

NOV 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 201564 STATION 1101
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION ~~INTERSECTION~~ STATION

NAME OF STATION: MINII

CHIEF OF PARTY: C.K. TOWNSEND YEAR: 1976 STATE: Hawaii COUNTY: MAUI
 Lanai Island

Description, including sketch of object:

Station is located on the south-east point of Lanai Island about 1/4 miles west of Kamaiki Pt. and 2.5 miles north-east of Manalo Bay. From station PUU PEHE it is located on the furthest east point visible and is 20 meters inland and about 13 meters in elevation. Station is a NOS disk stamped MINII 1976. It was reached by helicopter and access by road was not visible. Access by boat possible only in calm seas.

FORM CG5-525b (12-66)

Described by U.S. DEPARTMENT OF COMMERCE
 ERIA
 COAST AND GEODETIC SURVEY

ADJUSTED HORIZONTAL CONTROL DATA
 ADJUSTMENT BY NGS

NAME OF STATION: MINII

OBS BY NGS

STATE: HAWAII

YEAR: 1976

THIRD

ORDER

SOURCE: G-15810

GEODETIC LATITUDE:	20° 45' 39.83372	ELEVATION:	9.2
GEODETIC LONGITUDE:	156° 50' 41.14987		30 METERS FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	439,154.20	155,383.35	- 0° 03' 47"

* 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

THESE DATA OBTAINED FROM ADJUSTMENT OF OCT 1979

AL 014

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1102
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Molokini (Molokini Island, Hawaiian Government Survey, 1883; J. F. Pratt, 1905).—On Molokini Island, between Maui and Kahoolawe, on the highest point of the island, very near the edge of the bluff, and 266 meters from the northwest point of the island. Marked by an iron bar set in the rock with melted lead. In 1925 the Lighthouse Service found an iron bar reduced in section by corrosion to $\frac{3}{8}$ -inch square, but is was set in sulphur, not lead. Over it was placed a concrete block, 14 inches square and 12 inches high, with 1-inch threaded brass rod centered over iron bar. Top of brass rod projects 2 inches above concrete and is 15 inches above top of iron bar. A new wooden light tower is 17.2 feet from station in azimuth 221° 24'.

RECOVERY NOTE, TRIANGULATION STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 535
 (Rev. Feb. 1948)

NAME OF STATION: **MOLOKINI**
 ESTABLISHED BY: Hawaiian Govt. / YEAR: 1883 / 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 recovered plus or minus 2 inches. The original station, consisting of an iron bar and a cement block, was destroyed by artillery and bombing practice during world war number two. The distance and direction was taken to some fragments of sulphur which were found in the fractured rock. A new station, consisting of a standard disk, stamped MOLOKINI 1950, was established in a drill hole 4.050 feet west northwest of the original station. See new description for station MOLOKINI 2.

*Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.
 U. S. GOVERNMENT PRINTING OFFICE 16-50429-2

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **MOLOKINI**
 STATE: **HAWAII** YEAR: **1883** ORDER: **THIRD**

SOURCE: **G- 9311**
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20° 38' 01.472	ELEVATION:	57	METERS
GEODETIC LONGITUDE:	156° 30' 01.211	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	556,873.14	109,135.19	+ 0° 03' 31"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POSITION DETERMINED BY TRAVERSE FROM STATION MOLOKINI 2			

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1103
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 528
 Rev. Aug. 1963

DESCRIPTION OF TRIANGULATION STATION

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

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	HEIGHT OF LIGHT ABOVE STATION MARK METERS.		DIRECTION:
			feet	meters	
12a	KAMOA R. L. No. 1	NE // 19.452	5.929	00 00 00	
	Molokini Lighthouse (Center)	NE // 19.457	5.930	14 14 48	
	MOLOKINI (HGS) 1905	ESS // 4.050	1.235	25 02 45	
	La Perouse Bay Lighthouse	SE //		76 14	
12a	R. L. No. 2	WNW // 45.033	13.726	93 22 46.8	

The station is located on the highest part of the island of Molokini. It is 19.457 feet southwest of the center of the lighthouse tower and 5 feet north of sea cliff.

The station is best reached by boat from the village of Kihei on the island of Maui. The best landing is at the southwest end of the island.

The station is a standard disk, stamped MOLOKINI 1950, set into a drill hole in outcropping sandstone.

Reference mark number 1 is a standard disk, stamped MOLOKINI NO 1 1950, set into a drill hole in the concrete foundation of the lighthouse base. It is 1.94 meters lower than the station.

Reference mark number 2 is a standard disk, stamped MOLOKINI NO 2 1950, set into a drill hole in sandstone bedrock which is flush with the surface of the surrounding rock.

The lighthouse is a wooden structure 9.28 meters to the center of the light and rests on a concrete slab which is about 8 feet square.

The iron bar and concrete post which marked MOLOKINI (HGS) 1905 was destroyed by gun fire and bombing during world war number two. The distance and direction was taken to some fragments of sulphur which was found in the fractured rock.

Form 528
 (11-8-58)

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

R

NAME OF STATION: MOLOKINI 2
 ESTABLISHED BY: C. T. Husemeyer YEAR: 1950 STATE: Hawaii
 RECOVERED BY: H. J. Seaborg YEAR: 1963 COUNTY: Maui

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

The Station and reference marks were recovered in good condition as described by C. T. Husemeyer in 1950. The distances and directions to the reference marks were verified. The previous description is adequate and complete.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G- 9311

GEODETTIC LATITUDE:	20 ° 38' 01.481	ELEVATION:	49.4 METERS
GEODETTIC LONGITUDE:	156 30 01.253		162 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	± 10R Δ 01 ANGLE*
HI 2	5102	556,869.15	109,136.05	+ 0° 03' 31"

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

TO STATION OR OBJECT	GEODETTIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
KAMOA	207 04 30.5	207 00 59	5102

QE 320

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1104
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: MOLOKINI LIGHTHOUSE YEAR: 1950 STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:

The station is the center of the light at the Coast Guard Lighthouse on the island of Molokini.

This is an unattended, flashing, fixed light which is mounted on the top of a white wooden tower which is 9.28 meters in height. It rests on a concrete base which is about 8 feet square.

The station was used as an eccentric point for triangulation station MOLOKINI 2 which lies 19.457 feet southwest of the center of the tower.

RECOVERY NOTE, TRIANGULATION STATION

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

R

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

Station was not visited, however it is plainly visible from Maui, and was verified by check angle from several points on Maui.
 Station is the white light mounted on top of a 4-legged, skeleton tower, painted white, and about 30 feet tall.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOLOKINI LIGHTHOUSE

STATE: HAWAII

YEAR: 1950

THIRD

ORDER

SOURCE: G- 9311

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 20° 38' 01.599	ELEVATION: 56.7 METERS
GEODETIC LONGITUDE: 156° 30' 01.091	186 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ B' ANGLE
HI 2	5102	556,884.53	109,148.01	+ 0 03 31

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POSITION DETERMINED BY TRAVERSE FROM STATION MOLOKINI 2			

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1105
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **MUNRO** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Lanai**
 Described by:

CHIEF OF PARTY: **Harold J. Seaborg** YEAR: **1962**
 HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		DIRECTION: 0 00 00.0 25 35 52. 99 16 33.
		feet	meters	
	Surface-station mark, Underground-station mark			
	OBJECT	BEARING	DISTANCE	
	POHOULA (HGS) 1879-1962			
	R.M. No. 2	W 26.564'	8.098'	
	R.M. No. 1	E 36.41'	11.098'	

Station is located about 1-3/4 miles airline northeast of Lanai City, at about 2050 feet elevation, on the northwest end of a narrow ridge at the northwest end of the range of mountains to the east of Lanai City.

To reach station from the post office in Lanai City, go northwest on Lanai Avenu for 0.75 mile to left curve of highway by golf course. Continue on the highway for 0.15 mile to dirt side road right. Turn right and follow graded road, along left side of drain and up side of hill, for 0.7 mile to side road right at top of grade. Turn sharp right and follow graded road for 2.4 miles to a fork just below high tension line. Take right fork, main road, and go 0.05 mile to parking area on right, and end of truck travel. Pack northeasterly through trees for about 50 yards to double power poles. Bear right, uphill, for 45 yards to station.

Station mark is a standard disk stamped "MUNRO 1962", brased to the top of a 1-1/2-inch iron pipe that is set in cement and projects 3 inches above ground. It is at the northeast side of grove of trees; 3.6 feet southwest of a white witness post, 7.3 feet northwest of the horizontal trunk of a small eucalyptus tree, 45 yards southeast of the high tension line, and 60 yards southeast of a large sign "MUNRO TRAIL".

Reference mark number one is a standard disk stamped "MUNRO NO 1 1962", brased to the top of a 1-1/2-inch iron pipe that is set in cement and projects 4 inches above ground. It is on a grassy point at the north tip of a bare, eroded area and about 3 feet lower than the station.

Reference mark number two is a standard disk stamped "MUNRO NO 2 1962", brased to the top of a 1-1/2-inch iron pipe that is set in cement and projects 4 inches above ground. It is 10 feet northeast of tree line and about 5 feet lower than the station.

Station POHOULA (HGS) 1879-1962 will serve as the azimuth mark.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **MUNRO**
 STATE: **HAWAII** YEAR: **1962** SECOND ORDER

SOURCE: **G-13124**

GEODETIC LATITUDE	20° 50' 44.201	ELEVATION	657.7 METERS
GEODETIC LONGITUDE	156 54 07.346		2158 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ 01 ANGLE °
HI 2	5102	419,630.70	186,116.32	- 0° 05' 02"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POHOULA	97 02 52.0	97 07 54	5102

QF 360

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1106
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Nana (Lanai Island, F. G. Engle, 1927).—About 5 miles north of Kaumalapau Harbor, on highest point of westernmost (outermost) needle rock in Honopu Bay, west coast of Lanai. Marked according to note 3, standard disk in concrete in outcropping bedrock. Reference mark is standard reference disk (note 12b), stamped "Nana," and set in concrete in bedrock. Distance and azimuth from station to reference mark not known.

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: NANA
 ESTABLISHED BY: F.G.E. Year: 1927 State: Hawaii
 RECOVERED BY: H.J. Seaborg Year: 1962 County: Maui
 Island: Lanai

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

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

Station is located about 4-3/4 miles airline west of Lanai City and 2-3/4 miles north of the wharf at Kaumalapau Harbor, on the westernmost one of three rock spires that project from the ocean.

At low tide a rock bridge, or reef is exposed, that appears to connect all 3 spires with the island, however there are 3 narrow channels cutting through the reef that make it impossible to walk to the station. Station is best reached by small boat.

