

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1001
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 835
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: AHUPAI STATES: 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	
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				
	PUU O KOHA (HGS) 1950				
	R.M. No. 2	SW	33.73	10.283	0 00 00.0
	R.M. No. 1	NNW	32.55	9.922	0 11 38
					115 37 15

Located in north Maui, Makawao District, on H.C. & S. Co. property, about 8.5 miles, airline east of Kahului, 4 miles southeast of Paia and 0.5 miles northeast of the Haleakala Highway, on a prominent low knoll in a pineapple field. The knoll is grass covered on the west slope.

Station is a standard disk cemented in a two inch pipe in a concrete monument flush with the ground, stamped AHUPAI 1950. The concrete monument was a Plantation Survey station.

Reference mark No. 1 is north northwest of the station and 20 feet southeast of a field road. A standard disk welded to the top of a two inch pipe set in concrete and projecting 10 inches, stamped, AHUPAI NO 1 1950.

Reference mark No. 2 is southwest of the station and 25 feet west of a field road. A standard disk welded to the top of a two inch pipe set in concrete and projecting 8 inches, stamped AHUPAI NO 2 1950.

To reach from the Post Office at Kahului: go easterly on main highway toward Paia for 3.1 miles, turn right as per sign Haleakala and go southeast on Kula road for 5.0 miles. Turn left as per sign Hallimaile Village and go northerly on paved road for 0.75 miles to power pole No. 14, turn right and go east on main dirt field road for 1.6 miles to top of hill and 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.

16-58292-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: AHUPAI

STATE: HAWAII YEAR: 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 50 51.738	ELEVATION:	448.2 METERS
GEODETIC LONGITUDE:	156 20 24.345		1470 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	8 10R Δ 81 ANGLE
HI 2	5102	611,507.51	186,931.09	+ 0 06 58

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE 8 10R Δ 81 FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PUU O KOHA	53 38 08.6	53 31 11	5102

QE 310

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 1001

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

AHUPAI (continued)

FORM 524a
(6-18-60)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: AHUPAI
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		1.73 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 O KOHA (HGS) 1929-----1950	DISTANCE	and	DIRECTION-----	00	00	00.0	
R.M. No. 1	NNW	32.55	9.922	115	37	15	
PUU O KOHA (HGS) 1929-----1968	DISTANCE	and	DIRECTION-----	00	00	00.0	
R.M. No. 3	SW	22.856	6.968	09	43	48	
Paia Sugar Mill Stack	NNW			95	44	29.8	
R.M. No. 1	NNW	32.808	10.001	115	35	37	
Makawao, KNUI Radio Mast	ESE			237	58	03.7	

Station mark and RM No. 1 were recovered in good condition, but RM No. 2 has been destroyed. A new reference mark, No. 3, was established and a witness post was set. A complete description follows:

Station is located about 3/4-mile north-northwest of Pukalani and 1-3/4 miles west-southwest of Makawao, at about 1470 feet elevation, on a grassy area on the northwest end of a flat hill planted in pineapple.

To reach station from the post office in Pukalani, go northwest on State Highway 37 for 0.7 mile; turn right on Makani Rd. and go 0.45 mile

to end of macadam; continue ahead, on dirt road into pineapple field, for 0.1 mile to crossroad. Turn left and go northwest for 0.2 mile to end of hill and station on left, at a T-road left.

Station mark is a standard disk stamped "AHUPAI 1950", set in concrete 6 inches below ground level. It is 38 feet southwest of center line of main field road, 11 feet northwest of center line of the T-road and 3 feet southwest of a white witness post. There is a large cairn, with signal in middle, centered over the mark.

Reference mark number one is a standard disk stamped "AHUPAI NO 1 1950", set in the top of a 2-inch, iron pipe that projects 10 inches above ground. It is 27 feet southwest of center line of main field road and 1.2 feet lower than station mark.

Reference mark number three is a standard disk stamped "AHUPAI 1950 NO 3 1968", brazed to the top of a 2-inch, iron pipe that is set in concrete and projects 10 inches above ground. It is 0.4 foot higher than station mark.

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

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

USCOMMA-DC 27178-P89

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1002
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
PORTAL 838
Rev. Aug. 1949

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: AHUULA

STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C. T. Husemeyer

YEAR: 1950

Described by: C. J. Hoepfel

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	1.82 METERS.†	HEIGHT OF LIGHT ABOVE STATION MARK	METERS.
2	Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
OBJECT		BEARING	DISTANCE	DIRECTION‡
			feet	meters
	OHEO			00 00 00
12a	Kipahulu, Stack	SE	1.0 mile	111 54 43.8
12a	R. M. No. 1	SSW	32.155	144 58 16
12a	R. M. No. 2	NE	51.100	339 17 21
			9.804	
			9.480	

The station is located on a small, grassy, knoll which lies about 1.0 mile north northwest of Kipahulu, about 0.4 mile southwest of Oheo Gulch, about 0.1 mile southwest of a wire gate and 77 feet south southwest of the highest part of the knoll.

To reach from the village of Kipahulu; go northwest, on the track road which leads into the Kipahulu Valley, for 0.8 mile; bear to the left and go 0.2 mile; cross over a small gully and pass through a wire gate; then go to the right, west, for about 0.1 mile to the summit of the knoll and the station.

The station is a standard disk, stamped AHUULA 1950, set into a drill hole in bedrock which is flush with the surface of the ground.

Reference mark number 1 is a standard disk, stamped AHUULA NO 1 1950,

set into a drill hole in bedrock which projects about 3 feet on the east side and is flush with the crest of the ridge on the west. It is located about 3 feet lower than the station.

Reference mark number 2 is a standard disk, stamped AHUULA NO 2 1950, set into a drill hole in bedrock which projects about 1 foot. It is located on the west slope of the station hill about 3 feet lower than the station.

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

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: AHUULA

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20° 40' 16.089	ELEVATION	354.1 METERS
GEODETIC LONGITUDE:	156° 03' 55.760	1162	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	705,512.48	123,068.03	+ 0° 12' 44"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
KIPAHULU OLD SUGAR MILL STACK	335 50 28.0	335 37 44	5102

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1002

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

AHUULA (continued)

FORM 526a
(9-18-69)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: AHUULA
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		1.53 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				
Kipahulu Old Sugar Mill stack 1950	--1950	DIST. and DIR.	--00 00 00.0				
R.M. No. 1	SSW	32.165	9.804	33 03 32			
R.M. No. 2	NE	31.100	9.480	227 22 37			
KIPAHULU Old Sugar Mill stack 1950	--1960	DIST. and DIR.	--00 00 00.0				
R.M. No. 1	SSW	32.080	9.779	33 03 52			
R.M. No. 2	NE	31.101	9.480	227 22 14			

Station was recovered and all marks found in good condition. There is a slight discrepancy in the old distance to RM 1; it was double-checked and the 1959 distance is correct. A complete description follows: Station is located about 7-1/2 miles southwest of Hana, and 1 mile northwest of the Kipahulu Ranch Headquarters, on a sharp hill of about 1162 feet elevation, covered with scrub guava brush, and overlooking the surrounding green pastures. A small ridge, with many black rock outcrops, runs down to southeast from station. There is a wire fence running over the hill up near the top, on the northeast side.

To reach station from the Kipahulu Ranch headquarters, go east on the main road for 0.4 mile to board gate. Pass through board gate on left and follow track road for 0.45 mile to a fork. Take left fork, pass through a wire gate, and go 0.8 mile to top of grade. Bear left, across pasture, and go 0.15 mile to end of truck travel at a rocky ravine crossing, at northeast side of station hill. Pack west, through board gate and on around point of hill, for about 125 yards, then go right, up side of hill, about 100 yards to station.

Station mark is a standard disk stamped "AHUULA 1950", cemented in a drill hole in bedrock flush with top of hill. It is 103 feet southwest of the fence line, 75 feet southwest of highest point of the hill, and about 125 yards west of the board gate.

Reference mark number one is a standard disk stamped "AHUULA RM NO 1 1950", cemented in a drill hole in a bedrock ledge along hilltop, 4 feet lower than station mark.

Reference mark number two is a standard disk stamped "AHUULA RM NO 2 1950", cemented in a drill hole in a 2-foot rock outcrop projecting 1 foot from ground on the lower side and flush with ground on upper side. It is about 2 feet lower than station mark.

NOTE: 4-wheel-drive vehicle is needed to drive up the pasture roads.

*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 27173-P28

Q 201561 STATION 1003
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Alaea (Maui Island, Hawaiian Government Survey, 1877).—In east central part of East Maui, on a hill of the same name, in Koolau District, on the northeast slope of Mount Haleakala, about 7 miles due south of Pauwahu. Marked by redwood post and cairn of stones.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: ALAEA

STATE: HAWAII

YEAR: 1877

SECOND

-ORDER-

SOURCE: G-SP156

GEODETIC LATITUDE:	20 44 29.885	ELEVATION:	2329	METERS
GEODETIC LONGITUDE:	156 08 44.872	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	677,975.98	148,579.23	+ 0 11 04

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

PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\sin^2 \theta$ FORMULA REFLECTING THE SECOND TERM			
TO STATION OR OBJECT	GEODETTIC AZIMUTH (From south)	PLANE AZIMUTH ^a (From south)	CODE

QD 037

Q0 037

HORIZONTAL CONTROL DATA

QUAD 201561 STATION 1004
HAWAII
LATITUDE 20 030 ' TO 21 000 '
LONGITUDE 156 000 ' TO 156 030 '
DIAGRAM NF 4-16 MAUI

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

TOTAL CONTROL DATA BY NGS

NAME OF STATION: ARPA 1.6 M TELESCOPE OBS BY NGS
STATE: HAWAII YEAR: 1975 THIRD ORDER

SOURCE: G-15651

GEODETIC LATITUDE: 20 42 41.59385 GEODETIC LONGITUDE: 156 15 36.56210	ELEVATION: 3033 SCALED	METERS FEET
--	---------------------------	----------------

The point is located beneath the large dome at the east end of the ARPA Observatory and is the center of the 0.158-meter-diameter ring screwed onto a threaded shaft directly beneath the center (the vertical (azimuth) axis) of the revolving mechanism of the 1.6-meter telescope and is 2.76 meters above the floor (which is at ground elevation) of a 2.44-meter-square room below the telescope with access through a door on the west side of the room.

