

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1051  
 HAWAII  
 LATITUDE 21 ° 00' TO 21 ° 30'  
 LONGITUDE 156 ° 30' TO 157 ° 00'  
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
 U. S. COAST AND GEODETIC SURVEY  
 FORM 535  
 MAY, 1948

**DESCRIPTION OF TRIANGULATION STATION**

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

CHIEF OF PARTY: C.T. Husemeyer YEAR: 1950 Described by: G.B.G.

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.65 METERS. HEIGHT OF LIGHT ABOVE STATION MARK 1.35 METERS.

1a	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			
		BEARING	DISTANCE		DIRECTION
			feet	meters	
11a	HONOKAHAU 2				0 00 00.0
	R.M. No.2	SSE	34.07	10.386	70 10 16
	Azimuth mark	SSW	0.75 miles		119 55 20.6
	Hawea Point Light	WSW	2.5 miles		153 29 37.7
11a	R.M. No.1	E	31.25	9.525	357 30 05

Detailed description

Located on the northwest shore of West Maui, Lahaina District, on Cape Lipoa, in land of Honolulu, on an open grassy point surrounded by pineapple fields, about 100 feet southwest of the highest point of the hill. The station, a standard disk stamped MALO 1950, was set in a 1 1/2 inch iron pipe in the center of a concrete post flush with the ground. Reference mark No.1 is east of the station. A standard disk set in a square topped concrete post projecting 8 inches. Stamped MALO NO 1 1950.

Reference mark No.2 is south southeast of the station. A standard disk set in a square topped concrete post projecting 8 inches. Stamped MALO NO 2 1950.

Azimuth mark is a standard disk set in rock outcrop, six feet in from the vertical cliff overlooking the ocean. To reach from the station: go east 0.35 miles to the highway, turn right and go 1.5 miles. Mark is on a prominent point 75 feet west of the road. Stamped MALO 1950.

To reach from the court house at Lahaina: go west and north on road toward Hohokahau to Honokahau School 10.7 miles. Continue ahead on main road for 2.7 miles, turn left into a pineapple field and go westerly for 0.35 miles to summit of a low knoll and station.

Station MALO was not recovered. pipe found at sight and subsequently used as MALO 2 is not the original point. Top of knoll has evidently been graded to a flat surface. No assurance or evidence that the mark found was the original.

PO  
 (11-8-55)

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

**R**

NAME OF STATION: MALO 2  
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii  
 RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

The station and both reference marks were recovered in good condition. The azimuth mark was not searched for. The roads to the pineapple fields are closed by locked chains and a key may be secured at Baldwin plantation headquarters at Honokahau. The description is adequate and complete.

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MALO 2  
 STATE: HAWAII YEAR: 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 21 ° 01 ' 31.963	ELEVATION: 41.5 METERS
GEODETIC LONGITUDE: 156 38 28.548	136 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	508,663.69	251,412.28	+ 0 ° 00 ' 35 "

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
AZIMUTH MARK	20 ° 10 ' 20.7	20 ° 09 ' 48 "	5102

# HORIZONTAL CONTROL DATA

by the  
 NATIONAL GEODETIC SURVEY  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1051

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

MALO 2 (continued)

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MALO 2  
 ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK ALSO   
 RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui  
 HEIGHT OF TELESCOPE ABOVE STATION MARK 5 FEET. HEIGHT OF LIGHT ABOVE STATION MARK FEET.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
WAIKULU 2 1950				00 00 00.0
Azimuth Mark	SSW	About	3/4-mile	24 58 21.5
Hawaea Point Light 1912	SW			58 32 36.0
R.M. No. 3	NW	{625.098}	{190.530}	120 56 22
R.M. No. 4	NNW	{377.278}	{114.994}	160 31 53
3/4-inch Pipe	NE	61.107	18.626	235 02 22

The station mark and both RMs had been destroyed by pineapple cultivation; only the azimuth mark was recovered in good condition. After establishing a trial point by triangulation, the station location was determined by inverse, and an underground mark, consisting of a mass of concrete with a hole in center, from which the station pipe had been pulled, was found. The station was then rebuilt and two new RMs were set outside the pineapple field. A complete description follows:  
 Station is located about 2 miles northeast of Honokahua Village, on

a hill in a pineapple field, out on Lipoa Point, at about 136 feet above sea level.

To reach station from the post office in Lahaina, go northeast on Papalaua St. for 0.2 mile; turn left and follow State Highway 30 for 10.2 miles to Honokohua School on right. Continue on the highway for 1.15 miles to azimuth mark on left. Continue ahead for 1.25 miles to sign "F-53" on left. Follow pineapple field roads left for 0.5 mile to base of hill. Go right, up steep grade, for 0.05 mile to station on right.

Station mark is a standard disk stamped "MALO 2 1950 1969", set in the top of a 10-inch-square, concrete monument projecting 6 inches from ground. It is at south edge of field road, at base of the 2-foot ledge, 2 feet west of a white witness post and about 50 feet south of highest point of the road.

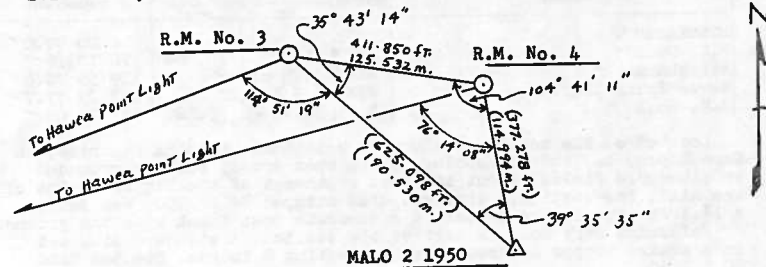
Underground mark is a standard disk stamped "MALO 2 1950 1969", set in concrete 30 inches below ground surface.

Reference mark number three is a standard disk stamped "MALO 2 1950 NO 3 1969", cemented in a drill hole in the center of a 5-foot-square, stone and concrete pier, with flat, concrete top 5-1/2 feet above ground. It is at the north end of a row of Norfolk Pines, along northwest edge of pineapple field, and about 60 feet lower than station mark.

Reference mark number four is a standard disk stamped "MALO 2 1950 NO 4 1969", set in the top of a 12-inch-square, concrete monument that projects 6 inches from ground. It is along north edge of the pineapple field, in a grassy strip bordering a row of pine trees, and about 60 feet lower than station mark.

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

3/4-inch Pipe is an iron pipe set in center of a 12-inch-diameter, concrete monument on center line of the field road, and flush with road surface. It is 10 inches higher than station mark.  
 Azimuth mark is a standard disk stamped "MALO 1950", cemented in a drill hole in a small bedrock outcrop projecting 6 inches from ground. It is located along steep bluff, at the northwest end of the long, red parking turnout at Makuleia Beach; 50.5 feet northeast of center line of highway, 97 feet north-northwest of a board gate at the southeast end of a long cut-bank, 65 yards northwest of the sign at head of trail leading down to Makuleia Beach, and about 5 feet lower than the highway.



# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1052  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

MANAWAI (Maui County, Hawaii, R.W.W., 1925;  
 J.M.D., 1931) The original  
 redwood post was found in position. It has deteriorated greatly  
 from the effects of time, weather and wood borers. None of the  
 original reference marks were found.  
 The redwood post was replaced by an Hawaii Territory Survey  
 standard bronze disk, set in concrete in the top of a 4-in. cast-  
 iron pipe, which later was set in a concrete block, 1-1/2 ft.  
 square at the top and 3 ft. into the ground.  
 The station is reached by a trail which leaves the main Gov-  
 ernment road on the Kaunakakai (W) side of Ualapue Courthouse,  
 which trail leads toward the sea.

(11-8-55)

### RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MANAWAI  
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii  
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui Island: Moloaki

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

Station was recovered and found in good condition. A complete description follows:  
 Station is located, airline, about 12 miles east of Kaunakakai, 2-1/2 miles east-northeast of Kamalo wharf, and 1-1/3 miles southwest of the Aaluaaha church, on the spit at the southeast end of the Puhaloa Fishpond.  
 To reach from the junction of State Highways 45 and 46 just south of the post office in Kaunakakai, go east on State Highway 45 for 10.7 miles to Kamalo wharf. Continue for 3.0 miles to side road right, at mailbox of Mr. Sagario. Turn right for 50 yards to fork. Take right fork for 0.05 mile to fork. Take right fork for 50 yards to end of road at beach. Walk southwest along beach for about 120 yards to fence corner. Continue along fishpond stone wall for about 110 yards to station mark on right.  
 Station mark is a bronze N.P.S. disk, unstamped, set in the top of an 18-inch-square concrete monument that projects 16 inches above ground. It is 5 yards west of a break in the stone wall, in a weedy area.

\* 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: MANAWAI  
 STATE: HAWAII YEAR: 1925 THIRD ORDER  
 SOURCE: G-SP156

GEODETIC LATITUDE: 21° 03' 25.52	ELEVATION:	METERS
GEODETIC LONGITUDE: 156 50 19.63		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ RI ANGL *
HI 2	5102	441,511.73	262,900.40	- 0 03 43 *

\* 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 494

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1053  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

Mapulehu (Molokai Island, Hawaiian Government Survey; E. R. Hand, 1915; R. W. Woodworth, 1925).—On southeastern coast of Molokai, 585 meters S. 78° W. from the end of Pukoo Wharf; not more than 5 feet from water, on a small sharp point formed by a semicircle of protecting stones which permitted the beach on either side to be cut back by wave action; and 380 meters southwest from the front range pole (private) of Pukoo. There is a stream bed directly west of the station, and a large unpainted house, with red roof, near which stands a low windmill, bears N. 63° W. from the station, 310 meters. Subsurface mark is a bottle set below low water. Surface mark is a concrete monument with standard United States Coast and Geodetic Survey bronze disk in top, note 6½. The post projects about 1 foot above surface of ground.

