two is a standard disk, unstamped, cemented in a drill hole in a 12-inch boulder that projects 8 inches above ground and is about 2 feet lower than station mark. It is 5.608 m (18.398 ft.) from station in azimuth 169° 00'.

NOTE: The discrepancy in distances to both reference marks was noted and checked in the field and the new distances are correct. The distances listed in a 1962 recovery description of the station by the U.S. Geological Survey also check the new distances within .002 ft.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIKOO

STATE: HAWAII

YEAR: 1910

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 09 ' 12.676	ELEVATION:	454.0	METERS
GEODETIC LONGITUDE:	159 19 58.963		1489	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ ± ANGLE °
HI 4	5104	556,501.23	116,344.42	+ 0 03 ' 47 "

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

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

QI 001

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

## HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1024  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

Kil (Kauai Island, O. B. French, 1910).—On the northeast coast of Kauai, on  
Lee o Kilauea, very close to the proposed location of lighthouse. Station is old  
survey station and is marked by 1-inch gas pipe.

Form 528  
(11-8-55)

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

### RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

R

NAME OF STATION: Kil  
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 destroyed.  
The point was leveled off when the light was constructed in 1913. A tower,  
now removed, once sat where the station was located.

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIL

STATE: HAWAII

YEAR: 1910

THIRD

—ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	22 ° 14' 05.83	ELEVATION:	49	METERS
GEODETIC LONGITUDE:	159 24 18.24	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 10R Δ § 1 ANGLE *
HI - 4	5104	532,109.03	145,905.54	+ 0° 02' 09"

\* 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

\* 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 343 14

Q1 135

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1025  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

Kilauea (Kauai Island, O. B. French, 1910; F. G. Engle, 1927).—On the northeast coast of Kauai, on a conspicuous hill about 1 mile southeast of Lae o Kilauea, and 1½ miles northeast of the village of Kilauea. The old government survey station was lost; the new (1910) station marked by a ¼-inch by 5-inch grate bar, which was replaced by the United States Geological Survey with a standard bronze disk set in concrete. Reference marks set in 1910 were as follows: No. 1, cross cut in rock about 5 feet back from edge of bluff and 44.7 feet from station in azimuth 112° 57'; No. 2, cross cut in rock at edge of bluff, 12.8 feet, 225° 43'; No. 3, cross cut in rock at edge of bluff, 19.6 feet, 284° 09'. Reference marks set in 1927 were standard reference disks in bedrock near edge of cliff and at the following distances and azimuths from station: No. 1, 6.617 meters (21.71 feet), 309° 52'; No. 2, 9.878 meters (32.41 feet), 113° 08'.

U.S. GEOLOGICAL SURVEY  
(6-18-1961)

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KILAUEA  
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	
KAMOKU 1910-1927.				00 00 00.0
R.M. No. 3	SW	13.720	4.182	61 18 42
R.M. No. 4	WNW	43.650	13.305	136 10 08

Station mark was recovered in good condition. Reference cross No. 1 of 1910 was recovered, it is quite worn from erosion, but is recognizable. Both reference marks set in 1927 are destroyed, although part of the shank of No. 2 remains in the drill hole. Two new reference marks, numbers 3 and 4, were established. A complete description follows:

Station is located about 1 mile northeast of Kilauea and ¾ mile southeast of Kilauea Point, on a prominent, lone butte of about 568 feet elevation, known as Crater Hill. There are several wooden antenna poles on the summit near the station.

To reach station from the post office in Kilauea, go northeast on paved road for 0.7 mile; take right fork, track road ahead, and go 0.4 mile, passing a cemetery, to locked gate on left. Pass through gate and follow old road uphill for 0.4 mile to top and station. (NOTE: Key for locked gate may be obtained at the plantation office across street from post office.)

Station mark is an unstamped U.S. Geological Survey disk, set in concrete at ground level. It is on high point of hill, 10 feet south from cliff edge and 36.5 feet northeast of the apex of a pyramidal, concrete cupola. A Type B-1 signal, constructed by the Hawaii Territorial Survey, is centered over station mark. Access to the mark is had through a small hand-tunnel passing beneath the center concrete pedestal.

Reference mark number three is a standard disk stamped "KILAUEA 1910-1927 NO 3 1965", cemented in a drill hole in the bedrock ledge running down-slope from station. It is 23 feet northeast of the concrete cupola, 19 feet east of the highest antenna pole, projects 6 inches above ground and is about 2-1/2 feet lower than station mark.

Reference mark number four is a standard disk stamped "KILAUEA 1910-1927 NO 4 1965", cemented in a drill hole in bedrock edge of hill, 8 inches east from old reference cross number one, 8 feet south of cliff edge, and about 2 feet lower than station mark.

(continued on next page)

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KILAUEA

STATE: HAWAII

YEAR: 1910

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 22° 13' 35.258	ELEVATION: 173.0 METERS
GEODETIC LONGITUDE: 159 23 52.181	568 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 10R Δ 01 ANGLE °
HI 4	5104	534,559.41	142,822.10	+ 0° 02' 19"

\* 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
KAMOKU	336 43 41.8	336 41 23	5104

Q1 014

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  
IOLU HAWAIIAN DATUM

QUAD 221592

STATION 1025

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

KILAUEA (continued)

Form 526  
(11-8-55)

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

**R**

NAME OF STATION: KILAUEA  
ESTABLISHED BY: O.B.F.    YEAR: 1910    STATE: Hawaii  
RECOVERED BY: E.H.F.    YEAR: 1971    COUNTY: Kauai

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

Description and  
to reach is adequate. Reference cross No. 1 of 1910, reference marks No. 3 and No. 4  
were recovered in good condition.

The Type B-1 superstructure built in 1930 has been converted to a Type A station with side  
walls built of concrete tile set on existing ground level platform and 4' 4" to top of  
6' x 6' observing concrete platform. The station mark is exposed at ground level and in  
middle of, but not connected to, old ground level observing platform.

\* 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-50 343 14



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1026  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

**Kilauea light (Kauai Island, F. G. Engle, 1927).**—On northeast corner of Kauai, on Lae o Kilauea, a bluff rock point. Lighthouse is a white conical tower about 50 feet high. Light is about 216 feet above high water.

Form 528  
(11-8-65)

## RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Kilauea Light  
ESTABLISHED BY: F.G.E. 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 in good condition.  
Located about 1-1/2 miles north of Kilauea village, on Kilauea Point, the northernmost point of Kauai Island, at the U.S. Coast Guard Station.