Station mark is a standard disk stamped "NANA 1927", cemented in a drill hole about 2 feet lower than highest point of pinnacle.

Reference mark is 5.75 meters west-southwest of station mark, and projects about 5 inches above surrounding rock. It is a standard disk stamped "NANA 1927", cemented in a drill hole in bedrock.

FORM 526a
 (9-5-56)

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

R

Name of Station: NANA
 Established By: F.G.E. Year: 1927 State: Hawaii
 Recovered By: H.J.S. Year: 1964 County: Maui
 Island: Lanai

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

Station recovered as described in good condition.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NANA

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-15124

GEODETIC LATITUDE:	20° 49' 40.394	ELEVATION:	12.0 METERS
GEODETIC LONGITUDE:	156 59 46.192		59 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	PLANE AZIMUTH ANGLE*
HI 2	510	387,478.35	179,735.08	- 0° 07' 02"

* 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

QF 386

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1107
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NOON
 STATE: HAWAII YEAR: 1904 ORDER: THIRD

SOURCE: G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 20 ° 34' 46.55	ELEVATION: METERS
GEODETIC LONGITUDE: 156 32 31.28	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	542,654.58	85,457.09	+ 0 02' 38"

* 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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201504 STATION 1108
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OAR
 STATE: HAWAII YEAR: 1904 ORDER: THIRD

SOURCE: G-SP156

GEODETIC LATITUDE	20° 34' 10.790	ELEVATION	METERS
GEODETIC LONGITUDE	156° 38' 44.472		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ ANGLE*
HI 2	5102	507,176.66	85,833.50	+ 0 00 27"

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

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

00 212

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1109
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Olai (Maui Island, J. F. Pratt, 1905; J. C. Gauger, 1912).—On northeast coast of West Maui, in Kaanapali District, on summit of Puu Olai, a prominent hill about 1¼ miles southeast of Kahakuloa village. Marked by standard bronze disk in top of concrete block flush with surface of ground. Reference mark is cross chiseled in native rock; it is 7.98 meters (26.2 feet) from station, in azimuth 151° 59'.

RECOVERY NOTE, TRIANGULATION STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 (Rev. Feb. 1948)

NAME OF STATION: OLAI
 ESTABLISHED BY: J. F. Pratt YEAR: 1905 STATE: Hawaii
 RECOVERED BY: C. T. Husemeyer YEAR: 1950 COUNTY: Maui

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

The original station was not recovered. An army lookout house now occupies the position of the original station. A new station, stamped OLAI 2 1949, was established about 5 feet north of the army lookout house.

* 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.

U. S. GOVERNMENT PRINTING OFFICE

16-56429-6

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OLAI
 STATE: HAWAII YEAR: 1905 THIRD ORDER

SOURCE: G-SP150

GEODETIC LATITUDE:	20 58' 48.866	ELEVATION:	304	METERS
GEODETIC LONGITUDE:	156 32 13.913	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ θ ANGLE *
HI 2	5102	544,168.03	234,974.14	+ 0° 02' 47"

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

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

QU 058

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1110
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 535
 Rev. Aug. 1965

DESCRIPTION OF TRIANGULATION STATION

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

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

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.62 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
		OBJECT	BEARING	DISTANCE feet meters	DIRECTION: ° ' "
4	Surface-station mark				
	Underground-station mark				
		HAY 1912		5.0 miles	00 00 00
12c		Nakalele Point Lighthouse	NW	36.11	187 24 51.1
12c		R. M. # 2	NW	11.007	189 30 53
12c		R. M. # 1	SSE	25.35	324 58 49

The station is located on the summit of Puu Olai and lies about 7.5 miles northwest of Kahului, about 1.75 miles southeast of the village of Kahakuloa, about 0.4 mile west of the sea, about 0.1 mile north of a graded road and 5 feet west of a steep cliff.

To reach from the post office at Kahului, go southwest, toward Wailuku, for 0.4 mile; turn right and go northwest for 0.8 mile; turn right, as per the sign reading Poukukalo, and continue northwesterly for 1.5 miles; take the right hand fork, as per the sign reading Waihee, and go northwesterly for 0.3 mile; take the right fork, as per the sign reading Waihee, and go northwesterly for 2.3 miles; take the right hand fork at the sign reading Waihee Valley and go northwesterly, on the main traveled road, for 5.5 miles to the foot of the station hill and the end of truck travel. From this point pack north for about 200 yards to the high ground and the station.

The station is a standard disk, stamped OLAI 2 1949, set into a drill hole in a boulder which projects about 1 foot.

Reference mark number 1 is a standard disk, stamped OLAI 2 1949, set into a drill hole in a boulder which projects about 1 foot. It is located about 5 feet west of the edge of the cliff and about 3 feet lower than the station.

Reference mark number 2 is a standard disk, stamped OLAI 2 1949, set into a drill hole in a boulder which projects about 3 feet. It is located about 10 feet north-east of the crest of the ridge and about 6 feet lower than the station.

Form 526
 (11-8-55)

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

R

NAME OF STATION: OLAI 2
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii
 RECOVERED BY: W.R.P. YEAR: 1960 COUNTY: Maui

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

The station and both reference marks were recovered in good condition as described. 1960 observations to reference marks follow:

Nakalele Point Light 1950		00 00 00
Ref. Mk 2	36.38 ft (11.090 m)	22 07 06
Ref. Mk 1	25.16 ft (7.669 m)	157 32 38

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 58' 49.008	ELEVATION: 304.2 METERS
GEODETIC LONGITUDE: 156 32 13.842	558 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	544,174.75	234,988.47	+ 0 02 47

* 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
KAHAKULOA	156 44 44.6	156 41 58	5102

QE 354

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
N^o OLD HAWAIIAN DATUM UM

QUAD 201564

STATION 1110

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

OLAI 2 (continued)

FORM 526a
21

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

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

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.49 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
		DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
KAHAKULOA (HGS) 1882				00 00 00.0
R.M. No. 1	ESE	25.165	7.671	135 27 27
Nakalele Point Light, 1950	NNW			337 53 19.5
R.M. No. 2	NNW	36.378	11.089	359 59 43

Station was recovered and all marks found in good condition. Discrepancies were noted in distance to both RMs in the 1950 description, but the distances listed in the 1960 description were found to be correct. A complete description follows:

Station is located about 6-1/2 miles north-northwest of Wailuku, 4 miles north of Maluhia Camp, and 350 feet northeast of State Highway 33, on the summit of Puu Olai, a prominent, round-topped hill of about 998 feet elevation.

To reach station from the intersection of Main and Market Streets in Wailuku, go north on Market Street for 0.5 mile to crossroad in Happy

Valley; continue ahead, on State Highway 33, for 1.8 miles to junction with State Highway 341; continue ahead on State Highway 33 for 4.4 miles to Maluhia Camp Road. Continue ahead on the highway for 3.1 miles to end of truck travel at base of hill on right. Pack up hill about 200 yards to station.

Station mark is a standard disk stamped "OLAI 1 1949", cemented in a drill hole in a 16-inch boulder projecting 8 inches from ground. It is 5 feet northeast of the edge of an old army observation hut.

Reference mark number one is a standard disk stamped "OLAI 2 1949", cemented in a drill hole in an 18-inch bedrock outcrop that projects 6 inches from ground. It is along edge of hill, 2-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "OLAI 2 1949", cemented in a drill hole in a bedrock knob that projects 16 inches from ground. It is on a sloping bedrock area, 5.2 feet lower than station mark.

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

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

USCGO-DC 37179-P89

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

0 201564 STATION 1111
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 533
 Rev. Aug. 1963

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: OLOWALU STATE: Hawaii COUNTY: Maui

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

NOTE*	HEIGHT OF TELESCOPE 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		HEIGHT OF LIGHT ABOVE STATION MARK METERS.	
		BEARING	DISTANCE feet meters	DIRECTION: 0 1 2	0 1 2
	Surface-station mark, Underground-station mark				
	OBJECT				
	LAHAINA SOUTHEAST BASE			00 00 00	
	KIEEA (HGS)	INE		66 33 57.4	
	Bench Mark (USGS)*(LOWALU TIDAL	NE	43.680 13.314	101 39 42	
	R. M. No. 1 EM 1)	S	32.320 9.851	205 00 36	
	Hydrographic Signal	W	13.05 3.98	291 16 49	

The station is located on the, rock filled, dock in the village of Olowalu. It lies 38 feet north of the seaward end of the dock.

The station is a standard disk, stamped OLOWALU 1950, set in a drill hole in a concrete slab which is 10 feet square and flush with the surface of the soil.

Reference mark number 1 is a standard disk, stamped OLOWALU NO 1 1950, set into a drill hole in the concrete sea wall. It is located at about the same elevation as the station.

The bench mark is a standard U. S. G. S. bronze disk, stamped 1925, set into a drill hole in the concrete sea wall. It is located at about the same elevation as the station.

The hydrographic signal is a wooden triangular structure having a base of about 8 feet and a height of about 20 feet. It rests on three concrete foundations which are about 1 foot in height.

U. S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
 (11-8-55) RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: OLOWALU
 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. Reference mark 1 was not recovered. It appears that the dock and the seawall in the area of the reference mark have been rebuilt and the mark destroyed.

The "USGS Bench Mark" was recovered. It is a standard Coast and Geodetic Survey Tidal Bench Mark disk on which the stamping is illegible. It is shown as "Tidal Bench Mark 1, Olowalu, Maui Island, Hawaiian Island - 9" dated 4/24/51.

The Hydrographic Signal has been torn down. The base timbers are still in place, fastened to the concrete foundations.

The description is adequate with the above corrections.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OLOWALU

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 48 42.333	ELEVATION: 1.92 METERS
GEODETIC LONGITUDE: 156 37 34.117	6.3 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# 10R Δ 01 ANGLE
HI 2	5102	513,839.81	173,763.97	+ 0 00 52

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
LAHAINA SE BASE	139 58 17.8	139 57 26	5102

QE 565

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1111

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

OLOWALU (continued)

RM 526a
 8-697

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

R

NAME OF STATION: **OLOWALU**

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 1.54 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
		DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
LAHAINA SOUTHEAST BASE -----1950	DISTANCE and	DIRECTION		-00 00 00.0
Bench Mark (USGS)	NE	43.680	13.314	101 39 42
LAHAINA SOUTHEAST BASE 1950--1969	DISTANCE and	DIRECTION		-00 00 00.0
Tidal BM 1, 1925 (R.M. No. 2)	ENE	43.644	13.303	101 40 03
R.M. No. 3	SSE	31.813	9.697	207 34 10

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

Station is located about 6 miles southeast of Lahaina and 1000 feet south-southwest of Olowalu Store, out on the end of the old Olowalu wharf.