MAPULEHU (MauI County, Hawaii, E.R.H., 1915; O.W.S., 1930)  
 -Station is on the SE coast of Molokai Island. It was recovered as described. Few stones are piled around the monument to hold the base of the signal.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAPULEHU  
 STATE: HAWAII YEAR: 1915 SECOND ORDER  
 SOURCE: G-12734

GEODETIC LATITUDE:	21° 04' 43.112	ELEVATION	1	METERS
GEODETIC LONGITUDE:	156 48 17.662	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ ° ANGLE °
HI 2	5102	452,868.12	267,690.89	- 0 02 59

\* 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
AZ MK KUPEKE	241° 50' 37.4	241° 53' 36"	5102

QF 323

# HORIZONTAL CONTROL DATA

by the  
 NATIONAL GEODETIC SURVEY  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1053

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

MAPULEHU (continued)

FORM 526a  
 (6-16-66)

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

R

NAME OF STATION: MAPULEHU  
 ESTABLISHED BY: E.R.H. YEAR: 1915 STATE: Hawaii Island: Molokai  
 RECOVERED BY: H.J. Seatorg YEAR: 1962 COUNTY: Maui

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
KAHAU				00 00 00.00
FM 2	WNW	60.37	18.402	31 46 31 -
KUPEKE (HGS) 1890 (Az. Mk.)	NE	( 0.75 mile )		109 16 59.3
FM 1	SW	72.98	22.245	301 48 36

Station was recovered and found to be in good condition, although the edges of the concrete monument are slightly chipped. Two new reference marks were established. A complete description follows:

Station is located, airline, about 1/4-1/2 miles east of Kaunakakai, 5 miles east-northeast of Kamalo Wharf, 1/4 mile east of the State Experimental Farm, and 1/4 mile southeast of State Highway 45; on a weed-covered point that extends about 10 yards south from the general shoreline and is about 3 feet higher than the gravel beach.

To reach from the junction of State Highways 45 & 46, just south of the post-office in Kaunakakai, go east on State Highway 45 for 16.2 miles to a sign "WAIIAU TRAIL" on the right. Continue on the highway for 0.05 mile to a side road right. Go right, south, on track road through orchard for 0.25 mile to buildings of the experimental farm. Turn left, passing to south of house, and follow track road east for 0.1 mile to wire gate. Pass through gate and continue for 0.05 mile to wire gate on right. Pass through gate and drive across gravel beach easterly for 0.1 mile to station on point.

Station mark is a standard disk, unstamped, set in the top of a concrete monument that projects about 18 inches above ground. It is 13.8 feet east of a lone fence post, 6.1 feet south of a white witness post, 3/4 yards south of a fence line, and on the east edge of a stream bed.

Reference mark one is a standard disk stamped "MAPULEHU NO 1 1915 1962", set in the top of a 12-inch-diameter, concrete cylinder that projects about 4 inches above ground. It is 36 feet west of small stream bed, 10 feet south of brush line, 10 feet north of shore line, and about 2 feet lower than station.

Reference mark two is a standard disk stamped "MAPULEHU NO 2 1915 1962", set in the top of a 12-inch-diameter, concrete cylinder that projects 2 inches above ground. It is 3 feet northwest of edge of dirt track road, 10 feet south of brush line, 18 feet northwest of the shore line, and about 2 feet lower than station.

Station KUPEKE will serve as the azimuth 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.

USCOMA-DC 27173-P59

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1054  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

FORM 526a  
 (6-15-65)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

### RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MOANUI  
 ESTABLISHED BY: H.G.S. YEAR: 1915 STATE: Hawaii  
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui Island: Molokai

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

Only description available was one obtained from the State of Hawaii Survey Office, which stated that the original station mark was a 4 x 6 redwood post. In 1933 this mark was searched for but not found and was believed destroyed when a fence was built. The following is a quote from the description: "Searched for this station on Oct. 21, 1933, but could find no trace of same. Unconfirmed reports that station was destroyed at the time a fence was being constructed nearby. Established a "Trail Point" marked by a R.W. post about 30 feet NE of said station", end quote. Note: They probably meant that a "Trial Point" was established.

The station was searched for and an iron pipe was recovered but it is not known if this is the original station or the "trial point". A complete description of the pipe mark that was recovered follows:

Station is located, airline, about 2-3/4 miles south-southwest of the old village of Halawa, 2-1/2 miles southwest of the Puu O Hoku Ranch headquarters and 1-3/4 miles northwest of Kumiai Point on the summit of a prominent brushy topped hill of about 1550 feet elevation that has a north-south wire fence with square posts, across its top.

To reach from the crossroad and gas pump at the entrance to the Puu O Hoku Ranch headquarters, go southwesterly on State Highway 45 for 3.4 miles to board gate No. 20 on the right, just east of station LUPEHU. Go through gate and follow track road upgrade for 1.1 miles to red cutbank on the left. Continue on the track road for 0.2 mile to board gate No. 19. Pass through gate and go sharp left, downgrade, on track road for 0.3 mile to end of road at fence line. Pack south-southwest on old trail about 200 yards to where trail crosses stream at two water pipes crossing stream. Cross stream and bear left through brush, south-southwest, to the face of a ridge; go up steep slope to crest of ridge, then go west along fence line for about 1/4 mile to grove of large trees on high point of ridge. Go left southeast down narrow ridge to bottom of draw; cross draw to right and go southwest up face of brushy ridge then up top of ridge to open grassy pasture. Go southwest across pasture about 200 yards to end, then follow trail westerly about 1/4 mile up ridge to fence line on top of hill. Go right, north, along right side of fence through dense ferns about 50 yards to station.

The pipe is 1-1/2 inches in diameter and projects 10 inches. It is 29.2 feet east of the 16th post from south end of fence (there is a triangle blaze on the post), and 30.4 feet north of old lone fence post. From gate No. 19 the station lies on a true bearing of 268 degrees, on hill above the open grassy pasture.

NOTE: When reobserved this station should be listed as MOANUI 2.

name of chief of party should be inserted here. The officer who actually visited the station is recovery note.

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

USCOMS-DC 7119-P-68

NAME OF STATION: MOANUI  
 STATE: HAWAII YEAR: 1915 SECOND ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 21° 07' 42.500	ELEVATION: 473 METERS
GEODETIC LONGITUDE: 156° 46' 01.570	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE*
HI 2	5102	465,770.27	288,807.25	- 0° 02' 10"

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

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

QI 500

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 211563 STATION 1055  
 HAWAII  
 LATITUDE 21 ° 00' TO 21 ° 30'  
 LONGITUDE 156 ° 30' TO 157 ° 00'  
 DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOKAPU  
 STATE: HAWAII YEAR: 1925 ORDER: THIRD

SOURCE: G-SP156

GEODETIC LATITUDE:	21 11 11.736	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 55 35.504		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE*
HI 2	5102	411,470.48	309,979.79	- 0 05 38

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
Q1 532			

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1056  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

FORM 526  
 (11-6-65)

U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY  
**DESCRIPTION OF TRIANGULATION STATION**

NAME OF STATION: **LOKOHOLA (HGS)**  
 ESTABLISHED BY: **H.J. Seaborg** STATE: **Hawaii** YEAR: **1962** COUNTY: **Kauai** Island: **Molokai**

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

A MARK consisting of a tin pipe filled with concrete was recovered. A complete description follows:  
 Station is located about 7 miles airline east of Kalaupapa and 1/4 mile north-northwest of Umiehi Point, on the highest point of Lokohola Island, a narrow bare northwest-southeast rock about 250 feet long and 30 feet wide, with the highest point being about 25 feet above water line.  
 Station was reached by skiff and also by helicopter.  
 Station mark is a 6-inch-diameter tin pipe, filled with concrete, and projecting 6 inches above surrounding rock. The letters "AEL" are inscribed in the concrete. Station is on the southeast end of the rock on the highest point and near the west edge of a ledge. Because of its location making it very difficult to occur, a new station, LOKOHOLA 2, was established. See description for that station.

**RECOVERY NOTE, TRIANGULATION STATION**

NAME OF STATION: **MOKOHOLA (HGS)**  
 ESTABLISHED BY: **H.J. Seaborg** YEAR: **1962** STATE: **Hawaii** BENCH MARK(S) ALSO   
 RECOVERED BY: **R.L. Newsom** YEAR: **1968** COUNTY: **Maui**  
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:  
**7 miles E. of Kalaupapa, Molokai**

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:  
 Recovered in good condition as previously described.

**R**

**R**

**ADJUSTED HORIZONTAL CONTROL DATA**

NAME OF STATION: **MOKOHOLA HGS**  
 STATE: **HAWAII** YEAR: **1962** SECOND ORDER

SOURCE: **G-12734**  
**NO OBSERVATION CHECK ON THIS POSITION**

GEODETIC LATITUDE:	21 10 28.954	ELEVATION	SCALED	METERS
GEODETIC LONGITUDE:	156 52 42.164			FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	427,868.45	305,638.88	- 0 04 35

\* 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

POSITION DETERMINED BY TRAVERSE FROM STATION MOKOHOLA 2



# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1057  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
 U. S. COAST AND GEODETIC SURVEY  
 FORM 555  
 Rev. Aug. 1963

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: MOKOHOLA 2 STATE: Hawaii COUNTY: Maui  
 Island: Molokai  
 Described by: J. R. S.  
 CHIEF OF PARTY: H. J. Seaborg YEAR: 1962  
 HEIGHT OF TELESCOPE ABOVE STATION MARK 1.61 METERS.<sup>†</sup> HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE 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 †
feet	meters					
4	Surface-station mark, Underground-station mark	KIKIPUA2 1962	SSE	49.81	15.183	00 00 00.00
		MOKOHOLA (HGS)				41 30 50.
		Molokai Lighthouse	SW			206 12 53.2 ✓

Station is located about 7 miles airline east of Kalaupapa and 1 1/2 miles north-northwest of Umilehi Point and in about the center of Mokohola Island, a bare rock about 250 feet long and 80 feet wide.