Station is cream-colored tower with large light on top surmounted by a red, conical roof upon which sets a large red ball. Tower is 52 feet high and was built in 1919. The light is 216 feet above sea level.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KILAUEA LIGHT  
ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: HAWAII BENCH MARK(S) ALSO ☐  
RECOVERED BY: E. PURSEL JR. YEAR: 1969 COUNTY: KAUAI  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 1.5 MILES NORTH OF KILAUEA

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

THIS INTERSECTION STATION WAS RECOVERED IN GOOD CONDITION AS DESCRIBED.  
THE LIGHT  
IS NOW PAINTED ALL WHITE WITH BATTLESHIP GREY TRIM AND A RED CONICAL ROOF.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KILAUEA LIGHT

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 14 '05.361	ELEVATION:	METERS
GEODETIC LONGITUDE:	159 24 17.137		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ G: ANGLE *
HI 4	5104	532,212.69	145,858.28	+ 0 ° 02 '10 "

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

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



## HORIZONTAL CONTROL DATA

QUAD 221592 STATION 1027  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

Form 526  
(11-8-65)

R

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

### ADJUSTED HORIZONTAL CONTROL DATA

### THIRD

ORDER 11

GEODETIC LATITUDE:	22° 12' 49".236	ELEVATION:	METERS
GEODETIC LONGITUDE:	159 24 37.372		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (OR $\Delta$ OR ANGLE)
HI - 4	5104	530,316.11	138,175.33	+ 0° 02' 02"

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

PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\sin$ FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south) D    F    N	PLANE AZIMUTH * (From south) D    F    N	CODE

QI 138

QI 138

\* Name of chief of party should be inserted here. The officer who actually visited the -  
NORZ.—One of these forms must be used :-

Did sign his name at the end of the recovery note.  
recovered.

COMM-DC 34214

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 221592 STATION 1028  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

Lia (Kauai Island, C. L. Garner, 1927).—On eastern coast of Kauai, on the headland south of the beach at Kealia, east of the main highway south of Kealia, and reached by crossing over a railway cut, on to a grassy area. Station is about 10 meters back from coastal slope. Marked according to note 2, except that the disk was a topographic mark, set in outcropping bedrock. Reference mark, standard reference disk, note 12a, in outcropping bedrock, is 6.410 meters (21.03 feet) from station in azimuth 132° 43'.

Form 526  
(11-8-55)

### RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: LIA  
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 mark

has been destroyed.

Reference mark, a standard disk stamped "LIA 1 1927", was recovered in good condition. It is cemented in a drill hole in bedrock on north side of the promontory, 28 yards west from its east end.

A check by distance and angle was made from the reference mark and the point falls in a hole about 2 feet in diameter and 1 foot deep, indicating that the rock has been removed.

\* 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 943 14

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LIA

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 05' 36.055	ELEVATION	9	METERS
GEODETIC LONGITUDE:	159° 18' 29.880	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	∠ OR Δ OR ANGLE *
HI 4	5104	564,903.15	94,495.23	+ 0° 04' 20"

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

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

Q1 047

QI 121

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1030  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

Molooa (Kauai Island, O. B. French, 1910; F. G. Engle, 1927).—On the northeast coast of Kauai, about 1 mile south of Molooa Harbor, on level bare land at top of bluff about 100 feet high, 100 feet back from edge of bluff, and 150 feet from high-water mark. Ground about station is covered with irregular chunks of lava. Approached by a road which leaves the main road at a point directly west of Papaa Harbor and winds through the lantana. Station marked by a United States Geological Survey bench mark, marked 223 feet above sea level. In 1927 three bronze reference disks were set in large rocks on the edge of the cliff. Nos. 2 and 3 are placed in crosses cut in rock at top of bluff, on the slope between level ground and top of bluff, and not likely to be disturbed by cultivation. These crosses were reference marks established in 1910. The following are the distances and azimuths to the reference marks from the station: No. 1, 46.520 meters (152.62 feet), 136° 33'; No. 2, 41.445 meters (135.97 feet), 152° 39'; No. 3, 37.785 meters (123.97 feet), 221° 58'.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOLOOA

STATE: HAWAII

YEAR: 1910

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 11 ' 26.461	ELEVATION:	68.0 METERS
GEODETIC LONGITUDE:	159 19 22.775		223 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	S FOR Δ S ANGLE °
HI 4	5104	559,887.39	129,848.49	+ 0° 04' 01"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE S FOR Δ S FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
PINE	138 28 25.7	138 24 25	5104

QI 051

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 221592

STATION 1030

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

MOLOAA (continued)

FORM 524a  
(10-10-59)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOLOAA  
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	
PINE 1927 --1927 DISTANCE and DIRECTION-----				
RM No. 3		123.97	37.785	00 00 00.0
RM No. 1		152.62	46.520	83 29 34
-----1965 DISTANCE and DIRECTION-----				
RM No. 3	NE	125.540	(38.265)	358 04 34
RM No. 1	NW	151.980	(46.323)	83 28 54

Station mark and reference marks No. 1 and 3 were recovered in good condition. RM No. 2 has been lost due to erosion of the red dirt bluff before trees were planted. A complete description follows:

Station is located about 5-3/4 miles east-southeast of Kilauea and 3 miles north of Anahola, on a bluff at 223 feet elevation, 3/4 mile south-east of Molokaa Bay, in a dense grove of large ironwood trees. It is 300 feet northeast of edge of cane field, in an area used by the plantation for disposal of rubbish.

To reach station from the post office in Anahola, go north 0.05 mile; turn left and go north on State Highway 56 for 3.0 miles; turn right on gravelled main canefield road, just past a road leading to weather station on right, and go northeast for 0.5 mile to T-junction. Turn right and go on road between fields and trees for 0.7 mile to side road left. Go left into trees on track road for 0.1 mile to station on left.

Station mark is a U.S. Geological Survey disk stamped "223", set in concrete 6 inches beneath the 5-foot-square, concrete platform of the Type B-1 signal built by the Hawaii Territorial Survey in 1930. It is 36 feet northeast of center line of track road, in roadside row of trees. Access to the mark is had through a small hand-tunnel passing beneath the center concrete pedestal of the signal.

Reference mark number one is a standard disk stamped "MOLOAA 1 1927", cemented in a drill hole in the sloping face of a 6-foot-diameter boulder that projects 4 feet; it sets on the edge of the bluff. The arrow on the disk points off several degrees west of the station mark.