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	Bearing Angle
HI 2	5102	638,927.68	137,541.58	+ 0°08'38"

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

* 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
	D I S	D I S	

THESE DATA ARE OBTAINED FROM ADJUSTMENT OF 1975

UC 002

UC 002

*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.

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 201561 STATION 1005
HAWAII
LATITUDE 20 30 ' TO 21 30 '
LONGITUDE 156 00 ' TO 156 30 '
DIAGRAM NF 4-16 MAUI

NOAA FORM 78-39
11-79

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

DESCRIPTION OF TRIANGULATION STATION
NAME OF STATION: ARPA 48 INCH TELESCOPE
NEAREST TOWN: STATE: Hawaii COUNTY: Maui
CHIEF OF PARTY: C.L. Novak QUADRANGLE NO.: 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 MARK, REFERENCE MARKS AND PROMINENT			
	UNDERGROUND-STATION MARK		OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
	OBJECT		BEARING	DISTANCE		DIRECTION
			FEET	METERS		

Detailed description

The point is located beneath the large dome at the northwest end of the ARPA Observatory and is the center of the 0.154-meter-diameter ring screwed onto a threaded shaft directly beneath the center (the vertical (azimuth) axis) of the revolving mechanism of the 48-inch telescope and is 2.63 meters above the floor (which is at ground elevation) of a 2.44-meter-square room below the telescope with access through a door on the south side of the room.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: ARPA 48 INCH TELESCOPE
STATE: HAWAII
YEAR: 1975
OBS BY NGS
THIRD
ORDER

SOURCE: G-15551

GEODETIC LATITUDE: 20 42 42.13703	ELEVATION: 3033 METERS
GEODETIC LONGITUDE: 156 15 36.21460	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE *
HI 2	5102	638,770.66	137,595.99	+ 0 08 37

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

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

THESE DATA ARE OBTAINED FROM ADJUSTMENT OF 1975

UC 001

IOAA FORM 78-39
12-70)

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1006
HAWAII
LATITUDE 20 30 ' TO 21 00 '
LONGITUDE 156 00 ' TO 156 30 '
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA
ADJUSTMENT BY NGS

QBS BY NGS

ARPA LASER BEAM DIRECTOR

THIRD

ORDER

STATE: HAWAII

YEAR: 1975

6-15051
SOURCE:

GEODETIC LATITUDE:	20 42 41.25386
GEODETIC LONGITUDE:	156 15 31.76243

ELEVATION: 3033 METERS
SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ S) ANGLE °
HA 2	5102	638,813.81	137,506.99	+ 0° 08' 37"

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

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\sin^2 \Delta$ 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 003			

UC 003

Detailed description:

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 1007
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: BED

STATE: HAWAII

YEAR: 1904

THIRD

ORDER

SOURCE: G-SP156

GEODETTIC LATITUDE:	20 ° 36' 28.732	ELEVATION:	METERS
GEODETTIC LONGITUDE:	156 26 37.180		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ: ANGLE °
HI 2	5102	576,264.95	99,801.96	+ 0 04 43 "

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

TO STATION OR OBJECT	GEODETTIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
	0 ° ' "	0 ° ' "	

00 143

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 1008
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

SEE STATION PUU NIANIAU

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: BENCH MARK 35 M USGS

STATE: HAWAII

YEAR 1950

SECOND

-ORDER

SOURCE: G- 9311
NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 ° 46' 32.175	ELEVATION:	2087.34 METERS
GEODETIC LONGITUDE:	156 14 51.584		6848.1 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# ON Δ RI ANGLE *
HI 2	5102	643,137.36	160,816.20	+ 0 08' 55"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE # ON Δ RI 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 NIANIAU			
QE 436			

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

ORDER

GEODETTIC LATITUDE: 20 38 12.967 GEODETTIC LONGITUDE: 156 27 16.439	ELEVATION: _____ METERS _____ FEET
--	---------------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# HOR Δ & ANGLE °
HI 2	5102	572,521.77	110,313.12	+ 0° 34' 29"

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

FORMULA REFLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEOCETIC AZIMUTH (From south) ° ' "	PLANE AZIMUTH * (From south) ° ' "	CODE

QD 137

QO 137

QE 437

JUN 1976
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 1011
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: CAMP

STATE: HAWAII

YEAR: 1900

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 48' 02.202	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 29 55.315		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ θ ANGLE *
HI 2	5102	557,370.29	169,743.25	+ 0 03 35

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

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

QD 121

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1012
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 INTERSECTION

NAME OF STATION: Catholic Church
ESTABLISHED BY: K.T.A. YEAR: 1929 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 identified by angle from station HEN and recovered.
Located in Wailuku, along the northwest side of Lower Main Street,
and near the Wailuku Sugar Co. Mill.

Station is the spire that rises from the top of a square tower
on the church building at St. Anthony Catholic Church and School.
Spire is sharp and copper-sheathed and has a cross on top which is
about 90 feet above ground.

R

NAME OF STATION: CATHOLIC CHURCH

STATE: HAWAII

YEAR 1929

THIRD

-ORDER

SOURCE: G- 447

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 ° 53 ' 45.53	ELEVATION	METERS
GEODETIC LONGITUDE	156 29 59.60		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ θ I ANGLE *
HI 2	5102	556,927.86	204,381.64	+ 0 03 ' 34 "

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

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

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

ORDER

AZIMUTH HAS BEEN COMPUTED BY THE "SIN 2" FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE

QD 076

Q0 076

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 1014
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: COCO

STATE: HAWAII

YEAR: 1904

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 37' 17.084	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 27.135		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ ANGLE *
HI 2	5102	577,212.43	104,681.45	+ 0 04' 46"

* 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

QD 141

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 1015
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: CDNE

STATE: HAWAII

YEAR: 1900

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 38' 29.251	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 27 02.863		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ IOR Δ θ 1 ANGLE °
HI 2	5102	573,809.02	111,957.69	+ 0° 04' 34"

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

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

QD 136

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1016
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: DAN
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 and identified by an angle check. Located about 4-1/2 miles south of the Kihei post office, 1/2-mile northeast of Puu Olai, and 700 feet west-northwest of Highway 31, along the seacoast, on Maluaka Point; about 150 yards southwest of a beach shack, and just inside the brush line of the point, among large trees.

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 ahead, on graded road, for 3.4 miles to highway junction where Highway 31 goes left, mauka; continue ahead for 0.5 mile to old church on right; continue for 0.45 mile to end of truck travel by power pole 63. Pack west along trail about 150 yards to beach shack; bear left and go about 150 yards along rocky shore to station on timbered point.

Station mark is a 1-inch iron pipe that projects 1 foot from ground. It is 5 feet southwest of a large, 4-foot-high kiawe stump, 8 feet east from bare rock beach line, and about 5 feet higher than beach.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: DAN

STATE: HAWAII

YEAR: 1962

THIRD

-ORDER

SOURCE: G-12995

GEODETIC LATITUDE:	20 ° 38' 50.802	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 55.233		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ 41 ANGLE *
HI 2	5102	574,530.77	114,132.92	+ 0 04 37 "

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE B OR Δ 41 FORMULA NEGLECTING THE SECOND TERM.

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1017
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 525
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: EAST POINT

STATE: HAWAII

COUNTY: MAUI

CHIEF OF PARTY: A. L. WADSWELL

YEAR: 1962

Described by: J. C. L.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.1	HEIGHT OF LIGHT ABOVE STATION MARK 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

The station is located on the east side of the crescent shaped volcanic cone known as Molekiai Island, about 10 meters north of a large rocky outcrop, and on the spine of the ridge, and about 109 meters south of the east tip of the crescent. It is a standard Triangulation disk stamped, "EAST POINT 1962", set in concrete in a drill hole in the bedrock. No reference marks were set for this station.

Detailed description:

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: EAST POINT

STATE: HAWAII

YEAR: 1962

THIRD

ORDER

SOURCE: G-12955

GEODETIC LATITUDE:	20 38 12.059	ELEVATION:	8	METERS
GEODETIC LONGITUDE:	156 29 47.452	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ ANGLE *
HI 2	5102	558,178.86	110,204.65	+ 0 ° 03 ' 36 "

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

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

HORIZONTAL CONTROL DATA

Q 201561 STATION 1018
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 37 51.147	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 49.300		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10M Δ α 1 ANGLE
HI 2	5102	575,102.37	108,115.14	+ 0 04 35

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\theta = \arctan \frac{b}{a}$ FORMULA NEGLECTING THE SECOND TERM.

