

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1101  
HAWAII  
LATITUDE 20° 30' TO 21° 00'  
LONGITUDE 156° 00' TO 156° 30'  
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM 885  
Rev. Aug. 1968

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KOA

STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C. T. Husemeyer

YEAR: 1950

Described by: C. J. Hoepfel

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	METERS.			
17	1.67	1				
OBJECT		DISTANCE		DIRECTION:		
		feet	meters			
MKAHAHANA 2				00	00	00
MKAALIHANAU (HGS)				78	37	53.14
pipe	R. M. No. 1	18.170	5.638	171	18	39
pipe	R. M. No. 2	17.704	5.397	269	20	50

The station is located on the upper slope of steep pasture land which is now becoming overgrown with brush and ferns. It lies about 3.6 miles northeast of Kipahulu, about 2 miles west of the sea and about 0.25 mile northeast of Papaahawahawa Gulch.

To reach from the Catholic Church, in the village of Kipahulu; go northerly, on the road which leads toward Hana, for 5.26 miles; turn left, into a rock walled lane, and go westerly for about 100 yards; pass through a board gate and continue westerly for about 200 yards; pass to the right hand side of a farm dwelling and continue westerly, up grade, for about 200 yards; pass through a board gate and follow to the left hand side of a wire fence for about 0.3 mile; cross over the fence and continue westerly, up the steep slope, for about 0.6 mile to the end of truck

travel at an old field road. From this point pack southwest for about 0.2 mile to a very small, flat, bench and the station.

The station is a standard disk, stamped KOA 1950, set in the top of a 3 inch concrete post which projects about 1 foot.

Reference mark number 1 is a standard disk, stamped KOA NO 1 1950, set in the top of a 2 1/2 inch iron pipe which projects about 2 feet. It is located at about the same elevation as the station.

Reference mark number 2 is a standard disk, stamped KOA NO 2 1950, set in the top of a 2 1/2 inch iron pipe which projects about 2 feet. It is located at about the same elevation as the station.

\* 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: KOA

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20° 42' 02.317	ELEVATION:	463.2 METERS
GEODETIC LONGITUDE:	156° 01' 52.942		1520 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE *
HI 2	5102	717,133.43	133,830.20	+ 0° 13' 29"

\* 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
POHUE	274 24 47.4	274 11 18	5102

QE 341

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1101  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

KOA (continued)

FORM 526a  
(8-18-68)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KOA  
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		1.5 METERS,		HEIGHT OF LIGHT ABOVE STATION MARK		METERS.	
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION							
OBJECT	BEARING	DISTANCE		DIRECTION			
		FEET	METERS				
POHUE -----1950 DISTANCE	and DIRECTION			00	00	00.0	
R.M. No. 1	SW	18.170	5.538	131	08	01	
R.M. No. 2	NW	17.704	5.397	229	10	12	
POHUE 1950 -----1969 DISTANCE	and DIRECTION			00	00	00.0	
R.M. No. 1	SW	18.170	5.539	131	07	55	
R.M. No. 2	NW	17.636	5.376	229	08	24	

Station was recovered and all marks found in good condition. A small difference was noted in the distance to RM No. 2; it was double-checked and the 1950 distance was found to be slope distance. A complete description follows:

Station is located about 4-1/2 miles southwest of Hana, between Alaaula Gulch and Papaahawahawa Gulch, at about 1520 feet elevation, near the upper end of the area once planted in pineapple, on a small flat point in pasture land, about 1000 feet downhill from a large, prominent grey area (old burn), 25 yards southwest of a shallow draw and 60 yards

northeast of 2 large trees setting in the shallow draw to southwest.

To reach station from the post office in Hana, go south on State Highway 31 for 5.7 miles to lane on right, at sign "KOALI RANCH". Go up lane 0.1 mile to board gate ahead. Pass through gate and through wire corral for 0.05 mile to end gate. Pass through gate and follow dim track road up pasture for 0.15 mile to board gate at tree line. Pass through gate and follow along fence line, gradually bearing left through guava trees, for 0.45 mile to wire gate. Pass through gate and bear slightly right, picking way up through guava thickets, for 0.2 mile to end of brush. Go up steep, grassy slope for 0.25 mile to end of truck travel at old lateral ditch. Pack up grassy slope, bearing slightly left, for about 1000 feet to station.

Station mark is a standard disk brazed to the top of a 2-1/2-inch pipe that projects 8 inches from ground.

Reference mark number one is a standard disk stamped "KOA NO 1 1950", brazed to the top of a 2-inch iron pipe that projects 1 foot from ground. It is about 6 inches lower than station mark.

Reference mark number two is a standard disk stamped "KOA NO 2 1950", brazed to the top of a 2-inch iron pipe that projects 10 inches from ground. It is 1-1/2 feet higher than station mark.

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

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

USCOMM-DC 27172-P89

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

Q 201561 STATION 1102  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KOALI

STATE: HAWAII

YEAR: 1904

THIRD

ORDER

SOURCE: G-SP156

GEODEIC LATITUDE:	20 41' 11.34"	ELEVATION:	METERS
GEODEIC LONGITUDE:	156 01 33.25		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\beta$ OR $\Delta$ OR $\alpha$ ANGLE *
HI 2	5102	719,023.38	128,694.29	+ 0 13 35

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

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

QO 173

HORIZONTAL CONTROL DATA

NO TEXT



# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1103

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

KOLEKOLE HGS (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KOLEKOLE (HGS)  
ESTABLISHED BY: H.G.S. YEAR: 1876 STATE: Hawaii BENCH MARK ALSO ☐  
RECOVERED BY: C.A.A. YEAR: 1969 COUNTY: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 19.5 miles southwest of Kahului  
HEIGHT OF TELESCOPE ABOVE STATION MARK FEET. HEIGHT OF LIGHT ABOVE STATION MARK FEET.

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	

The station mark and three reference marks were recovered as described and found to be in good condition. The distance and direction to the reference marks was not checked at this time but a different "to reach" was established. A new description follows.

The station is located atop Haleakala Crater in an area known as Science City in the west edge of Haleakala National Park.

To reach the station from the park headquarters, go southwest up winding asphalt road for 9.3 miles to a side road right, just before reaching an observing point. Turn right along asphalt road for 0.45 mile to a fork. Keep left fork for 0.2 mile to a fork. Keep right fork for 0.15 mile to a side road right. Continue ahead for 0.05 mile to a fork. Keep right fork following horseshoe drive for 0.05 mile to a white building on the right and station about 25 feet south of the building.

The station mark is a standard disk, stamped KOLEKOLE 1950, set in the top of a concrete monument which projects about 3 inches. It is 25 feet south of a white building.

Reference mark 1 is a standard disk, stamped KOLEKOLE NO 1 1950, cemented in a drill hole in outcropping rock. It is 30 feet south of the southeast corner of the University of Hawaii building and 8 feet north of the south edge of the hill.

Reference mark 2 is a standard disk, stamped KOLEKOLE NO 2 1950, cemented in a drill hole in a boulder which projects about 2-1/2 feet.

Reference mark 3 is a standard disk, stamped KOLEKOLE NO 3 1950, cemented in a drill hole in a boulder which projects about 6 inches. It is just northwest of a small building.

NOTE: About a 15 foot stand would be needed over the station to see reference mark 3.

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KOLEKOLE (HGS)  
ESTABLISHED BY: HGS YEAR: 1876 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		1.52 METERS.		ISLAND LIGHT		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						
HANAKAUIHI 2 1950				00	00	00.0			
R.M. No. 1	SSW			128	18	11			
Sat. Triang. Station 011 1966	NE	115.238	(35.125)	338	36	28			
R.M. No. 2	NE	46.741	14.247	347	13	05			

Station was recovered and all marks found in good condition, however RM 3 is blocked by a building. A discrepancy was noted in the distance to RM 2; it was double-checked and the 1969 distance is correct. Distance to RMs 1 and 3 was not checked. A complete description follows:

Station is located on summit of Haleakala, on a point slightly lower than highest part, on a rocky point at southwest side of a low, silver-colored, concrete block building, about 1400 feet southwest of Red Hill.

To reach station from the post office at Pukalani, go southeast on State Highway 37 for 0.35 mile; take left fork and follow highway for 28.4 miles to fork on summit. Take right fork and go 0.1 mile to station.

Station mark is a standard disk stamped "KOLEKOLE 1950", set in the top of a 14-inch-diameter, concrete monument projecting 3 inches from ground. It is 19 feet south of southeast corner of building.

Reference mark number one is a standard disk stamped "KOLEKOLE NO 1 1950", cemented in a drill hole in flat red lava rock projecting 12 inches from ground. It is on edge of bluff and on south side of a gravelled area, 38 feet southeast of southeast corner of a white concrete building with a radar dome on top and 12 feet northwest of the west 1 of a row of antennae.

Reference mark number two is a standard disk stamped "KOLEKOLE NO 2 1950", cemented in a drill hole in the top of a large rock outcrop that projects 2-1/2 feet from ground. It is 21 feet south of the end of a macadam drive and 7 feet lower than station mark.

Reference mark number three is a standard disk stamped "KOLEKOLE NO 3 1950", cemented in a drill hole in a small bedrock outcrop in front of the entrance of a small, brown, stone building of an aeronautical communications Co.

Satellite Triangulation Station 011 is a standard disk stamped "SATELLITE TRIANG STATION 011 1966", set in the top of a 16-inch-diameter concrete monument flush with ground. It is 9 feet south of the edge of a large, concrete circle, 53.5 feet south of south side of the communications Co. building, and 10 feet lower than station mark.

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

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

USCOMM-DC 27172-P28

\*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.

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1103  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

KOLEKOLE HGS (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KOLEKOLE (HGS)  
ESTABLISHED BY: HGS YEAR: 1876 STATE: Hawaii BENCH MARK ALSO ☐  
RECOVERED BY: C. L. Novak YEAR: 1975 COUNTY: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 19 miles west of Hana  
HEIGHT OF TELESCOPE ABOVE STATION MARK 4 FEET. HEIGHT OF LIGHT ABOVE STATION MARK FEET.

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	
KANAHAU 1950				00 00 00.0
RM 3	Trav. NNE	165.41	50.416	138 51 02
AZ MK SAT TRIANG 011	NE	0.3 mile		168 03 36.5
RM 2	ENE	47.04	14.339	172 02 48
RM 1	SSW	353.69	107.806	313 07 55
RM 2 to RM 3		128.64	39.211	

The station mark and reference marks 1, 2, and 3 were recovered in good condition and the directions from the station mark to the reference marks and the distances to reference marks 1 and 2 measured on this date agreed fairly well with the 1950 measurements. A building is located between the station mark and reference mark 3 so the distance and direction were calculated from a traverse through reference mark 2 and the distance was found to be 0.212 m. longer than the 1950 measurement but only 21 mm. shorter than the distance obtained by calculations from measurements made by the Army Map Service in 1966. A direction to AZ MK SAT TRIANG 011 was measured on this date. Various buildings and observatories have been built near the station site and the observatories in the immediate vicinity of the station are operated by the Institute for Astronomy of the University of Hawaii. A complete description follows:

The station is located in the Haleakala Science Reserve on the southwest rim of Haleakala Crater on the island of Maui and is airline about 21 miles southeast of Kahului and 19 miles west of Hana.

To reach the station from the Kahului Airport go southerly on Highways 37, 377, and 378 for 38 miles to the Haleakala Science Reserve and the station site.

The station mark is a C&GS triangulation station disk stamped "KOLEKOLE 1950" set in the top of a 0.4 meter concrete cylinder in an outcrop of lava about 1-1/4 meters above the surrounding ground and is 31.7 meters northwest of the southwest corner of the University of Hawaii LURE Observatory building and 6.3 meters south of the south corner of the University of Hawaii Airglow Observatory building.

Reference mark 1 is a C&GS reference mark disk stamped "KOLEKOLE NO 1 1950" cemented in a drill hole in an outcrop of lava projecting 0.1 meter above the ground and is 21.3 meters south-southwest of the southeast corner of the University of Hawaii Solar Observatory building and about 11 meters lower than the station mark.

Reference mark 2 is a C&GS reference mark disk stamped "KOLEKOLE NO 2 1950" cemented in a drill hole in an outcrop of lava projecting 0.8 meter above the ground and is 7.3 meters east of the east corner of the Airglow Observatory building and about 2 meters lower than the 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.

NOAA FORM 76-96 SUPERSEDES C&GS FORM 826A WHICH MAY BE USED (1-72)

U.S. DEPARTMENT OF COMMERCE  
U.S. G.P.O. 1972-769-566/544 REG. 96

\* Name of chief of party should be inserted here. The person who actually recovery note.

ign his name at the end of the

NOAA FORM 76-96 SUPERSEDES C&GS FORM 826A WHICH MAY BE USED. (1-72)

DEPARTMENT OF COMMERCE  
U.S. GOVERNMENT PRINTING OFFICE 1972: 760-438





# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1104  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

U. S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC SURVEY  
FORM 555  
Rev. AGE 1968

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KOOLAU STATE: Hawaii COUNTY: Maui  
CHIEF OF PARTY: C. T. Husemeyer YEAR: 1950 Described by: C. J. Hoepfel  
NOTE\* HEIGHT OF TELESCOPE ABOVE STATION MARK 1.70 METERS HEIGHT OF LIGHT ABOVE STATION MARK METERS  
Surface-station mark, DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS  
Underground-station mark WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

NOTE*	OBJECT	BEARING	DISTANCE		DIRECTION:
			feet	meters	
2					
12a	PUU NIANIAU R. M. No. 1	NE	12.918	3.937	00 00 00
	Survey Pipe	NE	5.885	1.794	117 14 07
12c	HAWAIIANUI, Target	SEE			130 55
	R. M. No. 2	SE	12.519	3.815	183 35
					207 43 00

The station is located on the summit of a prominent, sharp, knoll which lies about 1.5 miles east of The Hawaii National Park Headquarters about 200 feet north of a Forest Reserve Boundary fence and on the westerly rim of Koolau Gap.

To reach from the Hawaii National Park Headquarters and Checking Station; go easterly, on the road which leads toward the summit of Haleakala, for 1.2 miles to the end of truck travel at a sharp right hand, switchback curve. From this point pack easterly, crossing over several small gullies, for about 0.5 mile to the summit of the sharp knoll and the station.

The station is a standard disk, stamped KOOLAU 1950, set into a drill hole in bedrock which projects about 8 inches.

Reference mark number 1 is a standard disk, stamped KOOLAU NO 1 1950, set into a drill hole in bedrock which projects about 1 foot. It is located at about the same elevation as the station.

Reference mark number 2 is a standard disk, stamped KOOLAU NO 2 1950, set into a drill hole in a boulder which projects about 2 feet. It is located at about the same elevation as the station.

The survey mark is the center of a 1 1/2 inch iron pipe which has been driven into the soil and projects about 4 inches. It is located about 1 foot lower than the station.

\*Refers to notes in manuals of triangulation and state publications of triangulation. (Direction-angle measured clockwise, referred to initial station.)  
(To nearest meter only, when the trigonometric leveling is being done.)  
16-58852-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION KOOLAU  
STATE HAWAII YEAR 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 °45'50.984	ELEVATION:	2281.4
GEODETIC LONGITUDE:	156 13 32.160		7485
			METERS FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	650,685.55	156,680.41	+ 0° 09' 23"

\* 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
PUU NIANIAU	118 53 13.6	118 43 51	5102

QE 316

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1104

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

KOOLAU (continued)

FORM 526e  
(9-18-69)

U.S. DEPARTMENT OF COMMERCE  
NAVY

R

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KOOLAU  
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.5 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.  
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PUU NIANIAU -----1950	DISTANCE	and DIRECTION-----		00 00 00.0
R.M. No. 1	NE	12.918	3.937	117 14 07
R.M. No. 2	SE	12.519	3.815	207 43 00
PUU NIANIAU (HGS) 1877 ---1969	DISTANCE	and DIRECTION-----		00 00 00.0
R.M. No. 1	NE	12.916	3.937	117 09 36
R.M. No. 2	SE	12.481	3.805	207 45 29

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

Station is located on the north slopes of Haleakala, about 4 miles north-northeast of Red Hill, 1-1/2-miles east of the Park Ranger Station and at about 7485 feet elevation, on a small promontory about 300 feet outside the north boundary of the National Park, along Lelewi Pali and along the west side of Koolau Gap.