Reference mark number three is a standard disk stamped "MOLOAA 3 1927", cemented in a drill hole in a 3 x 6-foot boulder that projects 3 feet. It sets on edge of bluff and is almost hidden by trees.

NOTE: The discrepancies in both reference mark measurements were noted and were double-checked and the new values are correct. A 1962 recovery description by the U.S. Geological Survey very closely approximates the new distances and directions.

Station PINE 1927 is the only station now visible, because of trees.

\*Name of chief of party should be inserted here. The officer who actually visited the station should sign and date the recovery note.

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

USCOMMA-DC 27175-P50

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM.

QUAD 221592 STATION 1031  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

Nonou (Kauai Island, O. B. French, 1910; C. L. Garner, 1927).—Near east coast of Kauai, on a conspicuous peak of same name, 1 mile north of Wailua River, on a flat spot on highest point of peak. Reached by turning west on a by-road from the main road ¼ mile north of the Wailua race track; continue by roads through cane fields to base of spur which runs out to east; cross irrigation ditch, walk through cane field, and up steep path to grove of ironwood trees. Walk on top of stone fence up hillside until ridge is reached. Clear going will be found on ridge the rest of the way to the top. Marked by a standard United States Geological Survey bronze disk set in concrete, above which is an "ahu" (cain). Reference marks are standard reference disks set in crosses cut in rock, at the following distances and azimuths from the station: No. 1, 9.895 meters (32.46 feet), 332° 46'; No. 2, 5.615 meters (18.42 feet), 43° 47'.  
(11-8-58)

### RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: NONOU  
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 re-covered and all marks found in good condition. A complete description follows:

Station is located about 2-1/2 miles southwest of Kapaa, on the highest point of Nonou Mtn., known as "The Sleeping Giant".

To reach station from the post office in Hanamaulu, go north on State Highway 56 for 3.9 miles to the Wailua River bridge. Cross and continue on the highway for 0.45 mile; turn left on Haleililo Rd. and go northwest for 0.25 mile; continue ahead on right fork and go 0.8 mile; turn right and go 0.05 mile to end of truck travel in pumping station of water works. Follow trail up through trees and then up along ridge to station on the forehead of The Sleeping Giant. A 1-1/2-hour pack. Trail is usually kept open by hikers.

Station mark is an unstamped, U.S. Geological Survey disk, set in concrete 6 inches beneath the 6-foot-square, concrete floor, (flush with ground) of the Type B-1 signal which was built by the Hawaii Territorial Survey in 1930. Access to the mark is had through a small hand-tunnel passing beneath the center, concrete pedestal of the signal.

Reference mark number one is a standard disk stamped "NONOU 1 1927", cemented in a drill hole in the northwest end of a bedrock ledge 6 feet long, 2 feet wide, and projecting 1 foot above ground, and is about 1 foot lower than station mark. It is 9.853 m (32.328 ft.) from station in azimuth 332° 46'.

Reference mark number two is a standard disk stamped "NONOU 2 1927", cemented in a drill hole in a sloping bedrock outcrop on west side of hill, about 4 feet lower than station mark. It is 5.621 m (18.441 ft.) from station in azimuth 43° 47'.

NOTE: Top of hill is covered with dense growth of lantana brush up to 6 feet high.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NONOU

STATE: HAWAII

YEAR: 1910

SECOND

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 03' 51.589	ELEVATION:	378.0 METERS
GEODETIC LONGITUDE:	159° 21' 27.515		1240 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ °OR Δ °I ANGLE °
HI-4	5104	548,207.07	83,935.40	+ 0 03 13

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

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

QI 005

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1032  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

**Papaa (Kauai Island, F. G. Engle, 1927).**—On northeast coast of Kauai, on a very large rock outcrop, located on washed-out ground, 20 meters east of a grassy meadow, and south of Papaa Bay. Reached by taking a road on the south side of the gulley to Papaa Bay, alongside pineapple fields to a meadow; go through fence, across meadow, to shore. Marked according to note 2, standard disk in outcropping bedrock. Reference mark, note 4, a standard reference disk in boulder, is 11.390 meters (37.37 feet) from station in azimuth 214° 30'.

Form 528  
(11-8-65)

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

R

NAME OF STATION: PAPAA  
ESTABLISHED BY: F.G.E. 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 and both marks found in good condition, although the metal target is rusted so that it cannot be removed from the Type B-1 signal which was built by the Hawaii Territorial Survey in 1930. The station is now completely hidden by large ironwood trees. A complete description follows:

Station is located about 2 miles north of the Anahola post office, along the northeast coast of Kauai, on the point on the south side of Papaa Bay and is about 86 feet above sea level. It is at the lower end of a bare, eroded area, on a small lantana-covered hummock, about 100 feet east of a pineapple field.

To reach station from the post office in Anahola, go north for 0.05 mile; turn left and go north on State Highway 56 for 2.1 miles to side road right. Go right, following along power line, east, for 0.6 mile to corner of pineapple field. Go right, following along edge of field and ironwood trees on left, for 0.3 mile to end of truck travel in a corner of the field. Walk about 100 feet down across bare patch to station.

Station mark is a standard Hydrographic Station disk, stamped "PAPAA 1927", set 6 inches beneath the 6-foot-square, concrete platform of the Type B-1 signal. It is on top of the hummock but hidden by brush and is 38 feet south of a fence line.

The reference mark is a standard disk stamped "PAPAA 1 1927", cemented in a drill hole in a 2 x 3-foot boulder that projects 8 inches above ground. It is 6.5 feet south of the fence line and 6.3 feet southwest of a 1-1/4-inch, iron pipe that is set under the fence line and projects 4 inches above ground. The mark is 11.241 m (36.880 ft.) from station in azimuth 214° 30'.