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

QD 140

QO 140

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1019
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 OCEAN SURVEY
Form 515
REV. 1-66

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: FIELD TWO TEN STATE: Hawaii COUNTY: Maui

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	METERS.
17 33	2.50 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 HEHE 2	WNW	00 00 00	
Pala Stack (Sugar Mill)	WNW	13 39 39.2	
Azimuth mark	WNW	56 37 03.9	
Lighthouse, Pauwela Point	WNW	80 59 57.4	

The station is located in grass land which lies about 3.5 miles south-east of Pala, about 2 miles south of Haiku, 152 feet southwest of a graded road, 133 feet north northwest of a bridge over an irrigation ditch, 20 feet north of a pineapple field and 10 feet north of an irrigation ditch.

To reach from the T road intersection in Lower Pala, go easterly, on the highway toward Haiku, for 1.7 miles; turn right, as per the sign reading Maui High School, and go southeast for 1.3 miles; turn left and go northeast for 0.2 mile to a T road intersection at a theater; turn right and follow the main traveled road, up grade, southeasterly, for 3.0 miles to the station on the right hand side of the road.

The station is a standard disk, stamped FIELD TWO TEN 1949, set in the top of a square concrete post which projects about 4 inches.

The sub surface mark is a standard disk, stamped FIELD TWO TEN 1949, set in an irregular mass of concrete which is 40 inches below the surface of the soil.

The azimuth mark is a standard disk, stamped FIELD TWO TEN 1949, brazed to the top of a 2 1/2 inch iron pipe which projects about 1 foot. It is located 0.55 mile north northwest of the station, 10 feet west of the center of a dirt road and 4 feet east of an irrigation ditch. To reach from the station go northwesterly on the dirt road for 0.6 mile to the azimuth on the left hand side of the road.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: FIELD TWO TEN
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 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 has been destroyed. The exact point was located by setting on the old check angles, and a hole dug 4 feet deep but no marks found. This area is now planted in pineapple.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: FIELD TWO TEN

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 ° 53 ' 08.478	ELEVATION: 349.8 METERS
GEODETIC LONGITUDE: 156 19 48.014	1148 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	614,924.55	200,734.25	+ 0 ° 07 ' 12 "

* 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
AZIMUTH MARK	160 ° 37 ' 07.7	160 ° 29 ' 56 "	5102

QE 309

1. The purpose of this study is to determine the effect of the proposed project on the environment.

2. The study will be conducted in the following manner:

a. A detailed description of the project will be provided.

b. The potential impacts of the project on the environment will be assessed.

c. The results of the study will be presented in a report.

d. The report will be made available to the public.

e. The study will be completed by the end of the year.

f. The study will be conducted in accordance with the following schedule:

g. The study will be completed by the end of the year.

h. The study will be completed by the end of the year.

i. The study will be completed by the end of the year.

j. The study will be completed by the end of the year.

k. The study will be completed by the end of the year.

l. The study will be completed by the end of the year.

m. The study will be completed by the end of the year.

n. The study will be completed by the end of the year.

o. The study will be completed by the end of the year.

p. The study will be completed by the end of the year.

q. The study will be completed by the end of the year.

r. The study will be completed by the end of the year.

s. The study will be completed by the end of the year.

t. The study will be completed by the end of the year.

u. The study will be completed by the end of the year.

v. The study will be completed by the end of the year.

w. The study will be completed by the end of the year.

x. The study will be completed by the end of the year.

y. The study will be completed by the end of the year.

z. The study will be completed by the end of the year.

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1020
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 00' TO 156° 30'
DIAGRAM MAUI ISLAND

U. S. COAST AND GEODETIC SURVEY
FORM 535
REV. AUG. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: FILTRATION STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C. T. Husemeyer	YEAR: 1950	Described by: C. J. Hoepfel
NOTE: 1a	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.65 METERS.1	HEIGHT OF LIGHT ABOVE STATION MARK METERS.
3a	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:
11c	KAILUA	00 00 00
12c	R. M. No. 2	57 12 15
	R. M. NO. 1	293 33 16
		31.004
		9.450
		46.646
		14.797

The station is located about 4 miles southwest of Paia, about 5.5 miles south-east of Kahului, about 250 feet east of a graded road, about 250 feet northeast of a shed, 31 feet west of a concrete ditch. The station is at the filtration plant for the city of Paia and on the levee at the southwest corner of the highest reservoir.

To reach from the post office at Kahului; go east and north, on the road toward Paia, for 3.2 miles; turn right, onto the Haleakala Road, and go southeast for 1.8 miles to power pole number 33; turn right, onto a graded road, and go southerly for 1.0 mile; take the right hand fork and circle around the west end of a large reservoir and go 0.3 mile; take the left hand fork and follow the main traveled road, southeasterly for 0.7 mile to the filtration plant and the station.

The station is a standard disk, stamped FILTRATION 1949, set in the top of a square concrete post which projects about 4 inches.

The underground station is a standard disk, stamped FILTRATION 1949, set into an irregular mass of concrete which is 36 inches below the surface of the ground.

Reference mark number 1 is a standard disk, stamped FILTRATION NO 1 1949, set into a drill hole in a boulder which projects about 6 inches. This boulder forms part of the retaining wall of the upper reservoir.

Reference mark number 2 is a standard disk, stamped FILTRATION NO 2 1949, set into a drill hole in a concrete headwall of an irrigation flow ditch. It is located flush with ground and 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: FILTRATION

STATE: HAWAII

YEAR: 1950

FIRST

-ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 51' 12.509	ELEVATION: 138.90 METERS
GEODETIC LONGITUDE: 156° 24' 03.413	455.7 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# 100' Δ #1 ANGLE *
HI 2	5102	590,725.95	188,988.49	+ 0° 05' 41"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE # 100' Δ #1 FORMULA NEGLECTING THE SECOND TERM

TO STATION OR OBJECT	GEODETIC AZIMUTH (from south)	PLANE AZIMUTH * (from south)	CODE
KAILUA	268 57 56.7	268 52 16	5102

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1020

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

FILTRATION (continued)

FORM 526a
(8-18-68)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: FILTRATION.
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		1.57 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				
PIIHOLO (HGS) 1871	SE	31.002	9.450	00	00	00.0	
R.M. No. 2				57	21	36	
Puu Nene, Puu Nene Sugar Mill,	WNW			199	22	32.8	
South stack, 1912				205	21	56.0	
Kahului, Radio Station KMVI, mast	NE	48.516	14.788	293	37	59	
1950							
R.M. No. 1							

Station was recovered and all marks found in good condition. A complete description follows:
Station is located about 3-1/2 miles east-southeast of Puunene, 4 miles southwest of Paia and 400 feet northwest of the Lowrie Ditch, at about 456 feet elevation, on the brush-covered levee at the rounded, west corner of the highest reservoir at the water filtration plant of the city of Paia.
To reach station from the Kahului Shopping Center, go east on State Highway 32 for 0.25 mile; take right fork and go on State Highway 36 for 3.0 miles; go right, on State Highway 37, for 3.5 miles to paved cross-

road just after crossing the Lowrie Ditch. Turn right and go 0.45 mile to paved side road right. Turn right and go 0.8 mile; turn left onto field road and go southeast 0.45 mile to the Lowrie Ditch. Turn right and follow road along canal for 0.6 mile to fork. Take left fork and go 0.05 mile; take right fork and go 0.15 mile around base of hill to side road right. Turn right and go up onto top of rise by reservoir, then go right 30 yards to end of reservoir; turn left around end and go north on track road between reservoirs for about 100 yards to end of reservoir on right. Walk northeast up onto brushy rise on right about 30 yards.

Station mark is a standard disk stamped "FILTRATION 1949", set in the top of an 8-inch-square, concrete monument that projects 3 inches above ground, hidden by deep grass. It is 9 feet west of the curving, stone wall of the pond, 29 feet west of plank walk extending into the pond, and 2 feet southwest of a white witness post.

Reference mark number one is a standard disk stamped "FILTRATION NO 1 1949", cemented in a drill hole in a large boulder in the top of the west wall of the pond. It is 0.3 foot higher than station mark.

Reference mark number two is a standard disk stamped "FILTRATION NO 2 1949", cemented in a drill hole in the north end of a concrete spillway, 10 feet south of edge of pond, 3 feet northwest of a floodgate control wheel, flush with ground, and 0.2 foot lower than station mark.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: FILTRATION
ESTABLISHED BY: C. T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☒
RECOVERED BY: E. Pursel, Jr. YEAR: 1969 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 4.8 miles southeast of Puunene

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

Station and both reference marks recovered in good condition as described.