To reach station from the post office in Wailuku, go south on State Highway 30 for 5.3 miles to junction with State Highway 31; continue on Highway 30 for 6.3 miles to Olowalu Store. Turn left and go 0.1 mile to end of road by house on right. Walk south along wide trail about 125

yards to wharf, then about 85 yards out onto wharf and station.

Station mark is a standard disk stamped "OLOWALU 1950", cemented in a drill hole in the center of a 9 x 10-foot, concrete slab that projects 1 foot above ground. It is 33.5 feet northeast of the rounded wall at southwest end of the wharf, and 12.7 feet northeast of the center of 3 concrete blocks which are the foundation of the old Hydrographic Signal. Tidal BM 1, 1925 (R.M. No. 2) is a standard disk (bench mark disk), very faintly stamped "1 1925", cemented in a drill hole in the smooth, concrete bulkhead along the northeast edge of the wharf, 30 feet northwest of end of bulkhead, 15.5 feet northeast of the northwest 1 of 2 concrete blocks, and about 15 inches lower than station mark.

Reference mark number three is a standard disk stamped "OLOWALU 1950 NO 3 1969", cemented in a drill hole in the rough rock and concrete top of the curved section of wharf bulkhead, 4 feet north of sea edge of the wall, and at same elevation as station mark.

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

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

USCOMM-DC 27179-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

QUAD 201564 STATION 1112
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OLOWALU MILL FLAGSTAFF

STATE: HAWAII

YEAR: 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 48' 47.29"	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 37 32.64		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ θ ANGLE *
HI 2	5102	513,979.80	174,264.12	+ 0° 00' 52"

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

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

90 010

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1113
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 535
 (REV. FEB. 1965)

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: OLOWALU Tidal B.M. 1
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii

COUNTY: Maui

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

(From letter of H. O. Fortin 3/22/55)
 In conference with Mr. Fankhauser, it was decided that the mark designated as Bench Mark (USGS) 13.314 meters from triangulation station OLOWALU is OLOWALU Tidal Bench Mark 1. The U. S. Geological Survey has no bench marks in that immediate vicinity.
 The bench mark is described in Tidal Bench Mark records as a standard disk, stamped 1 1925, set horizontally flush with the top of the concrete landing face of the wharf, near the northerly derrick post. Elevation 5.82 feet above mean lower low water.

* Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.
 U. S. GOVERNMENT PRINTING OFFICE 16-50489-9
 Note.—One of these forms must be used for every station recovered.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: OLOWALU TIDAL BM 1

STATE: HAWAII

YEAR: 1950

SECOND ORDER

NO G- 9311
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20° 48' 42.539	ELEVATION:	2	METERS
GEODETIC LONGITUDE:	156 37 33.712	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	513,878.23	173,784.76	+ 0° 00' 52"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POSITION DETERMINED BY TRAVERSE FROM STATION OLOWALU			
QE 434			

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1114
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
 U. S. OCEANIC AND GEODETIC SURVEY
 FORM NO. 506 PA-
 RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **Lahaina Wireless Pole** STATE: **Hawaii** COUNTY: **Mau**
 ESTABLISHED BY: **J. B. M.** YEAR: **1914** LOCALITY: **Lahaina.**
 RECOVERED BY: **O. W. Swinson** YEAR: **1931**

R

Detailed statement as to the fitness of the original description:

Station not visited. Signal plainly visible and in good condition.

NAME OF STATION: **PA-LAHAINA WIRELESS POLE**
 STATE: **HAWAII** YEAR: **1914**

THIRD ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE	20° 53' 07.813	ELEVATION	METERS
GEODETIC LONGITUDE	156 41 23.085		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE °
HI 2	5102	492,121.62	200,547.33	- 0° 00' 30"

* 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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1115
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 532-D

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: PALAOA POINT LIGHT
 YEAR: 1962 STATE: Hawaii COUNTY: Maui
 Island: Lanai
 CHIEF OF PARTY: H.J. Seaborg

Description, including sketch of object:

Station is a white-painted, square, wooden skeleton structure that is 8 feet square at the base and tapers to 4 feet square on top, which is 41 feet above the foundation. A 10-inch light glass is mounted on top of the tower. Tower sets on an 8-foot-square, concrete foundation. It is located on Palaoa Point, at the southwest corner of Lanai Island, on shoreline bluff at east edge of Kaunolu Bay, and about 150 yards west-southwest of station KARA 1914 (USLES) 1914.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PALAOA POINT LIGHT
 ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: HAWAII BENCH MARK(S) ALSO
 RECOVERED BY: C.K. TOWNSEND YEAR: 1976 COUNTY: MAUI Island:
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:
 Lanai

7.5 miles south west of Lanai City
 Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:
 Station was recovered in good condition as described in 1962.

R

NAME OF STATION: PALAOA POINT LIGHT
 STATE: HAWAII YEAR: 1962 THIRD ORDER

SOURCE: G-13124

GEODETIC LATITUDE	20 ° 44 ' 07.801	ELEVATION	METERS
GEODETIC LONGITUDE	156 58 03.562		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ B' ANGLE
HI 2	5102	397,151.31	146,160.32	- 0 06 24

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

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

QF 385

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1116
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PAF

STATE: Hawaii

COUNTY: Maui

CHIEF OF PARTY: A.L. Wardwell

YEAR: 1962

Described by: R.F.L.

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	DISTANCE
		feet			meters
1(a)	Surface-station mark	1.5			0 00 00.0
	Underground-station mark				22 00 51.6
					67 08 30.6
					193 27 34.8

The station is located on Maui Island, on Papawai Point at the southwest side of Maalaea Bay. To reach from the General Store and Service Station in Maalaea village, go south and west for 2.2 miles on State Highway 30 to the middle of a small cut just before the highway turns north, and the station on the left.

Station mark is 136 feet east of the east end of a guard rail, 57.4 feet south of the centerline of Highway 30, and 22 feet south of the top of the cut, a standard disk set in a square concrete post flush with the surface of the ground.

Detailed description

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION PAF

STATE HAWAII

YEAR 1962

THIRD

ORDER

SOURCE: G-12955

GEODETIC LATITUDE: 20 ° 46 ' 42.715	ELEVATION: 34 METERS
GEODETIC LONGITUDE: 156 32 21.157	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	g OR Δ g ANGLE °
HI 2	5102	543,539.65	161,711.11	+ 0 02 43

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
KIHEI RADIO STA WWVH MAST	278 39 28.4	278 36 45	5102

QF 257

(continued on next page)

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1116
 LATITUDE ° ' TO ° '
 LONGITUDE ° ' TO ° '
 DIAGRAM

PAP (continued)

FORM 12-18-68

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: PAP
 ESTABLISHED BY: A.L. Wardwell YEAR: 1962 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.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
		DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
WAIAKOA 1950				00 00 00.0
PUU O KALI (HGS) 1879				17 51 36.6
KAMOA 1950				29 48 28.3
R.M. No. 2	SE	37.090	11.305	63 17 22
Molokini Lighthouse 1950	SSE			76 06 36.1
R.M. No. 1	E	15.067	4.592	357 35 05

Station mark was recovered in good condition, however, because of the planned construction of a scenic observation point by the State Highway Dept. it was necessary to remove the mark. Before construction began the station was referenced by distance and angle to 3 points out of the way of planned construction. Upon completion of the construction, which lowered the station knoll about 12 feet, the station was replaced at the same point from the reference points. Two reference marks were also established. A complete description follows:

Station is located about 5 miles west of the Kihei post office and

2-1/2 miles southwest of Maalaea, at Papawai Point, on south side of highway, in a bare dirt area at the west end of a macadam parking area.

To reach station from the post office at Kihei, go northwest on State Highway 31 for 3.7 miles; go left, on State Highway 30, and go south 6.0 miles to station on left.

Station mark is a standard disk stamped "PAP 1962 1968", set in the top of a 10-inch-diameter, concrete monument flush with ground. It is 57.0 feet south of center line of highway, 14 feet west of west end of the macadam parking area, 55.0 feet southwest of a highway "Stop" sign, and 14 feet west of the north end of the pipe railing bordering the macadam.

Reference mark number one is a standard disk stamped "PAP 1962 NO 1 1968", set in concrete in a 5-inch-square hole in the macadam surface, and flush with the surface. It is at west end of the parking area, 5.2 feet south of north end of pipe railing and 1 foot lower than station mark.

Reference mark number two is a standard disk stamped "PAP 1962 NO 2 1968", set in concrete in a 5-inch-square hole in the macadam surface, and flush with surface. It is in southwest corner of the parking area, 1.4 feet northeast of the corner post of the pipe railing and about 1-1/2 feet lower than station mark.

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

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

USCOMM-DC 27173-P69

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1117
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 533
 Rev. Aug. 1962

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PAPA WAI ✓ STATE: Hawaii COUNTY: Maui
 CHIEF OF PARTY: C.T. Husemeyer ✓ YEAR: 1950 ✓ Described by: G.B.G. ✓

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.63 METERS.†	HEIGHT OF LIGHT ABOVE STATION MARK 1.33 METERS.	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
	Surface-station mark. Underground-station mark		BEARING	DISTANCE feet meters	DIRECTION: ° ' "
4					
12c	RICE		ENE	20.77 ✓ 6.333 ✓	0 00 00.0
12c	R.M. No.1		ESE	8 miles	107 13 57.6 ✓
12c	WWVH Antenna		SE	17.81 ✓	142 46 30
	R.M.No.2				

Detailed description

Located on the south shore of West Maui, Wailuku District, about 5 miles west of Kihel Post Office, about 0.5 miles west of McGregor Point and about 0.3 miles north of the coast highway, at the south-west edge of a small grassy flat. Station is a standard disk set in a boulder projecting 8 inches, stamped PAPA WAI 1949.
 Reference mark No.1 is east northeast of the station. A standard disk set in a boulder flush with the ground, stamped PAPA WAI NO 1 1949.
 Reference mark No.2 is southeast of the station. A standard disk set in a boulder projecting 2 feet, stamped PAPA WAI NO 2 1949.
 To reach from the Post Office at Wailuku: go south and west on Lahaina Highway for 9.0 miles. Turn right onto track road and go northwest up grade for 0.1 mile to an old army observation post. From here pack northerly for about 0.3 miles to top of ridge and station at west end of flat.