NOTE: The discrepancy in distance to the reference mark was noted and checked in the field and the new distance is correct. The distance listed in a 1962 recovery description of the station by the U.S. Geological Survey also coincides very closely with the new distance.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAPAA

STATE: HAWAII

YEAR: 1927

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 10' 27.639	ELEVATION:	26.0 METERS
GEODETIC LONGITUDE:	159 18 53.358		85 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE
HI 4	5104	562,659.30	123,916.06	+ 0 ° 04' 12"

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

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

QI 052



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1033  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

**Pine (Kauai Island, F. G. Engle, 1927).**—On the northeast coast of Kauai on the north side of Molokaa Bay. Reached by a road starting at the top of the grade on the main highway north of the valley of Molokaa stream. This road passes three pineapple fields down a plateaulike point to lantana land. Follow south edge of this lantana land along a border of ironwood trees to the point. The station is beyond the ironwood trees on eroded land. Marked according to note 4, standard disk in bowlder. Reference marks, note 12c, standard reference disks in bowlders, are at the following distances and azimuths from station: No. 1, 12.835 meters (42.11 feet), 336° 51'; No. 2, 7.498 meters (24.60 feet), 252° 58'.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PINE  
ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii  
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai  
Island: Kauai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.86 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	
KIKOO 1910-1927				00 00 00.0
RM No. 3	SW	28.404	8.658	68 22 04
RM No. 4 (HTS)	NE	28.343	8.639	248 22 12

Station mark was recovered in good condition. Both reference marks are gone due to erosion. A pipe set in concrete and with "RM" inscribed in the cement was found; it was apparently set by the Hawaii Territorial Survey when they built the Type B-1 signal over the station mark, in 1930.

One new reference mark, number 3, was set and the pipe was used for number 4. A complete description follows:

Station is located about 5 miles east of Kilauea and 4 miles north-northwest of Anahola, on the tip of the point at the north side of Molokaa Bay, at about 156 feet elevation.

To reach station from the post office in Anahola, go north 0.05 mile;

Turn left and follow State Highway 56 northerly for 5.2 miles to reverse-Y fork on right (the first side road after coming up out of Molokaa Stream Gulch). Turn sharp right and go 0.2 mile, passing old cemetery, to fork; take left fork and go 0.15 mile to crossroad; continue ahead, along fence, to end of ridge and gate on right. Pass through gate and drive across pasture about 75 yards to trail. Walk down trail across eroded area about 200 feet to station.

Station mark is a standard disk stamped "PINE 1927", set 6 inches beneath the 5-foot-square, concrete platform of the Type B-1 signal. It is 38 feet northeast of an old, wartime excavation, 32 feet southwest of edge of bluff and 300 feet southeast of fenceline. Access to the mark is had through a small hand-tunnel passing beneath the center concrete pedestal.

Reference mark number three is a standard disk, stamped "PINE 1927 NO 3 1965", braced to the top of a 1-1/2-inch iron pipe that is set in concrete and projects 6 inches. It is set in center of a prominent, 20-foot diameter grass patch, 10 feet northeast from old excavation and about 4-1/2 feet higher than station mark.

Reference mark number four is a 1-1/4-inch iron pipe, projecting 6 inches from the center of a 12-inch-square, concrete block which has "RM" inscribed in it. It is at extreme edge of bluff, 6.1 feet lower than station mark.

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PINE  
STATE: HAWAII

YEAR: 1927

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 22° 12' 11.558	ELEVATION: 48.0 METERS
GEODETIC LONGITUDE: 159° 20' 05.661	157 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	SECTOR ANGLE
HI 4	5104	555,851.94	134,354.69	+ 0° 03' 45"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE SECTOR ANGLE FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
KIKOO	358 00 08.0	357 56 23	5104

Q1 053

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 221592 STATION 1033

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

PINE (continued)

Form 528  
(11-8-55)

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

**R**

NAME OF STATION: PINE  
ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii  
RECOVERED BY: E.H.F. YEAR: 1971 COUNTY: Kauai

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

Previous location and to reach descriptions by D.M. Whipp (1965) is adequate.  
The Type B-1 superstructure built in 1931 has been converted to Type A station with side walls built of concrete tile set on existing ground level platform and 36" high to top of 6' x 6' observing concrete platform. The station mark is exposed at ground level and in middle of, but not connected to, old concrete ground level observing platform.

Reference Marks No. 3 and No. 4 were recovered in good condition.

\* 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 949 14



QUAD 221592 STATION 1035  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

NO TEXT

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PINNACLE PEAK-NYE

STATE: HAWAII

YEAR: 1927

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22°09'05".734	ELEVATION:	METERS
GEODETIC LONGITUDE:	159 19 48.821		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE
HI 4	5104	557,455.42	115,644.96	+ 0° 03' 51"

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

PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\sin$ FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE

QI 113

QI 113

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1036  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

**Pohakupili** (Kauai Island, O. B. French, 1910).—In northeastern part of Kauai, on a very sharp peak of the same name, about 5 1/4 miles mauka (inland) from Kealia. The peak is about 1/2 mile east of the main ridge of Mokuleia Mountain hence it is not conspicuous from the coast, but is more so as one approaches it. Approached by the road from Kealia to Spalding's residence and thence through the fields by a private road which leads to the plantation power house. The trail leads off from this road 1/2 mile south of the power house. Station is on the middle of three large rocks, and is marked by standard United States Geological Survey bronze tablet. Reference marks are as follows: No. 1, bottle buried in ground, 10.0 feet, 80° 04'; No. 2; cross cut in face of large rock, 12.25 feet, 86° 28'; No. 3, cross cut in face of rock, 15.25 feet, 268° 01'; No. 4, bottle buried in ground, 14.25 feet, 268° 12'. The bottles were left with their necks projecting 2 inches, and have piles of small stones around them.

(11-B-85)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: POHAKUPILI  
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 and both reference crosses were recovered in good condition. One of the 1910 bottle reference marks was recovered in good condition and the other found laying on top of ground. A complete description follows:

Station is located about 5-3/4 miles west-northwest of Kealia and 2 miles due west of Mimino Reservoir, on the extreme high point of a very sharp-tipped, rocky peak of about 2592 feet elevation along a ridge running up to the main divide of the Makaleha Mountains about 1-1/2 miles westward.

To reach station from the post office in Kealia, go northwest for 0.4 mile; take left fork and go west for 2.0 miles to the Spalding Memorial; turn left and go 0.7 mile; take side road right and go 0.5 mile to bridge at bottom of canyon; continue ahead for 0.55 mile; take left fork and follow main road west to its end at right side of Mimino Reservoir. Walk west along base of hill about 100 yards to trail going up bank. Follow trail northwest to top of ridge; go left, following old ditch trail west for about 1/2 mile to point of ridge on left about 100 yards after crossing wooden footbridge. Here leave trail and go up along ridge about 1-1/2 miles to the very noticeable sharp peak and station.