The only way to reach the station is either by Helicopter or by Skiff.

The station is a standard disk stamped; MOKOHOLA 2 1962, cemented in a drill hole in the approximate center of the rock. It is flush with the surface of the rock and 7.5 feet northwest of a ledge that drops about five feet.

Note. The water around this rock is usually very rough.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOKOHOLA 2  
 ESTABLISHED BY: H. J. Seaborg YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO   
 RECOVERED BY: R. L. Newsom YEAR: 1968 COUNTY: Maui  
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai  
 7 miles E. of Kalaupapa, Molokai

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:  
 Recovered in good condition as previously described.

FORM CGS-526 (11-68)  
 USCGM-DC 38240-P48

U. S. DEPARTMENT OF COMMERCE  
 ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION  
 COAST AND GEODETIC SURVEY

\* Refer to notes in manuals of triangulation and state publications of triangulation.  
 † To nearest meter only, when no trigonometric leveling is being done.

† Direction-angle measured clockwise, referred to true local meridian.  
 16-60000-1 U. S. GOVERNMENT PRINTING OFFICE

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOKOHOLA 2  
 STATE: HAWAII YEAR: 1962 SECOND ORDER

SOURCE G-12734

GEODETIC LATITUDE	21° 0' 29.264	ELEVATION	2 METERS
GEODETIC LONGITUDE	156 52 42.578	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLE °
HI 2	5102	427,629.31	305,670.21	- 0° 04' 36"

\* 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
KIKIPUA 2	267 04 40.0	267 09 16	5102

QF 311

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 211563 STATION 1058  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

**Mokuhooniki (Molokai Island, Hawaiian Government Survey).**—Near eastern end of Molokai, on island of same name, 1¼ miles south of Cape Halawa, and 1 mile from mainland. Not visited in 1915. Old Hawaiian Government survey mark an iron bolt let into the rock.

MOKUHOONIKI (Maui County, Hawaii, E.R.H., 1915; O.W.S., 1931)

--Station was not visited, but the highest point of the island was used for hydrography. There was no signal over the station.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOKUHOONIKI  
 ESTABLISHED BY: E.R.H. YEAR: 1915 STATE: Hawaii  
 RECOVERED BY: H.J.S. YEAR: 1962 COUNTY: Maui  
 Island Molokai

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

The station was recovered but found to be in very bad shape and unsuitable for use. The station should be considered as lost.  
 A new point was mark with a iron pin cemented in bedrock "MOKUHOONIKI 2". See description for that station.

\* Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.  
 Note.—One of these forms must be used for every station recovered.

Coast-DC 514

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOKUHOONIKI

STATE: HAWAII

YEAR: 1915

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE	21° 08' 08.728	ELEVATION	62 METERS
GEODETIC LONGITUDE	156 42 21.718	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE *
HI 2	5102	486,584.26	291,444.36	- 0° 00' 51"

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

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

Q1 502

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1059  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE  
 U.S. COAST AND GEODETIC SURVEY  
 Form 522  
 Rev. Aug. 1962

NAME OF STATION: MOKUHOONIKI 2 STATE: Hawaii COUNTY: Maui  
 Island: Molokai  
 Described by: J.R. Snea  
 CHIEF OF PARTY: H. J. Seaborg YEAR: 1962  
 HEIGHT OF TELESCOPE ABOVE STATION MARK 1.53 METERS.1 HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE	HEIGHT OF TELESCOPE ABOVE 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 feet meters	DIRECTION ° ' "
	Surface-station mark				
	Underground-station mark				
12 a	RM 1	N	65.89	20.085	00 00 00.00
12 a	RM 2	S	20.93	6.830	139 20 15 / 306 29 43 -

Station is located 1.8 miles south of Cape Halawa, about 1 mile offshore from the east end of Molokai Island, and on the highest point of Mokuhooniki Island.  
 To reach the station a Helicopter or Skiff has to be used, on most days this station cannot be reached by a Skiff as the water is too rough. Station is marked by 1/2 inch steel pin about 12 inches long embedded in bedrock and surrounded by concrete.  
 RM 1 is a standard disk stamped, MOKUHOONIKI NO 1 1915 1962, cemented in a drill hole in bedrock that projects 1 foot and about two feet lower than the station.  
 RM 2 is a standard disk stamped, MOKUHOONIKI NO 2 1915 1962, cemented in a drill hole in bedrock, and about level with the station.  
 Note: This station was only visit once by helicopter. From a low level flight from the helicopter it appeared that the station mark was in good condition and only new reference marks would be needed. When the station was visited to be occupied it was found that the old station was in very poor condition and unsuitable to be occupied. A new station was not anticipated so no disk was available which is the reason for the steel pin as a station mark. Also the reference marks were stamped for the old station so they are stamped incorrectly

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOKUHOONIKI 2  
 ESTABLISHED BY: H. J. Seaborg YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO   
 RECOVERED BY: R.L. Newsom YEAR: 1968 COUNTY: Maui

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:  
 6.2 miles 056° from Fukoo, Molokai

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

Recovered in good condition as previously described.  
 RM#'s 1 and 2 were also recovered  
 in good condition.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOKUHOONIKI 2  
 STATE: HAWAII YEAR: 1962 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE: 21° 08' 08.864	ELEVATION: 62 METERS
GEODETIC LONGITUDE: 156° 42' 21.655	SCALED FEET

STATE COORDINATES (Ft)				
STATE & ZONE	CODE	X	Y	Bearing Δ Angle
HI 2	5102	486,586.44	291,458.08	- 0 00 51

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
LUPEHU	62 45 10.7	62 46 02	5102

QF 315

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1060  
 HAWAII  
 LATITUDE 21 ° 00' TO 21 ° 30'  
 LONGITUDE 156 ° 30' TO 157 ° 00'  
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
 U. S. COAST AND GEODETIC SURVEY  
 Form 523 b

## DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Molokai Lighthouse YEAR: 1962 STATE: Hawaii COUNTY: Maui  
 Island: Molokai

CHIEF OF PARTY: H.J.S.

Description, including sketch of object:

Station is located on Makanelua Peninsula, about 1.5 miles north-northeast of Kalaupapa, about 0.3 mile east of the Kalaupapa Airport, and about 0.3 mile south of Kahiu Point.

Station is the center of ball on finial of lighthouse. Structure is octagonal and pyramidal, constructed of concrete, about 140 feet high and painted white. The top part of the structure contains a glass enclosed light and the roof is painted black. Light is 238 feet above MSL.

Light is listed as number 2952 in List Of Lights And Other Marine Aids, Volume III, Pacific Coast And Pacific Islands.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Molokai Lighthouse  
 ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO   
 RECOVERED BY: R.L.N. YEAR: 1967 COUNTY: Maui

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai  
 1.5 miles north-northeast of Kalaupapa

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

Station was recovered as described - in excellent condition.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOLOKAI LIGHTHOUSE

STATE: HAWAII

YEAR: 1962

THIRD

ORDER

SOURCE: G-12734

GEODETIC LATITUDE: 21 ° 12 ' 45.750	ELEVATION: METERS
GEODETIC LONGITUDE: 156 58 20.865	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ B1 ANGLE °
HI 2	510c	355,840.08	319,493.37	- 0 ° 06 ' 38 "

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE B OR Δ B1 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 211563 STATION 1062  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

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

## DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: NAKALELE POINT LIGHT YEAR: 1950 STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:

The station is the center of the flashing white light at the Nakalele Point Lighthouse.

The lighthouse is located at the most northerly point of the island of Maui. It is a white, skeleton, tower which is 45 feet in height.

(11-8-55)

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Nakalele Point Light  
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii  
 RECOVERED BY: W.R.P. YEAR: 1960 COUNTY: Maui

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

The station was recovered in good condition as described. It is shown in the Light List, Pacific Coast, 1960 as "No. 2924 - White skeleton tower, built 1908, rebuilt 1948".

## RECOVERY NOTE, TRIANGULATION STATION intersection

NAME OF STATION: Nakalele Point Light  
 ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO   
 RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located at northwest point of the island, at Nakalele Point.

Station is the white light mounted atop a white, wooden, skeleton tower.

FORM CG5-526 (1-55)  
 USCOMM-DC 1950-955

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NAKALELE POINT LIGHT

STATE: HAWAII

YEAR: 1950

THIRD

ORDER

SOURCE G- 9311

GEODETIC LATITUDE: 21° 01' 56.235	ELEVATION: METERS
GEODETIC LONGITUDE: 156° 35' 35.826	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) α (ANGLE)
HI 2	5102	525,025.36	253,866.22	+ 0 01 35

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ (OR Δ) α (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 211563 STATION 1065  
 HAWAII  
 LATITUDE 21 ° 00' TO 21 ° 30'  
 LONGITUDE 156 ° 30' TO 157 ° 00'  
 DIAGRAM NF 4-16 MAUI

**Onini (Molokai Island, Hawaiian Government Survey; E. R. Hand, 1915).—**  
 On southern coast of Molokai, on the slope close to the shore, 50 meters above road and 3¼ miles east of Kaunakakai Wharf. Between mileposts 12 and 13 and on the upper side of the road there is an apiary, from the main shed of which the station bears N. 66° E., 100 meters. Subsurface mark is a bottle. Surface mark is a concrete monument with bronze disk in top, note 6¼. View of station from sea interrupted by algeroba trees growing along shore.

ONINI ( Maui County, Hawaii, E.R.H., 1915; O.W.S., 1930)  
 --Station is on the S coast of Molokai Island. It was recovered as described. The Territorial Government has placed a standard observing platform above the station as described by Note 14 A.

## RECOVERY NOTE, TRIANGULATION STATION

**R**

NAME OF STATION: ONINI  
 ESTABLISHED BY: F.R.H. YEAR: 1915 STATE: Hawaii  
 RECOVERED BY: H.J.S. YEAR: 1962 COUNTY: Maui H.I. 3.18m  
 Island: Molokai

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

The station was recovered in good condition.