1
 (11-8-55)

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

R

NAME OF STATION: PAPA WAI
 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 directions for reaching the station are adequate except that no observation post or a road leading to it were found. Park on Highway 30 and pack northerly to top of hill and station. A ten foot 2x2 pole was found over the 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.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAPA WAI
 STATE: HAWAII YEAR: 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 46' 55.052	ELEVATION: 116.0 METERS
GEODETIC LONGITUDE: 156 32 26.419	38.1 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β 10R Δ α 1 ANGLE *
HI 2	5102	343,039.37	162,955.40	+ 0 02 41

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
RICE	173 51 46.2	173 49 05	5102

QE 373

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM UG

QUAD 201564

STATION 1117

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

PAPAWAI (continued)

FORM 526e
 (6-18-69)

U.S. DEPARTMENT OF COMMERCE

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: **PAPAWAI**
 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 **1.47** METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.
 DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
RICE -----1950 DISTANCE and DIRECTION				00 00 00.0
R.M. No. 1	ENE	20.77	6.333	69 57 26
R.M. No. 2	SE	17.81	5.428	142 46 30
RICE 1950 -----1969 DISTANCE and DIRECTION				00 00 00.0
R.M. No. 1	NE	20.808	6.343	69 57 10
R.M. No. 2	SE	17.805	5.428	142 46 14
Molokini Lighthouse 1950	SSE			171 45 01.8

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

Station is located about 8 miles south-southwest of Wailuku and 2 miles west-southwest of Maalaea Harbor and 1700 feet north-northwest of the scenic observation point, where the highway rounds Papawai Point. It is up on the slopes of the steep hillside, at about 381 feet elevation, on the south edge of a large flat area several acres in size.

To reach station from the post office in Wailuku, go south on State Highway 30 for 5.25 miles to junction with State Highway 31; continue ahead on Highway 30 for 3.65 miles to the scenic overlook on left; continue ahead for 0.35 mile to end of truck travel on right, at a culvert and a highway sign "DO NOT PASS". Pack northerly, up steep hillside, about 300 yards to station.

Station mark is a standard disk stamped "PAPAWAI 1949", cemented in a drill hole in a 30-inch-diameter, round-topped, bedrock outcrop that projects about 6 inches from ground. It is 6 feet north of a large cairn.

Reference mark number one is a standard disk stamped "PAPAWAI NO 1 1949", cemented in a drill hole in a 2 x 3-foot bedrock outcrop that projects 2 inches from ground. It is 0.3 foot lower than station mark.

Reference mark number two is a standard disk stamped "PAPAWAI NO 2 1949", cemented in a drill hole in a 3-1/2-foot, red rock outcrop that projects 2 feet from ground. It is 2 feet higher than station mark.

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

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

USCOMM-DC 27173-P89

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1118
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 532
 Nov. 1959

NAME OF STATION: PAU STATE: Hawaii COUNTY: Maui
 Island: Lanai Described by: R. F. Hanson
 CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.1	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	HEIGHT OF LIGHT ABOVE STATION MARK METERS.	
			feet	meters
4	Surface-station mark Underground-station mark			
	OBJECT	BEARING	DISTANCE	DIRECTION
			feet meters	° ' "
12a	KAAPA 1927	N	10,212' 3.113	00 00 00.0
12b	R.M. No. 2	SW	46,209' 14.085	25 47 40"
12c	R.M. No. 1 Kaunalapau Light	W	0.3 mile	326 32 45.8

Station is located about 5 miles airline southwest of Lanai City and 1/2 mile southeast of the wharf at Kaunalapau Harbor; at about 450 feet elevation. It is 0.4 mile west of a power line which runs along a grassy ridge, and is on a rocky point at the west edge of the grassy slopes which run west down towards the coast from the power line.

To reach from the junction of Highways 44 and 441 at the south edge of Lanai City, go west on Highway 44 for 3.6 miles to paved left fork. Take left fork and go southerly on winding road for 1.25 miles to dirt side road right, at a hydrant. Turn right and go 0.4 mile to fork. Take left fork, through pineapple fields, for 0.5 mile to fork. Take right fork and go 0.1 mile to edge of field. Bear left and follow road along edge of field for 0.35 mile to side road right, 100 yards before

reaching the Lanai VOR installation. Turn right and go 0.1 mile across flat top of hill to fork. Take right fork and follow bulldozed road down along power line for 1.25 miles to crossroad. Continue ahead for 50 yards to last power pole. Bear left and go westerly, down-slope for 0.4 mile to station.

Station mark is a standard disk stamped "PAU 1962", cemented in a drill hole in a 3-foot-diameter, bedrock outcrop that projects 2 inches above ground. It is 7.0 feet east-southeast of a white witness post.

Reference mark number one is a standard disk stamped "PAU NO 1 1962", cemented in a drill hole in a 3 x 5-foot, red boulder that projects 2-1/2 feet above ground. It is on a small knoll that is separate from station hill, and is about 5 feet lower than the station.

Reference mark number two is a standard disk stamped "PAU NO 2 1962", cemented in a drill hole in a bedrock ledge that projects 6 inches above ground. It is on north edge of station hill and 7.5 feet north of the witness post.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-13124

GEODETIC LATITUDE	20° 47' 00.494	ELEVATION	151.7 METERS
GEODETIC LONGITUDE	156° 59' 19.654		452 FEET

STATE COORDINATES (Fm)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ ANGLE*
HI 2	5102	389,963.53	163,597.41	- 0° 36' 52"

* 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
KAAPA	151 03 34.2	151 10 26	5102

QF 375

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 201564 STATION 1119
LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

PAUPAU (continued)

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PAUPAU
ESTABLISHED BY: Hawaiian Govt. YEAR: 1879 STATE: Hawaii
RECOVERED BY: C. T. Husomeys YEAR: 1950 COUNTY: Maui

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

Station was recovered in good condition.
A new description follows.--

The station is located on the most westerly summit of Paupau which lies about 3 miles east southeast of Lahaina. The station hill is marked on its westerly side by a large L which has been cut into the brush. Higher ground lies to the east of the station.

To reach from the courthouse in the city of Lahaina, go westerly for one block to the Shell Oil Company service station; turn right and go northeast for 0.3 mile; cross over the railroad tracks, turn right, pass between two lone coconut trees and follow the main traveled road northeasterly, up a steep grade for 2.5 miles to the end of the road and the end of truck travel. From this point, cross over the irrigation ditch and follow the well worn trail, northerly for about 0.6 mile to the end of the trail and the station.

The station is a standard Territory Survey bronze disk, unstamped, set in the top of a square concrete post which is flush with the surface of the ground. A stone and concrete platform 6 foot square and 5 feet high has been built over this station.

For:
(11-0-55)

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

NAME OF STATION: PAUPAU
ESTABLISHED BY: H.G.S. YEAR: 1879 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 the observing platform were recovered in good condition as described by C.T.H. in 1950 except that the railroad mentioned has been dismantled and the grade paved into a private road of the Pioneer Sugar Mill Co. at Lahaina. The L on the hill is plainly visible. No hydrographic tripod was found but an old Hawaiian grave is located about 50 feet east of the station.

R

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PAUPAU
ESTABLISHED BY: HGS YEAR: 1879 STATE: Hawaii BENCHMARK(S) ALSO
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered in good condition. Located about 2-3/4 miles east-northeast of Lahaina, on the west, and lower, rounded hill of Paupau Hill, at about 2261 feet elevation, near the grave of David Malo.

To reach station from the post office in Lahaina, go northeast on Papalaua St. for 0.2 mile; turn right and go 0.3 mile to crossroad. Turn left, on Dickenson St., and follow main cane road upgrade for 2.8 miles to corner of cane field at stock-loading chute. Pack northerly, following old trail, for about 1/2-mile to station.

Station mark is an HTS disk, unstamped, set in the top of a 12-inch square, concrete monument flush with ground. A type-A signal is centered over the mark, with the 6-foot-square concrete platform 4 feet above ground. A metal target extends about 7 feet above platform.

Station is 30 feet east of the David Malo Memorial and grave, and 33 feet northeast of a large, green, metal box on a pipe.

FORM CGCS-526 (11-65)
USCOMM-DC 18509-PE1

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

R

R

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1119
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Paupau (Maui Island, Hawaiian Government Survey, 1879; J. C. Gauger, 1912).—Near the western coast of West Maui, in Lahaina District, on a conspicuous hill of the same name about 1 mile east of Lahainaluna. Station is on western summit near grave of D. Malo. Marked by a 4-inch iron pipe projecting 4 feet above the ground and surmounted by an iron plate bearing the letters "T. H. F. R." (Territory of Hawaii Forest Reserve). A tripod signal stands about 15 meters south of the station, and should not be confused with the station. There is no mark under the tripod, but the tripod may last a number of years.

RECOVERY NOTE. TRIANGULATION STATION

R

DEPARTMENT OF COMMERCE
 U. S. OCEANIC AND ATMOSPHERIC SURVEY
 FORM NO. 536

NAME OF STATION: Paupau STATE: Hawaii COUNTY: Maui
 ESTABLISHED BY: H.G.S. YEAR: 1879 LOCALITY: Lahaina
 RECOVERED BY: V.S. Seward YEAR: 1929

Detailed statement as to the fitness of the original description: Original description by W.D. Alexander good.

Original mark replaced by Hawaii Forest Reserve Monument - being a 2-1/2" pipe bearing the legend H.F. T.H. This mark was found to be in good condition.

New Mark: Standard bronze tablet set in concrete pier, 3 inches above ground. Over this mark was built a Type A Hawaii Territory Survey Triangulation Station Monument.

Note: Hawaii Forest Reserve Monument pipe was cemented in the wall of new monument with the legend H.F. T.H. Set within a few inches of the standard bronze tablet, which is both the new station mark, and the new Forest Reserve mark.