Station mark is a U.S. Geological Survey disk stamped "2589", cemented in a drill hole in the top of a 4 x 4-foot rock which comprises the highest point of the peak. It is covered with dirt and moss and appears to be a mound rather than a rock. The only noticeable rock bears reference cross # 3. The mark is likely to be covered with dirt and moss.

Reference cross # 2 is a 2-inch cross cut into the pointed east end of the top of a sharp rock projecting 3-1/2 feet. It is about 6 inches lower than station and is 3.758 m (12.330 ft) from station in azimuth 86° 26'.

Reference cross # 3 is a 2-inch cross cut into the face of the most prominent rock on the peak, 1-1/2 feet above ridge line and 3 feet lower than station. It is 4.645 m (15.240 ft) from station in azimuth 268° 01'.

NOTE: Both crosses were covered with moss.

The 1910 reference bottle is a green bottle set in ground on ridge line, with 3 inches of neck projecting, 1 foot west of base of rock in which reference cross # 3 is cut, and is about 4-1/2 feet lower than station. It is 4.298 m (14.1 ft) from station in azimuth 268° 12'.

NOTE: The ridge leading up to station is densely covered with high ferns and requires extensive clearing of trail all the way. About a 4-1/2-hour pack after trail is cleared. It is advisable to have a rope to get up the 30-foot rock point to station.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POHAKUPILI

STATE: HAWAII

YEAR: 1910

SECOND ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 07' 04.096	ELEVATION	790	METERS
GEODETIC LONGITUDE:	159 23 47.026	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	S - OR Δ - 01 ANGLE °
HI 4	5104	535,070.70	103,350.43	+ 0 02 20

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE S - OR Δ - 01 FORMULA NEGLECTING THE SECOND TERM

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

Q1 010

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1037  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

**Poló** (Kauai Island, C. L. Garner, 1927.)—On east coast of Kauai, 1 mile north-east of Wailua. Reached by going through the by-road north of Wailua race track to the stables; then turning south into the pasture. Station is located on the shore edge of the pasture several meters south of a fence surrounding a plot of trees. Marked according to note 4, standard disk in boulder. Reference mark, note 12c, a standard reference disk in boulder, is 9.550 meters (31.33 feet) from station in azimuth 259° 53'. The azimuth of flagstaff at the race course, distant about 100 meters, is 115° 59'.

(11-0-55)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: **Poló**  
ESTABLISHED BY: **C.L.G.** YEAR: **1927** STATE: **HAWAII**  
RECOVERED BY: **H.O.P.** 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. were recovered in good condition. Measurement to R.M. checked. A new description follows:

The station is on the beach side and closer to the N.E. corner of a pasture (formerly a race track); about 500 feet S.E. of two large Ironwood trees in the pasture; 381 feet S.W. of the northerly one of two Kamana trees; about 300 feet S.S.W. of a grove of 10 coconut trees; in a small break in the tree line and in line with the beach row of four rows of Ironwood trees; 78 feet N.E. of the beginning of a row of fleshy leaved brush along the beach and about 20 feet N.W. of and 6 feet higher than the M.H.W. Line. An old circular, stone, concrete observation station has toppled over about 5 feet towards the beach from the station. The station mark is set in a small boulder, flush with the ground, and the R.M. is set in a small boulder, protruding about four inches above the ground, N.E. of the station.

To reach from the P.O. in Lihue, go 7.3 miles N.E. along the main highway towards Wailua, to the corner of a pasture and a coconut grove on right side of highway, or 1.2 miles N.E. from the bridge over the Wailua River; walk about 0.2 mile S.E. across the pasture to the station in a small break in a row of Ironwood trees, near the beach line.

\* Name of chief of party should be inserted here. The officers 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.

COBR-DC 34314

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **POLO**  
STATE: **HAWAII** YEAR: **1927** THIRD ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE	22 ° 03 ' 28.911	ELEVATION:	4.0	METERS
GEODETIC LONGITUDE:	159 19 35.636		13	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE *
HI 4	5104	558,733.63	81,657.89	+ 0 ° 03 ' 55 "

\* 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
KALEPA	30 27 03.4	30 23 08	5104

QI 046

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 221592

STATION 1037

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

POLO (continued)

FORM 526a  
(2-18-65)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: POLO  
ESTABLISHED BY: C.L.G.  
RECOVERED BY: D.M. Whipp  
YEAR: 1927  
YEAR: 1965  
STATE: Hawaii  
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	
-----1927 DISTANCE and DIRECTION-----				
KALEPA 1910-1927				00 00 00.0
RM No. 1		31.33	9.550	229 25 57
-----1965 DISTANCE and DIRECTION-----				
RM No. 2	NW	18.693	5.698	117 09 18
RM No. 1	ENE	31.280	9.535	229 24 58

Station was recovered and both marks found in good condition. A new reference mark, number two, was established. A complete description follows:

Station is located about 1-1/2 miles south-southeast of Kapaa and 1 mile northeast of the mouth of the Waialua River, along coastline in ironwood trees at southeast side of the large pasture that lies at the southwest side of the large coconut grove and was once a racetrack.

To reach station from the post office in Kapaa, go south on State Highway

56 for 1.15 miles to wire gate on left; pass through gate and go south-east across pasture, along left side of fence, for 0.2 mile to shoreline; go left along trees for 0.15 mile to station on right.

Station is in a 40-foot gap in tree line and at top of slope of beach. The mark is a standard disk stamped "POLO 1927", cemented in a drill hole in a rock 2 inches beneath sand level. It is 3 feet southeast of the beach row of 4 rows of trees, 9 feet northeast of the tree on southwest side of gap, 5 feet northwest of a 5-foot-diameter concrete pad projecting 6 inches, 66 feet northeast of the end of a row of low, gnarled trees running between ironwoods and water, 255 feet south of the south end of a clump of 10 palm trees, and about 500 feet southwest of an old concrete building by beach.

Reference mark number one is a standard disk stamped "POLO R 1 1927", cemented in a drill hole in the top of a 10-inch boulder projecting 5 inches. It is 5 feet southeast of the beach row of trees and the tree at northeast side of gap, and 6 inches higher than station mark.

Reference mark number two is a standard disk stamped "POLO 1927 NO 2 1965", set in the top of a 12-inch-square, concrete monument projecting 5 inches. It is set among the ironwood trees, 3 feet seaward from the inland row of the 4 rows of trees, and at same elevation as station mark.