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

THIRD

-ORDER

GEODETTIC LATITUDE:	20° 45' 56.614	ELEVATION:	METERS
GEODETTIC LONGITUDE:	156° 27' 43.492		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR \angle
HI 2	5102	569,893.27	157,087.04	+ 0° 04' 21"

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

<small>PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\sin^2 \Delta$ FORMULA NEGLECTING THE SECOND TERM</small>			
TO STATION OR OBJECT	<small>GEODETTIC AZIMUTH (From south)</small>	<small>PLANE AZIMUTH * (From south)</small>	CODE

QO 125

Q0 125

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 1022
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: FOR
STATE: HAWAII YEAR: 1904 THIRD ORDER

SOURCE: G-SP156
NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 ° 35' 27.85	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 24 59.48		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR α ANGLE *
HI 2	5102	585,555.57	93,673.14	+ 0 ° 05' 17 "

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

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

QD 146

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 DATUM¹

Q 201561 STATION 1023
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: GABLE

STATE: HAWAII

YEAR: 1904

THIRD

-ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 °37'53.16	ELEVATION	METERS
GEODETIC LONGITUDE:	156 26 48.87		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	575,142.94	108,318.29	+ 0 04 39 "

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

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

QD 139

ATAS JOURNAL SECTION

ATAS JOURNAL SECTION

ATAS JOURNAL SECTION

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HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1024
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 00' TO 156° 30'
DIAGRAM NF 4-16 MAUI

Haiku (Maui Island, Hawaiian Government Survey, 1871).—In the northern part of East Maui, in Hamakualoa District, on the summit of Puu o Umi, in the land of Haiku adjoining the Maliko canyon, and about 7,000 feet from the sea. Marked by a concrete post sunk level with the ground, and surrounded by four redwood posts.

RECOVERY

OF TRIANGULATION STATION

U. S. COAST AND GEODETIC SURVEY
Form 522
REV. AUG. 1966

NAME OF STATION: **HAIKU**

STATE: **Hawaii**

COUNTY: **Maui**

CHIEF OF PARTY: **C.T. Husemeyer**

YEAR: **1950**

Described by: **G.B.G.**

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK **2.3** METERS. HEIGHT OF LIGHT ABOVE STATION MARK **2.0** METERS.

NOTE	OBJECT	BEARING	DISTANCE		DIRECTION
			feet	meters	
1b	Surface-station mark, Under-ground-station mark				
	Stack, Haiku	SE	1 mile		21 20 06.6
11a	Reference mark No.2	SE	19.03	5.800	42 34 52
	Lighthouse, Pauwela Point	NNE	2 miles		272 16 38.4
11a	Reference mark No.1	NE	32.66	9.955	300 52 25

Located in the northern part of East Maui, Makawao District, on the summit of Puu O Umi, which lies about 2 miles southwest of Pauwela Point, about 1 mile northwest of Haiku and just east of Maliko Gulch.

Station is a standard disk cemented in a 2 inch pipe set in a square concrete post projecting 6 inches. Stamped **HAIKU 1949**.

This monument is an old station but no information on it is available. Reference mark No.1 is northeast of the station. A standard disk set in a square topped concrete post projecting 8 inches, stamped **HAIKU NO 1 1949**.

Reference mark No.2 is southeast of the station. A standard disk set in a square topped concrete post projecting 8 inches, stamped **HAIKU NO 2 1949**.

To reach from the Post Office at Haiku: go westerly on paved road toward Kahului for 0.75 miles, turn left and go southwest on track road for 0.1 mile, take middle fork and continue ahead for about 0.15 miles. Here turn left and pick way up side of steep hill for about 0.2 miles to summit of hill and station.

Form 522
(11-8-55)

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

NAME OF STATION: **HAIKU**

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, both reference marks and the lighthouse at Pauwela Point were recovered in good condition as described. The stack at Haiku is no longer in existence.

Angles to the reference marks were observed as follows:

KULOLI 2 (HGS) 1950

Ref. Mark 2

19.03 ft. (5.800 m)

00 00 00

Ref. Mark 1

32.64 ft. (9.949 m)

55 44 06
334 44 17

The station is on property controlled by the Grove Ranch and a key to the gate should be obtained at their office in Kahului.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **HAIKU**

STATE: **HAWAII**

YEAR: **1871**

FIRST

ORDER

SOURCE: **G- 9311**

GEODETIC LATITUDE: 20° 55' 23.437	ELEVATION: 193.1 METERS
GEODETIC LONGITUDE: 156° 20' 03.309	634 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ S1 ANGLE
HI 2	5102	613,446.03	214,347.61	+ 0 07 07

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PUU NENE 2	70 38 55.5	70 31 49	5102

QE 311

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1024
LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

HAIKU (continued)

FORM 526a
(8-18-62)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: HAIKU
ESTABLISHED BY: H.G.S. YEAR: 1871 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.54 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 NENE 2 -----1950 DISTANCE and DIRECTION-----				00	00	00.0
Pauwela Point Lighthouse	NNE			129	41	35.7
R.M. No. 1	NE	32.66	9.955	158	17	23
R.M. No. 2	SE	19.03	5.800	259	59	50
PUU NENE 2 1950 -----1969 DISTANCE and DIRECTION-----				00	00	00.0
Paia Sugar Mill Stack	WSW			01	41	26.2
Pauwela Point Lighthouse, 1950	NNE			129	41	36.2
R.M. No. 1	ENE	32.588	9.933	158	11	39
R.M. No. 2	SSE	18.983	5.787	259	06	19

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

Station is located along the east side of Maliko Gulch, about 3/4-mile northwest of Haiku and 3 miles northeast of Paia, on the north end of Puu O Umi, a hill of about 634 feet elevation that has a heavy growth of large eucalyptus trees along the west side of the top, which block

most of the view. The hill is open and grassy along the east side of the top.

To reach station from the post office in Haiku, go north on the main road for 0.65 mile to side road left; go left on track road for 0.1 mile to T-junction at edge of pineapple field; turn right and go 0.05 mile; take side road left and go up along edge of pineapple field for 0.2 mile to highest point of field. From here pack southerly up through ironwood trees and brush for about 150 yards to top and station.

Station mark is a standard disk set in the top of a 9-inch-square, concrete monument projecting 2 inches above ground, but hidden by very deep, matted grass, and is 11 feet south of a 6-inch eucalyptus tree. There is a small pile of boulders over the mark, and a 16 x 16-foot fence, made with iron posts and barbed wire, surrounds the station.

Reference mark number one is a standard disk stamped "HAIKU NO 1 1949", set in the top of an 8-inch-square, concrete monument projecting 8 inches above ground, hidden in the heavy grass. It is 3.1 feet lower than the station mark.

Reference mark number two is a standard disk stamped "HAIKU NO 2 1949", set in the top of an 8-inch-square, concrete monument projecting 3 inches above ground, hidden in the heavy grass. It is 0.8 foot higher than the 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 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 1025
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: **HAIKU**
ESTABLISHED BY: **H.G.S.** YEAR: **1887** STATE: **Hawaii** BENCH MARK(S) ALSO ☐
RECOVERED BY: **R.C. Munson** YEAR: **1969** 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 was searched for but not found. The area where it was located was once a pineapple field and it is believed the station has been destroyed.

R

NAME OF STATION: **HAIKU**

STATE: **HAWAII**

YEAR: **1887**

SECOND

ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE:	20 ° 55' 43.78	ELEVATION:	85	METERS
GEODETIC LONGITUDE:	156 20 11.20	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLI *
HI 2	5102	612,693.73	216,398.54	+ 0 ° 07' 05 "

* 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

FORM C&GS-526 (1-65)
USCOMM-DC 18502-P08

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

QO 402

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 1026
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Haleakala 1 (Maui Island, Hawaiian Government Survey, 1871).—In central part of East Maui, Kula District, on Pakaoao or White Hill, near the southwest corner of Haleakala Crater, close to the brink of the precipice. It is 32 feet south of an old station occupied in 1869. Marked by a copper triangle let into the rock, and covered with a cairn of stones.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HALEAKALA 1

STATE: HAWAII

YEAR 1871

SECOND ORDER

SOURCE: G-SP156

GEODETIC LATITUDE	20 43 00.951	ELEVATION	3018	METERS
GEODETIC LONGITUDE	156 15 09.593	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ α ANGLE *
HI 2	5102	641,482.96	139,501.03	+ 0 08 47

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

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

QQ 031

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1027
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Haleakala 2 (Maui Island, Hawaiian Government Survey, 1885).—In central part of East Maui, in Kaupo District, on the south wall of Haleakala Crater, west of the Kaupo Gap, on high point of the ridge. 143 feet east of it is a station on the Nu'u boundary. Marked by cross cut in rock with pillar of stones over it.

ADJUSTED HORIZONTAL CONTROL DATA

RECOVERY DESCRIPTION OF TRIANGULATION STATION

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

NAME OF STATION: **HALEAKALA 2** STATE: **Hawaii** COUNTY: **Maui**

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

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
			DISTANCE		DIRECTION	
			Bearing	feet	meters	
2	Surface-station mark, Underground-station mark	1.66 METERS.1			1.36 METERS.	
	OBJECT					
	NINIAO					0 00 00-
12a	Reference Mark No.1		NE	20.55	6.265	06 59 40-
	Kaupo Catholic Church, Spire		SSE			52 50 31.1
12a	Reference Mark No.2		NW	24.05	7.328	179 26 20

Station was recovered as described. It is on the extreme east end of the south wall of the crater at the point where it breaks off into Kaupo Gap. A standard disk stamped HALEAKALA 2 1950 is cemented in a drill hole in the center of the cross cut in rock.

Reference mark No.1 is northeast of the station. A standard disk set in a drill hole in rock outcrop projecting about one foot, stamped HALEAKALA 2 NO 1 1950.

Reference mark No.2 is northwest of the station. A standard disk set in rock outcrop projecting one foot, stamped HALEAKALA 2 NO 2 1950.

To reach from the Observation House on the west rim of Haleakala crater: go east on posted trail for about 6 miles to Kapalaoa shelter house, continue ahead for about 0.5 miles, then right up steep slope to top of rim at the east end and the station.