RECOVERY NOTE. TRIANGULATION STATION

R

DEPARTMENT OF COMMERCE
 U. S. OCEANIC AND ATMOSPHERIC SURVEY
 FORM NO. 536

NAME OF STATION: Paupau STATE: Hawaii COUNTY: Maui
 ESTABLISHED BY: Hawn Govt Survey YEAR: 1879 LOCALITY: Lahaina
 RECOVERED BY: O. W. Swainson YEAR: 1931

Detailed statement as to the fitness of the original description:

Station was not visited, but signal was plainly visible. Terr. Govt. has evidently built concrete observing platform and signal over station mark.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAUPAU
 STATE: HAWAII YEAR: 1879 FIRST ORDER
 SOURCE: G- 9311

GEODETIC LATITUDE	20 53' 28.081	ELEVATION	687.2 METERS
GEODETIC LONGITUDE	156 38 32.952		2255 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ or ANGLE °
HI 2	5102	508,253.85	202,592.25	+ 0 00' 31"

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

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

QE 365

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1120
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 585
 Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PIILANI STATE: Hawaii COUNTY: Maui
 Island: Lanai Described by: R.F. Hanson
 CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962

NOTE*	HEIGHT OF TELESCOPE 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	HEIGHT OF LIGHT ABOVE STATION MARK METERS.		DIRECTION‡
			feet	meters	
4	Surface-station mark, Underground-station mark				
		OBJECT	BEARING		
12c		LEHUA			00 00 00.0
12a		RM 1	NE 6.77'	2.063'	76 38 12'
		RM 2	E 10.35'	3.153'	134 03 37'

Detailed description

Station is located about 7 miles airline southeast of Lanai City and 5-1/2 miles due south of the old village of Keomuku, on the prominent, black rock point that lies about 1/4 mile southwest of Naha Gulch and the southwest end of Highway 44. To reach station from the post office in Lanai City, go northerly on Highway 44 for 8.6 miles to end of paved road. Continue on dirt road, Highway 44, for 6.5 miles to old Keomuku Village. Continue on the road for 1.0 mile to fork. Take left fork and follow road along shoreline for 6.4 miles to fishing shack and sign "NO 13" on right. Continue ahead about 50 yards to end of road. Pack southwest along sandy beach for about 1/4 mile to prominent rock point and station. Station mark is a standard disk stamped "PIILANI 1962", cemented in a drill hole in a 6 x 8-foot bedrock ledge that extends eastward out onto the large half-

round ledge that comprises the main and prominent part of the point. The station mark is about 12 feet west of east edge of main ledge and about 2-1/2 feet higher, and is about 18 feet above sea level.

Reference mark number one is a standard disk stamped "PIILANI NO 1 1962", cemented in a drill hole in a 3-foot boulder at the north edge of the main ledge. It extends about 4 feet above the general ground line and is about 6 inches lower than the station.

Reference mark number two is a standard disk stamped "PIILANI NO 2 1962", cemented in a drill hole in the east edge of the main ledge, which extends about 5 feet above ground at this point. The mark is about 2 feet lower than the station mark.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PIILANI
 ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: C.K. Townsend YEAR: 1976 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Lanai

7 miles southeast of Lanai City.

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

Station and reference marks were recovered and distances to reference checked with the 1962 description. Station is in good condition. Station was reached by helicopter.

R

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE G-13124

GEODETIC LATITUDE	20° 46' 25.822	ELEVATION	5.7 METERS
GEODETIC LONGITUDE	156° 49' 52.418		19 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ OR Δ °' ANGLE *
HI 2	5102	443,783.64	160,018.22	- 0° 03' 30"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE § OR Δ °' FORMULA NEGLECTING THE SECOND TERM

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
LEHUA	126 46 14.0	126 49 44	5102

QF 370

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1121
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 532
 Rev. Aug. 1963

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PINE STATE: HAWAII COUNTY: MAUI

CHIEF OF PARTY: L.F.W. YEAR: 1965 Described by: W.S.S.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK		HEIGHT OF LIGHT ABOVE STATION MARK		METERS.
	1.26 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 ¹
			feet	meters	
	PUU MANU RM 1	N	34.55	10.532	0 00 00.0 10 01 06

Detailed description:

Station is located about 4 1/2 miles airline southeast of Lanai City and 2 1/2 miles north-northeast of Manele Bay on a ridge to the south of the hill top called Puu Manu.

To reach station from junction of Highways 44 and 441 at the south edge of Lanai City, go southerly on Highway 441 for 1.7 miles to a paved fork. Take the left fork and go 1.15 miles to end of paved road. Continue ahead on graded road for 0.2 miles to T-road left. Turn left and go 0.5 miles to crossroad at edge of pineapple field. Continue ahead on narrow, graded road up brushy draw and up along hillside, southeasterly, for 1.8 miles to fork at edge of pineapple fields on top of mesa. Take right fork and go along edge of field for

0.35 mile to crossroad. Turn right and follow graded road for 0.25 mile to dim right fork at bottom of grade and just before fence. Take right fork and follow dim tracks up side of hill and along crest 0.55 mile to high point and station PUU MANU. Continue on dim tracks down ridge to the south for 0.3 mile to a bare wash in the ridge. Turn left (east) 200 feet to the crest of the ridge and station.

Station mark is a standard traverse disk stamped PINE 1965, cemented in the top of a 2 inch galvanized pipe driven into the ground and projecting 1 foot.

Reference mark is a standard disk stamped PINE NO.1 1965, cemented in a drill hole in the top of a 1 foot boulder that projects about 3 inches above the ground. It is in a group to the south of the washout in the ridge and at about the same elevation as the station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PINE
 STATE: HAWAII YEAR: 1965 ORDER: SECOND

SOURCE: G-12664
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20° 46' 31.675	ELEVATION:	596 METERS
GEODETIC LONGITUDE:	156° 52' 20.611	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE ¹
HI 2	5102	429,721.86	160,624.85	- 0 04 23

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

TO STATION OR OBJECT	GEODETIC AZIMUTH ¹ (From south)	PLANE AZIMUTH ² (From south)	CODE
PUU MANU	178 43 19.1	178 47 42	5102

POSITION DETERMINED BY TRAVERSE FROM STATION PUU MANU

QF 573

* Refers to notes in manuals of triangulation and state publications of triangulation. ¹ Direction-angle measured clockwise, referred to initial station.
² To nearest meter only, when no trigonometric leveling is being done. 16-68892-1 U. S. GOVERNMENT PRINTING OFFICE

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1122
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 " MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POHAKULOA
 STATE: HAWAII YEAR: 1912 THIRD ORDER

SOURCE: G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 ° 47' 46.57"	ELEVATION	METERS
GEODETIC LONGITUDE	156 32 56.24		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	FOR Δ ANGLE *
HI 2	5102	540,205.92	168,150.94	+ 0° 02' 31"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH <i>(From north)</i>	PLANE AZIMUTH * <i>(From north)</i>	CODE
QU 005			

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1123
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Pohoula (Lanai Island, Hawaiian Government Survey, 1879; F. G. Engle, 1927).—In the central part of Lanai, District of Paomai, Land of Paomai, on the summit of a red bluff about 1,700 meters north of Koele Ranch. Reached by road turning northeast near house of Mr. Gibson, and running back to cemetery on top of bluff. Station is 300 meters southwest of cemetery. Marked by drill hole surrounded by triangle in top of stone. Reference marks (1927) are drill holes in stones which project several inches above ground. They are at the following distances and azimuths from the station: No. 1, 12.228 meters (40.12 feet), 220° 56'; No. 2, 9.570 meters (31.40 feet), 355° 57'.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **POHOULA**
 ESTABLISHED BY: **HGS** YEAR: **1879** STATE: **Hawaii**
 RECOVERED BY: **H.J. Seaborg** YEAR: **1962** COUNTY: **Maui**
 Island: **Lanai**

HEIGHT OF TELESCOPE ABOVE STATION MARK **1.42** 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	
KANEPUU (HGS) 1879 1962				00 00 00.0
R.M. No. 1	NE	40.12	12.229	107 13 20
R.M. No. 2	SSE	31.45	9.585	242 19 13

Station was recovered and all marks found to be in good condition. Original station mark was a 1-1/2-inch diameter hole, drilled 1-1/2 inches deep in the top of a 12-inch boulder. A new station disk was established. A complete description follows:

Station is located about 1-1/4 miles north of Lanai City, on a heavily timbered hill, 50 yards southwest of a cemetery boundary fence.

To reach station from the post office in Lanai City, go northwest on Lanai Avenue for 0.75 mile to left curve of highway, by golf course on right. Go left on highway for 0.15 mile to dirt side road right. Turn right and follow graded road along left side of grassy drain course and up side of hill for 0.7 mile to cemetery gate on left. Continue ahead, passing around fence corner, bear left and go southwest along right side of fence and continue ahead to edge of hill, a distance of 0.1 mile; then bear left along edge of hill for 50 yards to station.

Station mark is a standard disk stamped "POHOULA 1879 1962", cemented in the original station hole, in the top of a 12-inch-diameter boulder that projects 2 inches above ground. There is a white, 6-inch circle painted the mark.

Reference mark number one is a standard disk stamped "POHOULA 1 1927", cemented in a drill hole in the top of a 6 x 8-inch boulder that projects about 3 inches above ground. It is about 1 foot lower than the station.

Reference mark number two is a standard disk stamped "POHOULA 2 1927", cemented in a drill hole in a 6 x 8-inch boulder that projects 3 inches above ground. It is about 2 feet higher than the station.

Form 526
 (11-8-55)

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

NAME OF STATION: **POHOULA**
 ESTABLISHED BY: **HGS** YEAR: **1879** STATE: **Hawaii**
 RECOVERED BY: **EPC** YEAR: **1964** 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 1962 recovery by HJS.

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

USCGMA-DC 27173-P68

NOAA FORM 76-31
 (11-76)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **POHOULA**
 STATE: **HAWAII** YEAR: **1879** SECOND ORDER
 SOURCE: **G-13124**

GEODETIC LATITUDE	20 50 53.436	ELEVATION:	617.6 METERS
GEODETIC LONGITUDE:	156 55 26.855		2026 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# HOR Δ # ANGLES
HI 2	5102	412,090.86	187,059.60	- 0 05 30

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
KANEPUU	113 41 19.9	113 46 50	5102

QF 361

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1124
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Pond (Maui Island, J. C. Gauger, 1912).—On northwest coast of Maui, in Wailuku District, on the slope near the outer end of the sandstone ridge on the south side of Waihee Creek, about 65 meters back from the beach. Marked by a 5-inch drain tile pipe set in a block of cement and projecting 5 inches above surface of ground. Pipe is filled with concrete and is centered with a standard bronze disk.

(10-10-59)

RECOVERY NOTE, TRIANGULATION STATION

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

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
HAY 1912				00 00 00.0
R.M. No. 1	SW	16.667	5.081	64 39 56
R.M. No. 2	WNW	38.726	11.803	128 32 24
OLAI 2 1950				167 57 17.4
Kahului, Airport Control Tower, Beacon, 1960	SE			334 05 56.0

Station mark was recovered in good condition, in a dense kiawe thicket. Two reference marks were established, a witness post was set and lines were cleared. A complete description follows:

Station is located about 1 mile north of Waihee Village and 3/4-mile north-northwest of the Waihee Dairy, on the slope of the northeast end of the sand ridge at Waihee Point, and at about 65 feet elevation, in the southeast edge of a very dense kiawe thicket.