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

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

USCOMMA-DC 27179-P68

FORM 526  
(11-8-65)

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: POLO  
ESTABLISHED BY: C.L.G.  
RECOVERED BY: E.H.F.  
YEAR: 1927  
YEAR: 1971  
STATE: Hawaii  
COUNTY: Kauai

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

The 1965 description is adequate except for the following: To reach station from mouth of the Waialua River, go northeast along State Highway 56 for 0.75 mile and turn right into entrance to a complex of several hotels along the beach. Turn left along the "Beach Boy" Hotel and after passing parking area continue along on private paved road to break in in seaward side of curb, turn right into unimproved area and follow track road easterly about 0.3 mile to station on upper side of beach slope.

A 4-ft. X 4-ft. concrete platform, 4-inches thick was constructed and anchored into the sand with concrete piers extending 2 1/2 feet under each corner of the platform. The station mark is accessible thru a 9-inch X 10-inch opening in middle of platform. This work to preserve the station was done in August of 1971.

\*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.

COMMA-DC 34314



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1038  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

**Pooku (Hanalei Latitude Station)** (Kauai Island, O. B. French, 1910; F. G. Engle, 1927).—Also called Crows Nest Latitude Station. Near the north coast of Kauai, on a low flat-topped hill overlooking the Hanalei Valley, and 2 miles east of the village of Hanalei. Station is at the south edge of the practically level summit, which is overgrown with lantana and lauhala. Marked by a brick pier with hole in center. In 1927 a standard disk station mark was set in this hole. The pier is 1½ by 2¼ feet in plan, and about 1¼ feet above the ground. In 1927 standard reference disks were set at the following distances and azimuths from the station: No. 1, 10.345 meters (33.94 feet), 142° 15'; No. 2, 29.235 meters (95.92 feet), 136° 59'; No. 3, 17.663 meters (57.95 feet), 185° 46'.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: POOKU (Hanalei Latitude Station)  
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 2.8 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	
ROAN 1927				00 00 00.0
EM No. 5	W	29.521	8.998	50 02 17
EM No. 4	SSW	19.394	5.912	337 20 48

Station mark was recovered in good condition, however the Type A signal, built by the Hawaii Territorial Survey in 1930, was in bad condition due to erosion of the ground at southeast end of the 2 rock walls supporting the platform. The northeast wall had already begun to fall apart and was about half gone. Since part of the signal rests directly upon the brick pier the station would be destroyed when the signal collapsed, so the northeast wall was rebuilt with rocks and mortar and the southwest wall was re-enforced.

None of the old reference marks were recovered, it is believed they were destroyed by cultivation. Two new reference marks, numbers 4 and 5, were

established. A complete description follows:

Station is located about 2 miles east of Hanalei and 1/4 mile south of State Highway 56, in a pasture of the Princeville Ranch, on the southeast end of a low, flat-topped hill of 460 feet elevation.

To reach station from the main intersection in Kilauea, go west on State Highway 56 for 2.4 miles to an airstrip on left. Continue ahead for 2.0 miles to board gate on left, 0.2 mile before reaching ranch office. Go through gate and follow field road southeast for 0.4 mile; turn right, up onto hill, and go 0.1 mile to station.

Station mark is a standard disk stamped "POOKU 1927", set in the top of a red brick pier 1.8 x 2.2 feet and projecting 2 feet above ground. It is on the break where hill starts steep slope down to southeast, and is 19 feet northeast of fence-line and 95 feet southwest of a prominent, lone tree. The floor of the Type A signal is 6 feet above ground.

Reference mark number four is a standard disk stamped "POOKU 1910 1927 NO 4 1965", set in the top of a 10-inch-square, concrete monument that projects 4 inches. It is 1 foot northeast of fence-line and 0.8 foot lower than station mark.

Reference mark number five is a standard disk stamped "POOKU 1910 1927 NO 5 1965", set in the top of a 10-inch-square, concrete monument projecting 6 inches. It is 9 inches northeast of fence-line and 4 inches lower than station mark.

\*No chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of every note.

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

USCOMMA-DC 27173-P88

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POOKU-HANALEI LAT STA

STATE: HAWAII

YEAR: 1910

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 22° 12' 31.866	ELEVATION: 140.0 METERS
GEODETIC LONGITUDE: 159° 28' 03.245	459 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	S FOR Δ S1 ANGLE *
HI 4	5104	510,971.39	136,414.73	+ 0 00 44

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE S FOR Δ S1 FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
ROAN	44 43 24.3	44 42 40	5104

Q1 018



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 221592 STATION 1040  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM NO. 502-1

### DESCRIPTION OF TRIANGULATION ~~STATION~~ STATION

NAME OF STATION: PUU AUAU (HTS) YEAR: 1962 STATE: Hawaii COUNTY: Kauai

CHIEF OF PARTY: USGS

Description, including sketch of object:

Station is on the top of a low rounded hill, in a cultivated area which is a boundary between the lands of Moloka and Papaa. It is about 3 mi. NW of Anahola Bay, about 1 mi. S of Moloka Bay and about 300 ft. E of State Highway 56.

Station mark is a Hawaiian Territorial Survey disk centered under a type B-1 superstructure.  
No reference marks were set.

U. S. GOVERNMENT PRINTING OFFICE 16-60251-1

Described by \_\_\_\_\_

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU AUAU HTS

OBS BY USGS

STATE: HAWAII

YEAR: 1962

THIRD

-ORDER

SOURCE: G-12992

GEODETIC LATITUDE:	22 ° 11' 09.145	ELEVATION:	100.0 METERS
GEODETIC LONGITUDE:	159 20 09.467		328 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 10R Δ 01 ANGLE *
HI 4	5104	555,501.09	128,096.20	+ 0 ° 03' 43 "

\* 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 250

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1041  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

## NO ORIGINAL TEXT

Puu Ehu (Kauai Island, O. B. French, 1910; C. L. Garner, 1927).—In the northeastern part of Kauai, about 3 miles west-northwest of Anahola, and almost at the summit of the highest peak of the Anahola Mountain. The station is on a little knob which from the valley to the south seems to be the summit, but the real summit is about 100 feet to the northwest and 25 feet higher. Approached by a trail leading directly up the side of the mountain from a hou tree on the Anahola River just south of the station. Marked by a standard United States Geological Survey tablet set in cement. In 1927 reference marks Nos. 1 and 3 of 1910 were recovered. They are as follows: No. 1, bottle set in ground with neck projecting and protected by three guard stakes. It is under a leaning tree stump, and is 21.6 feet from station in azimuth 200° 58'. No. 3 is a bottle set in slope about 5 feet below station and protected by three guard stakes. Neck projects 2 inches. It is 12.4 feet from station in azimuth 60° 24'. In 1927 standard reference disks were set in rock outcrop at the following distances and azimuths from the station: No. 1, 1.873 meters (6.15 feet), 356° 54'; No. 2, 1.017 meters (3.34 feet), 306° 03'; No. 3, 1.701 meters (5.58 feet), 18° 08'.