NAME OF STATION: **HALEAKALA 2**

STATE: **HAWAII**

YEAR: **1885**

FIRST

ORDER

SOURCE: **G- 9311**

GEODETIC LATITUDE	20 42 17.055	ELEVATION	2495.7 METERS
GEODETIC LONGITUDE	156 10 33.943		8201 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE *
HI 2	5102	667,664.02	135,145.35	+ 0 10 24

* 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 *	CODE
NINIAO	291 37 24.8	291 27 01	5102

QE 291

* 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.

Q3 088

JUN 1978

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

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561

STATION 1029

HAWAII

LATITUDE 20 ° 30 ' TO 21 ° 00 '

LONGITUDE 156° 30' TO 156° 33'

DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

STATE HAWAII

YEAR 1912

THIRD

— 00000

GEODETIC LATITUDE	20° 53' 02.28	ELEVATION.	METERS FEET
GEODETIC LONGITUDE	156 11 35.53		

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

QD 053

HORIZONTAL CONTROL DATA

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HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1030
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 528
Rev. Aug. 1964

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: HANA NORTHWEST BASE STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C.T. Hubemeyer YEAR: 1950 Described by: G.B.G.
HEIGHT OF TELESCOPE ABOVE STATION MARK 1.69 METERS. HEIGHT OF LIGHT ABOVE STATION MARK 1.39 METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
1a	Surface-station mark	Underground-station mark	OBJECT	BEARING	DISTANCE	DIRECTION
					feet	meters
12a			HANA SE BASE	SSW	29.43	8.970
12a			Reference mark No.1	W	22.20	6.765
			Reference mark No.2			

Located near the eastern end of East Maui, in land of Honomale, about 5 miles, airline, west northwest of Hana and about 0.4 miles in from the coast, in the northwest corner of open pasture land of the Hana Ranch Co.. The station is 22 feet east of a rock point and fence and 15 feet west of a creek bank.

Station is a standard disk set in a square topped concrete post projecting 4 inches. Stamped HANA N W BASE 1950.

Reference mark No.1 is south southwest of the station. A standard disk set in rock outcrop projecting 18 inches above the pasture land. Stamped HANA N W BASE NO 1 1950.

Reference mark No.2 is west of the station. A standard disk set in a rock ledge 3 feet above the ground, at the end of a rock fence.

To reach from the Post Office at Hana: go westerly on the coast highway for 3.8 miles to the west edge of Kaeleka Village, turn right on track road at elevated green tank and go 1.6 miles, keep ahead between two large mango trees, cross creek, and go northerly along left side of fence for 0.1 miles to station.

The underground mark is standard disk stamped HANA NW BASE 1950 set in concrete 36 inches below the surface.

Form 528
(11-8-55)

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HANA NORTHWEST BASE
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:

After a two hour search, the station was found tilted on its side in the approximate position indicated in the description. An attempt was made to find the reference marks but they could not be located due to the lack of an azimuth line (the base line is blocked by brush and tree). Heavy rains prevented the further search for the marks.

* 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. 16-64000-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HANA NORTHWEST BASE

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 48 07.900	ELEVATION:	21.0 METERS
GEODETIC LONGITUDE:	156 02 29.953		69 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	BEARING ANGLE *
HI 2	5102	713,476.93	170,701.79	+ 0°13'19"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
HANA SE BASE	316 04 23.8	315 51 05	5102

POSITION DETERMINED BY TRAVERSE FROM STATION HANA SE BASE
AND CHECKED BY ADDITIONAL OBSERVATIONS

QE 331

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1030

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

HANA NORTHWEST BASE (continued)

FORM 2456
(9-18-69)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HANA NORTHWEST BASE
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		1.5 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	°	'	"		
HANA SOUTHEAST BASE 1950	✓			00	00	00.0		
R.M. No. 4	✓	S	25.829	7.873	52	49	00	
PUU HINAI 2 1950	✓			✓	95	18	29.2	
R.M. No. 3	✓	N	34.802	10.608	231	45	47	

Some bulldozing was done in the past and none of the marks could be found, so a point was established in the vicinity by triangulation, and the station point determined by inverse from this. Digging uncovered the station mark, but laying on a tilt, so it was removed and the underground mark was recovered. The concrete monument, with the surface mark, was then plumbed back over the underground mark and re-enforced with a large mass of stones and concrete. Two new reference marks were set and a witness post set. NOTE: RM No. 1 was later found, in a piece of rock laying loose on the ground, a considerable distance from original location, and was removed. A complete description follows:

Station is located about 4-1/2 miles northwest of Hana and 1-1/4 miles west of the Hana Airport, along the southwest side of a track road and across a dry stream bed from the track road, in the northwest point of a long, narrow pasture area.

To reach station from the post office in Hana, go west on State Highway 36 for 3.8 miles; take right fork, by old house, and go 0.1 mile to cattleguard; continue on field road for 1.4 miles; cross stream bed and continue for 0.1 mile to station on left, across stream bed.

Station mark is a standard disk, stamped "HANA NW BASE 1950", set in the top of a 12-inch-square, concrete monument projecting 6 inches from ground. It is 9 feet south of stream bank, 49 feet south of the track road, 13 feet north of a 4-foot rock point, 41 feet west-northwest of the northernmost tree of a row of breadfruit trees, and 3 feet west of a white witness post.

Underground mark is a standard disk stamped "HANA NW BASE 1950", set in a mass of concrete about 32 inches below ground level.

Reference mark number three is a standard disk stamped "HANA NW BASE 1950 NO 3 1968", cemented in a drill hole in a boulder projecting 1 foot from ground. It is 15 feet south of center line of road, 7 feet northwest of a large kukui tree and 10 inches higher than station mark.

Reference mark number four is a standard disk stamped "HANA NW BASE 1950 NO 4 1968", cemented in a drill hole in a 4 x 6-foot rock chunk projecting 3 feet from ground. It is up on a small raised area, 18 feet west of the northernmost breadfruit tree and 5 feet higher than 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.

4-OC 27173-P88

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1031
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **HANA SOUTHEAST BASE** 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
2	1.82		

OBJECT	BEARING	DISTANCE		DIRECTION
		feet	meters	
HANA NW BASE				
120 R. M. No. 1	SE	44.298	13.502	00 00 00
120 R. M. No. 2	SW	20.78	6.333	184 55 47
				273 52 33

The station is located in open pasture land and lies about 3 miles northwest of Hana, about 0.1 mile northwest of Kaeleku Camp, about 100 yards west of a wire fence, about 200 feet south of a track road and 40 feet south of the highest ground in the vicinity.

The station is a standard disk, stamped HANA SE BASE 1950, set into a drill hole in bedrock which is flush with the surface of the ground.

Reference mark number 1 is a standard disk, stamped HANA SE BASE NO 1 1950, set into a drill hole in a boulder.

Reference mark number 2 is a standard disk, stamped HANA SE BASE

NO 2 1950, set into a drill hole in a boulder.

Form 526
(11-8-65)

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

NAME OF STATION: **HANA SOUTHEAST BASE**
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 as described. Kaeleku Camp is now deserted. The description is adequate and complete.

* 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)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **HANA SOUTHEAST BASE**

STATE: **HAWAII**

YEAR: **1950**

FIRST

ORDER

SOURCE: **G- 9311**

GEODETIC LATITUDE:	20 ° 47' 16.357	ELEVATION:	91.4 METERS
GEODETIC LONGITUDE:	156 01 37.166		300 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLE °
HI 2	5102	718,505.95	165,520.99	+ 0° 13' 37"

* 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
AZIMUTH MARK 1968	273 ° 25' 23.8	273 ° 11' 46"	5102

QE 330

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1031
LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

HANA SOUTHEAST BASE (continued)

FORM 526a
10-10-69

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HANA SOUTHEAST BASE
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		1.61 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 HINAI 2 -----1950 DISTANCE	CE and	DIRECTION-----		00	00	00.0	
R.M. No. 1	SE	44.298	13.502	232	08	58	
PUU HINAI 2 1950 -----1968 DISTANCE	CE and	DIRECTION-----		00	00	00.0	
R.M. No. 3	NE	27.295	8.319	153	43	38	
Azimuth Mark	E	(About 1 1/2-mile		184	33	51.8	
R.M. No. 1	SE	44.293	13.501	232	09	00	

Station mark and R.M. No. 1 were recovered in good condition. R.M. No. 2 was found destroyed. A new reference mark and an azimuth mark were established. A cairn was built around the station mark.

Station is located about 3-1/4 miles northwest of Hana, 1 mile southwest of the Hana Airport, and about 425 feet north of State Highway 36, in open pasture land.

To reach station from the post office in Hana, go west on State Highway 36 for 3.4 miles to junction with the airport road. Continue ahead for 0.4 mile to fork at old house on right. Take right fork and go 0.1

mile to cattleguard; continue on field road for 0.05 mile, then turn left and go cross-country for 179 feet to station.

Station mark is a standard disk stamped "HANA SE BASE 1950", cemented in a drill hole in bedrock flush with ground. It is 30 feet north of a slightly higher, grassy knoll, 327 feet northwest of the cattleguard, and 179 feet southwest of center line of the track road.

Reference mark number one is a standard disk stamped "HANA SE BASE NO 1 1950", cemented in a drill hole in bedrock flush with ground, 1 foot higher than station mark, and usually hidden by turf.