Station is located about 7 miles northwest of the wharf at Kaula, about 3 miles southeast of Kaunakakai, and about 250 feet north of State Route 45. A standard triangulation station disk stamped 55 VA and set in the top of a concrete post. A Territory of Hawaii Type A structure is built over the station.

To reach the station from the junction of State Routes 45 and 46 at the post office in Kaunakakai, go 4.0 miles southeast on State Route 45 to gate and track road on left, turn left and go about 0.85 mile to station on right.

\* Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.  
 Note.—One of these forms must be used for every station recovered. COMB-DC 34314

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: ONINI  
 STATE: HAWAII YEAR: 1915 SECOND -ORDER  
 SOURCE: G-12734

GEODETIC LATITUDE:	21 ° 04' 31.577	ELEVATION SCALED	17 METERS
GEODETIC LONGITUDE:	156 58 34.845		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\beta$ OR $\Delta$ OR ANGLE *
HI 2	5102	394,420.12	269,636.05	- 0° 06' 41"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE  $\beta$  OR  $\Delta$  OR 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 211563 STATION 1067  
 HAWAII  
 LATITUDE 21 ° 00' TO 21 ° 30'  
 LONGITUDE 156 ° 30' TO 157 ° 00'  
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

FORM 524  
 (6-15-65)

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

R

NAME OF STATION: **POHAKULOA**  
 ESTABLISHED BY: **R.W.W.** YEAR: **1925** STATE: **Hawaii**  
 RECOVERED BY: **H.J.S.** YEAR: **1962** COUNTY: **Mau** Island: **Molokai**  
 (East end)

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

The only description available was one obtained from the State of Hawaii Survey Office, which stated that the station was marked by a 4 x 4 redwood post.

Station was searched for and a redwood post was recovered. A complete description follows:

Station is located, airline, about 3-1/4 miles west of the old village of Halawa, 2-1/2 miles east-southeast of the mouth of Wailau Stream, on a small round knoll of about 2260 feet elevation on the southwest end of a narrow topped ridge. It sets at the northeast side of a large and prominent double-topped hill that is about 150 feet higher.

To reach from the gas pump at crossroad at entrance to the Puu O Hoku Ranch headquarters, go northerly on State Highway 45 for 2.7 miles to bottom of grade at old church. Turn back sharp left for 0.05 mile to fork. Take right fork and go 0.1 mile to concrete bridge, and end of truck travel. Pack northeast along old beach road for about 1/4 mile to gate at fence corner. Pass through gate and continue for 1/4 mile to fence corner on left. Continue on washed out road winding up canyon for about 1 mile to gate at top of grade. Pass through gate and continue on road for about 1 mile to station KAWAIKAPU 2 on the knoll on left. Continue westerly on road about 3/4 mile to fork. Take right fork, over small rise, then down into brushy draw and up along ridge, for about 1 mile to top of ridge and beginning of cleared pasture land at end of road. Continue west, on trail along narrow ridge tops for about 1 mile, keeping towards the higher and more prominent hill to station on ridge just before reaching this higher hill.

The redwood post is on highest point of a small round-topped knoll and projects about 20 inches above ground.

NAME OF STATION: **POHAKULOA**  
 STATE: **HAWAII** YEAR: **1925** **THIRD** ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE:	<b>21 ° 09' 50.63</b>	ELEVATION:	METERS
GEODETIC LONGITUDE:	<b>156 47 53.17</b>		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ α ANGLE °
HI 2	5102	457,108.76	301,741.06	- 0 02' 44"

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

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

QI 523

Name of party should be inserted here. The officer who actually visited the station should sign his name and date.

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

USCGC 27178-P-88



# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1069  
 HAWAII  
 LATITUDE 21° 03' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

**Pukoo** (Maui County, Hawaii, R. W. Woodworth, 1925).—On the southeastern coast of Molokai, back from the village of Pukoo, on top of a grass-covered knob on the ridge running back from Pukoo Fish Pond, the first ridge east of the one along which runs the Wailua foot trail. Station is at the apex of the triangle formed by two great converging gulches which become one just above the station, and whose base is flat ground at sea level. This triangle shows smooth grass-covered slope of light green against the dark green of the gulches on either side and the timber seen above the apex across the remarkably deep gulch formation. Pineapple cultivation is being started on the lower slopes of the hill, and a road is under construction which will lead some half way up the hill. Subsurface mark is a bottle. Surface mark is a concrete monument with standard bronze disk, note 6 1/4.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUKOO  
 ESTABLISHED BY: R.W. Woodworth YEAR: 1925 STATE: Hawaii  
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui Island: Molokai

HEIGHT OF TELESCOPE ABOVE STATION MARK 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	

### Station

was recovered and found in good condition. A complete description follows:  
 Station is located, airline, about 1-1/2 miles northwest of Kupeke Fishpond and 1-3/4 miles northeast of the Kaluasha Church, on a brushy point of about 1500 feet elevation on a ridge that lies between Punaula Gulch and Pukoo Gulch and is the first ridge east of the one that the Wailua Trail runs up.

To reach from the Pukoo post office, go east on State Highway 45 for 0.8 mile to the Kaluasha Church on the left. Continue for 1.7 miles to sign on right "WAILUA TRAIL". Continue for 0.15 mile to old board gate on left, 10 yards after crossing a white wooden bridge. Go left, through gate, and follow track road north for 0.25 mile to wire gate in fence corner. Pass through gate and go right on old track road for 0.15 mile to dim fork by a lone fence post. Take left fork and follow bulldozed road up ridge for 0.45 mile to dim crossroad. Turn right and go up grade on track road for 0.7 mile to station on narrow, brushy point.

Station mark is a standard disk, unstamped, set in a horizontal, square opening or tunnel which passes through the side of a 12-inch-square, concrete monument. The mark sets about 14 inches above ground; the top of the monument extends to about 24 inches above ground. An iron pipe is installed vertically through the center of this top part, permitting an instrument to be plumbed over the mark, and also serving as a socket which supports a removeable metal cylinder target mounted on a 1-inch iron pipe. The target is 8 inches in diameter and about 40 inches long; it extends about 8 feet above ground.

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

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

USCGM-DC 2717B-P89

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUKOO  
 STATE: HAWAII YEAR: 1925 THIRD ORDER

SOURCE G-SP156

GEODETIC LATITUDE: 21° 05' 33.40	ELEVATION: 465 METERS
GEODETIC LONGITUDE: 156° 48' 30.61	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	451,649.07	275,792.54	- 0° 03' 04"

\* 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 457

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 211563 STATION 1070  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU ALII  
 STATE: HAWAII YEAR: 1925 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21° 07' 54.26	ELEVATION:	1287	METERS
GEODETIC LONGITUDE:	156 54 00.94	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE *
HI 2	5102	420,390.06	290,041.46	- 0 05 03

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

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

QI 536

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1071  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

FORM 526a  
 (8-18-68)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

R

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU KAE0  
 ESTABLISHED BY: HJS  
 RECOVERED BY: H.J. Seaborg  
 YEAR: 1890  
 STATE: Hawaii  
 YEAR: 1962  
 COUNTY: Maui  
 Island: Molokai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.13 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
KALUAHAUONI (HGS) 1890	NE	18.0		00 00 00.00
Cross on boulder	ENE	6.9		59 19 26
Cross on boulder	SW	6.1		144 15 57
Cross on boulder				257 10 15

Only description available was obtained from the Hawaii State Survey Office. It stated that the original station was marked by a redwood post and referenced by 3 crosses on stones. Station was recovered but the original post has been replaced by a 1-1/2-inch iron pipe. All three crosses were recovered and found to check the old measurements very close. A complete description follows:

Station is located, airline, about 7 miles northeast of Kaunakakai, 5-1/2 miles southeast of Kalaupapa, and 2-3/4 miles east of the State Forestry Camp, on the summit of a brushy round-topped hill of 3702 feet elevation that sets on the west rim of Waikolu Canyon. A large white rain gauge is mounted on the station pipe and projects about 7 feet above ground, making a very prominent target.

To reach station from the junction of State Highways 45 and 46 just south of the post office in Kaunakakai, go westerly on State Highway 46 for 3.7 miles to a crossroad at south end of a long bridge. Turn right and go east on graded road for 0.25 mile to a board gate and cattleguard. Pass and continue for 2.9 miles to a fork. Take left fork and continue for 0.75 mile to a board gate. Pass through gate and continue for 2.35 miles to the State Forestry Camp. Bear right and follow main road for 1.2 miles to a tank and reservoir on left. Continue for 1.0 mile to a side road left. Continue ahead on main road for 0.85 mile to a side road right and a camp on the left. Continue ahead on main road for 0.35 mile to a white historical plaque on left. Continue ahead for 0.4 mile to fork. Take left fork for 0.05 mile to dim right fork. Take right fork and go 0.15 mile to end of road at brush line on hillside. From here pack northerly, keeping around to left where brush is less dense, for about 150 yards to top and station.

Station mark is a 1-1/2-inch iron pipe set in concrete and projecting about 16 inches above ground.

Northeast cross is 18.0 feet from station, on large flat bedrock.

Southeast cross is 6.9 feet from station, on northwest face of a small boulder hidden by ferns.

West cross is 6.1 feet from station, in a small boulder hidden by ferns.

Name of chief of party should be inserted here. The officer who actually visited the station recovery note.

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

USCGM-DC 3717a-P88

NAME OF STATION: PUU KAE0

STATE: HAWAII

YEAR: 1890

SECOND

ORDER

SOURCE: G-12734

GEODETIC LATITUDE:	21° 08' 21.198	ELEVATION	1128	METERS
GEODETIC LONGITUDE:	156 55 44.860	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ IOR Δ θ I ANGLE
HI 2	5102	410,556.63	292,774.73	- 0° 05' 41"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
KALUAHAUONI	146 56 11.1	147 01 52	5102

QF 308

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1072  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

FORM 526a  
 (6-18-69)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU KAHEA  
 ESTABLISHED BY: E.R.H. YEAR: 1915 STATE: Hawaii  
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui Island: Molokai

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

Only description available was one obtained from the State of Hawaii Survey Office, which stated that the station was marked by a redwood post.