To reach station from the post office at Pukalani, go southeast on State Highway 37 for 0.35 mile; take left fork and follow State Highway

377 for 6.2 miles to junction. Take left fork and follow State Highway 378 for 11.7 miles to Ranger Station on right. Continue on the highway for 3.6 miles to sign "HALEMAU TRAIL". Go left for 0.05 mile to end of road. Pack easterly down Halemau Trail for about 1/2-mile to junction. Follow trail to left, northwest, about 1/4-mile, then leave trail, bearing right along pali for about 1/4-mile to station on prominent point.

Station mark is a standard disk stamped "KOOLAU 1950", cemented in a drill hole in a 16-inch, triangular bedrock outcrop that projects 2 inches from ground. There is a 4-foot tripod inside of a cairn, center over mark.

Reference mark number one is a standard disk stamped "KOOLAU NO 1 1950" cemented in a drill hole in a rounded, 4-foot bedrock outcrop projecting 14 inches from ground. It is 4 feet west of the edge of the cliff and about 6 inches lower than station mark.

Reference mark number two is a standard disk stamped "KOOLAU NO 2 1950", cemented in a drill hole in a 2-foot, boulder-like outcrop projecting 16 inches from ground. It is 8 inches higher than station mark.

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

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

USCOMMA-DC 27173-P59

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

0 201561 STATION 1105  
HAWAII  
LATITUDE 20 ° 50' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KUIAHA

STATE: HAWAII

YEAR: 1912

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 54 51.82	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 18 19.76		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE *
HI 2	5102	623,269.73	211,178.89	+ 0 07 44

\* 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

QO 085

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

Q 201561 STATION 1106  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION KUIKI

STATE HAWAII

YEAR 1912

THIRD

-ORDER

SOURCE G-SP156

GEODETIC LATITUDE:	20 ° 43' 15.98	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 08 26.42		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ FOR $\Delta$ $\theta$ 1 ANGLE *
HI 2	5102	679,751.60	141,128.41	+ 0 ° 11' 10 "

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

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

QD 080

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1107  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE  
U. S. OCEANIC AND ATMOSPHERIC SURVEY  
FOYER 886

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Kuloli STATE: Hawaii COUNTY: Maui  
ESTABLISHED BY: J.C.G. YEAR: 1912 LOCALITY: Hamakualoa  
RECOVERED BY: V.S.Seward YEAR: 1929

Detailed statement as to the fitness of the original description:

Mark Found: A 1-1/2 inch pipe supported by a concrete pier and resting on a concrete post.  
New Description: On the summit of the hill of the same name, one mile northwest of Government Triangulation Station Kapuai and one half mile Southeast of the Village of Peahi. Type B Hawaii Territory Survey Triangulation Station Monument.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Kuloli  
ESTABLISHED BY: J.C.G. YEAR: 1912 STATE: Hawaii BENCH MARK(S) ALSO ☐  
RECOVERED BY: M. Unemori YEAR: 1967 COUNTY: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

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

Station mark was unintentionally moved by a workman in clearing the field for planting.

R

NAME OF STATION: KULOLOI

STATE: HAWAII

YEAR: 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 55' 11.92	ELEVATION	METERS
GEODETIC LONGITUDE:	156 17 08.80		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ R: ANGLE *
HI 2	5102	629,992.37	213,222.40	+ 0 ° 08' 10 "

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

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

NOV 22 1950

NOV 22 1950



# HORIZONTAL CONTROL DATA

QUAD 201561 STATION 1108  
 LATITUDE ° ° ' TO ° ° '   
 LONGITUDE ° ° ' TO ° ° '   
 DIAGRAM

by the  
 NATIONAL GEODETIC SURVEY  
 OLD HAWAIIAN DATUM

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

JUN 1978

KUULOLI 2 (continued)

U.S. DEPARTMENT OF COMMERCE  
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KUULOLI 2  
 ESTABLISHED BY: C.T.H.  
 YEAR: 1950 STATE: Hawaii  
 RECOVERED BY: R.C. Munson  
 YEAR: 1968 COUNTY: Maui  
 Island: Maui  
 HEIGHT OF TELESCOPE ABOVE STATION MARK 1.5 METERS  
 DISTANCES AND DIRECTIONS TO AZIMUTH MARKS, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	FEET	METERS	DISTANCE	DIRECTION
KAPUAI (HGS) 1877	NW	30.763	9.377	00 00 00.0	
R.M. No. 2	NW	152 06 21	152 06 21	00 00 00.0	
Pauwela Point Lighthouse, 1950	SE	65.164	19.863	331 58 18	
R.M. No. 1	NW	152 26 04.8	152 26 04.8	00 00 00.0	

The HTS Type B signal was found pushed away by a bulldozer; a trial point was established in the vicinity and the old station mark was re-covered as described in 1929, 1 foot below ground level. This mark was then lowered. Two reference marks were also established and a witness post was set. A complete description follows:  
 Station is located about 2-1/2 miles east of Hakua and 3/4-mile north of Ulualea, on a prominent hill of about 856 feet elevation that sets in pineapple fields and has a heavy growth of large eucalyptus trees on the southeast end, beginning just south of the station.

To reach station from the intersection of Baldwin Ave. and State Road. Turn right and go 0.3 mile; turn left into pineapple field and follow field roads up around left side of hill for 0.3 mile to top and station.  
 Station mark is a standard disk stamped "KUULOLI 2 HTS 1929", set in the top of a 14-inch-diameter concrete monument projecting 6 inches from ground. Underneath the disk is a 3/4-inch iron pin, with the imprint of a 2-inch pipe-and-surrounding it, in the center of a 10-inch-square concrete block, 2 feet below surface of ground. The station is 58 feet east from edge of hill, and 3 feet south of a white witness post.  
 Reference mark number one is a standard disk stamped "KUULOLI 2 HTS 1929 NO 1 1968" set in the top of a 10-inch-square concrete monument projecting 6 inches from ground. It is 5-1/2 feet northwest of a large eucalyptus tree and 0.8 foot higher than station mark.  
 Reference mark number two is a standard disk stamped "KUULOLI 2 HTS 1929 NO 2 1968", brazed to the top of a 2-inch, iron pipe set in concrete and projecting 10 inches from ground. It is 1.6 feet lower than station mark.

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

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

USCGM-P-DC 2173A-P-88

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

# HORIZONTAL CONTROL DATA

STATION 1108  
HAWAII  
201561  
20° 30' 10" N  
156° 00' 10" W  
DIAGRAM NF 4-16 MAUI

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KULOLI 2

STATE: HAWAII

YEAR: 1950

THIRD

SOURCE: G-9311

GEODETIC LATITUDE: 20 55 11.931	ELEVATION: 260.9 METERS
GEODETIC LONGITUDE: 156 17 08.779	856 FEET

STATE COORDINATES (feet)	STATE & ZONE	CODE	X	Y	ANGLE
HI 2	5102	629,994.36	213,223.51	+ 0 38 10	

TO STATION OR OBJECT	GEODETIC AZIMUTH (from south)	PLANE AZIMUTH (from south)	CODE
KAPUAI	336 16 10.2	336 08 00	5102

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

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KULOLI 2

STATE: Hawaii

YEAR: 1950

Described by: G.B.G.

HEIGHT OF LIGHT ABOVE STATION MARK METERS

CHIEF OF PARTY: C.T. HUBBARD  
SURFACE STATION MARK: WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	DISTANCE	DIRECTION
KAPUAI	NW	3 miles	152 00 00.0
Faurelo Point Lighthouse			152 26 12.1

Located near the north coast of Central Maui, in Hamakua District, in land of Peahi, about 2.5 miles, air line, east of Peahi, about 2 miles from the coast, 1/2 mile southeast of the summit of Kulihi Hill. There is no evidence of this being the original station. Station recovered by Hawaiian Territory survey in 1929 was, "A 1 1/2 inch pipe supported by a concrete pier and resting on a concrete post". This was replaced in 1929 by a Type B Hawaiian Territory survey monument. The center of the iron pipe target holder was used as the station. To reach from the Post Office at Haliu: go easterly on paved road toward Hama for four miles, turn right as per sign Halehaku School and go south for 0.9 miles to school on right. From here back east to top of prominent hill and station.

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

NAME OF STATION: KULOLI 2  
ESTABLISHED BY: C.T.H.  
RECOVERED BY: W.R.P.  
YEAR: 1950  
STATE: Hawaii  
COUNTY: Maui  
Detailed statement as to the status of the original description, including marks found, stampings, changes made, and other pertinent facts:  
The station was recovered in good condition as described. The description and directions for reaching the station are adequate with the addition that the station can be reached by truck after securing a key from the Grove Ranch office in Kanului.

\* 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

(continued on next page)

DE 391



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

0 201561 STATION 1109  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAVA

STATE: HAWAII

YEAR: 1904

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 °30' 47.636	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 34.480		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (OR $\Delta$ ) ANGLE °
HI 2	5102	576,518.82	101,709.51	+ 0° 04' 44"

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

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

QD 142

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

Q 201561 STATION 1110  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

## ADJUSTED HORIZONTAL CONTROL DATA

NO TEXT

NAME OF STATION: LIGHTHOUSE

STATE: HAWAII

YEAR: 1904

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 °36' 10.456	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 20.603		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ $\theta$ 1 ANGLE *
HI 2	5102	577,842.29	97,960.29	+ 0 04' 48"

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

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

QC 407

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

Q 201561 STATION 1111  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LORRINS HILL

STATE: HAWAII

YEAR 1912

THIRD

ORDER

SOURCE: G-SP120

GEODETIC LATITUDE:	20 °44'36.58	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 07 44.56		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ $\theta$ ANGLE °
HI 2	5102	683,698.32	149,273.44	+ 0°11'26"

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

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

Q0 081

Q0 082

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

Q 201561 STATION 1113  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

LUALAILUA (Maui Island, Hawaiian Government Survey, 1879).—Near the southern coast of East Maui, on southwestern summit of a hill of same name, in Kahikinui District, 2 1/4 miles from the sea. Marked by copper triangle buried with redwood post and cairn over it. Four reference stones were placed around it, each 5 feet distant.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM NO. 128  
(Rev. Feb. 1968)

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LUALAILUA

ESTABLISHED BY: Hawaiian Govt Year: 1879 STATE: Hawaii

RECOVERED BY: C.T. Husemeyer Year: 1950 COUNTY: Maui

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 and remarked with a standard disk welded to a two inch iron pipe set in concrete, projecting ten inches, stamped LUALAILUA 1950.

The underground mark is a standard disk set in concrete 36 inches below the surface, stamped LUALAILUA 1950.

Reference mark No.1 is south of the station. A standard disk cemented in a terra cotta pipe set in concrete and projecting one foot. Stamped LUALAILUA NO 1 1950.

Reference mark No.2 is east southeast of the station. A standard disk welded to a two inch iron pipe set in concrete and projecting one foot. Stamped LUALAILUA NO 2 1950.

To reach from the Post Office at Makena: go easterly on main road for 4.0 miles to junction above prison camp.

Continue ahead for 3.6 miles, turn left on track road and go north for 0.1 miles, then right and go east for 0.15 miles to a dry wash and Azimuth mark on left in rock outcrop on west bank of wash. Continue east to saddle between hills then right up steep slope to summit and station at highest point.

Azimuth mark is a U.S. Geological Survey Bench Mark, stamped 1534 M 60 1933.

OBJECT	DISTANCE	DIRECTION
SHORE D HGS 1950	Feet Meters	0° 00' 00"
Reference mark No.1 S	25.07 7.642	36 00-34
Azimuth Mark WNW	0.25 miles	111 30 36.8
Reference mark No.2 ESE	19.97 6.086	301 16 50

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LUALAILUA

STATE: HAWAII

YEAR: 1879

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 ° 36' 58.724	ELEVATION	597.8	METERS
GEODETIC LONGITUDE:	156 18 37.490		1961	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE °
HI 2	5102	621,827.48	102,908.92	+ 0 ° 07' 32"

\* 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
AZ MK BENCH MARK M 60 USGS	95 ° 29' 45.3	95 ° 22' 14"	5102

QE 381

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1113  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

LUALAILUA (continued)

Form 526a  
(9-16-67)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

R

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LUALAILUA  
ESTABLISHED BY: HGS YEAR: 1879 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.28 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	
PIMOE (HGS) 1879 -----1950 DISTANCE and	WNW	0.25 mile		00 00 00.0
Azimuth Mark	ESE	19.97	6.086	08 01 08.4
R.M. No. 2	S	25.07	7.642	197 47 22
R.M. No. 1				292 31 06
PIMOE (HGS) 1879 -----1968 DISTANCE and	WNW	(Approx 0.4 mile)		00 00 00.0
BM 1534 USGS (Azimuth mark)	ESE	19.962	6.085	08 01 08.6
R.M. No. 2	SSW	25.062	7.639	197 46 52
R.M. No. 1				292 29 31

Station was recovered and all marks found in good condition. The track road is now blocked at the azimuth mark and station must be reached from east side. A complete description follows:

Station is located about 6-1/2 miles east-southeast of Ulupalakua, on the south end of the west rim of old crater, at about 1961 feet elevation, and 1/4-mile north of Highway 31.

To reach station from the post office at Ulupalakua, go southeast on

State Highway 37 for 0.85 mile; take right fork and follow Highway 31 for 6.3 miles to dim crossroad, at west side of station hill. Continue on the highway for 1.8 miles to a dim track road left, by a small lava ridge. Follow this rough, overgrown, jeep road northwest for 1.2 miles to saddle between the hills. Go left, up onto hill and along crest for 0.25 mile to station.

Station mark is a standard disk stamped "LUALAILUA 1949", brazed onto the top of a 2-inch iron pipe that projects 10 inches from ground.

Reference mark number one is a standard disk stamped "LUALAILUA NO 1 1950", brazed onto the top of a 2-inch iron pipe that projects 15 inches from ground and is 2.5 feet lower than station mark.

Reference mark number two is a standard disk stamped "LUALAILUA NO 2 1950", brazed onto the top of a 2-inch iron pipe that projects 12 inches from ground and is 3.6 feet lower than station mark.

BM 1534 USGS (Azimuth mark), is a USGS Bench Mark disk stamped "1534 60M 1928", cemented in a drill hole in a bedrock ledge, 10 feet north of center line of old jeep road, 6.6 feet east of a fence, 15.8 feet north of the end metal post of fence line, 23.7 feet northeast of a fence corner 96 feet south of end of lane, 4 feet higher than the jeep road, and on west edge of dry wash. To reach from the dim cross-road, go north for 0.1 mile to old house; go right, down brushy lane, for 100 yards to it's end at dry wash. Walk right, along fence, for 96 feet to the mark.