Reference mark number three is a standard disk stamped "HANA SE BASE NO 3 1950 1968", cemented in a drill hole in a 16-inch bedrock outcrop projecting 3 inches from ground. It is on a slight knoll, 0.1 foot higher than station mark.

Azimuth mark is a standard disk stamped "HANA SE BASE 1950 1968", cemented in a drill hole in bedrock on top of a rock knoll, or bank, about 8 feet high, along west side of the airport road. It is 26 feet west of center line of road, 9.6 feet west of a T-fence junction, 4 feet north of the fence crossing the knoll, 71 feet northwest of a power pole, and 75 yards south of a green water tank. To reach the mark from junction of State Highway 36 and the Airport Road, go north on the Airport Road for 0.15 mile to mark on left.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HANA SOUTHEAST BASE
ESTABLISHED BY: C. T. H. YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: E. Pursel, Jr. YEAR: 1969 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: About 3 miles N.W. of Hana

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

This station was recovered in good condition as described with RM#1. RM#2 was not found. RM#3 1968 was recovered in good condition.

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1032
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 655
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

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

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK 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
pipe			HALEAKALA 2		0 00 00.0
x			Reference mark No.1	NNW	14.00 4.267 179 --
x			Reference mark No.2	NE	14.07 4.288 245 --

Located in the eastern part of East Maui, in Koolau District, on the summit of the ridge east of Koolau Gap.

The original station was a pillar of stones ten feet high. It is reported destroyed in 1884. The present station is located about 10 feet south of that point, on the south edge of the ridge.

A 2 inch galvanized iron pipe set firmly in the rocks was found. No record of who set it is available. A standard disk stamped HANAKAUHI 2 1950 was cemented in the center of the pipe, over which was placed a red wood target surrounded by a cairn 6 feet high.

Station was not occupied at this time and directions to reference marks was measured with a protractor.

The reference marks are chiseled crosses in bed rock.

Detailed description follows

* 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.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HANAKAUHI 2

STATE: HAWAII

YEAR: 1950

THIRD

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 44 17.421	ELEVATION: 2715.0 METERS
GEODETIC LONGITUDE: 156 10 55.984	8907 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	665,535.14	147,283.04	+ 0 ° 10 18 "

* 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
HALEAKALA 2	350 13 23.8	350 03 06	5102

Q 201561 STATION 1033
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

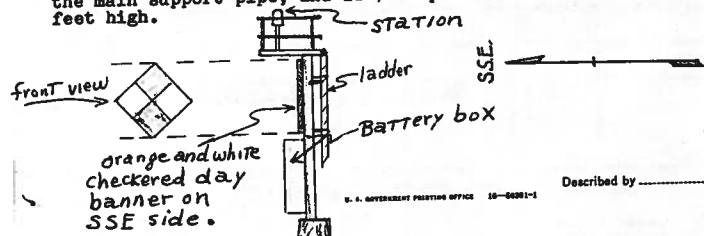
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 525 b

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Hanamanioa Point Light YEAR: 1969 STATE: Hawaii COUNTY: Maui
Island: Maui
CHIEF OF PARTY: R.C. Munson

Description, including sketch of object: Located about 14 miles south of Kihai, at Cape Hanamanioa, at the southeast side of La Perouse Bay, at end of a jeep road crossing lava flow, and about 70 feet above sea level.

Station is the white light atop a structure about 16 feet tall, which consists of a 6-inch-diameter, white, iron pipe supported on a small concrete foundation, and with a platform about 3 x 4 feet in size, on top. The light is offset about 3 feet south-southeast from the main support pipe, and is on top of a 4-inch iron pipe about 3 feet high.



by the
National Ocean Survey
OLD HAWAIIAN DATUM

NAME OF STATION: HANAMANIOA POINT LIGHT

STATE: HAWAII

YEAR 1969

THIRD

— **INDEX**

SOURCE: G-12664

GEODETIC LATITUDE:	20° 35' 10.96278	ELEVATION	METERS
GEODETIC LONGITUDE:	156° 24' 53.46218		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta \rightarrow \Delta \rightarrow \theta$: ANGLE
HI 2	5102	586,129.94	91,970.29	+ 0° 05' 19"

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

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ OR Δ α FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From α or θ)	PLANE AZIMUTH* (From α or θ)	CODE

QF 578

QF 578

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 1034
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Hanawi (Maui Island, Hawaiian Government Survey, 1877).—Near the northeast coast of East Maui, in Koolau District, on a hill east of the Hanawi River, above Nahiku, in land of Honolulu Nui, at the west corner of Grant 3190. Marked by a 4-inch iron pipe set in concrete, and covered with a cairn.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HANAWI

STATE: HAWAII

YEAR: 1877

THIRD

ORDER

SOURCE: G-SP150

GEODETIC LATITUDE	20 ° 49' 27.89	ELEVATION	165	METERS
GEODETIC LONGITUDE	156 ° 06' 14.55	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE *
HI 2	5102	692,139.22	178,693.88	+ 0 ° 12' 00"

* 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

QQ 097

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 1035
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Haou (Maui Island, Hawaiian Government Survey, 1878).—Near eastern end of East Maui in southern part of Hana District, in land of same name, near the sea, and just below the government road below the schoolhouse. Marked by cross cut in rock sunk in ground.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HAOU

STATE: HAWAII

YEAR 1878

THIRD

—ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 41' 47.78	ELEVATION:	40	METERS
GEODETIC LONGITUDE:	156 00 23.68	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ θ) ANGLE *
HI 2	5102	725,614.22	132,397.27	+ 0 14 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

QO 112

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1036
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

RECOVERY NOTE, TRIANGULATION STATION

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY
(Rev. Feb. 1968)

NAME OF STATION: Hay
ESTABLISHED BY: J.C. Gauger YEAR: 1912 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:

Station recovered in good condition. A Hawaii Territory Survey Type A monument was placed over the station in 1929.

"On the northeast coast of Maui, in the Wailuku District, on the highest point of the sandstone ridge 1 mile southeast of Waihee Village, about 400 meters back from the shore, and opposite the Chinese cemetery lying on the east side of the main road between Wailuku and Waihee. Station previously established by plantation engineers.

Marked by a 5 inch drainage pipe cemented flange end down into the sandstone rock with about 5 inches projecting above the surface. Pipe is filled with cement and center marked by a standard brass disk station mark".

To reach from the junction of Main and Market Streets in Wailuku: go north on Market Street and continue on paved road toward Waihee for 2.3 miles, turn right, enter Chinese cemetery, turn left and circle around north end to top of hill and ETT. From here pack east along ridge about 150 yards to station.

OBJECT	DISTANCE	DIRECTION
MAUI NORTH BASE (HGS) 1912	0 00 00.00	
Kahului, water tank, final, Maui Pineapple Co.	31 31 49.30	
Wailuku, Stack, center of top, Wailuku Sugar Co.	66 51 02.10	
Wailuku Territory HGS	75 22 08.45	

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Hay
ESTABLISHED BY: J.C. Gauger YEAR: 1912 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 2-1/4 miles north-northeast of Wailuku, 1-1/4 miles southeast of Waihee, 600 feet northeast of the boundary of an old cemetery, and 500 feet southeast of end of golf course, at about 178 feet elevation, on the highest point of the sand hills along the coast.

To reach station from the intersection of Main and Market Streets in Wailuku, go north on Market St. and Kahekili Highway for 2.3 miles to junction with State Highway 341; continue ahead for 0.1 mile to side road right; turn right, into cemetery, then go left up around end of cemetery for 0.15 mile to top of grade. Pack northeast about 600 feet to station.

Station mark is a standard disk, unstamped, set in the top of a 6-inch diameter, concrete-filled, concrete pipe projecting 2 inches from ground. A Type A signal is centered over the mark, with the 6-foot-square, concrete platform 3 feet above ground, and a red and white metal target extending 7 feet above it.

FORM CGS-526 (1-68)
U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HAY
STATE: HAWAII YEAR: 1912 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 55 28.810	ELEVATION	54.4 METERS
GEODETIC LONGITUDE	156 29 56.664		178 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ OR ANGLE *
HI 2	5102	557,195.37	214,802.06	+ 0 °03 '36 "

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
MAUI NORTH BASE	297 56 57.0	297 53 21	5102

QE 352

Q 201561 STATION 1037
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: HELELEIKEOHA

STATE HAWAII I

YEAR 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 20° 48' 37.36" GEODETIC LONGITUDE: 156° 03' 45.82"	ELEVATION: _____ METERS FEET
--	---------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ IOR Δ θ I ANGLE
H1 2	5102	706,267.59	173,646.73	+ 0° 12' 53"

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

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

QD 095

Q0 055

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1038

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

HEN (continued)

FORM 526a
(8-18-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: HEN
ESTABLISHED BY: J.C. Gauger YEAR: 1912 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		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, Kaahumanu Church, spire 1899				00	00	00.0
Wailuku, Wailuku Sugar Company						
Mill, stack, 1912	SW			01	40	49.4
R.M. No. 2	N	10.472	3.193	143	47	00
R.M. No. 1	ESE	15.159	4.621	259	28	34
Catholic Church, 1929	SW			353	29	37.8

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

Station is located about 1-1/2 miles northeast of the center of Wailuku, 1700 feet west-southwest of Nehe Point, 200 feet north of Iao Stream, 400 feet northeast of the highway bridge over Iao Stream, and 200 feet south of a gravel road, on a sand hill heavily covered with kiawe trees and koa brush, which has a fence line running north-south over the top.