Station was recovered and the original redwood post found still standing and fairly solid. A pipe set in concrete was recovered on the same knoll. A complete description follows:

Station is located, airline, about 3 miles west-southwest of the Puu O Hoku Ranch headquarters and 4 miles north-northeast of Kupeke Fishpond, on the summit of a prominent, brush and tree covered hill of about 2336 feet elevation.

To reach from the crossroad and gas pump at the entrance to the Puu O Hoku Ranch headquarters, go northerly on State Highway 45 for 0.35 mile to a board gate, No. 14, on the left, just after rounding curve near top of grade. Go left, through gate, and follow field road westerly for 0.3 mile to gate. Pass through gate and continue for 0.3 mile to another gate. Pass through gate and follow track road for 0.7 mile to wire gate at Forest Reserve boundary. Pass through gate and follow track road up along brushy ridge for 0.6 mile to small clearing and end of truck travel. From here pack westerly along the track road (which is too wet to drive except in extremely dry weather) for about 1/2 mile to end of road. Continue on trail up along ridge for about 1/2 mile to top of hill and station.

The redwood post is at the west side of the small clearing and projects about 3 feet above ground.

The pipe mark is a 1-1/2 inch iron pipe that projects 20 inches above ground. It is set in a concrete monument 12 inches square and flush with the ground. Some information has been inscribed in the concrete but only part that is legible is the word "BUILT". The mark is 22 feet east of the redwood post.

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

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

USCOMM-DC 27178-P89

NAME OF STATION: PUU KAHEA

STATE: HAWAII

YEAR: 1915

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21° 08' 11.15"	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 46 53.07		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ = ANGLE *
HI 2	5102	460,856.86	291,701.18	- 0° 02' 29"

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

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

Q1 514



# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211503 STATION 1073  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

FORM 526-  
 (8-18-59)

U. S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU KOLEKOLE  
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii Island: Molokai  
 RECOVERED BY: Harold J. Seaborg YEAR: 1962 COUNTY: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

Only description available was obtained from the State of Hawaii Survey Office, which stated that the original station mark was a 4 x 4 redwood post referenced by 3 crosses on stones. Station was recovered and found to be marked by a pipe. Two of the reference crosses were recovered and the station identified by measurement to them. A complete description follows:

Station is located, airline, about 7-3/4 miles east of Kaunakakai, 5 miles south-east of the Kolokai Forestry Camp, and 4-1/4 miles north-northwest of Kamalo Wharf, on the summit of a prominent hill of 3951 feet elevation that has a row of juniper trees across its north end and a northeast-southwest fence line across the top.

To reach from the junction of State Highways 45 and 46, just south of the post office in Kaunakakai, go westerly on State Highway 46 for 3.7 miles to a crossroad at a ready-mix plant on the left. Turn right and go east for 0.25 mile to cattleguard. Cross and continue for 3.0 miles to fork. Take left fork and go 0.75 mile to a cattleguard. Cross and continue for 2.4 miles to forestry camp buildings. Bear right and follow forest road for 1.15 miles to tank and reservoir on left. Continue on main road for 3.4 miles to metal buildings on left. Continue ahead for 1.3 miles to fork. Take left fork, straight ahead, off of main road, for 50 yards to fork. Take left fork, passing along a fence, for 0.2 mile to fence corner and fork. Take left fork for 0.6 mile to fork. Take right fork and follow main road for 0.5 mile to end of road. Pack southerly on good trail down ridge for 300 yards to concrete bridge, and small reservoir on left. Go left before crossing bridge for about 30 yards; cross stream to right and enter tunnel that is partially hidden by brush. Pass through tunnel then go left down trail about 100 yards to concrete bridge. Cross bridge and go right on trail up along ridge for about 1/2 mile to top of ridge and trail fork. Go sharp right and go about 1/2 mile to station on point of hill.

Station mark is a 1-1/2-inch iron pipe projecting from a 5-gallon can that is full of cement, set flush with the ground and surrounded by a mass of concrete. It is set in the fence-line, 1 foot northeast of the highest fence post. A metal cylinder target mounted on a 1-inch iron pipe set into the station pipe projects about 6 feet above ground.

West cross is 6.5 feet from station.

East-northeast cross is 8.3 feet from station.

NOTE: Packing time about 1 hour.

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 - These forms must be used for every station recovered.

USCGM-DC 27173-P88

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU KOLEKOLE  
 STATE: HAWAII YEAR: 1925 SECOND ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21° 06' 19.588	ELEVATION:	1204
GEODETIC LONGITUDE:	156° 54' 16.091	SCALED	METERS FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE °
HI 2	5102	418,941.46	280,491.67	- 0° 05' 08"

\* 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 457

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 211563 STATION 1074  
HAWAII  
LATITUDE 21 ° 00' TO 21 ° 30'  
LONGITUDE 156 ° 30' TO 157 ° 00'  
DIAGRAM NF 4-16 MAUI

**Puu Mano** (Maui County, Hawaii, H.G.S., 1890)  
-On the southeastern coast of Molokai, just above and north of the shore road and the locality known as Honomuni, which is 2 miles east of Pukoo. Station is on a very prominent, dome-like hill, grass covered. It may be identified from the shore as follows: From the two red houses on the beach, belonging to Bowen, it bears N. 35° W., 1,270 meters; from the small conical unpainted steeple close to and just below government road it bears north 1,330 meters. Subsurface mark is a bottle. Surface mark a concrete monument and bronze station mark in top, note 6%. The lower slopes of this hill are under cultivation for pineapples, and a good road leads up the hill almost to the station.

PUU MANO (Maui County, Hawaii, H.G.S., 1890; Hawaiian Territorial Survey, 1930)  
Station is on a hill of the same name, in Land of Kainalu, Molokai, about 3/4 mi. inland, elevation is 938 ft.

The original station correctly remarked by the U.S.C.&G.S. with a pyramidal concrete monument and bronze disk. Monument agrees with all three original witness crosses. Concrete is badly disintegrated and the reinforcing rods exposed, covered with rust and scale.

Repaired the monument with a 3-in. casing of concrete and galvanized reinforcing wire wound around the vertical bars.

Built a Type B1 superstructure of boulder concrete, edges of platform are 1 ft. below ground surface and 1 ft. thick all around.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU MANO  
STATE: HAWAII YEAR: 1890 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE:	21 06 02.052	ELEVATION:	286	METERS
GEODETIC LONGITUDE:	156 46 47.465	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\beta$ OR $\Delta$ OR ANGLE *
HI 2	5102	461,418.19	278,675.54	- 0 02 27

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

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

QF 321

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 211563 STATION 1074

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

PUU MANO (continued)

FORM 524a  
 (5-14-69)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

R

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU MANO  
 ESTABLISHED BY: H.G.S. YEAR: 1890 STATE: Hawaii  
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui  
 Island: Molokai

HEIGHT OF TELESCOPE ABOVE STATION MARK 2.55 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	

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

Station is located, airline, about 15-1/2 miles east of Kaunakakai, 2 miles northeast of Pukoo and 3/4 mile northwest of the shoreline, on property of Mr. W.B. Dunbar, on the summit of Puu Mano, a grass-covered, round-topped hill of 938 feet elevation that has a grove of trees on its west and northwest sides.

To reach station from the junction of State Highways 45 and 46, just south of the post office in Kaunakakai, go easterly on State Highway 45 for 16.2 miles to a sign on right "WAILAU TRAIL". Continue on the highway for 4.9 miles to a green church on the left. Continue for 0.35 mile to a track road left, at sign "PUU MANO SHARK GOD HILL". (This is 0.25 mile after passing Mr. Dunbar's house on the left). Go left on the track road for 0.05 mile to a board gate. Pass through gate and continue for 0.4 mile to board gate. Pass through gate and continue on track road upgrade for 0.4 mile to board gate. Pass through gate and follow road right, up along fence, for 0.2 mile to board gate. Pass through gate and follow road left upgrade for 0.25 mile to crest of ridge and a large boulder on the left. Turn left, off of road, and go southwest for 0.1 mile to station on summit of hill.

Station mark is a standard disk, unstamped, set in a concrete monument. The Hawaiian Territorial Survey has constructed a stone and concrete platform, known as a Type B-1 Superstructure, over the mark. This consists of a 6-foot-square, concrete platform which projects 2 feet above ground on the south side and 1 foot on the north side. The stone and concrete foundation of the platform extends about 1 foot below ground level. At the center of the platform, above the station mark, there is a concrete pedestal about 1 foot square, with a 2-inch pipe in its center, projecting 2 feet above the platform. This pipe allows instrument to be plumbed over the mark and also serves as a socket to hold a removable, red-and-white, metal target that extends about 8 feet above the platform. Access to the mark is gained through a small depression or tunnel under the pedestal.

NOTE: 4-wheel-drive vehicle required to drive to station. Mr. Dunbar requests that he be notified when anyone visits station.

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

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

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1075  
 HAWAII  
 LATITUDE 21 ° 00' TO 21 ° 30'  
 LONGITUDE 156 ° 30' TO 157 ° 00'  
 DIAGRAM NF 4-16 MAUI

**Puu o Hoku** (Molokai Island, Hawaiian Government Survey; E. R. Hand, 1915).—On eastern shore of Molokai, on a poorly defined, flat, grassy hill, 2 miles southwest from Cape Halawa, and ½ mile back from shore. It is 40 to 50 meters from the main road, in the sharp bend where the road comes up out of a great gulch and turns northwest toward Brown's house and the village of Halawa. Station not on highest point, but 2 feet below it and 30 meters south of it. Sub-surface mark is a bottle. Surface mark is concrete monument with standard bronze disk in top, note 6½.