(11-8-85)

### RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: PUU EHU  
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 and reference mark number 3 were recovered in good condition, however the published azimuth for the reference mark was 180 degrees off. Reference marks number 1 and 2 were not found and are believed destroyed. The 1910 reference mark number 3, consisting of a bottle set in ground, was also recovered. A complete description follows:

Station is located 2-1/2 miles west-northwest of Anahola, on a knoll that is about 100 feet southwest of the knob which is the highest point of the Anahola Mountains and is about 25 feet higher than station.

To reach station from the post office in Kealia, go north on old road for 0.5 mile; take left fork and go 2.0 miles to crossroad at Spalding Memorial; continue ahead for 2.3 miles to fork; take right fork and go 0.75 mile to fork; take right fork and go 0.55 mile to fork. Take left fork and go 0.6 mile to start of trail on right. Pack down trail to Anahola River, then follow downriver about 1/4-mile to start of trail up bank across stream. Follow up this trail to main divide, then left along divide about 1/2-mile to station. NOTE: The last part of the trail, up the steep, fern-covered ridge and along brushy main divide is not used and must be cleared. A 4-hour pack after trail is cleared. Clearing would be required at station before a helicopter could land.

Station mark is a U.S. Geological Survey disk set in concrete flush with ground. In 1930 the Hawaii Territorial Survey put a 12-inch-square concrete extension, 3 inches thick with a 2-1/2-inch-diameter pipe in the middle centered over the mark, to support a metal target. No stamping could be seen on the disk.

Reference mark number three, 1927, is a standard disk, stamped "PUU EHU 3 1927" cemented in a drill hole in rock 2 inches below ground level. It is 1.697 m, (5.568 ft.) from station in azimuth 198°.

Reference mark number three, 1910 is a green bottle buried in the ground with 2 inches of the neck projecting. It is 3.672 m, (12.048 ft) from station in azimuth 60° 24', and is about 4 feet lower than station.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU EHU

STATE: HAWAII

YEAR: 1910

SECOND

--ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 09' 35.576	ELEVATION:	593	METERS
GEODETIC LONGITUDE:	159 21 07.731	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE °
HI 4	5104	550,034.35	118,648.55	+ 0° 03' 21"

\* 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 012

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 221592 STATION 1042  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

NO ORIGINAL TEXT

### ADJUSTED HORIZONTAL CONTROL DATA

#### RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: PUU EU  
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:

Station is small conical peak on easternmost part of curving, north-south ridge between Hanalei and Kawaihau Districts, elevation is 2750 feet. Located about 5-1/2 miles due south of Kilauea and 2-1/2 miles west of Kaneha Reservoir.

FORM C&GS-326 (11-58)  
USC&MS-DC 1850P-P&S

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

R

NAME OF STATION: PUU EU

STATE: HAWAII

YEAR: 1910

THIRD

ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	22 ° 08' 02.46	ELEVATION:	METERS
GEODETIC LONGITUDE:	159 24 45.42		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ & ANGLE *
HI 4	5104	529,576.53	109,236.44	+ 0 ° 01' 59 "

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ FOR Δ & FORMULA NEGLECTING THE SECOND TERM.

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

Q1 114

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1043  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

**Roan (Kauai Island, F. G. Engle, 1927).**—In northern part of Kauai, on a sharp knob on the western of two ridges which run in a general northeasterly direction from the mountains, about 2 miles southeast of the village of Hanalei, and approximately two-thirds of the distance to the top of the ridge. From the east, the station appears as a red knob. Approached from the Hanalei valley road which leaves the government highway on the south side of the Hanalei River bridge. A trail leads from the Chinese cemetery up the western ridge. Marked by a standard disk station mark cemented in the top of a 1½-inch gas pipe projecting about ¼ foot above surface of ground. Reference marks are standard disks cemented in bottles, set at the following distances and azimuths from the station: No. 1, 3.01 meters (9.9 feet), 201° 03'; No. 2, 4.04 meters (13.2 feet), 358° 53'.

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

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **ROAN**  
ESTABLISHED BY: **F.G.E.** 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.  
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	
HINIHINI ---1927 DISTANCE and DIRECTION				00 00 00.0
RM No. 1		9.9	3.01	86 18 17
RM No. 2		13.2	4.04	244 08 17
---1965 DISTANCE and DIRECTION				
RM No. 1	NNE	9.861	3.006	86 18 44
RM No. 2	S	13.238	4.036	244 08 10

Station was recovered; the station mark was found leaning slightly and projected 1 foot above ground. Both reference marks were found in good condition. A comparison of reference mark measurements indicated that station was about 2 inches out of position. A 2 x 2 target was found setting directly on top of the station mark, and since the pipe was only driven into the ground this is believed the cause of the station shifting, because of continual wind pressure. The station pipe was reset, in concrete, to coincide with the original reference mark measurements. A complete description follows:

Station is located about 1-1/4 miles southeast of Hanalei, on a knoll of about 917 feet elevation on a fern-covered ridge running down into the east end of the Hanalei Valley. A high-tension line crosses lower end of ridge and 1 tower sets at about the 500 foot elevation on the ridge. A heavy growth of ferns usually covers station knoll and clearing is required to find the marks.

To reach station from the post office in Hanalei, go east on State Highway 56 for 1.5 miles to fork just before crossing large bridge. Go right for 0.5 mile to dim side road right. Turn right and go 0.15 mile to old cemetery; bear left and follow steep road for 0.55 mile to it's end at the high-tension tower. (4-wheel-drive vehicle required for the steep road.) Pack south up gradual ridge for about 1/2 mile to station; a slow trip because of ferns.

Station mark is a standard disk set in the top of a 1-1/2-inch iron pipe that is set in concrete and projects 8 inches from ground. Disk not stamped. Reference mark number one is a standard disk, unstamped, set in cement in the top of a bottle. It projects 1/2 inch from ground and is about 1-1/2 feet lower than station mark.