To reach station from the intersection of Main and Market Streets in Wailuku, go north on Market St. for 0.5 mile to a crossroad in Happy Valley; continue ahead, on Kahekili Highway, for 1.8 miles; turn right on Waiehu Rd. and go 0.9 mile southeast to crossroad where Kuhio Pl. goes right. Turn left and go 0.1 mile; take side road left and go 0.05 mile to end of truck travel at T-fence on right. Pack uphill along fence about 200 feet to top and station.

Station mark is a standard disk stamped "HEN 1912", set in the top of an 8-inch-diameter, concrete-filled, concrete pipe projecting 1 foot from ground. It is 7.5 feet east of fence-post where the fence line makes a slight bend and goes downhill to south.

Reference mark number one is a standard disk stamped "HEN NO 1 1912", cemented in a drill hole in a 3-foot, black boulder projecting 14 inches from ground. It is on the southeast slope of the hilltop and is 20 inches lower than station mark.

Reference mark number two is a standard disk stamped "HEN 1912 NO 2 1968", set into the top of a 2-inch, iron pipe projecting 2 inches from ground; 10 feet east of fence and 1 foot lower than station mark.

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

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

USCOM-DC 27173-P89

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1039
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

HOKUKANO (HGS)
(Maui Island, Hawaiian Government Survey).—Back from the southern coast of Maui, on summit of hill in Auwahi, Kahikinui. Marked by an iron pin. Four reference stones were placed around the station each 5 feet distant from it.

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
FORM 526
(Rev. Feb. 1965)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HOKUKANO (HGS)

ESTABLISHED BY: Hawaiian Govt. YEAR: 1904 STATE: Hawaii

RECOVERED BY: O. T. Hucemeyer 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 standard Territory Survey bronze disk was set in the exact spot as was occupied by the iron pin. Two reference marks were established. A new description follows.

The station is located on the summit of a prominent, low, cinder cone which lies about 3 miles east southeast of Kanio, about 1.5 miles north of the sea and 0.3 mile south of the graded road which leads around the island.

The station is a standard Territory Survey bronze disk, stamped HOKUKANO 1950, set in the top of a square concrete post which projects about 8 inches.

Reference mark number 1 is a cross carved into a rock.

Reference mark number 2 is a cross carved into a rock.

NOTE	OBJECT	BEARING	FEET	METERS	DILUTION
	PIMOE				00 00 00
CROSS	R. M. No. 1	NW	29.99	9.14	22 44 00
CROSS	R. M. No. 2	NE	23.83	7.26	80 00 15

Form 526
(11-8-55)

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

NAME OF STATION: HOKUKANO (HGS)

ESTABLISHED BY: H.G.S. YEAR: 1904 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. The description by C.T.H. in 1950 is adequate except that the reference marks were found to be nails set in cement instead of crosses in the rock.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HOKUKANO HGS

STATE: HAWAII

YEAR: 1904

THIRD

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 36 34.825	ELEVATION: 446.0 METERS
GEODETIC LONGITUDE: 156 19 56.285	1463 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	614,347.52	100,481.88	+ 0° 07' 04"

* 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
PIMOE	95 49 20.3	95 42 16	5102

QE 395

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1039
LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

HOKUKANO (HGS)(continued)

FORM 7600
(10-18-68)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

R

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HOKUKANO (HGS)
ESTABLISHED BY: H.G.S. YEAR: 1904 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.27 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				00	00	00.0
R.M. No. 1	WNW	29.955	9.131	22	38	08
R.M. NO. 2	SSW	23.810	7.258	280	03	26

Station mark and both reference points were recovered, however the angle to RM 2 was found to be incorrect (it should have been 280° 00' 15" instead of 80° 00' 15"). Two reference mark disks were set at the 1950 points. A complete description follows:

Station is located about 5-1/2 miles southeast of Ulupalakua and 1/2-mile south of Highway 31, at about 1463 feet elevation, on the top of a bare rounded hill.

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 5.2 miles to locked gate on right, by corrals. (Key was obtained at

the Ulupalakua Ranch Office). Pass through gate and follow track road 0.65 mile to base of hill. Go right, up along gradual ridge, for 0.2 mile to station. (4-wheel-drive vehicle required).

Station mark is a standard Hawaii Territorial Survey disk, stamped "HOKUKANO", cemented into the top of a 2-inch, iron pipe projecting 1 foot from ground.

Reference mark number one is a standard disk stamped "HOKUKANO HGS 1950 NO 1 1968", cemented in a drill hole in a large, sloping, bedrock outcrop projecting 4 inches from ground. It is about 5-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "HOKUKANO HGS 1950 NO 2 1968", cemented in a drill hole in a small bedrock outcrop projecting 1 inch from ground. It is 30 inches 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 27178-P89

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

THIRD

ORDER

GEODETIC LATITUDE	20 55' 13.09	ELEVATION	METERS
GEODETIC LONGITUDE	156 14 07.02		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE
HI 2	5102	647,225.38	213,384.06	+ 0 05 15

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\theta = \arctan \frac{a}{b}$ FORMULA NEGLECTING THE SECOND TERM

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

QO 089

QO 385

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1041
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Honokalani (Maui Island, Hawaiian Government Survey, 1878).—On eastern coast of East Maui, in northern part of Hana District, near the shore and near Keakulikuli Point. Marked by block of concrete sunk in ground and covered with cairn.

RECOVERY NOTE, TRIANGULATION STATION

R

U. S. COAST AND GEODETIC SURVEY
PORT 535
(REV. Feb. 1963)

NAME OF STATION: **HONOKALANI**
ESTABLISHED BY: **Hawaiian Govt.** YEAR: 1878 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:

This station was searched for and was not recovered. Several pits were found at the highest ground in this vicinity where other parties have searched without success. It must be presumed that this station has been lost.

A new station, consisting of a standard disk, stamped **HONOKALANI 2** 1950, was established in this same general vicinity.

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

16-50400-2

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **HONOKALANI**

STATE: **HAWAII**

YEAR: 1878

SECOND

—ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE	20 ° 48' 00.455	ELEVATION	17	METERS
GEODETIC LONGITUDE	156 00 41.586	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ HOR Δ ϕ ANGLE *
HI 2	5102	723,761.81	169,991.42	+ 0 13' 58"

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

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

QQ 039

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1042
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 532
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

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

CHIEF OF PARTY: C. T. Rusemeyer YEAR: 1950 Described by: C. J. Hoepffel

NOTE*		YEAR: 1980	Described by: C. J. Hoepfel			
1a	HEIGHT OF TELESCOPE ABOVE STATION MARK	1.77 METERS.	HEIGHT OF LIGHT ABOVE STATION MARK METERS			
7a	Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
	OBJECT	BEARING	DISTANCE		DIRECTION:	
			feet	meters		
	K APIKALUA					
	Azimuth mark	SSW	0.15 mile		00 00 00	
12c	R. M. No. 2	WNW	65.98	17.062	85 42 25el	
12c	R. M. No. 1	NE	35.60	10.870	191 43 08	294 53 16

The station is located on Honokalani Point which lies about 2 miles North northwest of Hana, and about 100 yards east of the southeast end of the Hana Airport. The ground in the vicinity of the station is composed of AA lava.

The station is a standard disk, stamped HONOKALANI 2 1950, set in the top of a square post of concrete which projects about 10 inches.

Reference mark number 1 is a standard disk, stamped HONOKALANI 2 NO 1 1950, set into a drill hole in a boulder.

Reference mark number 2 is a standard disk, stamped HONOKALANI 2 NO 2 1950, set into a drill hole in a boulder.

The azimuth mark is a standard disk, stamped HONOKALANI 2 1950, set into a drill hole in a boulder which is flush with the surface of the ground. It lies on a side hill about midway between the airport runway and a wire fence.

The underground mark is a standard disk stamped HONOKALANI 2 1950, set in an irregular mass of concrete 36 inches below the surface.

Form 532
(11-8-55)

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

NAME OF STATION: HONOKALANI 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 as described. The azimuth mark was not searched for. The south-east end of Runway 26 may be reached by truck after checking with the field caretaker.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HONOKALANI 2

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 ° 47' 59.725	ELEVATION	10.8 METERS
GEODETIC LONGITUDE	156 ° 00' 40.501		55 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10R Δ α 1 ANGLE °
HI 2	5102	723,827.10	169,918.03	+ 0 ° 13' 58 "

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
AZIMUTH MARK	28 ° 36' 44.8	28 ° 22' 47 "	5102

QE 326

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1042

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

HONOKALANI 2 (continued)

FORM 526a
(8-18-68)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HONOKALANI 2
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: 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	
KAPUKAULUA -----1950	DISTANCE	and DIRECTION-----		00 00 00.0
Azimuth mark	SSW	0.15	mile	85 42 25.1
R.M. No. 2	WNW	55.98	17.062	191 43 06
R.M. No. 1	NE	35.60	10.870	294 53 16
KAPUKAULUA (HGS) 1878 -----1968	DISTANCE	and DIRECTION-----		00 00 00.0
Azimuth mark	SW	About 750	feet	85 42 21.5
R.M. No. 2	NW	55.980	17.063	191 43 37
R.M. No. 1	NE	35.666	10.872	294 53 00

Station was recovered and all marks found in good condition. A complete description follows:
Station is located about 3 miles northwest of Hana, along the coast, just north of the east end of the Hana Airport runway, in rough lava area. To reach station from the post office in Hana, go northwest on State Highway 36 for 3.5 miles; turn right and go north 1.0 mile to the airport

terminal. Pass through gate and go east along runway for 0.4 mile to east end and end of truck travel. Walk northerly 400 feet to station.
Station mark is a standard disk stamped "HONOKALANI 2 1950", set in the top of a 9-inch-square, concrete monument projecting 10 inches from the lava rock. It is 400 feet north-northeast of the northeast corner of the runway, on a small knoll, and has a large cairn with signal in center built over it.