To reach station from the intersection of Main and Market Streets in Wailuku, go north on Market Street for 0.5 mile to crossroad in Happy

Valley. Continue ahead, on Kahakili Highway, for 1.8 miles to junction with Highway 341. Continue ahead, on Highway 33, for 1.25 miles to sign "Waiehu Golf Course". Turn right and go 0.45 mile to fork; take left fork and go 0.35 mile to the Waihee Dairy buildings. Continue ahead, through gate, and follow track road right for 1.0 mile to board gate; pass through gate and continue for 0.15 mile to point of ridge. Pack left about 50 yards up slope on dim trail to station.

Station mark is a standard disk, unstamped, set in the top of a concrete-filled, 8-inch-diameter, brown, sewer pipe projecting 8 inches from ground. It is about 100 yards north-northeast of a large, lone iron-wood tree, 22 feet west of a trail passing through the thicket, 100 feet west of the track road, 3.3 feet north of a white witness post, and about 6 feet inside the thicket.

Reference mark number one is a standard disk stamped "POND 1912 NO 1 1968", set in the top of a 2-inch iron pipe that is set in concrete and projects 8 inches from ground. It is in sand area, just south from edge of kiawe thicket.

Reference mark number two is a standard disk stamped "POND 1912 NO 2 1968", set in the top of a 12-inch-square, concrete monument that projects 6 inches from ground. It is set just outside the west edge of the thicket, 1-1/2 feet higher than station mark.

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

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

USCOMB-DC 27173-P88

ADJUSTED HORIZONTAL CONTROL DATA

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

GEODETIC LATITUDE: 20° 56' 59.628	ELEVATION SCALED 20 METERS
GEODETIC LONGITUDE: 156 30 43.450	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ 91 ANGLE *
HI 2	5102	552,751.28	223,960.44	+ 0° 03' 15"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE # OR Δ 91 FORMULA NEGLECTING THE SECOND TERM

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
HAY	334 11 49.1	334 08 30	5102

QQ 055

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1125
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Puu Hele (Maui Island, Hawaiian Government Survey).—In the southern part of Wailuku District, on summit of Puu Hele, near a small cemetery, east of the road from Wailuku to Maalaea Landing, and 6,000 feet north of Maalaea Bay. Marked by a concrete post.

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: Puu Hele STATE: Hawaii COUNTY: Maui
 ESTABLISHED BY: Hawaiian G.S. YEAR: 1912 LOCALITY: Wailuku
 RECOVERED BY: V.S.Seward YEAR: 1929

NAME OF STATION PUU HELE

STATE HAWAII

YEAR 1912

THIRD

ORDER

Detailed statement as to the fitness of the original description: On the summit of a hill of the same name, near a small cemetery. East of the road from Wailuku to Maalaea Landing, and 6000 feet North of Maalaea Bay.

SOURCE: G-SP156

Original Mark: A concrete post and tripod signal.
 Mark Found: 1/2 inch hole drilled in top of rock flush with ground. Buried 1 foot under this mark was a bottle in an upright position.

GEODETIC LATITUDE:	20° 48' 55.624	ELEVATION	49	METERS
GEODETIC LONGITUDE:	156 30 29.241	SCALED		FEET

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

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: Puu Hele STATE: Hawaii COUNTY: Maui
 ESTABLISHED BY: H.G.S. YEAR: 1912 LOCALITY: S.W. Maui, Maalaea Bay Area
 RECOVERED BY: Kelly McBean YEAR: 1943

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE *
HI 2	5102	554,146.21	175,129.78	+ 0° 03' 23"

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

Detailed statement as to the fitness of the original description:

Original description adequate and station is well marked. Concrete and masonry observing platform, 30" high, has been erected over standard disc marker by the Territory of Hawaii, and target erected. This station is being encroached upon by borrow pit excavation and disturbed by blasting and should henceforth be regarded as uncertain. It will probably be destroyed in 1943. Before it was disturbed, a new station, Puu Hona, was established 4,784.550 feet distant, azimuth 91° 52' 23.0", from Puu Hele.

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

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: Puu Hele STATE: Hawaii COUNTY: Maui
 ESTABLISHED BY: Hawaiian G.S. YEAR: 1912 LOCALITY: Maalaea Bay
 RECOVERED BY: U.S.E. YEAR: 1944

Detailed statement as to the fitness of the original description:

Letter of W.D. Patterson, Supervisor, Pacific District, Honolulu, T.H. dated August 18, 1944:

Station has been destroyed by excavation of Puu Hele for surfacing material. It is recoverable on Aerial Photographs by resection from visible cultural features.

QU 115

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1126
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 FORM CGS

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **Puu Hele 2** STATE: **Hawaii** COUNTY: **Maui**
 LOCALITY: **Wailuku**
 ESTABLISHED BY: **V.S. Seward** YEAR: **1929**

Detailed statement as to the fitness of the original description: On the summit of a hill of the same name, near a small cemetery. East of the road from Wailuku to Maalaea Landing, and 6000 feet North of Maalaea Bay.

Original Mark: A concrete post and triped signal.
 Mark Found: 1/2 inch hole drilled in top of rock flush with ground. Buried 1 foot under this mark was a bottle in an upright position.

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

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: **PUU HELE 2**
 ESTABLISHED BY: **H.G.S.** YEAR: **1929** STATE: **Hawaii**
 RECOVERED BY: **H.J.S.** YEAR: **1961** COUNTY: **Maui**

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

The station was not found. The hill has been leveled by excavation, and in view of the letter by the Supervisor, Pacific District, dated 18 August 1944, it is recommended that the station be considered destroyed.

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: **PUU HELE 2**
 ESTABLISHED BY: **HGS** YEAR: **1929** 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 destroyed long ago by excavation of a cinder quarry. There is now a large pit here.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **PUU HELE 2**
 STATE: **HAWAII** YEAR: **1929** THIRD ORDER

SOURCE **G- 5535**

GEODETIC LATITUDE	20 ° 48 ' 55.679	ELEVATION	50	METERS
GEODETIC LONGITUDE	156 30 29.222	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	554,148.01	175,135.34	+ 0 ° 05 ' 25 "

* 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

QF 040

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1127
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: Puu Hona
 CHIEF OF PARTY: Kelly McBean
 Surface-station mark, Note,*
 Underground-station mark, Note,*
 Reference mark, Note,*
 Reference mark, Note,*
 Witness mark, Note,*
 Witness mark, Note,*

Height of signal above station mark meters.
 Height of telescope above station mark meters.
 Detailed description:

STATE:	LOCALITY:	DISTANCES AND DIRECTIONS TO REFERENCE MARKS AND PROMINENT OBJECTS	
HAWAII	Maui - Maalaea Bay Area		
YEAR: 1943			
OBJECT	DISTANCE	DIRECTION	AZIMUTH

In Maalaea District of southwest Maui, on a prominent knob on the ridge south of Pohakea Gulch, 0.9 miles west of Hele Hill, and 0.75 miles west of the junction of the Wailuku-Maalaea road with the Kihei road one mile north of Maalaea. The station is marked by a standard disc, cemented in a drill hole in ledge rock, and is on the east edge of the summit of the knob, 34.7 feet east of a rock cairn marking an angle point in the Ukumehame Lana Grant boundary, but is not intended to identify this boundary.

RM 1 is a standard disc set in concrete, in rock, 50' on line with Puu Hele 2, azimuth 91°52'23.0". RM 2 is a standard disc stamped "AZ MARK," 2300 feet true north, on the ridge north of Pohakea Gulch.

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 886
 (REV. FEB. 1950)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Puu Hona
 ESTABLISHED BY: K. McB. YEAR: 1943 STATE: Hawaii
 RECOVERED BY: G. T. Risemeyer YEAR: 1950 COUNTY: Maui

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:
 Located on the south side of West Maui, Wailuku District and about 5.5 miles south of Wailuku Town and about 2.5 miles north of McGregor Point. The ridge below the station can be readily seen by its bare scattered rock formation, the color of which is almost white in appearance from a distance.
 Station Mark is a standard disk set flush in a large flat rock about 1 foot high. Stamped Puu Hona, 1943.
 Reference Mark No. 1 is east of the station. A standard disk cemented into a 2 1/2 inch galvanized pipe projecting 1 foot. Stamped R. M. 1 1943.
 To reach from junction of main roads to Lahaina, Wailuku and Kihei, go towards Lahaina for 0.30 mile and 150 feet beyond Telephone Pole 127 then turn right into field dirt road and follow for 0.20 mile then turn right along concrete ditch for 0.10 mile. From here pack westerly across fence, through pasture with Kiawe growth to foot of hill then follow bare ridge to top of hill and station.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU HONA
 ESTABLISHED BY: K. McB YEAR: 1943 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 Reference mark 1 were recovered in good condition as described by C.T.H. in 1950. A power line crosses the ridge about 1/4 mile northwest of the station.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU HONA

STATE: HAWAII

YEAR: 1943

THIRD

ORDER

SOURCE: G- 5535

GEODETIC LATITUDE:	20° 48' 57.226	ELEVATION:	276 METERS
GEODETIC LONGITUDE:	156° 31' 19.628	SCALE:	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ or ANGLE °
HI 2	5102	549,366.00	175,286.92	+ 0 33 05 "

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
AZIMUTH MARK 1908	257° 07' 36.5	257° 04' 32 "	5102

QF 041

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

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1127
 LATITUDE ° ' TO ° '
 LONGITUDE ° ' TO ° '
 DIAGRAM

PUU HONA (continued)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

R

RECOVERY NOTE, TRIANGULATION STATION

R

FORM 526a
 (8-19-63)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU HONA
 ESTABLISHED BY: K. McBean
 RECOVERED BY: R.C. Munson
 YEAR: 1943
 YEAR: 1968
 STATE: Hawaii
 COUNTY: Maui
 ISLAND: Maui

NAME OF STATION: PUU HONA
 ESTABLISHED BY: K. McBean
 RECOVERED BY: J.V. Teater
 YEAR: 1943
 YEAR: 1973
 STATE: Hawaii
 COUNTY: Maui
 BENCH MARK(S) ALSO
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: About 1 1/2 miles north of Maalaea.