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

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

USCOMMA-DC 27178-P88

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1114  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

Luke (Maui Island, J. C. Gauger, 1912).—On northern coast of Maui, in Wailuku District, about ½ mile southeast from Wailuku, on the highest sandstone hill adjacent to and due north of the H. C. & S. Co.'s water reservoirs. This is a plantation survey point. Marked by a 5-inch draitile pipe cemented flange down into the sandstone with about 5 inches projecting above surface. Filled with cement, and centered with standard brass station mark. Reference mark is a 2-inch galvanized iron pipe cemented into the rock with 1 foot projecting above surface. It is 9.04 meters (29.7 feet) from station in azimuth 312° 11'.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Luke STATE: Hawaii COUNTY: Maui  
ESTABLISHED BY: J.C.G. YEAR: 1912 LOCALITY: Wailuku  
RECOVERED BY: V.S.Seward YEAR: 1929

Detailed statement as to the fitness of the original description: Original Description and mark not changed. Type A Hawaii Territory Survey Triangulation Station Monument built over original mark.

## RECOVERY NOTE, TRIANGULATION STATION

U. S. COAST AND GEODETIC SURVEY  
FORM 535  
(Rev. Feb. 1965)

NAME OF STATION: LUKE  
ESTABLISHED BY: J.C.Gauger YEAR: 1912 STATE: Hawaii  
RECOVERED BY: C.T.Husemeyer YEAR: 1950 COUNTY: Maui

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

The reference mark was not recovered.

To reach from the Post Office at Wailuku: Go northeast on Main Street for 0.5 miles, pass to left of overpass and continue 0.1 mile, turn right and go east for 0.6 miles, turn left and go 0.2 miles to ETT. From here pack northwest to top of low knoll and station.

OBJECT	DISTANCE	DIRECTION
Maui S Base (HGS) 1912		0 00 00.00
KMVI Antenna	0.5 mile	91 42 54.90
Kahului, Struck, Central Power Co. 3 miles		118 54 19.10
Kahumahu Church, Wailuku, 1 mile		342 22 33.6

\* 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.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LUKE

STATE: HAWAII

YEAR: 1912

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 53 00.679	ELEVATION:	92.9 METERS
GEODETIC LONGITUDE:	156 29 56.708		305 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ' ANGLE "
Hi 2	5102	557,206.79	199,856.82	+ 0 03 55 "

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
WAILUKU	167 12 33.1	167 08 58	5102

QE 307

(continued on next page)

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

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1114

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

LUKE (continued)

FORM 5  
(2-10-68)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LUKE  
ESTABLISHED BY: J.C. Gauger YEAR: 1912 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.5 METERS		HEIGHT OF LIGHT ABOVE STATION MARK METERS		
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
WAILUKU (HTS) 1907				00 00 00.0
Kahului, Airport Control Tower				
Beacon, 1960	E			89 42 10.0
SW Corner Mausoleum Roof	SW	44.282	13.498	230 23 01
NW Corner Mausoleum Roof	NW	44.243	13.485	322 17 53

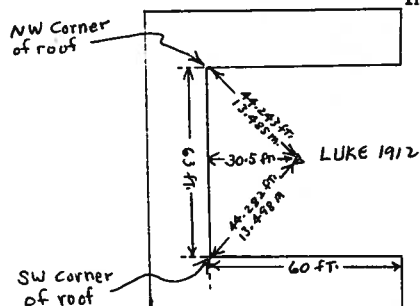
Station mark was recovered in good condition. A mausoleum building, in the shape of a square C, has been built around the station. No reference marks were established, however the station was referenced to the inside northwest and southwest corners of the building. A complete description follows:

Station is located in the southern edge of Wailuku on a sand hill, at about 305 feet elevation. It is at the southeast corner of the cemetery grounds, 1/2-mile southwest of the Maui Hospital and about 150 feet southwest of a large, green, water tank.

To reach station from the post office in Wailuku, go south on Wells St. for 0.45 mile to T-junction. Turn right on Waiale Rd. and go 0.45 mile; turn left on macadam side road by cemetery office and go uphill 0.25 mile to dirt side road left. Go left 50 yards, then go left again 25 yards, up onto rise at base of hill behind mausoleum, and station.

Station mark is a standard disk set in the concrete-filled top of a 7-inch-diameter, sewer tile set flush with ground. No stamping can be seen on the disk due to the large iron bar setting down nearly on it.

There is a Type A signal over station mark.



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

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

USCOMA-OC 27173-P59



AUG 1979  
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 201361 STATION 1115  
HAWAII  
LATITUDE 20 30 ' TO 21 00 '  
LONGITUDE 156 00 ' TO 156 30 '  
DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

LURE RECEIVER

NAME OF STATION: LURE RECEIVER STATE: Hawaii COUNTY: Maui  
NEAREST TOWN: QUADRANGLE NO.:  
CHIEF OF PARTY: C.L. Novak YEAR: 1975 DESCRIBED BY:

NOTE:	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS, I	HEIGHT OF LIGHT ABOVE STATION MARK METERS,
	SURFACE-STATION MARK, DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	
	UNDERGROUND-STATION MARK	
	OBJECT	BEARING
		DISTANCE
		FEET METERS
		DIRECTION

Detailed description:

The point is located in the north dome of the LURE Observatory and is marked by a punch mark in the center of the 3/4-inch head of a galvanized steel carriage bolt epoxied in a drill hole in the concrete floor in the crawl space beneath the center of a 3-foot-square opening in the center of a 10-foot-diameter circular concrete pad on which the receiving telescope will rest.

## ADJUSTED HORIZONTAL CONTROL DATA

ADJUSTMENT BY NGS

NAME OF STATION: LURE RECEIVER OBS BY NGS  
STATE: HAWAII YEAR: 1975 THIRD ORDER

SOURCE: G-15651

GEODETIC LATITUDE: 20 42 38.09392	ELEVATION: 3045 METERS
GEODETIC LONGITUDE: 156 15 31.34057	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (OR $\Delta$ $\theta$ ) ANGLE *
HI 2	5102	639,424.27	137,189.71	+ 0 08 39 "

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

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

THESE DATA ARE OBTAINED FROM ADJUSTMENT OF 1975

UC 005

\*Refers to notes in manuals of triangulation and state publications of triangulation. 1 Direction-angle measured clockwise, referred to initial station.  
1 To nearest meter only, when no trigonometric leveling is being done.

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1116  
HAWAII 20 30' TO 21 00'  
LATITUDE 156 00' TO 156 30'  
LONGITUDE NF 4-16 MAUI  
DIAGRAM

NOAA FORM 76-39  
11-70

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

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LURE STAT TRANSMITTER  
STATE: Hawaii COUNTY: Maui  
NEAREST TOWN: QUADRANGLE NO.:  
CHIEF OF PARTY: C.L. Novak YEAR: 1975 DESCRIBED BY:

NOTE:	HEIGHT OF TELESCOPE ABOVE STATION MARK	METERS	HEIGHT OF LIGHT ABOVE STATION MARK	METERS
	SURFACE STATION MARK		DISTANCES AND DIRECTIONS TO ADJUTANT MARKS, REFERENCE MARKS AND PROMINENT	
	UNDERGROUND STATION MARK		OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	
	OBJECT	BEARING	DISTANCE	DIRECTION
			FEET	METERS

The point is located in the south dome of the LURE Observatory and is marked by a punch mark in the center and top of the threaded end of a 1/2-inch bolt projecting 0.1 meter above a 1.5x3.4-meter concrete pad on which the mirror and fixed telescope are mounted. The bolt is the front (north) bolt used to fasten down the fixed telescope and is an equal distance from the sides of the pad and 1.4 meters south of the north end of the pad. The point is 0.848 meter lower than the horizontal axis of the reflecting mirror and 0.752 meter south of its vertical axis.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LURE STAT TRANSMITTER OBS BY NGS  
STATE: Hawaii YEAR: 1975 THIRD ORDER

SOURCE: G-15651

GEODETIC LATITUDE:	20 42 37.43208	ELEVATION:	3049	METERS
GEODETIC LONGITUDE:	156 15 31.34040	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ANGLE
HI 2	5102	639,424.45	137,122.94	+ 0 08 39 "

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

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

THESE DATA ARE OBTAINED FROM ADJUSTMENT OF 1975

UC 004

\*Refers to notes in manuals of triangulation and state publications of triangulation. 1 Direction-angle measured clockwise, referred to initial station.  
1 To nearest meter only, when no trigonometric leveling is being done.

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1117  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
PAPER 555  
REV. AUG. 1968

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: MAHOE STATE: Hawaii COUNTY: Maui

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.48 METERS.†	HEIGHT OF LIGHT ABOVE STATION MARK 1.18 METERS.	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
	Surface-station mark, Underground-station mark		DISTANCE		DIRECTION‡	
	OBJECT	BEARING	feet	meters	°	' "
pipe	PIMO HGS 1950				0	00 00.0
	Hammonia Light	SW	4 miles		59	05 54.8
pipe	Reference mark No.1	NE	30.16	9.195	250	45 38.
pipe	Reference mark No.2		17.91	5.461	347	26 50.
	Kanaio Church	SE	2 miles		322	44 52.1

Located in the southeast part of east Maui, Makawau District, on the southern summit of Puu Mahoe, in Kaunuaahane, on the southwest slope of Haleakala, about 4 miles from the coast and about 1.5 miles southeast of the Ulapalakua Ranch headquarters and Makena Post Office.

This is near the location of station PUU MAHOE (HGS) 1879. The position of the old station was determined and a thorough search was made. It appears to have been destroyed by Army installation.

The station is a standard disk welded to a 2½ inch iron pipe set in concrete and projecting one foot, stamped MAHOE 1950.

Reference mark No.1 is northeast of the station. A standard disk welded to a 2½ inch iron pipe set in concrete and projecting 14 inches, stamped MAHOE NO 1 1950.

Reference mark No.2 is southeast of the station. A standard disk welded to a 2½ inch iron pipe set in concrete and projecting 14 inches, stamped MAHOE NO 2 1950.

To reach from the Makena Post Office: go southeasterly on main road for 2.4 miles, cross cattle guard, make U turn left through a gate and go north for 0.25 miles, turn left through gate and go 0.4 miles to summit of south one of two hills and station.

\*Refers 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. 16-58202-1 U. S. GOVERNMENT PRINTING OFFICE

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAHOE

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 ° 38' 06.292	ELEVATION: 810.9 METERS
GEODETIC LONGITUDE: 156 23 14.351	2660 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ° ANGLE *
HI 2	5102	595,512.37	109,674.43	+ 0 ° 05' 54"

\* 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
PIMO	329 29 25.0	329 23 31	5102

QE 343

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1117

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

MAHOE (continued)

FORM 3200  
(8-18-69)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

R

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MAHOE  
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.4 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	
PIMOE (HGS) -----1950 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 1	NE	30.16	9.195	250 45 38
PIMOE (HGS) 1879 -----1968 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 3	W	15.313	4.668	116 53 14
R.M. No. 1	NE	30.156	9.192	250 42 38
Puu Keonehunehune summit, steel tank, 1950	NE			259 32 02.0

Station was recovered in poor condition; the station disk had been removed from the top of the pipe, however the pipe was still in place and solid. RM No. 2 was found destroyed. RM No. 1 was recovered in good condition. A new station mark disk was set into the top of the pipe, and a concrete monument was built up around the pipe. A new reference mark, No. 3, was established. A complete description follows:

Station is located about 1-1/2 miles southeast of the Ulupalakua Ranch headquarters and 3 miles northeast of La Perouse Bay, on the south-

east hill, or rim, of an old crater; there is a telephone company installation on the slightly higher hill to the northwest. Both hills are heavily covered with large trees and the only lines now open from the station are to PIMOE and POLIPOLI. Station is at about 2660 feet elevation, and is on the southwest and low end of the hill.

To reach station from the post office at Ulupalakua, go southeast on State Highway 37 for 0.9 mile to fork; take left fork and go 1.5 miles to fork; take left fork a U-turn, and go 0.25 mile to board gate on left. Pass through gate and go upgrade for 0.1 mile; turn left across cattle-guard and go 0.1 mile to house; go left along narrow ridge for about 100 yards to base of hill. Pack up along fence line about 150 yards to station.

Station mark is a standard disk stamped "KAMO 1950 1968", set into the top of a 2-inch iron pipe in the center of a 10-inch-diameter, concrete monument that projects 1 foot from ground. It is 7 feet southeast of a fence line that runs northeast along crest of hill, 78.0 feet northeast of a fence corner, and 42 yards southwest of a slight jog in the fence, and the highest point of the hill.

Reference mark number one is a standard disk stamped "MAHOE NO 1 1950", brazed onto the top of a 2-inch iron pipe that projects 1 foot from ground. It is 3 feet northwest of the fence line and 4 feet higher than station.

Reference mark number 3 is a standard disk stamped "MAHOE 1950 NO 3 1968", brazed onto the top of a 2-inch iron pipe that is set in concrete and projects 8 inches from ground. It is 6 inches southeast of the fence line and 2 feet lower than station mark.

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

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

USCOMA-DC 27178-P8

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1118  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 30'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 555  
Rev. Aug. 1965

## DESCRIPTION OF TRIANGULATION STATION

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

CHIEF OF PARTY: C. T. Husemeyer YEAR: 1950 Described by: C. J. Hoepfel

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	METERS.
4	1.76 METERS.		
12a	Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	
	OBJECT	BEARING	DISTANCE
			feet meters
			DIRECTION:
			0 00 00
12a	KEKAAMANU 2		49 46 44
	R. M. No. 1	ENE	18,060
	Puuiki, Spire (Puuiki Cath. Church)	E	5,501
12a	R. M. No. 2	NW	16,323
			4,978
			281 33 14

The station is located on the summit of a low bench, covered with fern and ti plants, which lies about 4 miles south southwest of Hana, about 4 miles northeast of Kipahulu and about 1.5 miles west of the sea.

This station was originally marked with a redwood post in the year of 1878. In 1950 a 1 inch pipe was found driven into the soil, however, no record of this pipe was found and a new station was established 0.47 meters west of the pipe.

To reach from the Catholic Church in the village of Kipahulu; go northerly, on the road which leads toward Hana, for 7.5 miles to the end of truck travel. Pass through a board gate and follow the trail, westerly, for about 0.75 mile; cross over the pipe line and continue westerly, through the dense ferns and brush for about 0.5 mile to the first prominent bench and the station.

The station is a standard disk, stamped MAKAAHANANA 1950, set into a drill hole in a boulder which projects about 2 inches.

Reference mark number 1 is a standard disk, stamped MAKAAHANANA NO 1 1950, set into a drill hole in a boulder which projects about 1 foot. It is located about 2 feet lower than the station.

Reference mark number 2 is a standard disk, stamped MAKAAHANANA NO 2 1950, set into a drill hole in a boulder which projects about 2 feet. It is located about 2 feet higher than the station.

\* Refer to notes in manuals of triangulation and state publications of triangulation. 1 Direction-angle measured clockwise, referred to initial station.  
† To nearest meter only, when no trigonometric leveling is being done.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAKAAHANANA 2

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 42 25.042	ELEVATION	355.3 METERS
GEODETIC LONGITUDE	156 01 19.412		1297 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE
HI 2	5102	720,307.75	136,135.59	+ 3 13 41

\* 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
KEKAAMANU 2	206 00 11.9	205 46 31	5102

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
N. OLD HAWAIIAN DATUM

QUAD 201561 STATION 1118  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

MAKAHAHANA 2 (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MAKAAHANA 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 FEET. HEIGHT OF LIGHT ABOVE STATION MARK FEET.

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	
KEAKAAMANU 2 -----1950 DISTANCE and DIRECTION				00 00 00.0
R.M. No. 1	ENE	18.060	5.501	49 46 44
Makahahana Pipe		1.5	0.47	
R.M. No. 2	NW	16.323	4.978	281 33 14
-----1969 DISTANCE				
R.M. No. 1	ENE	18.050	5.502	
Makahahana Pipe	ESE	1.394	0.425	
R.M. No. 2	NW	16.321	4.975	

Station was recovered and all marks found in good condition, however a discrepancy was noted in the distance to the Pipe; it was double-checked and the 1969 distance is correct. A complete description follows:  
Station is located about 4 miles southwest of Hana and 1-1/4 miles west of Puuiki Church, at about 1297 feet elevation, on a small flat area on the east end of a ridge that is now covered with guava brush up to 12

feet tall. There is a hau thicket on the hill which is very noticeable when looking at station hill from down along the highway, as it is very dark against the lighter-colored brush background.