Reference mark number one is a standard disk stamped "HONOKALANI 2 NO 1 1950", cemented in a drill hole in a 5-foot, rounded lava knob that projects 3 feet from ground and is 5-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "HONOKALANI 2 NO 2 1950", cemented in a drill hole in a 4-foot lava knob that projects 3 feet from ground and is 1-1/2 feet higher than station mark.

Azimuth mark is a standard disk stamped "HONOKALANI 2 1950", cemented in a drill hole in bedrock projecting 2 inches, on the bare rock slope at south side of runway end. It is 125 feet south-southwest of edge of the rounded, macadam run-up area at end of runway, 52 feet north of an old fence line and edge of lauhala trees, and about 20 feet higher than runway.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HONOKALANI 2
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: Jb. Vladimir Dykan YEAR: 1978 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: At Hana Airport

Detailed statement as to the fitness of the original description, including marks found, stampings, changes made, and other pertinent facts:
The station, RM 1, RM 2, and the azimuth mark were recovered in good condition as described by R. C. Munson in 1968.

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 1043
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: HONOLULU

STATE: HAWAII

YEAR: 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 56 14.98	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 14 31.13		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# HOR Δ # ANGLE *
HI 2	5102	644,923.14	219,022.30	+ 0 09 06

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

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

QD 050

HORIZONTAL CONTROL DATA

Page 1 of 1

NO. 1

HORIZONTAL CONTROL DATA

Q 201561 STATION 1044
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

R

NAME OF STATION: HUEL0

STATE HAWAII

YEAR 1877

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 54' 55.162	ELEVATION:	110	METERS
GEODETIC LONGITUDE:	156 13 18.823	SCALED		FEET

Note: Present mark built by East Maui Irrigation Company, and is known as Huelo Station. No information as to whether the present location is the same as the original.

Present Description: About one mile makai of Govt. Road at Huelo Church and School. Third class road leaves Govt. Road 50 feet east of school and works to a 500 feet S.E. of Church and winds through Pine-apple fields to two field houses to station. Center of bluff ridge about 1500 feet mauka of sea pali. 3 feet mauka of pineapple field road. Standard bronze tablet set in concrete pier flush with ground. Over which was built a Type A Hawaii Territory Survey Triangulation Station Monument.

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ θ) ANGLE
HI 2	5102	651,799.62	211,587.71	+ 0° 09' 32"

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

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

end of the recovery note.

11-7032

NOAA FORM 76-31
(11-76)

Q1 036

Q 201561 STATION 1045
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 535
Rev. Aug. 1949

NAME OF STATION: HUELO 2 (HTS) STATE: Hawaii COUNTY: Maui

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

[illegible]

Located on the northern coast of East Maui on a bluff in land of the same name, in the Makawau District, about 7 miles east of Haiku, about 0.4 miles east of Waipio Bay and about 0.1 miles south of the coast. A Hawaii Territory Survey bronze disk set in the top of a concrete post flush with the ground. Not stamped. A Hawaii Territory Survey Type A monument is built over the station.

To reach from the Post Office at Haiku: go easterly on Hana road for 9.9 miles to the Huelo School. Turn left and go east down hill for 0.55 miles, turn left and go north for 0.5 miles to station.

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

NAME OF STATION: HUELO 2 (HTS)
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 was recovered in good condition as described. The area around the station is presently under cultivation in pineapples.

The description and the directions for reaching the station are adequate and complete.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: HUELO 2 (HTS)
 ESTABLISHED BY: C.T. Hugemeyer YEAR: 1950 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. No reference marks were est. Located about 7 miles east of Haiku and 1/2-mile northeast of the old churches at Huelo, on Huelo Point on an open, flat pasture area about 365 feet above sea level.

To reach station from the main intersection in Paia, go east on State Highway 36 for 13.6 miles to Huelo Church sign. Take left fork and go downhill on gravel road for 0.5 mile to crossroad. Turn left and go 0.1 mile to wire gate. Pass through gate and continue ahead for 0.25 mile to fence corner on right; continue ahead on track road for 0.1 mile, then go right, across pasture, for 0.05 mile to station.

Station mark is an HTS disk, unstamped, set in the top of a 12-inch-square, concrete monument projecting 3 inches from ground. A Type A signal is centered over the mark, with the 6-foot-square, concrete platform 3-1/2 feet above ground. A red and white metal target extends 8 feet above the platform.

FORM C&GS-526 (1-68)
USCOMM-PC 18509-P&S

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HUELO 2 HTS

STATE HAWAII YEAR 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 54' 53.095 GEODETIC LONGITUDE: 156 13 18.810	ELEVATION: 111.2 METERS 365 FEET
--	-------------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ DEG Δ θ ANGLE
HI 2	5102	651,801.43	211,376.16	+ 0 09 32

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

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\sin \Delta$ FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
	0 1 2 3 4 5 6 7 8 9 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	0 1 2 3 4 5 6 7 8 9 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	

QE 514

Q 201561 STATION 1046
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NE 4-16 MAUI

Hunt (Maui Island, J. F. Pratt, 1904).—On western shore of Maui, about 20 meters from shore line at a point of a ridge which extends to the water about 1½ miles north of Makena Bay. Marked by a 3 by 4 inch signal pole with rocks piled around its base. In 1905 this was determined as a "No check" point, and was reported to be identical with Hawaiian Government Survey station *Wailea*; the old signal being found standing. The old position was also a "No check" determination, and the two positions differ considerably.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HUNT

STATE HAWAII

YEAR 1904

THIRD

OROE A

SOURCE **G-SP156**

SOURCE: 0-01100
NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20° 40' 54.89	ELEVATION:	METERS
GEODETIC LONGITUDE:	156° 26' 49.22		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	575,084.90	126,652.85	+ 0° 04' 39"

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

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

QD 129

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 556

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **Hunt** STATE: **Hawaii** COUNTY: **Maui.**
ESTABLISHED BY: **J. F. Pratt** YEAR: **1904** LOCALITY: **West Coast Maui.**
RECOVERED BY: **O. W. Swainson** YEAR: **1932**

Detailed statement as to the fitness of the original description:

a 3 x 4" signal pole with rocks piled around the base was found which evidently

marked the old station. No new permanent marks were placed over 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.

13. a. **INTERMEDIATE FINANCIAL STATEMENTS**

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

11-7002

QD 129

Q 201561 STATION 1047
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: HUT

STATE: HAWAII

YEAR 1904

THIRD

ORDER

SOURCE: G-SP156

SOURCE: G-SP158
NO OBSERVATION CHECK ON THIS POSITION

GEODETTIC LATITUDE:	20° 38' 50.47"	ELEVATION:	METERS
GEODETTIC LONGITUDE:	156° 26' 54.71"		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ TOR Δ S: ANGLE
HI 2	5102	574,580.48	114,099.49	+ 0 04 37

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

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ϕ OR Δ * FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETTIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE

QU 134

QÜ 134

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

-ORDER

GEODETIC LATITUDE:	20° 37' 04.96	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 16 42.63		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR \angle
HI 2	5102	632,736.82	103,563.02	+ 0 08 12

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

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

QO 162

QO 162

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1049
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: IT

STATE HAWAII

YEAR 1904

THIRD

-ORDER

SOURCE G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 35 17.41	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 24 57.21		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ θ ANGLE *
HI 2	5102	585,772.86	92,620.19	+ 0 05 18

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

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

QD 147

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1050
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: **JOE**
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 and identified by angle check. Located in the southern part of the island, about 1-1/2 miles northwest of La Perouse Bay, at the northwest end of Kape Kinau, on Ka Lae Mamane, on a prominent rock bluff about 25 feet above water. To reach from the post office at Kihei, go south on State Highway 31 for 6.1 miles to end of macadam road; continue ahead on graded road for 3.2 miles to where Highway 31 goes left, mauka; continue ahead for 3.1 miles to start of lava flow and rubbish dump on right. Turn right and follow road along lava flow for 0.2 mile to end of road at beach. Pack south on beach trail about 1/4-mile to station. Station is marked by a 1-inch iron pipe set in a small cairn on top of a prominent rock projection about 4 feet wide, 2 feet thick and 4 feet above general elevation of point. The entire front face of the point is whitewashed and is visible from a distance. Station is about 100 yards south of the last kiawe grove along the coast.

FORM C&GS-526 (1-62)
USCOMM-DC 16509-P68

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

R

NAME OF STATION: **JOE**

STATE: **HAWAII**

YEAR: **1962**

THIRD

ORDER

SOURCE: **G-12955**

GEODETIC LATITUDE:	20 °36' 47.967	ELEVATION	METERS
GEODETIC LONGITUDE:	156 26 34.751		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE °
HI 2	5102	576,495.03	101,742.87	+ 0 04' 44"

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

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

QF 262