Reference mark number two is a standard disk, unstamped, set in cement in the top of a bottle. It projects 1/2 inch from ground and is about 1 foot lower than station mark.

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

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

USCOMM-GC 27172-P88

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **ROAN**

STATE: **HAWAII**

YEAR: **1927**

THIRD

-ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE: <b>22 ° 11 '40.535</b>	ELEVATION: <b>280.0</b> METERS
GEODETIC LONGITUDE: <b>159 28 57.827</b>	<b>919</b> FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	S FOR Δ & ANGLE *
HI 4	5104	505,842.94	131,234.08	+ 0 ° 00 '24 "

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE S FOR Δ & FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
HINIHINI	114 44 43.2	114 44 19	5104

QI 127



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1044  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 00' TO 159° 30'  
DIAGRAM NF 4-6 KAUAI

**Ruddy (Kauai Island, F. G. Engle, 1927).**—On northeast coast of Kauai and reached by taking a road north from the main highway in the Waipake district, and on the east side of Waipake stream. At the end of the road continue north along the high ground, and about ¼ mile from the sea cross the valley and stream and continue north to a red eroded point. Station marked according to note 2, a standard disk in outcropping bedrock. Reference marks, standard reference disks in outcropping bedrock, note 12a, are at the following distances and azimuths from the station: No. 1, 6.499 meters (21.32 feet), 139° 02'; No. 2, 13.325 meters (43.72 feet), 193° 39'; No. 3, 12.955 meters (42.50 feet), 261° 52'.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: RUDDY  
ESTABLISHED BY: F.G.E. 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.		
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	
KILAUEA 1910-1927				00 00 00.0
RM No. 4	NE	14.638	4.462	124 42 38
RM No. 5	ESE	19.452	5.930	184 18 32

Station mark was recovered in good condition. All three reference marks have been lost due to erosion of the very soft rock in the area; disks No. 1 and No. 3 were found laying nearby, No. 2 was not found. Two new reference marks, numbers 4 and 5 were established. A complete description follows:

Station is located about 3-1/2 miles east of Kilauea, on Kepuhi Point where the coastline changes direction from northwest to west. It is in an area of jumbled rock and rock outcrops between the red dirt area and the lower, flat bedrock point which extends out about 200 feet to water.

To reach station from the main intersection in Kilauea, go east on

State Highway for 3.6 miles to a fork just before crossing culvert. Take left fork into cane field for 0.1 mile; take right fork, crossing canal, and follow along edge of field northerly for 1.0 mile; take right fork, leaving cane field, and go downridge for 0.2 mile to end of ridge and station and station about 150 feet down slope.

Station mark is a standard disk stamped "RUDDY 1927", cemented in a drill hole in a bedrock outcrop. It is about 10 feet higher than the flat rock point and about 38 feet above water line.

Reference mark number four is a standard disk stamped "RUDDY 1927 NO 4 1965", cemented in a drill hole in a rock outcrop about 3 feet lower than station mark.

Reference mark number five is a standard disk stamped "RUDDY 1927 NO 5 1965", cemented in a drill hole in the top of a bedrock ledge about 2 feet lower than station mark.

## ADJUSTED HORIZONTAL CONTROL DATA

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

GEODETIC LATITUDE: 22° 13' 02.604	ELEVATION: 12.0 METERS
GEODETIC LONGITUDE: 159° 21' 12.257	39 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	± OR Δ ± ANGLE °
HI 4	5104	549,588.71	139,539.31	+ 0° 03' 20"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE  $\sin \Delta \alpha \approx \Delta \alpha$  FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
KILAUEA	102 22 35.5	102 19 16	5104

Q1 054

\*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.



QI 146

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221592 STATION 1046  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 00' TO 159 ° 30'  
DIAGRAM NF 4-6 KAUAI

## ADJUSTED HORIZONTAL CONTROL DATA

Wal (Kauai Island, O. B. French, 1910).—On northeast coast of Kauai, near north point (Kueahu) of Anahola Bay, back from the brow of the bluff. This is a Hawaiian Government Survey point. Marked by flag in "ahu" (cairn) of rock. In 1927 station was searched for and not found. A single rock with drill hole in top and an arrow on one face was found. It was loose in position.

Form 526  
(11-8-55)

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

R

NAME OF STATION: Wal  
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, however it is now marked with a Type B-1 signal built by the Hawaii Territorial Survey in 1931. Subsequent investigation at the Hawaii State Survey office proved this to be the old station. The results, obtained from the Hawaii State Highway Department, of observations made by them about 10 years ago at the station, coincide very closely with the old check angle, also indicating that it is the correct point.

Station is located about 1-1/4 miles north-northeast of Anahola, along the northeast side of a pineapple field at Kueahu Point, about 400 feet back from shoreline, in edge of grove of large ironwood trees bordering field.

Station mark is an unstamped, Hawaii Territorial Survey disk, set about 6 inches beneath the 6-foot-square, concrete platform of the Type B-1 signal. It is 16 feet northeast of field boundary road and at southeast end of a row of very large boulders. A red and white metal target extends about 7 feet above the platform. Access to the mark is had through a small hand tunnel passing beneath the center, concrete pedestal of the signal.

NOTE: KIKOO is the only station visible because of ironwood trees.

Form 526  
(11-8-55)

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

R

NAME OF STATION: WAL  
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii  
RECOVERED BY: E.H.F. YEAR: 1971 COUNTY: Kauai

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

Previous location description by D.M. Whipp (1965) is adequate. Station originally established and called "NORTH BASE" by F.E. Harvey, Haw'n Govt. Survey in 1904 (Govt. Reg. Map 2282). Station later renamed "WAL" as described by O.B. French, (1910)

In 1931, a Type B-1 superstructure was built over the recovered mark, a drill hole in triangle cut in large rock and a standard Hawaii Territory Survey Disc was cemented in drill hole.

The station superstructure has been converted to Type A station with side walls built of concrete tile set on existing ground level platform and 36" high to top of 6' x 6' observing concrete platform. The station mark is exposed at ground level and in middle of, but not connected to, old concrete ground level observing platform.

NAME OF STATION: WAL

STATE: HAWAII

YEAR: 1910

THIRD

ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 22 ° 09' 40.62	ELEVATION: METERS
GEODETIC LONGITUDE: 159 18 33.38	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE °
HI 4	5104	564,543.04	119,173.71	+ 0° 04' 19"

\* 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 116

\* 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 343 14