PUU O HOKU (Maui County, Hawaii, E.R.H., 1915; O.W.S., 1931)  
 --Station is on the NE end of Molokai Island. The location is as described. The hill is now used for cultivation of pineapples, but the monument has not been disturbed. Signal, tripod, was placed in a clear place in the field about 10 m. from the station and towards Brown's house.

QUAD AND GEODETIC SURVEY  
**RECOVERY NOTE, TRIANGULATION STATION**

NAME OF STATION: PUU O HOKU  
 ESTABLISHED BY: E.R. Hand YEAR: 1915 STATE: Hawaii Island: Molokai  
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.19 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	

Station mark was recovered and found to be in good condition. No reference marks were established because the station is in a location where there is little danger of being disturbed. A complete description follows:

Station is located about 1/2 mile airline south-southeast of the Puu O Hoku Ranch headquarters, on the east end of Molokai Island, about 1/2 mile northwest of the shoreline, in pasture land on a grassy flat hill of 668 feet elevation.

To reach from the Puu O Hoku Ranch headquarters, go west on track road for 0.2 mile to crossroad at gas pump. Turn left and go southerly on graded road for 0.75 mile to board gate number 31 on right. Turn right, through gate, then go left, southerly along pasture trail for 0.35 mile to top of hill and station.

Station mark is a standard disk, unstamped, set in the top of an 8-inch square concrete monument that projects about 1 foot above ground. It is about 100 yards west of the road and on the south slope of the hill.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU O HOKU

STATE: HAWAII

YEAR: 1915

SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE: 21 ° 08' 17.279	ELEVATION: 204 METERS
GEODETIC LONGITUDE: 156 43 59.619	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ ◊ ANGLE *
HI 2	5102	477,316.81	292,310.19	- 0 01 26

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

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

QF 317

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1076  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

### ADJUSTED HORIZONTAL CONTROL DATA

Form 526  
 (11-8-55)

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

**R**

NAME OF STATION: PUU OLELO  
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii  
 RECOVERED BY: H.J. Seaborg YEAR: 1964 COUNTY: Maui Island: Molokai

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:  
 Only description available was one obtained from the State of Hawaii Survey office, which stated that the original mark was a redwood post. A pipe set in concrete was recovered and is believed to be the station.

To reach from the main crossroad in Kualapuu, go east-northeast on State Highway 47 for 2.7 miles to end of paved road. Continue, on graded highway, for 0.75 mile to left turn in highway at a metal gate on track road straight ahead. Pass through gate and go 0.45 mile to gate after crossing a draw. Pass through gate and continue for 0.65 mile to old gate. Pass through gate and go left on dim track road up grassy hill for 0.1 mile to fence corner on left. Continue up along fence for 0.1 mile to top of hill and station on point of hill just north of fence.

Station mark is a 1-inch iron pipe set in concrete and projecting about 6 inches above ground. The letters "AE" are inscribed in top of the concrete.

NOTE: key for locked gate may be obtained at the Molokai Ranch office in Kaunakakai.

NAME OF STATION: PUU OLELO  
 STATE: HAWAII YEAR: 1925 THIRD ORDER  
 SOURCE: G-SP156

GEODETIC LATITUDE: 21° 10' 11.83"	ELEVATION: METERS
GEODETIC LONGITUDE: 156 59 13.62	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (HOR $\Delta$ $\theta$ ) ANGLE *
HI 2	5102	390,817.15	303,973.29	- 0° 06' 57"

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

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

\* Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.  
 Note.—One of these forms must be used for every station recovered. COM-DC 34314

JUN 1978

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

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 211563 STATION 1077  
HAWAII  
LATITUDE 21° 00' TO 21° 30'  
LONGITUDE 156° 30' TO 157° 00'  
DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

**Puu Papai (Molokai Island, Hawaiian Government Survey; E. R. Hand, 1915; R. W. Woodworth, 1925).**—On the southern coast of Molokai, in the ridge of the prominent hogback hill which is almost on the shore, and trends at right angles to it, at a point 2 miles west of Kamalo Wharf. Station is not on the most conspicuous part of the hill as seen from offshore, but is 280 meters south of the top of the hogback. Subsurface mark is copper triangle placed in first marking of station; surface mark placed in 1915 is a concrete monument with bronze disk in top, note 6½. The post projects some 6 inches above the ground.

PUU PAPA I ( Maui County, Hawaii, E.R.H., 1915; O.W.S., 1930)  
as described. Station was recovered

Station mark is loose as the concrete post is broken at the top. Mark is still holding to the concrete. A cairn of stones is around the mark with a piece of pipe standing in it. A keawi tree was cut down about 8 m. towards the sea from the station, and the stump was left standing about 3 ft. high.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM 526  
(Rev. Feb. 1968)

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **Puu Papai**  
ESTABLISHED BY: **E. R. Hand** YEAR: **1915** STATE: **Hawaii**  
RECOVERED BY: **W. R. Porter** YEAR: **1957** COUNTY: **Maui**

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

Recovered as described but station mark has fallen away from the concrete. Rock cairn still marks station.

FORM 526  
(11-8-68)

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

NAME OF STATION: **PUU PAPA I**  
ESTABLISHED BY: **E. R. Hand** YEAR: **1915** STATE: **Hawaii**  
RECOVERED BY: **W.R. Porter** YEAR: **1961** COUNTY: **Maui**

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

The station was recovered as described except that the standard disk was loose in the concrete. The disk was removed and the underground mark searched for but not recovered.

When the disk was removed, the location of the station was kept as a scribe mark on a wooden bench plumbed over the original mark. The station was not re-marked or the disk re-set. A cairn of stones surrounds the bench.

\* 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

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **PUU PAPA I**  
STATE: **HAWAII** YEAR: **1915** SECOND ORDER  
SOURCE: **G-12734**

GEODETIC LATITUDE:	21° 03' 57.974	ELEVATION SCALED:	207 METERS
GEODETIC LONGITUDE:	156 54 08.536		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR ANGLE *
HI 2	5102	419,635.66	266,202.54	- 0° 05' 05"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
ONINI	97 40 09.9	97 45 15	5102

QF 528

# HORIZONTAL CONTROL DATA

by the  
 NATIONAL GEODETIC SURVEY  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1077

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

PUU PAPAI (continued)

FORM 526a  
 (8-18-69)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU PAPAI  
 ESTABLISHED BY: E.R. Hand  
 RECOVERED BY: H.J. Seaborg  
 YEAR: 1915 STATE: Hawaii  
 YEAR: 1962 COUNTY: Maui  
 Island: Molokai

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
ONINI 1915				0 00 00.0
RM 1	NE	15.48	4.718	131 22 22
RM 2	SE	13.89	4.231	221 02 21

The plumb bench mentioned in the 1961 recovery had been removed. The concrete mark did not appear to have been removed from the ground. A portion of the concrete from the top of the mark containing an impression left after the disk had been removed was found firmly attached to one of the reinforcing bars. This bar was still embedded in the concrete mark but twisted out of place. The piece of concrete was centered over the part of the mark that was still in the ground and the point thus determined was used in setting the new station mark. This location agrees fairly close with the published distances from 2 of the original crosses cut in rock outcrops. The section of the mark still remaining in the ground was removed and a thorough search was made for the underground mark. No evidence of the copper triangle could be found. A new station mark and two reference marks were set.

Station is located on the southeast coast of Molokai, about 8 miles east-southeast of Kaunakakai, about 2 miles northwest of the wharf at Kamalo and about 0.5 mile from the beach.

Station is on the south slope of a prominent brush covered hogback, about 100 yards south of a T-intersection of fence lines, about 105 feet west of a fence line, about 20 feet west of the ridge line, about 16 feet east of where the ridge drops off sharply to the west, and in a small clearing that contains many large red boulders and outcrops. A standard station disk stamped PUU PAPAI 1915 1962 and set in the top of a 12 inch diameter concrete post that projects about 4 inches.

Reference mark 1 is northeast of and about 5 feet higher than station. A standard disk stamped PUU PAPAI NO 1 1915 1962, cemented in a drill hole in a rock outcrop about 5 feet in diameter and projecting 3 feet. It is northwest 1 of 2 large outcrops.

Reference mark 2 is southeast of and about same elevation as station. A standard disk stamped PUU PAPAI NO 2 1915 1962, cemented in a drill hole in the northwest face of a boulder about 2 x 2 feet and projecting about 1 foot.

Station RAYKAMA 1961 will serve as the azimuth mark.

To reach the station from the junction of State Routes 45 and 46 at the Post Office in Kaunakakai, go 10.0 miles southeast on State Route 45 to gate on left. Gate is very narrow and almost obscured by brush and trees. A dim track road continues up the slope 0.6 mile but a 4-wheel-drive vehicle is needed as the road is narrow, winding, steep, and very rocky. To reach station from end of track road pack about 0.2 mile west up slope to ridge line and station.

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

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

USCOMM-DC 27178-01

FORM 526a  
 (8-18-69)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU PAPAI  
 ESTABLISHED BY: E.R. Hand  
 RECOVERED BY: L.F. Joodcock  
 YEAR: 1915 STATE: Hawaii  
 YEAR: 1965 COUNTY: Maui  
 Island: Molokai

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
				0 00 00.0
				131 22 22
				221 02 21

Station and reference marks were recovered in good condition. A complete description follows.

Station is on the southeast coast of Molokai, about 8 miles east-southeast of Kaunakakai, about 2 miles northwest of the wharf at Kamalo and about 0.5 mile from the beach. Station is on the south slope of a prominent brush covered hogback, about 50 yds south of a T intersection of fence line, about 20 feet west of the ridge line, about 16 feet east of where the ridge drops off sharply to the west, and is in a small clearing of small bushes and many large red boulders and rock outcrops. A standard station disk stamped PUU PAPAI 1915 1962 and set in the top of a 12 inch diameter concrete post that projects about 3 inches was recovered.