To reach station from the post office in Hana, go south on State Highway 31 for 5.7 miles to rocky lane on right, at sign "KOALI RANCH". Go up lane 0.1 mile to corner, go right 35 yards down lane to gate, pass through gate and go left up lane for 0.05 mile to gate on right. Pass through gate and follow pasture road for 0.55 mile to wire gate on left. Pass through gate and go up across pasture for 0.1 mile to timber line. Pack northwest through trees about 1/4-mile to good trail. Follow the trail northwest about 800 yards to point of ridge; bear left and go along ridge line about 200 yards to station.

Station mark is a standard disk stamped "MAKAHAHANA 2 1950", cemented in a drill hole in a 20-inch bedrock outcrop that projects 4 inches from ground. It is 80 feet southwest of the hau thicket, near southern edge of the hilltop and 3 feet northeast of a small cairn.

Reference mark number one is a standard disk stamped "MAKAHAHANA 2 NO 1 1950", cemented in a drill hole in a 30-inch, pyramid-shaped rock projecting 2 feet from ground. It is 2 feet lower than station mark.

Reference mark number two is a standard disk stamped "MAKAHAHANA 2 NO 2 1950", cemented in a drill hole in a 2-foot rock outcrop projecting 1 foot from ground, and is 14 inches higher than station mark.

Makahahana Pipe is a 1-1/2-inch iron pipe, projecting 10 inches from ground.

\* 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.

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

SEE STATION MAKAAHANA 2

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1119  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAKAAHANA PIPE

STATE: HAWAII

YEAR: 1950

SECOND

ORDER

SOURCE: G- 9311

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 °42'25.037	ELEVATION	395	METERS
GEODETIC LONGITUDE	156 01 19.397	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	Bearing & Angle *
HI 2	5102	720,309.18	136,135.09	+ 0°13'41"

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

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

POSITION DETERMINED BY TRAVERSE FROM STATION MAKAAHANA 2

QE 430

# HORIZONTAL CONTROL DATA

Table with 4 columns: Station, Elevation, Azimuth, and Distance. The table contains data for various stations and their corresponding measurements.

Station	Elevation	Azimuth	Distance
1	100.0	0.0	100.0
2	100.0	0.0	100.0
3	100.0	0.0	100.0
4	100.0	0.0	100.0
5	100.0	0.0	100.0
6	100.0	0.0	100.0
7	100.0	0.0	100.0
8	100.0	0.0	100.0
9	100.0	0.0	100.0
10	100.0	0.0	100.0
11	100.0	0.0	100.0
12	100.0	0.0	100.0
13	100.0	0.0	100.0
14	100.0	0.0	100.0
15	100.0	0.0	100.0
16	100.0	0.0	100.0
17	100.0	0.0	100.0
18	100.0	0.0	100.0
19	100.0	0.0	100.0
20	100.0	0.0	100.0
21	100.0	0.0	100.0
22	100.0	0.0	100.0
23	100.0	0.0	100.0
24	100.0	0.0	100.0
25	100.0	0.0	100.0
26	100.0	0.0	100.0
27	100.0	0.0	100.0
28	100.0	0.0	100.0
29	100.0	0.0	100.0
30	100.0	0.0	100.0
31	100.0	0.0	100.0
32	100.0	0.0	100.0
33	100.0	0.0	100.0
34	100.0	0.0	100.0
35	100.0	0.0	100.0
36	100.0	0.0	100.0
37	100.0	0.0	100.0
38	100.0	0.0	100.0
39	100.0	0.0	100.0
40	100.0	0.0	100.0
41	100.0	0.0	100.0
42	100.0	0.0	100.0
43	100.0	0.0	100.0
44	100.0	0.0	100.0
45	100.0	0.0	100.0
46	100.0	0.0	100.0
47	100.0	0.0	100.0
48	100.0	0.0	100.0
49	100.0	0.0	100.0
50	100.0	0.0	100.0
51	100.0	0.0	100.0
52	100.0	0.0	100.0
53	100.0	0.0	100.0
54	100.0	0.0	100.0
55	100.0	0.0	100.0
56	100.0	0.0	100.0
57	100.0	0.0	100.0
58	100.0	0.0	100.0
59	100.0	0.0	100.0
60	100.0	0.0	100.0
61	100.0	0.0	100.0
62	100.0	0.0	100.0
63	100.0	0.0	100.0
64	100.0	0.0	100.0
65	100.0	0.0	100.0
66	100.0	0.0	100.0
67	100.0	0.0	100.0
68	100.0	0.0	100.0
69	100.0	0.0	100.0
70	100.0	0.0	100.0
71	100.0	0.0	100.0
72	100.0	0.0	100.0
73	100.0	0.0	100.0
74	100.0	0.0	100.0
75	100.0	0.0	100.0
76	100.0	0.0	100.0
77	100.0	0.0	100.0
78	100.0	0.0	100.0
79	100.0	0.0	100.0
80	100.0	0.0	100.0
81	100.0	0.0	100.0
82	100.0	0.0	100.0
83	100.0	0.0	100.0
84	100.0	0.0	100.0
85	100.0	0.0	100.0
86	100.0	0.0	100.0
87	100.0	0.0	100.0
88	100.0	0.0	100.0
89	100.0	0.0	100.0
90	100.0	0.0	100.0
91	100.0	0.0	100.0
92	100.0	0.0	100.0
93	100.0	0.0	100.0
94	100.0	0.0	100.0
95	100.0	0.0	100.0
96	100.0	0.0	100.0
97	100.0	0.0	100.0
98	100.0	0.0	100.0
99	100.0	0.0	100.0
100	100.0	0.0	100.0



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1120  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

**Makali Hanau** (Maui Island, Hawaiian Government Survey, 1878; J. C. Gauger, 1912).—On southeastern coast of Maui, in Hana District, in the land of Muolea, on the southern edge of the summit of a prominent hill lying about 200 meters north of the road. Marked (in 1912) by a 2-inch galvanized iron pipe set in a block of concrete.

### RECOVERY DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 532  
Rev. Aug. 1965

NAME OF STATION: MAKALIIHANAU STATE: Hawaii COUNTY: Maui

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

NOTE*	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	DIRECTION:
				feet	meters
				0	1 2 3

On the southeast coast of East Maui, South Hana District, in land of Muolea, about 3500 feet from the sea on the summit of a prominent hill about 0.2 miles north of the Government road.

The original mark was a redwood post but was later replaced by a 2 inch galvanized iron pipe set in a core of concrete projecting about 8 inches.

A standard Hawaiian Territor Survey bronze disk stamped MAKALIIHANAU 1950 was cemented in the center of the iron pipe.

To reach from the Post Office at Hana: go southwest on the coast road for 6.3 miles, turn right into narrow lane between ranch houses and go to second gate, turn left along fence and go 0.25 miles to top of hill and station.

P<sub>1</sub>  
(11-8-65)

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

R

NAME OF STATION: MAKALIIHANAU  
ESTABLISHED BY: H.G.S. YEAR: 1878 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 was recovered in good condition as described in the recovery note by C.T.H. in 1950. It is about 10 feet east of a fence, on land of the Koali Ranch. A key to the gate entering the field may be secured at the house across Highway 31 from the ranch entrance.

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAKALIIHANAU

STATE: HAWAII

YEAR: 1878

THIRD

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 °41 '33.546	ELEVATION:	187.0 METERS
GEODETIC LONGITUDE:	156 01 20.006		614 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ ANGLE *
HI 2	5102	720,272.02	130,939.72	+ 0 °13 '40 "

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

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

QE 357

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 201561 STATION 1120  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

MAKALIIHANAU (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MAKALIIHANAU  
ESTABLISHED BY: HGS YEAR: 1878 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 mark was recovered and found slightly loose and projecting excessively from the ground, so was rebuilt by lowering the concrete post and setting it in a large mass of concrete and boulders. A complete description follows:

Station is located about 4-1/2 miles southwest of Hana and 1-1/2 miles southwest of Puuiki Church, on the Koali Ranch, overlooking the highway, on the southeast rim of an old crater, now overgrown with grass and guava brush, and is at about 613 feet elevation.

To reach station from the post office in Hana, go south on State Highway 31 for 5.7 miles to rocky lane right, at sign "KOALI RANCH". Go up lane 0.1 mile to corner; continue ahead through metal gate, then cross wire corral, pass out of gate and continue on field road for 0.15 mile to board gate at tree line. Pass through gate, then go left across flat pasture for 0.2 mile to top of crater rim. Go left along rim for 0.05 mile to station at fence line.

Station mark is a Hawaii Territory Survey disk, unstamped, set in the top of a 6-inch-diameter concrete post projecting 6 inches from the center of an 18-inch-diameter mass of concrete. It is 5 feet southeast of a fence line, 40 feet southeast of highest point of hill, and 5.3 feet north of a metal fence post.

## HORIZONTAL CONTROL DATA

Q 201561 STATION 1121  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

### ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY Form 638 Rev. Aug. 1946		<h2 style="margin: 0;">RECOVERY OF TRIANGULATION STATION</h2>	
NAME OF STATION: <b>Makena Tidal Bench Mark 2</b>		STATE: <b>Hawaii</b> COUNTY: <b>Mauai</b>	
CHIEF OF PARTY: <b>C. T. Husemeyer</b>		YEAR: <b>1950</b>	
NOTE:	HEIGHT OF TELESCOPE ABOVE STATION MARK <b>1.46</b> METERS.	Described by: <b>G. B. G.</b> HEIGHT OF LIGHT ABOVE STATION MARK <b>1.16</b> METERS.	
Surface-station mark, Underground-station mark		DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	
OBJECT		BEARING	DIRECTION
		feet	meters
			DIRECTION: 0 1 2

Located on the west shore of East Maui, Makawao District, about 10 miles south of Kihel Post Office, at the old wharf at Makana Bay. 50 feet west of the southwest corner of the slip, about 20 feet northwest of and about 10 feet above the ocean.

A standard tidal bench mark disk set in a sharp point of rock outcrop projecting 3 feet above the surface. Stamped NO 2 1931.

To reach from the Post Office at Kihel: go south on main coast road for 9.7 miles, turn right and go 200 feet to old slip and station.

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

NAME OF STATION: MAKENA TIDAL BENCH MARK 2  
ESTABLISHED BY: O.W. S. YEAR: 1931 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 was recovered in good condition as described by C.T.H. in 1950. The mark is in the yard of a rough built house and the rock pinnacle has been marked by white paint.

YEAR: 1931

**SECOND**

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 39' 25.985 GEODETIC LONGITUDE: 156° 26' 41.873	ELEVATION: 3.2 METERS 10 FEET
--	----------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE
HI 2	5102	575,754.75	117,684.22	+ 0° 04' 42"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PUU OLAI	19 16 09.4	19 11 27	5102

QE 382

\* 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

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

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1121  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

## MAKENA TIDAL BENCH MARK 2 (continued)

FORM 524a  
(2-15-65)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **MAKENA, TIDAL BENCH MARK 2**  
ESTABLISHED BY: **O.W.S.** YEAR: **1931** STATE: **Hawaii**  
RECOVERED BY: **R.C. Munson** YEAR: **1968** COUNTY: **Maui**  
Island: **Maui**

HEIGHT OF TELESCOPE ABOVE STATION MARK **1.44** 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	
PUU OLAI (HGS) 1879				00 00 00.0
Molokini Lighthouse, 1950	SW			46 30 54.3
Tidal BM No. 4 (RM No. 2)	WSW	16.392	4.997	56 05 16
Tidal BM No. 3 (RM No. 1)	NE	31.255	9.527	231 41 52

Station was recovered in good condition. Tidal Bench Marks No. 3 and 4 were tied in for reference marks. A complete description follows: Station is located about 9 miles south of the post office at Kihei, and 100 yards south of the junction where Highway 31 goes mauka, at the small boat launching ramp at Makena, on the rocky point up above west side of the ramp, and at south side of a house.

To reach station from the post office at Kihei, go south on State Highway 31 for 6.1 miles to end of macadam road; continue south, on graded road, for 3.4 miles to junction where Highway forks left and goes mauka. Continue ahead, around curve, for 0.15 mile, turn back sharp

right, and go 0.1 mile to end of road at launching ramp and first house.

Station mark is a standard bench mark disk, stamped "2 1931", cemented in a drill hole in the sharp tip of a black rock outcrop. It is 21 feet south-southeast of the southeast corner of the house, 8-1/2 feet west-southwest of a stone and concrete wall bordering west side of the landing, and 85 feet south of center line of track road. The rock outcrop is painted yellow around the mark.

Tidal Bench Mark No. 3 (RM No. 1) is a standard bench mark disk stamped "MAKENA NO 3 1961", cemented in a drill hole in the top of the west quay of the boat landing; 21 feet northeast of the stone and concrete wall, 15 feet north-northwest of outer corner of quay, 26 feet south-southeast of a slight angle in the quay wall, 59.2 feet south-southeast of the northern end of the west quay, and 8.7 feet lower than station mark.

Tidal Bench Mark No. 4 (RM No. 2) is a standard bench mark disk stamped "MAKENA NO 4 1961", cemented in a drill hole in bedrock, between two higher outcrops projecting about 2 feet above mark. It is 25.6 feet south-southeast of the southwest, concrete, corner of the house, 14.5 feet southeast of an outdoor shower stall, and 0.3 foot lower than station mark.

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

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

USCOMM-DC 27179-P88

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1122  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

**Maneoneo** (Maui Island, Hawaiian Government Survey, 1881).—Near southern coast of East Maui, in western part of Kaupo District, on a hill a little east of Nuu Harbor. Marked by an iron pin and cairn of stones with four reference stones marked with crosses each 5 feet distant.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
PORTS, BEES  
(Rev. Feb. 1965)

## RECOVERY NOTE, TRIANGULATION STATION

**R**

NAME OF STATION: MANEONEO  
ESTABLISHED BY: Hawaii G.S. Year: 1881 State: Hawaii  
RECOVERED BY: C.T. Husemyer Year: 1950 County: Maui

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

The cairn and three reference rocks were recovered. The iron pin could not be found. A square head iron bolt cemented in a drill hole in a buried boulder was placed at the approximate position as the station as near as could be determined by the reference marks. See description of PUU MANEONEO 2 1950.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MANEONEO

STATE: HAWAII

YEAR: 1881

SECOND

ORDER

SOURCE: G- 9311

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 37 47.274	ELEVATION:	109	METERS
GEODETIC LONGITUDE:	156 10 16.873	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR $\alpha$ ANGLE *
HI 2	5102	669,367.67	107,931.62	+ 0° 10' 28"

\* 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

POSITION DETERMINED BY TRAVERSE FROM STATION PUU MANEONEO 2

QE 431

\* 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.  
U. S. GOVERNMENT PRINTING OFFICE NOTE.—One of these forms must be used for every station recovered.



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1123  
HAWAII  
LATITUDE 20° 30' TO 21° 00'  
LONGITUDE 156° 00' TO 156° 30'  
DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

Maui north base (Maui Island, Hawaiian Government Survey, 1871; J. C. Gauger, 1912).—On northwest coast of Maui, in Wailuku District, a little over a mile east of Kahului. Reached by following the Kahului railroad track toward Paia until within 200 meters of the switch leading to the Puu Nene mill, and the station will be found 80 meters south of the track and just south of a sand-hill ridge. Marked by a granite post projecting 3 feet above surface with copper bolt in top.