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:
 The station and reference marks 1 & 3 were recovered as described in the 1968 recovery note. The azimuth mark was not searched for.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
LUKE 1912	NE	About 3/4 mile	00 00 00.0	
Azimuth Mark	E	50.064	15.260	59 22 33.3
R.M. No. 1				74 06 39
WAIAKOA 1950	NW	10.038	3.060	101 41 39.3
R.M. No. 3				315 27 17

Station mark and RM No. 1 were recovered in good condition. RM No. 2 was not searched for since it is in an isolated location which makes it almost unusable for an azimuth mark. A new reference mark and an azimuth mark were established. A complete description follows:
 Station is located about 1-1/2 miles north-northwest of Maalaea, 5-1/2 miles south-southwest of Wailuku, and 3/4-mile due west of the junction of State Highways 30 and 31, on a hill of about 905 feet elevation, about on line with the power line running up the ridge to west, and is about 150 yards east of the first power line poles on the ridge, and the lower end of a bulldozed road.

To reach station from the post office at Kihel, go northwest on State Highway 31 for 3.7 miles to junction with State Highway 30. Turn left and go south on Highway 30 for 0.55 mile; turn right, at culvert, and go up cane field road for 0.45 mile to T-junction at canal and edge of field. Go right, along canal road, for 0.15 mile to end of truck travel just past jog in canal. Pack west about 1/2-mile to station.

Station mark is a standard disk stamped "PUU HONA 1943", cemented in a drill hole in the west side of a flat, 10-foot-diameter bedrock formation that projects 2 feet above ground. It is 14.7 feet south of a fence line. Reference mark number one is a standard disk stamped "RM 1 1943", set into the top of a 2-inch pipe projecting 10 inches from ground. It is 25 feet south of the fence and 15.2 feet lower than station mark. Reference mark number three is a standard disk stamped "PUU HONA 1943 NO 3 1968", cemented in a drill hole in a 3-foot boulder projecting 1 foot from ground. It is 6 feet south of the fence and about 1 foot higher than station mark.

Azimuth mark is a standard disk stamped "PUU HONA 1943 1968", cemented in a drill hole in the north end of the west concrete bridge abutment of the highway bridge at Pohakea Gulch. The mark is 18 feet west of center line of highway, 6 feet west of the metal guard rail, 3 feet east of the west face of the abutment wall, 3 feet north of the "1937" inscribed in the concrete bridge rail, and 10 inches above ground. To reach from junction of State Highways 30 and 31 go north on Highway 30 for 0.2 mile to north end of highway bridge and the mark on left.

*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 37173-P69

FORM C&GS-526 (9-60)
 USCOMM-DC 38896-P66

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1128
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Puu Manu (Lanai Island, Hawaiian Government Survey, 1879; F. G. Engle, 1927).—In southeastern part of Lanai, in Kaohai District, on Puu Manu, the crest of the main ridge about 600 meters southwest of the government road. In 1927 this road was said to be in poor but passable condition. Station marked by concrete post surrounded by large cairn of rocks. Reference marks (1927) are drill holes in large boulders, at the following distances and azimuths from the station: No. 1, 4.970 meters (16.31 feet), 110° 50'; No. 2, 15.25 meters (50.0 feet), 305° 54'; No. 3, 12.42 meters (40.7 feet), 27° 24'.

COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU MANU
 ESTABLISHED BY: HGS YEAR: 1879 STATE: Hawaii
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui
 Island: Lanai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.48 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
KAMAO				00 00 00.0
Lanai, VOR (LNY)	WSW	6.5	miles	39 18 35.8
R.M. No. 1	WSW	16.344	4.982	67 31 23
R.M. No. 2	SE	49.342	15.040	262 38 15
R.M. No. 3	SW	40.777	12.428	344 09 16

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

Station is located about 4-1/2 miles airline southeast of Lanai City and 2-1/2 miles north-northeast of Manele Bay, on the summit of a bare hill of 2072 feet elevation that overlooks Palawai Basin to the west, and is the highest of the group of bare hills that set apart from the much higher range of timbered hills to the north and northeast.

To reach station from the junction of Highways 44 and 441 at the south edge of Lanai City, go southerly on Highway 441 for 1.7 miles to a paved fork. Take left fork and go 1.15 miles to end of paved road. Continue ahead on graded road for 0.2 mile to T-road left. Turn left and go 0.5 mile to crossroad at edge of pineapple field. Continue ahead on narrow, graded road up brushy draw and up along hillside, southeasterly, for 1.8 miles to fork at edge of pineapple fields on top of mesa. Take right fork and go along edge of field for 0.35 mile to crossroad. Turn right, through gate, and follow graded road for 0.25 mile to dim right fork at bottom of grade. Take right fork and follow dim tracks up side of hill and then along crest of ridge for 0.55 mile to highest point of hill and station.

Station mark is a 6-inch-square, pre-cast, concrete post, with a large cross on its top, projecting 3 inches above ground. It is a boulder-strewn area, 13 feet northwest of center line of track road and 3.6 feet west-northwest of a white witness post.

Reference mark number one is a standard disk stamped "MANU 1 1927", cemented in a drill hole in a 2-1/2-foot-square lava rock outcrop that projects 1 foot above ground. It is about 1 foot lower than the station.

Reference mark number two is a standard disk stamped "MANU 2 1927", cemented in a drill hole in the top of a 3-foot boulder that projects about 3 feet above ground. It is 9 yards southeast of the center line of the track road and about 3 feet lower than the station.

Reference mark number 3 is a standard disk stamped "MANU 3 1927", cemented in a drill hole in the top of a 3-foot-diameter boulder that projects 6 inches above ground. It is 18 feet northwest of the center line of the road and about 2 feet lower than the station.

(continued on next page)

*N. 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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU MANU
 STATE: HAWAII YEAR: 1879 SECOND ORDER
 SOURCE: G-SP156

GEODETIC LATITUDE: 20° 46' 47.214	ELEVATION: 632 METERS
GEODETIC LONGITUDE: 156 52 20.980	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β 10R Δ 41 ANGLE *
HI 2	5102	429,688.85	162,192.64	- 0° 04' 23"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β 10R Δ 41 FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
KAMAO	43 18 23.7	43 22 47	5102

QI 445

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 201564 STATION 1128

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

PUU MANU (continued)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU MANU
ESTABLISHED BY: H.C.S. YEAR: 1879 STATE: Hawaii BENCH MARK(S) ALSO
RECOVERED BY: C.K. Townsend YEAR: 1976 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Lanai

4.5 miles southeast of Lanai City.

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:
Station and reference marks were recovered as described in 1962.
No measurements were made to reference marks. Station was reached by helicopter.

R

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1129
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NOAA FORM 76-39
 2-70

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: PUU NENE STATE: Hawaii COUNTY: Maui
 NEAREST TOWN: QUADRANGLE NO.: Island: Lanai
 CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962 DESCRIBED BY: R.F. Hanson

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK		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	DISTANCE		DIRECTION
				FEET	METERS	
2	KAHEA					
12c	R.M. No. 1		ENE	9.519	2.902	00 00 00.0
12a	R.M. No. 2		S	6.432	1.961	39 46 29 142 13 12

Detailed description:

Station is located about 5-1/2 miles airline east of Lanai City and 1-3/4 miles southwest of the old Halepalaoa wharf, on the east end of Puu Nene Flat. It is on a boulder-covered shoulder where the hill drops off rather steeply to the east, and is at about 1200 feet elevation.

To reach station from the post office in Lanai City, go northerly on Highway 44 for 8.6 miles to end of paved road; continue ahead on dirt road, Highway 44, for 6.5 miles to old Keomuku Village. Continue ahead for 1.0 mile to fork. Take left fork and continue along shoreline for 0.65 mile to point where road jogs right, at old well and coconut trees on right, then jogs left again. Continue southeasterly on the road for 0.3 mile to very dim side road right. Turn right and follow old badly washed-out track road southwest up ridge for 1.9 miles summit of east end of Puu Nene Flat. Bear left along shoulder of flat for 0.05 mile to station.

Station mark is a standard disk stamped "PUU NENE 1962", cemented in a drill hole in the center of an 8-foot-diameter, flat boulder that projects about 2-1/2 feet above ground. It is 50 yards north of a fence line, 12 feet east of a bare, eroded strip, and 7.0 feet east-northeast of a white witness post.

Reference mark number one is a standard disk stamped "PUU NENE NO 1 1962", cemented in a drill hole in a huge, rough, lava boulder about 8 x 14 feet in size. It is about 1 foot higher than the station.

Reference mark number two is a standard disk stamped "PUU NENE NO 2 1962", cemented in a drill hole in a 4-foot-diameter bedrock outcrop that projects about 2-1/2 feet above ground. It is 6 feet east of the witness post and about 3 feet higher than the station.

NOTE: A small jeep is the only vehicle that can be driven up the washed-out track road.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU NENE
 STATE: HAWAII YEAR: 1962 SECOND ORDER

SOURCE: G-13124

GEODETIC LATITUDE: 20° 49' 06.638	ELEVATION: 366.8 METERS
GEODETIC LONGITUDE: 156° 50' 06.602	1203 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	442,454.61	176,244.45	- 0° 05' 36"

* 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
KAHEA	211 36 44.4	211 40 20	5102

QF 367

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1130
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

PUU PEHE (MauI County, Hawaii, J.B.M., 1914; O.W.S., 1931)

Station is marked by a large cairn of rocks, located on the top of the rocky bluff, on the SW side of Manele Bay. There is a rocky island called Puu Pehe rock just offshore from the station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUU PEHE
 STATE: HAWAII YEAR: 1914 SECOND ORDER

SOURCE: G-13124

GEODETIC LATITUDE	20° 44' 20.468	ELEVATION	36.2 METERS
GEODETIC LONGITUDE	156 53 36.214		119 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ ° ANGLE *
HI 2	5102	422,525.14	147,396.92	- 0 04' 49"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
KAEA USPLHS	87 29 42.1	87 34 31	5102

QF 372

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: PUU PEHE
 ESTABLISHED BY: J.B.M. YEAR: 1914 STATE: Hawaii
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui
 Island: Lanai

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.67 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	
KAEA 1914 (USLHS) 1933				00 00 00.0
R.M. No. 1	N	15,070	4.593	92 02 47
R.M. No. 2	WSW	18,779	5.724	331 58 46
Palaoa Pt. Light	WSW	4.8	miles	359 38 06.6

The remains of a large cairn was recovered, and beneath it was found a mark consisting of the neck of a bottle cemented in a hole in a large block of rock. The rock was slightly loose so was removed and the station was re-marked with a standard disk plumbed to the original point. Two reference marks were established. A complete description follows:

Station is located about 6-1/2 miles airline south-southeast of Lanai City and 1/2 mile southwest of the small boat harbor at Manele Bay; on the summit of a brush-covered, rocky bluff opposite a prominent rock butte known as Sweetheart Island that sets about 100 yards south of the shoreline cliff.