To reach the station from the junction of state routes 45 and 46, at the Post Office in Kaunakakai, go 8.0 miles southeast on State route 45 to gate on left. Gate is very narrow and partly hidden by brush. A dim trail leads up the hill from the gate but its washed out condition prevents any use by four wheel drive vehicles. To reach station from gate, go 100 feet west to fence that goes up hill. Follow fence almost to the top of the hill about 150 feet south of the T fence intersection. Station is 100 feet west. The entire pack trip is about 0.5 mile. Old lumber from observing stands was scattered about. At this recovery, a tripod was built for offshore hydrography.

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

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

USCOMM-DC 27173-P89

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1078  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
 U. S. COAST AND GEODETIC SURVEY  
 FORM 535  
 Rev. Aug. 1962

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PUWAHI STATE: Hawaii COUNTY: Maui  
 Island: Molokai  
 Described by: R.F. Hanson

CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.56 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	DISTANCE		DIRECTION
			feet	meters	
1b	Surface-station mark,	KAHIO Molokai Lighthouse	NNE	( 2.8 miles)	00 00 00.00
7a	Underground-station mark		SE	25.87 7.887	01 20 29.7
11 b		Azimuth mark	W	( 0.3 mile)	101 07 16 -
11 b		RM 2	NW	17.71 5.398	239 58 32.8 -
					282 18 21 -

Detailed description

Station is located, airline, about 6 miles north-northeast of Kaunakakai, 3-1/4 miles northeast of Kualapuu, 1-1/4 miles southwest of Kalaupapa, and 1/4 mile east of where the trail to Kalaupapa starts down the pali. It is near the edge of the pali, near the north end of a fence line and about 40 yards north of a power line that runs along the highest part of the pasture.

To reach from the main crossroad in Kualapuu, go east-northeast on State Highway 47 for 2.5 miles to end of paved road. Continue on the graded highway for 0.75 mile to left curve in road. Go left, north, for 0.85 mile to a locked board gate on right, 0.1 mile before reaching end of road and power sub-station. Pass through gate and go east on track road for 0.3 mile to fence line and gate. Turn left at fence and go north along west side of fence for 0.1 mile to edge of pali and station 40 yards after passing under power line.

Station mark is a standard disk stamped "PUWAHI 1962", set in the top of a 10-inch-diameter, concrete monument that projects 3 inches above ground. It is 22.0 feet west-northwest of the north end of fence line and 4.3 feet north of a white witness post.

Reference mark one is a standard disk stamped "PUWAHI NO 1 1962", set in the top of a 10-inch-diameter, concrete monument that projects 6 inches above ground. It is 1.3 feet west of fence line, 15 feet south of north end of fence line and about 3 feet higher than station.

Reference mark two is a standard disk stamped "PUWAHI NO 2 1962", set in the top of a 10-inch-diameter, concrete monument that projects about 2 inches above ground. It is 9 feet southwest of edge of pali and about 2 feet lower than the station.

Bench Mark T-17 will serve as the azimuth mark. It is a U.S. Geological Survey bronze bench mark disk, stamped "BMT T-17 1603.6", cemented in a drill hole in a 3 x 6-foot boulder that projects about 2 feet above ground. It is located just north of the end of State Highway 47 at the Kalaupapa observation platform; 15 feet north-northeast down-slope from the platform and about 8 feet lower than the platform.

NOTE: Key to locked gate may be obtained from the Molokai Ranch Office in Kaunakakai.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUWAHI BENCH MARK(S) ALSO

ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii COUNTY: Maui

RECOVERED BY: R.L.N. YEAR: 1967

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai

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

Recovered in good condition as previously described,

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUWAHI STATE: HAWAII YEAR: 1962 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE	21° 10' 40.574	ELEVATION	518 METERS
GEODETIC LONGITUDE	156 59 49.950	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	φ OR Δ OR ANGLE*
HI-2	5102	387,384.76	306,880.50	- 0 07 10

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
AZ MK BENCH MARK T 17 USGS	92° 21' 05.7	92 28 16	5102

R

QF 295





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 211563 STATION 1080  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

R (Maui Island, Hawaiian Government Survey; J. C. Gauger, 1912).—On northwest coast of Maui, in the Kaanapali District, about 2 miles northwest of Kahakuloa, on top of and near the edge of a prominent eroding red bluff just south of the trail to Honokahau. Marked by a 3-inch galvanized iron pipe filled with concrete and projecting 8 inches above surface of ground.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: R  
 STATE: HAWAII YEAR: 1912 THIRD ORDER  
 SOURCE: G-SP156

GEODETIC LATITUDE:	21° 01' 03.09	ELEVATION:	139	METERS
GEODETIC LONGITUDE:	156 34 42.54	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	φ OR Δ OR ANGLE °
HI 2	5102	530,076.14	248,506.80	+ 0° 02' 54"

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

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

QO 006

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1081  
 HAWAII  
 LATITUDE 21 ° 00' TO 21 ° 30'  
 LONGITUDE 156 ° 30' TO 157 ° 00'  
 DIAGRAM NF 4-16 MAUI

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: RAYKAMA STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: W. R. Porter YEAR: 1961 Described by: C. G. E.  
 NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.42 METERS. HEIGHT OF LIGHT ABOVE STATION MARK 4.27 METERS.

NOTE*	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			
		BEARING	DISTANCE		DIRECTION†
1a None			feet	meters	
	PUU PAPA 1925				0 00 00.0
	Raydist Tower (not marked)	NW	205.00	62.484	17 23 14.7
11a	RM 2	NNW	70.480	21.510	37 37 59.8
11a	RM 1	E	42.480	12.940	139 25 05.4
	Kamalo Wharf (southeast corner)	SE	657.895	200.526	228 09 32.45

Station is located on the south side of Molokai Island, Hawaii about 8.8 miles east-southeast of the town of Kaunakakai, and at the northern end of Kamalo Wharf.

To reach the station from the junction of Hawaii State Highways 45 and 46 just south of the Kaunakakai Post Office, go easterly on Highway 45 for 10.1 miles to a side road right at a sharp bend to the left in the highway. Turn right (south) towards Kamalo Wharf and go 344 feet to station on the right (west).

Station mark, a standard disk stamped "RAYKAMA 1961" is set in a 6 inch square concrete monument about flush with the ground. The mark is located 12 feet west of centerline of a dirt road leading to the wharf and 27 feet southwest of the southern-most clump of trees on the east side of the approach to the wharf.

Reference Mark No. 1, a standard disk stamped "RAYKAMA NO. 1 1961", is set in a 6 inch square concrete monument about level with the ground. The mark is located 2 feet west of fence line and 24 feet east of centerline of the road leading to Kamalo Wharf.

Reference Mark No. 2, a standard disk stamped "RAYKAMA NO. 2 1961", is set in a 6 inch square concrete monument projecting about 4 inches above the ground. The mark is located 12 feet SSE of a forked tree and 24 feet west of centerline of the road leading to Kamalo Wharf.

\* Refer to notes in manuals of triangulation and state publications of triangulation. † Direction-angle measured clockwise, referred to initial station. (To nearest meter only, when no trigonometric leveling is being done.)

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: RAYKAMA

STATE: HAWAII

YEAR: 1961

SECOND

SOURCE: G-12734

GEODETIC LATITUDE: 21 ° 02' 59".404	ELEVATION: 1 METERS
GEODETIC LONGITUDE: 156 52 38.045	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	∠ OR Δ OR ∠ ANGLE °
Hi 2	5102	428,197.86	260,281.18	- 0 04' 32"

\* 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
PUU PAPA 1	124 35 27.0	124 39 59	5102

QF 327

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 211563 STATION 1081

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

RAYKAMA (continued)

FORM 526a  
(2-18-65)

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

R

NAME OF STATION: RAYKAMA  
ESTABLISHED BY: W.R. Porter     YEAR: 1961     STATE: Hawaii     Island: Molokai  
RECOVERED BY: H.J. Seaborg     YEAR: 1962     COUNTY: Maui

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PUU PAFAI 1915-1962				00° 00' 00.00
RM 2	NNW	70.60	21.520	37 37 09 /
RM 1	E	42.44	12.936	139 24 01 /

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

Station is located about 10 miles airline east-southeast of Kaunakakai, on the point of land at the north end of Kamalo Wharf.

To reach from the junction of State Highways 45 & 46, just south of the post office in Kaunakakai, go east on State Highway 45 for 10.7 miles to a sharp left curve in the highway and a track side road right. Turn right and go south about 35 yards to fork. Take left fork and go south 0.05 mile to station on right at south end of road loop just north of wharf.

Station mark is a standard disk stamped "RAYKAMA 1961", set in the top of a 6-inch-square, concrete monument flush with the ground. It is at the northeast tip of a weed area, 12 feet west of center line of road, 157.5 feet north of the north end of old concrete bridge leading onto wharf, and 33 feet southwest of south end of dense brush growth along east side of road.

Reference mark one is a standard disk stamped "RAYKAMA NO 1 1961", set in the top of a 6-inch-square, concrete monument flush with the ground. It is 30 feet east of center line of wharf road, 1-1/2 feet west of fence line, 2 feet southwest of the 6th fence post south of thicket, and at same elevation as station.

Reference mark two is a standard disk stamped "RAYKAMA NO 2 1961", set in the top of a 6-inch-square, concrete monument about flush with the ground. It is 24 feet west of center line of wharf road, in grassy area on north side of road loop, and at same elevation as station.

Station KEAWANUI 1925 will serve as the azimuth mark.

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: RAYKAMA  
ESTABLISHED BY: W.R.P.     YEAR: 1961     STATE: Hawaii     BENCH MARK(S) ALSO   
RECOVERED BY: R.L.N.     YEAR: 1967     COUNTY: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: ISLAND: Molokai

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

Station recovered in good condition as previously described.