### RECOVERY NOTE, TRIANGULATION STATION.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 536

NAME OF STATION: MAUI NORTH BASE STATE: HAWAII County: Maui  
ESTABLISHED BY: H. G. S. SURVEY YEAR: 1871 LOCALITY: WAILUKU DISTRICT  
RECOVERED BY: E. T. ADAMS YEAR: 1929

Detailed statement as to the fitness of the original description: About 1.2 miles east of Kahului. Reached by following the Kahului R. R. tracks towards Paia. It is 900 feet east of mile post 1. This part of the road is double tracked and the station is 3.08 meters north of the center of the north tracks and 7.30 meters north of the south track. The granite post with copper bolt in top projects about 20 inches above the surface of the ground.  
The track mentioned in the original description has been torn up.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 536

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MAUI NORTH BASE STATE: Hawaii County: Maui  
ESTABLISHED BY: H. G. S. SURVEY YEAR: 1871 LOCALITY:  
RECOVERED BY: Kelly McBean YEAR: 1943

Detailed statement as to the fitness of the original description:

Original granite post with copper bolt embedded in top was found projecting approximately 18 inches above the ground, and apparently undisturbed. The station is in a dense growth of kiawe trees, and a 40 foot tower was erected over it in order to occupy it during this survey. Observed azimuths appear to confirm that the station is in original position. Description of this station should be changed where it states "Station will be found 80 metres south of the tracks." The railroad was re-aligned several years ago, and the station is now 6 metres north of the tracks.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 536  
(REV. MAR. 1962)

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MAUI NORTH BASE  
ESTABLISHED BY: H. G. S. YEAR: 1871 STATE: Hawaii  
RECOVERED BY: C. T. Rusemeyer YEAR: 1950 COUNTY: Maui

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

Located on the northeast coast of Maui, in Wailuku District, a little over one mile east of Kahului at the north edge of HASKA, about 0.1 mile south of the coast, 140 feet west of a drainage canal and railroad bridge and 30.0 feet north of the north rail.

Station is a six by eight inch granite post six feet long and projecting two feet above the ground with a copper bolt in center with a punch mark.

Reference mark No. 1 is east of the station in the west end of the south abutment of a railway bridge. Stamped MAUI N BASE 1950 NO 1.

Reference mark No. 2 is south southeast of the station, set in the top of 10 inch iron pipe filled with concrete and buried flush with the ground. Stamped MAUI N BASE NO 2 1950

Azimuth mark is 0.2 miles east of the station and 30.0 feet south of the centerline of a paved road. Set in the top of an 8 inch iron pipe filled with concrete and projecting one inch. A 2 inch iron pipe is set in concrete against the mark and projects 2 feet. A standard azimuth disk, stamped MAUI N BASE 1950.

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAUI NORTH BASE

STATE: HAWAII

YEAR: 1871

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 53 59.853	ELEVATION:	2.02 METERS
GEODETIC LONGITUDE:	156 26 58.307		6.6 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ ANGLE
HI 2	5102	574,115.54	205,847.25	+ 0 04 39

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
AZIMUTH MARK	255° 58' 46.6	255° 54' 08"	5102

QE 505

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1123

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

## MAUI NORTH BASE (continued)

OBJECT	BEARING	DISTANCE	DIRECTION
MAUI SOUTH BASE		Feet Meters	0 00 00.0
KIVI Antenna	WSW	3 miles	46 07 08.88
Red light Kahului Airport	EHE	0.5 "	223 48 22.48
Azimuth mark	EHE	0.2 "	228 25 08.58
R.M. No. 1	E	138.26 37.444	239 14 08.0
Pumeha Hill south stack	S	2.5 miles	344 30 30.98
R.M. No. 2	SSE	67.90 23.314	315 43 18.5

For  
(11-B-55)

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

R

NAME OF STATION: MAUI NORTH BASE  
ESTABLISHED BY: H.G.S. YEAR: 1871 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 and both reference marks were recovered in good condition as described by C.T.H. in 1950. The description is adequate. The azimuth mark was found but the pipe witness post mentioned in 1950 was not in place. The mark is 113 feet west of a fire hydrant, 140 feet west of a road intersection, 174 feet southwest of the westerly of two wooden antenna poles, and 30 feet south of the center of the paved road that parallels the railroad at this point.

ORM 526a  
(11-50)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MAUI NORTH BASE  
ESTABLISHED BY: HGS YEAR: 1871 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui  
Island: 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				
MAUI SOUTH BASE -----1950 DISTANCE and DIRECTION-----							
R.M. No. 1	E	138.26	37.444	239	14	08	
R.M. No. 2	SSE	67.90	23.314	315	43	18.5	
-----1968 DISTANCE-----							
R.M. No. 1	E	138.735	(42.287)				
R.M. No. 2	SSE	68.353	20.836				

Station mark and reference marks were found in good condition, but the azimuth mark was found destroyed. Angles to reference marks could not be checked due to high trees blocking all view, however the distances were checked, and slight discrepancies noted in the distance in feet to both marks, and rather large blunders found in the distance in meters to both marks, apparently due to errors in conversion. A comparison between 1950 and 1968 measurements is shown above. A new azimuth mark couldn't be established due to the trees. A complete description follows:

To reach station from the intersection of State Highways 32 and 35 in Kahului, go east on State Highways 32 and 36 for 0.8 mile; fork left onto Highway 37 and go 0.4 mile to junction with Highway 38. Follow Highway 38 for 0.95 mile to side road left, across from airport entrance. Go left on macadam road for 0.35 mile to T-junction. Turn left and go 0.3 mile to end of macadam road; go right 25 yards, then go left on track road (old railroad grade) for 220 feet to station on right.

Station is located about 1-1/4 miles east-northeast of Kahului, 1/2-mile northwest of the Kahului Airport, 1/2-mile northeast of Kanaha Pond, and in a low area along the north side of the old railroad grade, now a track road.

NOAA FORM 76-31A  
(11-74)

NOAA FORM 76-185  
(12-72)  
(OLD 5408 824)

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

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

USCOMM-NOAA-ASHEVILLE

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MAUI, NORTH BASE  
ESTABLISHED BY: H.G.S. YEAR: 1871 STATE: Hawaii BENCH MARK(S) ALSO ☒  
RECOVERED BY: E. Pursel Jr. YEAR: 1969 COUNTY: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 1 mile east of Kahului

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

This station was recovered in good condition, a new description follows: Located near the northeast coast of Maui, in Wailuku District, a little over one mile east of Kahului at the north edge of Kahului Airport Property. It is about 0.1 mile south of the coast, 140 ft. west of a drainage canal and a bridge, and 24 ft. north of the centerline of the road.

Station is six by eight inch granite post projecting about two ft. above the ground with a copper bolt in the center, and is set 2.8 ft. east of a white witness post.

Reference mark No 1 is east of the station in the west end of the south side of the bridge. Reference mark No 2 is southsoutheast of the station, 44.0 ft. south of the road, and 37.1 ft. east of pole. It is set in the top 10 inch iron pipe filled with concrete and buried flush with the ground.

The Azimuth mark was looked for but not located.

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MAUI NORTH BASE  
ESTABLISHED BY: HI Govt. S. YEAR: 1871 STATE: Hawaii BENCH MARK(S) ALSO ☒  
RECOVERED BY: Ja. V. D. YEAR: 1978 COUNTY: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

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

The station, RM 1 and RM 2 were recovered in good condition as described by R. C. Munson.

The track road is now fully paved.



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1124  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

## ADJUSTED HORIZONTAL CONTROL DATA

**Maui south base (Maui Island, Hawaiian Government Survey, 1871).**—  
About the center of the Wailuku Peninsula, about 2 miles east-southeast of  
Waikapu village, south of the road from Waikapu to Kula, east of a range of  
sand hills, and on the summit of rising ground. Marked by copper bolt with  
cross lines on it set in a granite post which is inclosed in a pier of masonry.  
RECOVERY NOTE. TRIANGULATION STATION

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 535  
(Rev. Feb. 1965)  
NAME OF STATION: South Base STATE: Hawaii COUNTY: Maui  
ESTABLISHED BY: Hawaii G.S. YEAR: 1871 LOCALITY: Wailuku  
RECOVERED BY: V.S. Seward YEAR: 1929

Detailed statement as to the fitness of the original description: Original description and mark good,  
with this exception: masonry enclosing granite post was partially  
in a state of ruin.

New Work: Masonry was repaired, and a wire fence was built around  
the station to keep cattle from further disturbing the  
masonry foundation.  
Nothing more was done as the station is enclosed by a  
forest of Keawe trees about 25 feet high.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MAUI SOUTH BASE  
ESTABLISHED BY: Hawaiian Govt. YEAR: 1871 STATE: Hawaii  
RECOVERED BY: C. T. Husenmeyer 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 original station was recovered, as described, in good condition. An  
azimuth mark was established for this station. A new description follows—  
The station is located in pasture land, which is covered with a heavy growth of  
kiawe trees, on land belonging to the Puu Nene Plantation. It lies about 3.5 miles south-  
east of Wailuku, about 2 miles west of Puu Nene Village, about 1.0 mile west of the road  
which runs between Kahului and Kihai, about 200 yards east of a track road and 19 feet  
east of a fence intersection.

To reach from the post office at Kahului go southeast for 1.8 miles to the  
village of Puu Nene; turn right and go south, toward Kihai, for 1.7 miles; turn right,  
onto a graded road, and go westerly for 0.9 mile; turn left and go south for .05 mile;  
pass through a beard gate and continue south, on a track road, for 0.2 mile; (The azimuth  
mark is to the right hand side of this point) turn left and go east for 0.05 mile to the  
station.

The station is the center of a copper plug which is wedged into a drill hole  
on the top of a 1 foot square granite post. This granite post is set on the top of a  
stone and concrete monument which is about 10 feet square and 4 feet high.

The azimuth mark is a standard disk, stamped MAUI SOUTH BASE 1949, which is  
set in the top of a square concrete post which projects about 4 inches. It is located  
about 0.05 mile west of the station and 18 feet west of the center of a track road.

OBJECT	BEARING	DISTANCE	DIRECTION
PUU NENE 2			00 00 00
Azimuth mark	NW	200 meters	264 54 58.4
Wailuku Antenna (Station KHWI)	NW	3 1/2 miles	294 35 55.1

(continued on next page)

NAME OF STATION: MAUI SOUTH BASE

STATE: HAWAII

YEAR: 1871

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 ° 50' 47.687	ELEVATION:	48.7 METERS
GEODETIC LONGITUDE	156 28 45.137		160 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ θ) ANGLE
HI 2	5102	564,005.12	186,446.55	+ 0 ° 04' 00"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
AZIMUTH MARK	138 ° 41' 45.3	138 37 45	5102

QE 304

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 201561 STATION 1124  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

MAUI SOUTH BASE (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MAUI SOUTH BASE  
ESTABLISHED BY: HGS YEAR: 1871 STATE: Hawaii BENCH MARK(S) ALSO ☐  
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui  
Island: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

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

Station mark and azimuth mark were recovered and found in good condition. A witness post was set at the azimuth mark and the line was cleared to the station. A complete description follows:

Station is located about 2 miles east-southeast of Waikapu, 2 miles southwest of Puunene, and 1700 feet south of Highway 40, in an area covered with large kiawe trees, about 475 feet southeast of the southeast corner of a large rubbish dump belonging to the Puunene Sugar Co. There is a wooden tower about 24 feet high, built over the station, and an old wire fence surrounds station.

To reach station from the Kahului Shopping Center, go south on State Highway 35 for 1.9 miles to Puunene; continue on the highway for 1.7 miles to intersection with Highway 40. Turn right and go west on Highway 40 for 0.9 mile to crossroad at power pole No. 9. Turn left and go 0.1 mile to fork at chain gate, and sign "PRIVATE DUMP". Take right fork, passing through gate, and go southwest on track road along edge of dump for 0.15 mile to southeast corner of dump, and the azimuth mark. Pack southeast about 150 yards through trees to station.

Station mark is a 3/4-inch brass plug, set into a drill hole in the rounded top of an 8-inch-square granite post that projects 2 feet from the center of a 10-foot-square, stone and mortar pier 4 feet high.

Azimuth mark is a standard disk stamped "MAUI SOUTH BASE 1949", set in the top of an 8-inch-square, concrete monument that projects 3 inches above ground. It is 110 feet southeast of southeast corner of rubbish dump, 19 feet northwest of the center line of a grassy, track road, 98 feet south-southeast of the intersection of the grassy track road and the curve of the track road bordering the dump, and 1-1/2 feet southwest of a white witness post.

NOTE: Station is 445.0 feet southeast from the azimuth mark.

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

Q 201561 STATION 1125  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

Mawini (Puu) (Maui Island, Hawaiian Government Survey, 1882).—In western part of West Maui, on a hill in the Kaanapali District, nearly due east 4,849 meters from Kekaa or Black Rock. Mark, no record.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAWINI-PUU

STATE: HAWAII

YEAR: 1882

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 38 50.58	ELEVATION	975	METERS
GEODETIC LONGITUDE:	156 16 44.39	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ FOR $\Delta$ & $\alpha$ ANGLE *
HI 2	5102	632,544.23	114,218.64	+ 0 ° 08' 12 "

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

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

QD 161

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

0 201561 STATION 1126  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION MID

STATE HAWAII

YEAR 1904

THIRD

ORDER

SOURCE G-SP156  
NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 38 03.78	ELEVATION	METERS
GEODETIC LONGITUDE	156 26 56.76		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (OR $\Delta$ ) ANGLE *
HI 2	5102	574,392.09	109,388.72	+ 0 04 36

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

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

QD 138

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1127  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

**Mokuia** (Maui Island, Hawaiian Government Survey, 1881; J. C. Gauger, 1912).—On southeastern coast of East Maui, in Kaupo District, in land of Mokuia on top of bluff about 120 meters westward from rocky spur that juts out from shore line in this vicinity. Station is 20 meters back from edge of "pali" directly adjacent to rock projecting 1 foot above surface of ground and having a triangle lightly chisled on its northern face. Marked (in 1912) by a 2-inch galvanized iron pipe set in block of concrete.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM 534  
(REV. MAR. 1963)

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOKUIA  
ESTABLISHED BY: Hawaiian Govt. YEAR: 1881 STATE: Hawaii  
RECOVERED BY: C. T. Husemeyer 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, as described, in poor condition. The mark, consisting of an iron pipe, was badly rusted and unfit for use. This pipe was located too close to a large boulder to permit the resetting of this station. A new station, consisting of a standard disk, stamped MOKUIA 2 1960, was set into a drill hole in a boulder which projects about 1 foot. The new station is located 0.350 meters 1.149 feet distant from the old station. See description card for MOKUIA 2 1960.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOKUIA  
ESTABLISHED BY: HGS YEAR: 1881 STATE: Hawaii BENCH MARK(S) ALSO ☐  
RECOVERED BY: R.C. Munson YEAR: 1968 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 about 1-3/4-miles east-northeast of Kaupo, on grassy hillside along south side of State Highway 31, where it rounds the bluff overlooking Mokuia Point, at about 280 feet elevation, and at station MOKUIA 2 1950.

Station is marked by a 2-inch iron pipe about 4 inches beneath ground surface, between two boulders. It is 0.311 meter (1.02 ft.) north-northwest of MOKUIA 2 1950, in azimuth 169° 16' 51".

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOKUIA

STATE: HAWAII

YEAR: 1881

SECOND

ORDER

SOURCE: G- 9311

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 ° 38' 42.533	ELEVATION:	85	METERS
GEODETIC LONGITUDE:	156 05 53.672	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ α1 ANGLE *
HI 2	5102	654,548.51	113,588.59	+ 0 ° 12' 02"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ OR Δ α1 FORMULA NEGLECTING THE SECOND TERM.