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1082  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

**NO ORIGINAL TEXT**

Form 526  
 (11-8-55)

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

**R**

NAME OF STATION: TOM  
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii  
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui Island: Molokai

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

An iron pipe was recovered on the station hill and is believed to be the station. A complete description follows:  
 Station is located, airline, about 6-1/4 miles east of Kaunakakai, 4 miles north-west of Kamalo Wharf, 1-1/4 miles northeast of Kakaheia Fishpond, the only fishpond along the north side of State Highway 45, and 1-1/4 miles north of State Highway 45. It is at about 1120 feet elevation on a ridge running northeasterly up to the higher hills, and at the southwest end of a flat, or step, of the ridge where it runs north-east at about the same elevation a short distance to the steeper hill. It is along the northwest side of a large canyon, 12 feet west of canyon rim. Station mark is a 1-1/2-inch iron pipe set into ground and projecting about 4 inches above ground.  
 To reach from the junction of State Highways 45 and 46, just south of the post office in Kaunakakai, go east on State Highway 45 for 5.7 miles to fishpond on left, and a side road left. Continue on highway for 0.2 mile to T-fence junction on left and end of truck travel. Pack northerly along left side of fence through trees about 200 yards to end of fence. Continue northerly and northeasterly, through trees and up along rocky and brushy ridge about 1 mile to station.  
 Packing time about 1 hour.

\* Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.  
 Note.—One of these forms must be used for every station recovered.

Comm-DC 34314

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: TOM  
 STATE: HAWAII YEAR: 1925 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 21° 04' 51.00	ELEVATION:	METERS
GEODETIC LONGITUDE: 156 55 47.81		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\phi$ OR $\Delta$ ANGLE*
HI 2	5102	410,242.27	271,567.29	- 0° 05' 41"

\* 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 486

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1083  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

FORM 524a  
 (6-18-69)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

### RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: WAIALEIA  
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii Island: Molokai  
 RECOVERED BY: Harold J. Seaford YEAR: 1962 COUNTY: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 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	

Only description available was one obtained from the State Of Hawaii survey office which stated that the original station mark was a 4 x 4 redwood post referenced by 3 crosses on stones. A pipe set in concrete, and 2 reference crosses, were recovered, and the station identified by measurements to the crosses. A complete description follows:

Station is located, airline, about 7 miles northeast of Naunakakai, 3-3/4 miles southeast of Kalaupapa, and 2-1/4 miles east-northeast of the Molokai Forestry Camp, on the north slope of a brushy hill of about 3283 feet elevation at the edge of the pali along the southwest side of Waikolu Stream. The hill is the north-northwest one of two hills of about the same elevation and about 1/4 mile apart.

To reach from the junction of State Highways 45 and 46, just south of the post office in Naunakakai, go westerly on State Highway 46 for 3.7 miles to crossroad at ready-mix plant on left. Turn right and go east on graded road for 0.25 mile to a cattleguard. Cross and continue for 2.9 miles to a fork. Take left fork and go 0.75 mile to a cattleguard. Cross and continue for 2.4 miles to the forestry camp buildings. Turn right and follow forest service for 1.15 miles to water tank and reservoir on left. Continue for 2.2 miles to a white, historical plaque on left. Continue ahead for 0.4 mile to a fork. Take left fork, leaving main road, and go north for 0.55 mile to alternate fork. Take either road and continue downgrade, finally swinging right and going southeast, and then left, north along ridge, for 1.9 miles to end of road in a small clearing at top of hill. From here pack northerly, down across saddle and then up to top of hill and station, a distance of about 1/4 mile.

Station mark is a 1-inch iron pipe that projects about 7 feet above ground. It is set in a dome-topped concrete monument that is 10 inches in diameter and about 4 inches below ground surface. An 8-inch-diameter, 40-inch-long metal cylinder target is mounted on top of the station pipe. Station is 60.5 feet southeast of station KALUAHAUONI.

Measurements to crosses are as follows:	Old Measurement	New Measurement
North Cross	3.1 feet	3.1 feet
West Cross	4.5 feet	4.4 feet.

North cross is 2 inches below ground surface; west cross is in trail and flush with ground.

NOTE: A 4-wheel-drive vehicle is required to drive to station. Packing time about 10 minutes.

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

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

USCOMM-DC 27179-P89

NAME OF STATION: WAIALEIA  
 STATE: HAWAII YEAR: 1925 ORDER: SECOND

SOURCE: G-SP15c

GEODETIC LATITUDE	21 09' 21.952	ELEVATION	1002 METERS
GEODETIC LONGITUDE	156 56 26.642	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	PLANE ANGLE
HI 2	5102	406,611.97	298,911.21	- 0° 05' 56"

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

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

Q1 525

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1084  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

### ADJUSTED HORIZONTAL CONTROL DATA

FORM 526a  
 (6-18-65)

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

R

NAME OF STATION: **WAIALUA**  
 ESTABLISHED BY: **E.R.H.** YEAR: **1915** STATE: **Hawaii**  
 RECOVERED BY: **H.J. Seaborg** YEAR: **1962** COUNTY: **Mau** Island: **Molokai**

NAME OF STATION **WAIALUA**  
 STATE **HAWAII** YEAR **1915** SECOND ORDER

SOURCE: **G-SP156**

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

A description obtained from the State of Hawaii Survey Office describes the station mark as a 4 x 6 redwood post, with 3 reference crosses on stones. Station was recovered and identified by the 3 crosses, all of which were located, but the redwood post has been replaced with a length of 1-inch iron pipe. A complete description follows:  
 Station is located, airline, about 16 miles east of Kaunakakai, 2 miles north-northeast of Pukoo, and 1-1/2 miles northwest of Highway 45. It is at 1550 feet elevation, on the summit of a grassy hill that has brush and small trees around the top. The hill is on a ridge that lies between Kahawaiiki Gulch and Puniuohuanui Gulch.

To reach station from the junction of State Highways 45 and 46, just south of the post office in Kaunakakai, go easterly on State Highway 45 for 16.2 miles to a sign on right "WAILAU TRAIL". Continue on the highway for 4.9 miles to a green church on the left. Continue for 0.35 mile to a track road left at sign "PUU MANO SHARK GOD HILL". Take left fork for 0.05 mile to board gate. Pass through and continue for 0.4 mile to board gate. Pass through and continue on track road up-grade for 0.4 mile to board gate. Pass through and continue on track road right, up along fence for 0.2 mile to board gate. Pass through and follow road left upgrade for 0.25 mile to crest of hill at large boulder and station PUU MANO. Continue northwesterly on track road for 0.5 mile to board gate. Pass through and continue for 0.35 mile to a small draw. Cross draw and bear right along old fence line for 0.1 mile to fence corner. Turn right and follow bulldozed road around side of hill for 0.05 mile to gate. Pass through and continue for 0.1 mile to end of cutbank at grassy flat. Go sharp left off of road and follow dim tracks northerly up steep slope for 0.15 mile to fence, and station. Station mark is a 1-inch iron pipe projecting 1 foot above ground. It is 13.7 feet north-northwest of the fence, 5 feet northeast of dim trail and at the southwest edge of a patch of brush.

The 3 reference crosses are on the sides of stones about flush with ground and sod must be removed to see them.  
 \*\*\*\*\*Original\*\*\*\*\*1962\*\*\*\*\*  
 Northwest Cross 3.2 feet 3.5 feet  
 Northeast Cross 3.0 feet 2.4 feet  
 South Cross 3.0 feet 3.4 feet

NOTE: 4-wheel-drive vehicle required.  
 \*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.

GEODETIC LATITUDE: 21° 06' 40.124	ELEVATION: 471 METERS
GEODETIC LONGITUDE: 156 46 55.729	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	∠ OR Δ OR ANGLE *
HI 2	5102	460,638.48	282,517.35	- 0 02 30

\* 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

QI 455

# HORIZONTAL CONTROL DATA

by the  
 National Ocean Survey  
 OLD HAWAIIAN DATUM

QUAD 211563 STATION 1085  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

**Waialua Sea (Molokai Island, Hawaiian Government Survey; E. R. Hand, 1915).**—On southeastern coast of Molokai, on the sand point at Waialua village and gulch, at high-water line. About 120 meters west of station is a creek and bridge, while a church, cream colored and having a spire with slat ventilators, is on the far side of the road from the station, distant 260 meters, N. 10° W. Subsurface mark is a bottle. Surface mark is concrete monument with bronze station mark in top, note 6½.

WAIALUA SEA (Maui County, Hawaii, E.R.H., 1915; O.W.S., 1931)  
 --Station is on the S coast of Molokai Island. It was recovered as described except that the church, mentioned in the original description is now in ruins. There is a new church across the road from the school. The monument is still intact, and a few stones were piled up around to hold the signal pole.

RECOVERY NOTE, TRIANGULATION STATION

**R**

NAME OF STATION: WAIALUA SEA  
 ESTABLISHED BY: E.R.Hand YEAR: 1915 STATE: Hawaii  
 RECOVERED BY: H.J.Seaborg YEAR: 1962 COUNTY: Maui  
 Island: Molokai

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

The station was searched for but could not be found. Station location is along a sandy beach on the south shore of Molokai and according to local information the shoreline has receded a great distance as a result of the 1946 seismic wave and later high storm waves. The station is assumed to be lost.

\* Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.  
 Note.—One of these forms must be used for every station recovered. COMB-DC 34314

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: WAIALUA SEA  
 STATE: HAWAII YEAR: 1915 THIRD ORDER

SOURCE G-SP156

GEODETIC LATITUDE:	21° 05' 57.63	ELEVATION:	1 METERS
GEODETIC LONGITUDE:	156 45 40.50	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	∠ ION Δ ∠ ANGLE *
HI 2	5102	467,758.67	278,225.25	- 0° 02' 03"

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

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

Q1 511





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 211563 STATION 1087  
 HAWAII  
 LATITUDE 21° 00' TO 21° 30'  
 LONGITUDE 156° 30' TO 157° 00'  
 DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: WAILAU  
 STATE: HAWAII YEAR: 1925 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21° 00' 19.32	ELEVATION:	1386 METERS
GEODETIC LONGITUDE:	156 51 33.92	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (HOR $\Delta$ ) ANGLE *
HI 2	5102	434,256.56	280,443.85	- 0° 04' 10"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
Q1 542			