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

POSITION DETERMINED BY TRAVERSE FROM STATION MOKUIA 2

QE 428



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1128  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
PORTS AND WATERS  
Rev. Aug. 1963

## DESCRIPTION OF TRIANGULATION STATION

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

CHIEF OF PARTY: C. T. Eusemeyer YEAR: 1950 Described by: C. J. Hoepfel

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK 2.47 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 feet meters	DIRECTION ° ' "
4	Surface-station mark, Underground-station mark					
			KA LAE O KA ILIO (HCS) ✓			00 00 00 ✓
			Kaupo Spire (Kaupo Catholic Church) ✓			18 06 24.8 ✓
12c	R. I. No. 2 ✓			W ✓	28.261 ✓	30 17 40 ✓
12c	R. I. No. 1 ✓			ESE ✓	11.540 ✓	233 10 43 ✓
pipe	MOKUIA 1912 ✓			N ✓	1.149 ✓	108 32 + ✓

The station is located on a grassy sidehill which lies about 3.25 miles west southwest of Kipahulu, about 1.5 miles east northeast of Kaupo, 200 feet east of a telephone line, 100 feet northwest of the sea bluff and 57 feet east of the center of a graded road.

To reach from the Catholic Church, in the village of Kipahulu; go west-erly, on the road which leads toward Kaupo, for 4.0 miles to the station on the left hand side of the road.

The station is a standard disk, stamped MOKUIA 2 1950, set into a drill hole in a boulder which projects about 1 foot.

Reference mark number 1 is a standard disk, stamped MOKUIA 2 NO 1 1950, set into a drill hole in a boulder which projects about one foot and is about 1 foot lower than the station.

Reference mark number 2 is a standard disk, stamped MOKUIA 2 NO 2 1950, set into a drill hole in a boulder which projects about 4 inches. It is located 44 feet east of the center of the graded road and about 1 foot higher than the station.

MOKUIA 1912, is a badly rusted iron pipe which projects about 2 inches above the soil and is 2 inches in diameter.

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

(11-B-55)

NAME OF STATION: MOKUIA 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 pipe which was the 1912 station has rusted off and is not recoverable. The graded road mentioned is State Highway 31.

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOKUIA 2

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETTIC LATITUDE	20 38 42.322	ELEVATION	85.2 METERS
GEODETTIC LONGITUDE	156 05 53.670		280 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	± CH Δ S1 ANGLE °
HI 2	5102	694,348.71	113,587.48	+ 0 12 02

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

TO STATION OR OBJECT	GEODETTIC AZIMUTH (from south)	PLANE AZIMUTH (from south)	CODE
KA LAE O KA ILIO	60 44 52.9	60 32 51	5102

QE 348

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1128

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

MOKUIA 2 (continued)

FORM 326a  
(10-15-65)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MOKUIA 2  
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.45 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	
KA LAE O KA ILIO (HGS)				00 00 00.0
Kaupo, Catholic Church Steeple	W			18 06 24.8
R.M. No. 2	W	28.261	8.616	30 17 40
R.M. No. 1	ESE	11.540	3.518	233 10 43
KA LAE O KA ILIO (HGS) 1885				00 00 00.0
Kaupo, Catholic Church, steeple	WSW			18 06 27.0
R.M. No. 2	W	28.286	8.622	30 18 08
Kipahulu, Old Sugar Mill, Stack	ENE			191 24 12.1
R.M. No. 1	ESE	11.470	3.496	233 10 51

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

Station is located about 1-3/4 miles east-northeast of Kaupo and 3 miles west-southwest of Kipahulu, on a grassy hillside, at 280 feet elevation, on south side of State Highway 31, where it rounds the bluff overlooking Mokuia Point.

To reach station from the post office at Ulupalakua, go southeast on State Highway 37 for 0.85 mile; take right fork and follow State Highway 31 easterly for 20.2 miles to the Kaupo Store; continue on the highway for 2.3 miles to station on right, at top of grade.

Station mark is a standard disk stamped "MOKUIA 2 1950", cemented in a drill hole in a 1 x 2-foot boulder projecting 6 inches from ground. It is in a small, flat, grassy area between road and edge of bluff; 60.4 feet southeast of center line of highway, 106 feet south-southwest of a red and white, metal, "Kapu - No Trespassing" sign, and 2 feet north of a white witness post.

Reference mark number one is a standard disk stamped "MOKUIA 2 NO 1 1950", cemented in a drill hole in a 20-inch boulder projecting 4 inches from ground. It is 1 foot lower than station mark.

Reference mark number two is a standard disk stamped "MOKUIA 2 NO 2 1950", cemented in a drill hole in a 2 x 2-foot rock that projects 2 inches from ground. It is 0.7 foot higher than station mark.

MOKUIA (HGS) 1881 is a 2-inch iron pipe, beneath ground surface, between two boulders, 0.311 meters (1.02 ft.) north from 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.

USCOMMA-DC 27178-P88



QE 344

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 201561 STATION 1129  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

MOPUA (continued)

FORM 526a  
(8-18-59)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

R

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOPUA  
ESTABLISHED BY: HGS YEAR: 1881 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		1.52 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			
MUOLEA -----1950 DISTANCE		and	DIRECTION		00	00	00.0
R.M. No. 2		ESE	18.24	5.558	22	43	32
MUOLEA 1950 -----1969 DISTANCE		and	DIRECTION		00	00	00.0
R.M. No. 2		ESE	18.247	5.562	22	37	03
R.M. No. 3		NW	6.146	1.873	221	40	42

Station mark and RM No. 2 were recovered in good condition. RM No. 1 was not found and is believed destroyed. A new RM, No. 3, was established, and a witness post was set. A complete description follows:

Station is located about 6 miles southwest of Hana, 2 miles northeast of Kipahulu Ranch Headquarters and 1/4-mile northwest of the highway, at about 810 feet elevation, on a brushy knoll on the southeast end of a ridge, on property of Mr. Frank De Coit of Hana.

To reach station from the post office in Hana, go south on State Highway 31 for 8.25 miles to corral and locked gate on right, about 1/2-mile

after crossing Wailua Gulch bridge. (Key was obtained from Mr. De Coit.) Pass through gate and follow track road upgrade for 0.3 mile to point opposite east side of station hill. Pack west about 200 yards to station.

Station mark is a standard disk stamped "MOPUA 1950", set in the top of a 6-inch-square, concrete monument that projects 4 inches from ground. It is 3 feet south of a white witness post.

Reference mark number two is a standard disk stamped "MOPUA NO 2 1950", cemented in a drill hole in an 8 x 12-inch boulder that projects 1 inch from ground. It is on northeast slope of hill and 3.8 feet lower than station mark.

Reference mark number three is a standard disk stamped "MOPUA HGS 1881 NO 3 1969", cemented in a drill hole in a 6-inch-square, boulder top that projects 3 inches from ground and is at same elevation as station mark.

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

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

USCOMM-OC 27178-PSS

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

0 201561 STATION 1130  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 855  
Rev. Aug. 1968

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: MUOLEA STATE: Hawaii County: Maui

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

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.70 METERS. HEIGHT OF LIGHT ABOVE STATION MARK 1.40 METERS.

NOTE*	OBJECT	BEARING	DISTANCE		DIRECTION:
			feet	meters	
2	Surface-station mark, Underground-station mark				
	PUHILELE				0 00 00.0
	Makaliihanua (target)	W	1 mile		59 14 53.8
12a	Reference mark No.1	NW	55.74	16.991	114 21 01-
12a	Reference mark No.2	NE	20.63	6.287	204 55 32-

Located on the southeast coast of East Maui, Hana District, in land of Muolea, about 5 miles, airline, southwest of Hana and about 1 mile east of the Government where it crosses Papahawahawa Gulch.

On a small bluff 0.4 miles northeast of Muolea Point and about 300 feet due east of the mouth of Papahawahawa Gulch, 55 feet south of a stone wall, 40 feet above the sea and above and 20 feet north of a rock cut for cattle trail.

Marked with a standard disk cemented in a drill hole in solid lava outcrop. Stamped MUOLEA 1950.

Reference mark No.1 is northwest of the station, and 3 feet south of a stone wall. A standard disk cemented in lava outcrop projecting 2 1/2 feet, stamped MUOLEA NO 1 1950

Reference mark No.2 is northeast of the station, and on the same bluff, about 4 feet lower than the station. A standard disk stamped MUOLEA NO 2 1950. Cemented in drill hole in rock outcrop.

To reach from the Post Office in Hana: Go southwesterly on Government road for 6.0 miles to a stone wall and corrals on left. From here pack easterly down wash to coast then left for about 1/2 mile to end of ridge and station.

\* 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 initial station. 16-52200-1 U. S. GOVERNMENT PRINTING OFFICE

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MUOLEA

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 °41'22.027	ELEVATION:	19.2 METERS
GEODETIC LONGITUDE:	156 03 40.253		63 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ & ANGLE *
HI 2	5102	724,051.19	129,792.66	+ 0 13 54

\* 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
POHUE	224 25 39.7	224 11 46	5102

QE 340

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1130

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

MUOLEA (continued)

FORM 526a  
(5-15-69)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MUOLEA  
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		1.45 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			
POHUE -----1950 DISTANCE		and DIRECTION			00	00	00.0
RM No. 2		NE	20.63	6.287	28	21	58
RM No.1		NW	55.74	16.991	297	47	27
POHUE 1950 -----1969 DISTANCE		and DIRECTION			00	00	00.0
RM No. 2		ENE	20.624	6.286	28	21	18
Kipahulu, Old Sugar Mill, stack		SW			189	45	15.9
RM No. 2		NNW	55.753	16.994	297	47	36

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

Station is located about 4-3/4 miles south of Hana and about 1000 feet east-southeast of the Papaahawahawa Stream highway bridge, on a small bluff about 63 feet above sea level, about 50 yards northeast of the inner end of the small cove at the mouth of Papaahawahawa Stream, and about 30 feet above the small grassy plot by the stream.

To reach station from the post office in Hana, go south on State High-

way 31 for 3.8 miles to fork; take left fork and continue for 1.6 miles to bridge at Papaahawahawa Stream, and end of truck travel. Walk south-easterly, down stream bed, about 1000 feet to station on knoll to left.

Station mark is a standard disk stamped "MUOLEA 1950", cemented in a drill hole in a bedrock outcrop that projects 6 inches above ground. It is about 14 feet northwest of edge of knoll.

Reference mark number one is a standard disk stamped "MUOLEA NO 1 1950", cemented in a drill hole in a bedrock outcrop that projects 2 feet above ground. It is 3 feet southeast of a stone fence and 4 feet higher than station mark.

Reference mark number two is a standard disk stamped "MUOLEA NO 2 1950", cemented in a drill hole in a large rock outcrop that projects 2 feet from ground. It is 2.7 feet lower than station mark.

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

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

USCOMM-DC 27175-P89

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1131  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

**Naholoku** (Maui Island, Hawaiian Government Survey, 1882).—In southern part of East Maui, in Kaupo District, on a hill about ¼ mile below the Kaupo Gap, and 3 miles back from the sea. Marked by an iron stake with top nearly level with ground and a cairn of stones.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM 534  
(Rev. Feb. 1963)  
**RECOVERY NOTE, TRIANGULATION STATION**

NAME OF STATION: **NAHOLOKU**  
ESTABLISHED BY: Hawaiian Govt. YEAR: 1882 STATE: Hawaii  
RECOVERED BY: C. T. Husemeyer YEAR: 1950 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, in good condition. A new station disk was established in the exact position of the original iron pin and two reference marks were established. A new description follows—

The station is located on the crest of a prominent, black lava, ridge which lies near the mouth of the Kaupo Gap; about 2.5 miles north northwest of the village of Kaupo, about 1.5 miles west of Manawainui Stream, about 0.3 mile west of the Kaupo trail and 32 feet east southeast of a 3/4 inch water pipe.

The station is a standard disk, stamped NAHOLOKU 1950, set into a drill hole in a buried boulder which projects about 2 inches.

Reference mark number 1 is a standard disk, stamped NAHOLOKU NO 1 1950, set into a drill hole in a boulder which projects about 5 feet. It is located on the westerly slope of the hill about 2 feet lower than the station.

Reference mark number 2 is a standard disk, stamped NAHOLOKU NO 2 1950, set into a drill hole in a boulder which projects about 1 foot. It is located about 2 feet higher than the station.

NOTE	OBJECT	BEARING	FEET	METERS	DIRECTION
	KIAIAO				00 00 00
	Kaupo spire (Kaupo Cath.Ch)	S			104 34 42.0
12e	R. H. NO. 1	N	18.815	5.735	208 36 55
12e	R. H. NO. 2	NNE	18.550	5.653	327 34 35

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **NAHOLOKU**  
STATE: **HAWAII**

YEAR: **1882**

FIRST

ORDER

SOURCE: **G- 9311**

GEODETIC LATITUDE	20 40 07.846	ELEVATION	851.8 METERS
GEODETIC LONGITUDE	156 08 52.703		2795 FEET

STATE COORDINATES (Fvvi)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	51J2	677,317.32	122,139.10	+ 0 10 59

\* 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
KA LAE O KA ILIO	354 05 27.5	353 54 29	5102

QE 379

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1131

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

NAHOLOKU (continued)

FORM 524a  
(9-16-69)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: NAHOLOKU  
ESTABLISHED BY: HGS YEAR: 1882 STATE: Hawaii  
RECOVERED BY: R.C. Mynson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.5 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.  
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	DISTANCE		DIRECTION		
		FEET	METERS			
KA LAE O KA ILIO (HGS) 1885 --1950		DISTANCE and DIRECTION		00	00	00.0
R.M. No. 1	W	18.815	5.735	99	25	57
R.M. No. 2	NNE	18.550	5.653	218	23	57
Kaupo spire (Kaupo Cath. Ch)	S			355	23	43.9
KA LAE O KA ILIO (HGS) 1885 --1969		DISTANCE and DIRECTION		00	00	00.0
R.M. No. 1	W	18.884	5.744	99	25	23
R.M. No. 2	NE	18.499	5.639	218	23	03
Kaupo, Cath. Church, steeple 1950	SSE			355	23	45.8

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

Station is located about 12 miles southwest of Hana, 1-1/4 miles north-northwest of the Kaupo Ranch Headquarters, and 2000 feet west of the Kaupo Trail, at about 2795 feet elevation, on the south end of a small, narrow-topped ridge that borders the west side of a shallow ravine; a similar ridge borders the east side of the ravine, 50 yards east of station.

A 3/4-inch pipeline, running down across pasture on a northeast-southwest angle, crosses both of the ridges and the floor of the ravine just north of the station.

To reach station from the post office at Ulupalakua, go east on State Highway 37 for 0.9 mile; take right fork and follow State Highway 31 for 20.4 miles to side road left, 0.15 mile past the Kaupo Store. Take side road and go 1.6 miles to the Kaupo Ranch buildings. Follow track road up to left of buildings for 0.1 mile to board gate; pass through gate and go uphill for 1.3 miles to water tanks at pipeline. (Station is 1/2-mile northwest of here, but not visible due to the east ridge blocking it). Go uphill on road for 0.4 mile to end of truck travel at 2800 feet elevation. Pack west at about same elevation for 2000 feet to station.

Station mark is a standard disk stamped "NAHOLOKU 1950", cemented in a drill hole in the top of an 8-inch rock outcrop projecting 2 inches from ground. It is 34 feet south of point where pipeline crosses crest of ridge.

Reference mark number one is a standard disk stamped "NAHOLOKU RM 1 1950", cemented in a drill hole in a large rock outcrop on west edge of hill, and projecting 2 feet from ground. It is 15 feet east of the pipeline and 2 feet lower than station mark.

Reference mark number two is a standard disk stamped "NAHOLOKU RM 2 1950", cemented in a drill hole in a 3-foot-diameter bedrock outcrop that projects 2 feet above ground. It is 3 feet higher than station mark.

NOTE: A 4-wheel-drive vehicle is needed from Kaupo Ranch buildings to end of truck travel.

\*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

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

0 201561 STATION 1132  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NAHUNA

STATE: HAWAII

YEAR 1904

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 39' 29.92	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 47.06		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ $\theta$ ANGLE *
HI 2	5102	575,301.62	118,080.55	+ 0 04' 40"

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

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

QD 131

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1133  
HAWAII  
LATITUDE 20 °30' TO 21 °00'  
LONGITUDE 156 °00' TO 156 °30'  
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: NAHUNA 2  
ESTABLISHED BY: A.L. Wardwell YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO ☐  
RECOVERED BY: R.C. Munson YEAR: 1968 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 in good condition. Located about 3-3/4 miles south of the Kihei post office, 1-1/2 miles north-northeast of Puu Olai, 0.1 mile northwest of the junction where Highway 31 goes left, mauka, 400 feet west-northwest of Highway 31, and 300 feet north, across a small cove, from a red house; on a prominent, black rock point, about 16 feet above sea.

To reach station from the post office at Kihei, go south on State Highway 31 for 6.1 miles to end of macadam road; continue, on graded road, for 3.35 miles to side road right, at top of grade, 75 yards before reaching highway junction. Go right for 0.05 mile to end of road in yard at red house. Pack northerly along rocky shore about 125 yards to north side of cove and station.

Station is marked by a 1-1/2-inch iron bar, projecting 7 inches from the top of a 20-inch-diameter, concrete mound, which has "NAHUNA 2 5-27-57" inscribed in it. It is about 90 feet west from shoreline and 120 feet east from extreme tip of point.

FORM C&CS-526 (1-68)  
USCOMNAVDC 18008-PES

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

NAME OF STATION: NAHUNA 2

STATE: HAWAII

YEAR: 1962

THIRD

-ORDER

SOURCE: G-12995

GEODETIC LATITUDE:	20 °39'33.852	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 °26'46.499		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\phi$ FOR $\Delta$ $\phi$ 1 ANGLE *
HI 2	5102	575,354.36	118,477.32	+ 0 °04'40"

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

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

QF 264



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1134  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 830  
Rev. Aug. 1948

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: NINIAO

STATE:

Hawaii County: Maui

CHIEF OF PARTY: C.T. Hibemeyer

YEAR: 1950

Described by: G.B.G.

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.67 METERS. HEIGHT OF LIGHT ABOVE STATION MARK 1.37 METERS.

NOTE*	OBJECT	BEARING	DISTANCE		DIRECTION		
			feet	meters	°	'	"
4	HALEAKALA 2 (HGS)	NE	76.74	23.389	106	41	59
12a	Reference Mark No.1	SSW	21.51	6.555	266	52	40
12c	Reference Mark No.2						

Located in southeast Maui, Kaupo District, in the Forest Reserve, north of the Kaupo Homestead, 2.5 miles in from the coast and  $\frac{1}{2}$  mile south of Puu Ahulili, at the north end of Niniao Pali, 80 feet south of a narrow rock outcrop that breaks off sheer to the bottom of the canyon at the extreme north end of the pali, and 10 feet east of the rim of the pali.

A standard disk set in a drill hole in a buried boulder projecting 4 inches, stamped NINIAO 1950.

Reference mark No.1 is northeast of the station. A standard disk cemented in a drill hole in rock outcrop projecting 18 inches, stamped NINIAO NO 1 1950.

Reference mark No.2 is south southwest of the station. A standard disk cemented in drill hole in a buried boulder projecting 4 inches, stamped NINIAO NO 2 1950.

To reach from the Post Office at Hana: go southwesterly on the coast highway for 18.5 miles to a new concrete bridge over Manawainui Stream, turn right, pass through loading corral gates and go to top of pasture land on left side of wide draw. From here pack north on old trail along edge of pali to end of canyon and station.

\* Refer to notes in manuals of triangulation and state publications of triangulation.  
† To nearest meter only, when the trigonometric leveling is being done.

(Direction-angle measured clockwise, referred to initial station.)  
16-55552-1 U. S. GOVERNMENT PRINTING OFFICE

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NINIAO

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 ° 40' 57.341	ELEVATION:	1225.2 METERS
GEODETIC LONGITUDE:	156 ° 07' 00.369		4013 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	8-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100
HI 2	5102	687,967.80	127,167.88	+ 0 11 39

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE 8-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100 FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
HALEAKALA 2	111 38 40.3	111 27 01	5102

QO 148

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1136  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

Ohai (Maui Island, Hawaiian Government Survey, 1877).—On southeastern coast of Maui, on summit of ridge in land of Puuokohola in South Hana near the sea "pali." Marked by iron stake and pile of stones.

## RECOVERY

### DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM 535  
Rev. Aug. 1968

NAME OF STATION: OHAI

STATE:

Hawaii

COUNTY: Maui

CHIEF OF PARTY: C. T. Eusemeyer

YEAR: 1950

Described by: C. J. Hoepfel

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK 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	HEIGHT OF LIGHT ABOVE STATION MARK METERS.
	OBJECT	BEARING	DISTANCE feet meters
			DIRECTION: 0 00 00 60 29 59
12e	MUOLEA ✓	W ✓	14.036 ✓ 4.278 ✓
12e	R. M. No. 2 ✓		
12e	R. M. No. 1 ✓	SW ✓	8.860 ✓ 2.700 ✓

The station is located on a brush covered promontory which lies about 1.5 miles northeast of Kipahulu, about 1.5 miles southwest of Koali, about 0.2 mile southeast of the road which runs between Kipahulu and Hana, about 150 feet west of the sea and about 100 feet above sea level.

To reach from the Catholic Church in the village of Kipahulu; go northerly, on the road toward Hana, for 3.1 miles to a left hand turn and the end of truck travel. From this point pack southeast, through the ferns and brush, for about 0.2 mile to the end of the ridge and the station.

The station is a standard disk, stamped OHAI 1950, set into a drill hole in a buried boulder which projects about 1 foot.

Reference mark number 1 is a standard disk, stamped OHAI NO 1 1950, set into a drill hole in a boulder which projects about 6 inches. It is located about 1 foot lower than the station.

Reference mark number 2 is a standard disk, stamped OHAI NO 2 1950, set into a drill hole in a boulder which projects about 5 feet. It is located about 3 feet higher than the station.

FORM 526a  
(9-5-56)

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

Name of Station: OHAI

Established By: HGS

Year: 1877 State: HAWAII

Recovered By: H.J. Seaborg Year: 1963 County: MAUI

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

Station was recovered in good condition as described by C.T.H. in 1950.

The following change should be made in the description: The distance from the Catholic church in Kipahulu is 2.1 miles rather than the 3.1 miles as stated by C.T.H. in 1950.

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OHAI

STATE: HAWAII

YEAR: 1877

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 ° 40' 24.577	ELEVATION:	72.3 METERS
GEODETIC LONGITUDE:	156 02 25.465		237 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ANGLE
HI 2	5102	714,085.68	123,556.84	+ 0 13 16

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE  $\theta = \Delta \theta + \Delta \theta^2$  FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
MUOLEA	239 52 21.6	239 39 06	5102

QE 342

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1136

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

OHAI (continued)

FORM 526a  
(2-15-55)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: OHAI  
ESTABLISHED BY: HGS YEAR: 1877 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.52 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	
MUOLEA -----1950 DISTANCE and DIRECTION				00 00 00.0
R.M. No. 1	SW	8.860	2.700	144 38 22
R.M. No. 2	W	14.036	4.278	208 35 21
MUOLEA 1950 -----1969 DISTANCE and DIRECTION				00 00 00.0
R.M. No. 1	SW	8.877	2.706	144 47 27
R.M. No. 2	W	14.053	4.284	208 37 00

Station was recovered and all marks found in good condition, however there is a considerable discrepancy in the angle to R.M. No. 1; this is believed due to the instrument being unable to focus down to such a short distance, resulting in a rough pointing. A complete description follows:

Station is located about 1-1/4 miles northeast of Kipahulu and 6-1/2 miles southwest of Hana, at Ohai Point, at about 237 feet elevation, at the extreme southeast end of the narrow, timbered ridge running down from the road.

To reach station from the post office in Hana, go south on State Highway 31 for 3.8 miles to fork. Take left fork and continue for 4.9 miles

to right curve of road, at a triangle blaze on large tree on left, 0.1 mile before reaching the bridge at Mahalawe Stream, and end of truck travel. Pack southerly down narrow, heavily-timbered ridge for about 1000 feet.

Station mark is a standard disk stamped "OHAI 1950", cemented in a drill hole in a 12 x 16-inch boulder projecting 6 inches from ground. It is 5 feet southeast from the last pandanus tree on the ridge.

Reference mark number one is a standard disk stamped "OHAI NO 1 1950", cemented in a drill hole in the northeast end of a large rock that projects 1 foot from ground. It is about 1-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "OHAI NO 2 1950", cemented in a drill hole in a 3-foot boulder that projects 16 inches from ground. It is 2-1/2 feet higher than station mark.

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

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

USCOM-DC 27179-P88

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

0 201561 STATION 1137  
HAWAII  
LATITUDE 20° 30' TO 21° 30'  
LONGITUDE 156° 00' TO 156° 30'  
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
JULY 1955  
REV. AUG. 1968

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: OHEO STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C.T. Husemeyer	YEAR: 1950	Described by: G.B.G.
NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.30 METERS.	HEIGHT OF LIGHT ABOVE STATION MARK 1.00 METERS.	
pipe	Surface-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION
	Underground-station mark	
	OBJECT	BEARING
		DISTANCE
		feet
		meters
		DIRECTION:
	MUOLEA	0 00 00
12c	Reference mark No.2	271 23 28
12c	Reference mark No.1	326 20 34
	NNW	54.26
	NE	39.53
		16.540
		12.048

Located on the southeast coast of East Maui, South Hana District, in land of Alaeiki, about 1.0 mile in from the coast at upper edge of steep pasture land of the Kipahulu Ranch. 0.2 miles east of Oheo Gulch and 0.1 miles below the Kipahulu Forest Reserve Boundary. 50 paces northeast of a small wash, at the northeast edge of a clump of Guava trees on a narrow shelf that appears to be an old ditch. A standard disk cemented in the top of a terra cotta pipe projecting 8 inches, stamped OHEO 1950.

Reference mark No.1 is northeast of the station. A standard disk cemented in a drill hole in a buried boulder projecting 2 inches, stamped OHEO NO 1 1950.

Reference mark No.2 is north northwest of the station. A standard disk cemented in a drill hole in a buried boulder projecting four inches, stamped OHEO NO 2 1950.

To reach from the Post Office at Hana: go southwesterly on coast highway for 10.3 miles to a board gate on right just before reaching Seven Pools. Turn right through gate and and go west to upper end of pasture and station.

Form 526  
(11-8-55)

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

NAME OF STATION: OHEO  
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 description is adequate.

The station is a standard disk cemented into a 2 inch iron pipe and the reference marks are hidden by the tall grass.

A key to enter the gate leading to the field may be secured from the Ulupalakua Ranch branch at Kipahulu.

\* 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.

(continued on next page)

COM-DC 34314

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OHEO

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 40' 53.280	ELEVATION: 450.0 METERS
GEODETIC LONGITUDE: 156° 03' 17.691	1575 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ ANGLE °
HI 2	5102	709,113.40	126,833.86	+ 0° 12' 58"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
MUOLEA	259° 00' 44.0"	258° 47' 46"	5102

QE 343

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1137

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

OHEO (continued)

FORM 526a  
(10-15-69)

U.S. DEPARTMENT OF COMMERCE  
NAVY

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: OHEO  
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui  
Island: 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			
MUOLEA -----1950 DISTANCE and	DIRECTION-----			00	00	00"0
R.M. No. 2	NNW	54.26	16.540	271	23	28
R.M. No. 1	NE	39.53	12.048	326	20	34
-----1969 DISTANCE-----						
R.M. No. 2	NNW	53.836	16.410			
R.M. No. 1	NE	39.804	12.132			

Station was recovered and all marks found in good condition, although discrepancies were found in the distance to both RMs. A complete description follows:

Station is located about 7 miles southwest of Hana, 1-1/4 miles northwest of the Seven Sacred Pools, 1/4-mile east of Oheo Gulch, 400 feet southwest of a small but deep and wooded gulch, and 50 yards north-east of a shallow draw, at upper end of the steep pasture land running up from the highway. It is just inside the heavy guava brush bordering the pasture, on a small, rounded point, along an 8-foot-wide, flat area,

now a cattle trail, but appearing to have been an old ditch.

To reach station from the Kipahulu Ranch headquarters, go east on the main road for 1.2 miles to wire gate on left, just past the Seven Sacred Pools. Pass through gate and go up steep pasture slope, first passing around left end of a guava row part way up, then working back to right, for 1.2 miles to end of truck travel at fence line. Pack on up pasture about 1/3-mile to guava brush and station.

Station mark is a standard disk stamped "OHEO 1950", set in the top of a 2-1/2-inch pipe projecting 1 foot from ground. It is on the lower edge of the trail, hidden by grass, and has a few boulders around it.

Reference mark number one is a standard disk stamped "OHEO NO 1 1950", cemented in a drill hole in a 12-inch bedrock flush with ground, along the uphill side of the trail, at about same elevation as station mark.

Reference mark number two is a standard disk stamped "OHEO NO 2 1950", cemented in a drill hole in a boulder flush with ground, on the steep slope above trail, 14.2 feet higher than station mark, and hidden by grass.

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

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

USCOMMA-DC 27178-P88



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 201561

STATION 1138

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

OKOHOLA (continued)

P  
(11-6-55)  
U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY  
RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: OKOHOLA  
ESTABLISHED BY: H.G.S.     YEAR: 1877     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, a Type B, Hawaiian Territory Survey Monument, was recovered in good condition. The State Forest Service has cleared the land immediately north on the ridge and is replanting the area. The power transmission line leading to Hana crosses the ridge about 50 ft. north of the station which is on the ridge between Honomanu Bay and Haipuaena Falls at an elevation of 848 feet.

The 1950 recovery note is adequate with the additions noted above.

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: OKOHOLA  
ESTABLISHED BY: HGS     YEAR: 1877     STATE: Hawaii     BENCH MARK(S) ALSO ☐  
RECOVERED BY: R.C. Munson     YEAR: 1968     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 in good condition, however the hill is now covered with a heavy growth of koa trees and all lines are blocked. Located about 10 miles east-southeast of Haiku, 2-1/2 miles west-northwest of Keanae School, and 1/2-mile south of Kaumahina State Park, on a timbered ridge, 175 feet west of a power line and about 1500 feet northeast of a track road.

To reach station from the main intersection in Paia, go east on State Highway 36 for 22.0 miles to track road right, 0.3 mile before Kaumahina State Park. Go up track road for 0.35 mile to power line; continue for 0.5 mile to dim crossroad; turn left and go 0.1 mile to end of truck travel. Pack northeast through timber about 1500 feet to station.

Station is marked by a Type B signal, a 2-1/2-inch iron pipe in the center of a 12-inch-square concrete pier 30 inches high, in the center of a 6-foot-square, concrete platform flush with ground. A red and white metal target extends 8 feet above the platform. Station is 6 feet northeast of a triangle blaze on a tree, 12 feet southwest of another triangle blaze, and 100 feet northeast of the northeast edge of a group of very large mango trees that set in the head of a draw, at about same elevation as station.





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

Q 201561 STATION 1140  
HAWAII  
LATITUDE 20° 30' TO 21° 30'  
LONGITUDE 156° 00' TO 156° 30'  
DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE  
U.S. COAST AND GEODETIC SURVEY  
Form 550  
Rev. Aug. 1965

RECOVERY  
DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: OLOPAWA STATE: Hawaii COUNTY: Maui  
Established By: HGS Year: 1878  
Chief of Party: G.T. Husemeyer Year: 1950  
Described by: G.B.G.  
HEIGHT OF TELESCOPE ABOVE STATION MARK 0.79 METERS  
HEIGHT OF LIGHT ABOVE STATION MARK 0.49 METERS

NOTE: Surface-station mark, Under-ground-station mark

OBJECT	BEARING	DISTANCE		DIRECTION
		feet	meters	
PUU HINAI 2	ESE	3.5 miles	160 00 00.0	
Kauiki Head Light	SE	2.5 miles	160 02 26.6	
Puu O Kahaula (target)			168 04 58.1	

Old description: "near eastern end of east Maui, on summit of hill of same name, in northern part of Hana District, 3 miles inshore, in land of Kaeleku, and 2½ miles from the sea. Mark, a concrete post. The station was recovered by the Hawaiian Territorial Survey in Nov. 1929 in good condition. It was replaced at that time by a Type B Monument. The center of the 2½ inch pipe target holder was used as the station to reach from the Post Office at Hana: go westerly on the coast highway for 3.8 miles to the west edge of Kaeleku Village. Turn left at elevated green tank and go southerly on ranch roads to foot of first prominent hill, thence up steep side to top and station.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: OLOPAWA  
ESTABLISHED BY: HGS YEAR: 1878 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 in good condition, although completely overgrown with brush and vines.

Located about 3 miles west-northwest of Hana and 1 mile south of State Highway 36, on the summit of a prominent, brush and tree-covered hill of about 1846 feet elevation.

To reach station from the post office in Hana, go northwest on State Highway 36 for 3.8 miles to wire gate on left, across from old house. Go through gate and follow pasture road upgrade for 0.3 mile to wire gate. Pass through gate and go 0.1 mile to end of road. Pack up around left side of hill to back of ridge, then up ridge to station. A 2-hr. pack due due to dense brush.

Station is marked by a Type B signal; the concrete platform is flush with ground. A 12-inch-square, concrete pier extends 26 inches from center of platform, and has a 2-1/2-inch pipe in the center which holds a metal target extending 8 feet above platform.

The hilltop has a heavy cover of ti plants up to 12 feet tall, and other heavy, but lower, brush, which obscures station.

NAME OF STATION: OLOPAWA  
STATE: HAWAII YEAR: 1878 FIRST ORDER  
SOURCE: G- 9311

GEODETIC LATITUDE:	20° 46' 16.792	ELEVATION:	562.8 METERS
GEODETIC LONGITUDE:	156° 02' 06.195		1846 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ θ: ANGLE
HI 2	5102	715,774.94	159,500.35	+ 0° 13' 26"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PUU HINAI 2	122 30 33.1	122 17 07	5102

QE 329

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

Q 201561 STATION 1141  
 HAWAII  
 LATITUDE 20 ° 30' TO 21 ° 00'  
 LONGITUDE 156 ° 00' TO 156 ° 30'  
 DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OPANE

STATE: HAWAII

YEAR: 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 56 53.20	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 17 04.08		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ ST ANGLE *
HI 2	5102	630,415.45	223,441.97	+ 0 08 12

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

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

QO 087

HORIZONTAL CENTER DATA

NO TEXT

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1142  
HAWAII  
LATITUDE 20° 30' TO 21° 00'  
LONGITUDE 156° 00' TO 156° 30'  
DIAGRAM NF 4-16 MAUI

**Opikoula (Maui Island, Hawaiian Government Survey, 1877).—On northeast coast of East Maui, in Koolau District, Nahiku subdistrict, near the edge of the sea cliff. Marked by a 4-inch iron pipe set in concrete and covered with cairn.**  
DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
PAPER 580  
RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Opikoula STATE: Hawaii COUNTY: Maui  
ESTABLISHED BY: Hawaii C.S. YEAR: 1877 LOCALITY: Koolau  
RECOVERED BY: V.S. Seward YEAR: 1929

Detailed statement as to the fitness of the original description: Original description good.

Original mark replaced by a 2 inch pipe set in a concrete pier.

New Mark: Standard bronze tablet set in concrete pier. Over which was built a Type A Hawaii Territory Survey Triangulation Station Monument.

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

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: OPIK OULA  
ESTABLISHED BY: Hawaiian Govt. YEAR: 1877 STATE: Hawaii  
RECOVERED BY: C. T. Husemeyer YEAR: 1950 COUNTY: Maui

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

Station was recovered in good condition.

new description;

The station is located near the northerly end of a grassy point which is located about 0.5 mile north of the village of Nahiku and about 30 feet west of the sea bluff.

The station is a standard Territory Survey bronze disk, unstamped, set in the top of a square concrete post which is flush with the surface of the ground.

Reference mark number 1 is a standard disk, stamped OPIK OULA NO 1 1950, set into a drill hole in a boulder which is about 6 feet in diameter and projects 4 feet.

Reference mark number 2 is a standard disk, stamped OPIK OULA NO 2 1950, set into a drill hole in a boulder which is about 4 feet in diameter and projects 3 feet.

NOTE	OBJECT	BEARING	FEET	METERS	DIRECTION
12a	HONOKALANI 2	S	69.358	21.141	00 00 00
12a	R. M. No. 2	71 18 55			
12a	R. M. No. 1	WNW	45.280	13.799	192 28 18

(continued on next page)

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OPIK OULA

STATE: HAWAII

YEAR: 1877

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 49' 49.302	ELEVATION: 10.6 METERS
GEODETIC LONGITUDE: 156 05 14.563	54 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	557,822.22	180,844.13	+ 0 12 22

\* 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
HONOKALANI 2	292 59 45.0	292 47 23	5102

QE 326

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1142

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

OPIKOULA (continued)

PC  
(11-55-55)

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

R

NAME OF STATION: OPIKOULA  
ESTABLISHED BY: H.G.S. YEAR: 1877 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 station was marked by a Type A, Hawaiian Territory Survey Monument in 1929. The center of the pipe projecting from the platform was used by this party. It was not possible to see whether the disk in the monument was unstamped as the pipe mentioned is plumbed over the monument.

To reach the station from the intersection of the Hana Highway and the road to Lower Nahiku marked by a Hawaii Visitors Bureau sign, go north on road down draw to the old church at Lower Nahiku. Turn right (east) on jeep trail for about 1/2 mile to a gate on the left. Pass through gate and go north through pasture on jeep trail which leads directly to the station.

FORM 526a  
(5-15-59)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: OPIKOULA  
ESTABLISHED BY: HGS YEAR: 1877 STATE: Hawaii  
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui  
Island. Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 2.48 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		
HONOKALANI 2 -----	1950 DISTANCE and DIRECTION-----	00	00	00.0	
R.M. No. 2	S	69.358	21.141	71	18 56
R.M. No. 1	WNW	45.280	13.799	192	28 18
HONOKALANI 2 1950 -----	1968 DISTANCE and DIRECTION-----	00	00	00.0	
R.M. No. 2	S	69.365	21.143	71	19 46
R.M. No. 1	NW	45.292	13.805	192	26 51.

Station was recovered and all marks found in good condition. The HTS metal target was rusted in and could not be removed, so was hacksawed off and a new target installed. A complete description follows:

Station is located about 8 miles northwest of Hana and 1/2-mile east-northeast of Nahiku Village, on the bare bluff at Opikoula Point.

To reach station from the post office in Hana, go northwest on State Highway 36 for 3.4 miles to junction with road to the Hana Airport. Continue on the highway for 6.5 miles to gravel side road right. Go right for 2.3 miles to old church at Nahiku; turn sharp right and follow track

road for 0.3 mile to wire gate on left. Pass through gate and go 0.25 mile down through pasture to station out on point.

Station mark is a Hawaii Territorial Survey disk, unstamped, set in concrete flush with ground, 20 feet west of edge of bluff. There is a Type A signal centered over the mark, with the 6-foot-square, concrete platform 4 feet above ground. A red and white metal target extends about 7 feet above the platform.

Reference mark number one is a standard disk stamped "OPIKOULA NO 1 1950", cemented in a drill hole in the top of a large boulder projecting 3-1/2 feet above ground, and is 1.9 feet lower than station mark.

Reference mark number two is a standard disk stamped "OPIKOULA NO 2 1950", cemented in a drill hole in a black, 4-foot boulder projecting 3 feet above ground. It is 8 feet west of edge of bluff, 30 feet north of peak of small knoll and 2 feet higher than station mark.

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

Q 201561 STATION 1143  
HAWAII  
LATITUDE 20° 30' TO 21° 00'  
LONGITUDE 156° 00' TO 156° 30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAEHALA

STATE: HAWAII

YEAR: 1904

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 40' 34.24	ELEVATION:	METERS
GEODETIC LONGITUDE:	156° 02' 20.19		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE *
HI 2	5102	714,580.82	124,933.71	+ 0° 13' 18"

\* 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

QQ 171

## HORIZONTAL CONTROL DATA

Q 201561 STATION 1144  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

### ADJUSTED HORIZONTAL CONTROL DATA

THIRD

-ORDER

ELEVATION SCALED	256	METERS FEET
---------------------	-----	----------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (OR $\Delta$ ) ANGLE °
HI - 2	5102	726,745.26	147,638.32	+ 0° 14' 06"

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

NOTE: REDUCTION HAS BEEN COMPUTED BY THE "FORMER" FORMULA NEGLECTING THE SECOND TERM			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
	0 1 2	0 1 2	

QD 176

QD 176



NO TEXT

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

### ADJUSTED HORIZONTAL CONTROL DATA

**SECOND**

-ORDEA

GEODETIC LATITUDE: 20° 43' 01.53 GEODETIC LONGITUDE: 156 15 13.91	ELEVATION: 3011 METERS SCALED FEET
--	---------------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	Bearing or Angle
HI 2	5102	641,073.00	139,558.40	+ 0° 08' 46"

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

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

QD 403

QD 403

Q0 033

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

Q 201561 STATION 1147  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 00'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

**Palaha** (Maui Island, Hawaiian Government Survey, 1877).—In eastern part of East Maui, in Koolau District, at northeast corner of Haleakala Crater, near the edge of the precipice, on a large flat rock which is the center where the eight districts of East Maui meet; called Pohaku Palaha. Marked by a pillar of stones.

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PALAHA

STATE: HAWAII

YEAR: 1877

THIRD

—ORDER

SOURCE G-SP156

GEODETIC LATITUDE:	20 44 01.182	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 08 40.769		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ $\phi$ ANGLE *
HI 2	5102	678,374.76	145,684.56	+ 0 11 05

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

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

QD 034



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

Q 201561 STATION 1148  
HAWAII  
LATITUDE 20° 30' TO 21° 00'  
LONGITUDE 156° 00' TO 156° 30'  
DIAGRAM NF 4-16 MAUI

## NO ORIGINAL TEXT

Pauwalu (Maui Island, Hawaiian Government Survey, 1877; J. C. Gauger, 1912).—On northeast coast of Maui, in Koolau District, 1 meter south-south-west from the base of the Pauwalu Point Light. The light bears N. 38° E., 1.61 meters (5.3 feet). Marked (in 1912) by concrete post with cross in top, sunk nearly flush with surface of ground.

### DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 502 RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Pauwalu STATE: Hawaii COUNTY: Maui  
ESTABLISHED BY: Hawaii G.S. YEAR: 1877 LOCALITY: Koolau  
RECOVERED BY: V.S. Soward YEAR: 1929

Detailed statement as to the fitness of the original description: Original description & mark good.

Now Mark: Standard bronze tablet set in concrete pier. Over which was built a Type A Hawaii Territory Survey Triangulation Station Monument.

### RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PAUWALU  
ESTABLISHED BY: Hawaiian Govt. YEAR: 1877 STATE: Hawaii BENCH MARK(S) ALSO ☐  
RECOVERED BY: C.T. Husemeyer YEAR: 1950 COUNTY: Maui  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

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

The 1912 mark, consisting of a "concrete post with a cross in top" was not recovered. At the time of this 1950 survey, a Territory Survey bronze disk, unstamped, was found set into the top of a concrete post which is flush with the surface of the soil. Over this disk is a 5 by 5 foot concrete platform which projects 3 feet. Inscribed on the upper surface of this platform is the word PAWALA. A new description follows--

The station is located on the most northerly promontory of Pauwalu Point, just inshore from a prominent island and 75 feet back from the edge of the sea bluff.

The station is the top and center of a 2-1/2 inch iron pipe which projects about 4 inches from the top of a square concrete platform which is 5 feet on each side and 3 feet in height. (Due to the rusted condition of the pipe it was impossible to plumb to the lower disk.)

No reference marks were set at this station.

ORD 328  
11-8-55)

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

NAME OF STATION: PAUWALU  
ESTABLISHED BY: H.C.S. YEAR: 1877 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 was not visited but the Type A, Hawaiian Territory Survey Monument is clearly visible from Keanae Peninsula.

The 1950 recovery note appears to be adequate.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAUWALU  
STATE: HAWAII

YEAR: 1877

FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20° 51' 43.286	ELEVATION	32.7 METERS
GEODETIC LONGITUDE	156° 08' 03.880		107 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10R Δ θ1 ANGLE *
HI 2	5102	681,722.52	192,319.32	+ 0° 11' 22"

\* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ 10R Δ θ1 FORMULA NEGLECTING THE SECOND TERM.

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

QE 325

(continued on next page)

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

COGS-DC 34314

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 201561

STATION 1148

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

PAUWALU (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: PAUWALU  
ESTABLISHED BY: HGS     YEAR: 1877     STATE: Hawaii     BENCH MARK(S) ALSO ☐  
RECOVERED BY: R.C. Munson     YEAR: 1968     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 in good condition. Located about 12 miles northwest of Hana and 3/4 mile northeast of the Keanae School, on Pauwalu Point just across small cove from the Natural Arch, and at about 107 feet elevation, on an open, grassy bluff.

To reach station from the main intersection in Paia, go east on State Highway 36 for 28.1 miles to the Keanae School. Continue for 0.2 mile to power pole No. 55; turn left into yard, pass to right of garage, and go 0.15 mile, pass through gate, turn left and go 0.05 mile to fork. Take left fork and follow winding road through forest for 0.6 mile to sea bluff. Pack northwest down across beach and up other side to station. A 5-min. pack.

Station mark is an unstamped HTS disk, set in the top of a 12-inch-square, concrete monument flush with ground. A Type A signal is centered over the mark, with the 6-foot-square, concrete platform 3 feet above ground. The words "PAWALA STA" are inscribed in the concrete platform. Station is 23 yards south of end of bluff.

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

0 201561 STATION 1149  
HAWAII  
LATITUDE 20 ° 30' TO 21 ° 30'  
LONGITUDE 156 ° 00' TO 156 ° 30'  
DIAGRAM NF 4-16 MAUI

NO TEXT

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION PAUWELA

STATE HAWAII

YEAR 1912

THIRD

ORDER

SOURCE G-SP156

GEODETIC LATITUDE	20 ° 56' 56.87"	ELEVATION	METERS
GEODETIC LONGITUDE	156 ° 19' 26.21"		FEET

STATE COORDINATES (feet)				
STATE & ZONE	CODE	X	Y	$\phi$ OR $\Delta$ ANGLE *
H1 2	5102	616,942.89	223,781.78	+ 0 ° 07' 21"

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

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

QD 086