To reach station from the junction of Highways 44 and 441 at the south edge of Lanai City, go south on Highway 441 for 4.0 miles to paved fork at sign "HULOPOE BAY". Take left fork and go south for 3.7 miles to bottom of grade at boat harbor on left. Continue ahead on dirt road for 0.45 mile, keeping to east side of cove, to end of road at shoreline cliff. Pack easterly up along edge of cliff for about 300 yards to top of ridge. Go left, northerly, through brush, for about 75 yards to station.

Station mark is a standard disk stamped "PUU PEHE 1914 1962", set in the top of a 10-inch diameter concrete monument flush with the ground. It is at the center of a large circle of red cinder boulders, in a small clearing in the brush.

Reference mark number one is a standard disk stamped "PUU PEHE NO 1 1914 1962", cemented in a drill hole in a 1 x 2-foot boulder that projects 6 inches above ground. It is about 1 foot higher than the station.

Reference mark number two is a standard disk stamped "PUU PEHE NO 2 1914 1962", cemented in a drill hole in an 18 x 30-inch boulder that projects 6 inches above ground. It is at about the same elevation as the station mark.

Station PUU MANU (HGS) 1879 1927 will serve as the azimuth mark.

(continued on next page)

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

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

USCOMM-DC 27178-P88

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201564

STATION 1130

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

PUU PEHE (continued)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: PUU PEHE
ESTABLISHED BY: J.B.M. YEAR: 1914 STATE: Hawaii BENCH MARK(S) ALSO
RECOVERED BY: C.K. TOWNSEND YEAR: 1976 COUNTY: MAUI ISLAND:
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Lanai

6.5 miles south-southeast of Lanai City

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

Station mark and reference marks were recovered in good condition. There was no evidence of a circle of red cinder boulders as described in the 1962 recovery note. Distances measured to RM 1 and RM 2 checked with distances in the recovery note. Reference mark RM 3 stamped PUU PEHE RM 3 1976 was established and is located 66.687 meters on an azimuth of 12° 32' 57.9" from the station. RM 3 is a NOS disk stamped as a reference mark.

NOV 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 201564 STATION 1131
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

SEE STATION PUU PEHE

ADJUSTED HORIZONTAL CONTROL DATA

ADJUSTMENT BY NGS

NAME OF STATION: PUU PEHE RM 3 OBS BY NGS
 STATE: HAWAII YEAR: 1976 THIRD -ORDER

SOURCE: G-15810

GEODETIC LATITUDE:	20° 44' 18.35122	ELEVATION:	35.3 METERS
GEODETIC LONGITUDE:	156 53 36.71455		116 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ ° ANGLE *
HI 2	5102	422,481.33	147,183.42	- 0° 04' 49"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
PALAOA PT LIGHT	87° 36' 24.01	87° 41' 13"	5102

THESE DATA OBTAINED FROM ADJUSTMENT OF OCT 1979

RL 015

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1132
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 635 b

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: PUUKOLII, CENTRAL POWER CO., STACK
 YEAR: 1950 STATE: Hawaii COUNTY: Maui
 CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:

The station is the top and center of a fluted concrete smoke stack which is located on the north side of The Central Power Company number 6 in the village of Puukolii.

The stack is 193 feet in height, about 12 feet in diameter, and rests on a circular base which is flush with the surface of the ground.

(11-0-55)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Puukolii Central Power Co. Stack
 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 stack is now painted black and is at the abandoned Puukolii Power Station on the east side of the highway.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Puukolii, Central Power Co. Stack
 ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located about 3 miles north-northwest of Lahaina, 1 mile northwest of Puukolii Village, and 800 feet southeast of State Highway 30, opposite the south end of the Lahaina Airport.

Station is the center of the greyish, concrete stack, with fluted top, about 140 feet tall and 12 feet in diameter, at north end of the power plant building.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PUUKOLII CENTRAL POWER CO STK
 STATE: HAWAII YEAR: 1950 THIRD ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 56 34.826	ELEVATION	METERS
GEODETIC LONGITUDE	156 41 31.219		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ θ ANGLE*
HI 2	5102	491,555.63	221,433.35	- 0° 00' 33"

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

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

NOV 1979
 U. S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SURVEY ; NATIONAL GEODETIC SURVEY
 MAR 1981

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1131
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

PUU PEHE RM 3 (Maui Island, Hawaii, C.K.T., 1976) Station is a
 NOS disk stamped PUU PEHE RM 3 1976 used as a reference mark.
 Station is located 66.687 meters on an azimuth of 12° 32' 57.9"
 from station PUU PEHE.

ADJUSTED HORIZONTAL CONTROL DATA

ADJUSTMENT BY NGS

NAME OF STATION: PUU PEHE RM 3 OBS BY NGS
 STATE: HAWAII YEAR: 1976 THIRD ORDER

SOURCE: G-15810

GEODETIC LATITUDE:	20° 44' 18.35122	ELEVATION:	35.3
GEODETIC LONGITUDE:	156 53 36.71455		116 METERS FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	∠ OR Δ OR ANGLE °
HI 2	5102	422,481.33	147,183.42	- 0° 04' 49"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
PALAOA PT LIGHT	87° 36' 24.01	87° 41' 13"	5102

THESE DATA OBTAINED FROM ADJUSTMENT OF OCT 1979

RL 015

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 201564 STATION 1132
 HAWAII
 LATITUDE 20 °30' TO 21 °00'
 LONGITUDE 156 °30' TO 157 °00'
 DIAGRAM NF 4-16 MAUI

MAR 1981

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 535
 250, 1969

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: HONO
 CHIEF OF PARTY: O. W. Swainson,
 Surface-station mark, Note,*
 Underground-station mark, Note,*
 Reference mark, Note,*
 Reference mark, Note,*
 Witness mark, Note,*
 Witness mark, Note,*
 Height of signal above station mark meters.
 Height of telescope above station mark meters.
 Detailed description:

STATE: HAWAII COUNTY: Maui			
YEAR: 1931	LOCALITY: N. W. Coast of Maui.		
DISTANCES AND DIRECTIONS TO REFERENCE MARKS AND PROMINENT OBJECTS			
OBJECT	DISTANCE	DIRECTION	AZIMUTH

Station is a tall white concrete stack, owned by the Pioneer Mill Co., located at Honokawai, which is about 2 miles north of Kekaa Pt. Station is a prominent landmark. Clearly visible offshore. This is an intersection station.

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

RECOVERY OF TRIANGULATION INTERSECTION STATION

HONO
 NAME OF STATION: PUUKOLII, CENTRAL POWER CO., STACK
 CHIEF OF PARTY: C. T. Husemeyer
 YEAR: 1950 STATE: Hawaii COUNTY: Maui

Description, including sketch of object:

The station is the top and center of a fluted concrete smoke stack which is located on the north side of The Central Power Company number 6 in the village of Puukolii.

The stack is 193 feet in height, about 12 feet in diameter, and rests on a circular base which is flush with the surface of the ground.

RECOVERY NOTE, TRIANGULATION STATION

HONO
 NAME OF STATION: (Puukolii Central Power Co. Stack)
 ESTABLISHED BY: C.T.H. YEAR: 1931 STATE: Hawaii
 RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

The station was recovered in good condition as described. The stack is now painted black and is at the abandoned Puukolii Power Station on the east side of the highway.

RECOVERY NOTE, TRIANGULATION STATION

HONO
 NAME OF STATION: HONO
 ESTABLISHED BY: O.W. Swainson YEAR: 1931 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered; it is the same as Intersection Station Puukolii, Central Power Co. Stack.

Located about 3 miles north-northwest of Lahaina, 1 mile northwest of Puukolii Village, and 800 feet southeast of State Highway 30, opposite south end of the Lahaina Airport.

Station is a greyish, concrete stack, with fluted top, about 140 feet tall, at north end of power plant building.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HONO
 STATE: HAWAII YEAR: 1931 THIRD ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 °56'34.826	ELEVATION: METERS
GEODETIC LONGITUDE: 156 41 31.219	FEET

STATE COORDINATES (Ft)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	491,353.63	221,433.35	- 0 00 33

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

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

QE 421

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1133
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

SEE STATION KAHUA

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: RAINTRAP 24 N COR
 STATE: HAWAII YEAR: 1962 THIRD -ORDER

SOURCE: G-13124
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 ° 54' 00.334	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 50 02.191		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE *
HI 2	5102	408,770.68	205,921.59	- 0 35 43 "

* 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

POSITION DETERMINED BY TRAVERSE FROM STATION KAHUA

QF 387

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1134
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: RAW
 STATE HAWAII YEAR 1914 THIRD -ORDER

SOURCE G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 ° 54' 28.93	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 41 21.55		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR $\Delta \theta$ ANGLE *
HI 2	5102	452,268.33	208,731.33	- 0 ° 00' 29 "

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

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

QO 023

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1135
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Red (Kahoolawe Island, J. F. Pratt, 1904).—In the western part of Kahoolawe, on a bare red hill overlooking a portion of the northern shore line, distant about 1 mile from the nearest shore line, and about 300 meters from the shallow opening at the northwest end of a large depression. Marked by flagpole driven into ground with small stones piled around its base.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: RED
 STATE: HAWAII YEAR: 1904 THICK ORDER
 SOURCE: G-SP156

GEODETIC LATITUDE:	20° 32' 53.905	ELEVATION:	METERS
GEODETIC LONGITUDE:	156° 38' 46.444		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	506,990.25	78,076.74	+ 0° 00' 26"

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

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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1136
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: REEF
 STATE: HAWAII YEAR: 1904 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 33' 29.840	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 40 45.296		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ HOR Δ ϕ ANGLE *
HI 2	5102	495,695.66	81,701.86	- 0 00' 16"

* 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

QD 209

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1137
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: REFERENCE MARK 3
 ESTABLISHED BY: K. McBean YEAR: 1943 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

R

NAME OF STATION: REFERENCE MARK 3
 STATE: HAWAII YEAR: 1943 THIRD ORDER

SOURCE: G- 5535

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

for but not found and believed destroyed.

Searched

A trial point was established in the vicinity by triangulation from stations WAIKOA, PUU HONA and Radio Station WWVH, mast 1950; a search was made at the distance and angle determined by inverse from this point but no mark was found.

The point falls in the roadway of the cane-field boundary road of Field No. 97 of the Wailuku Sugar Company, and since this road and canal were constructed prior to 1920 the mark was apparently located on the roadway, and is believed to have been knocked by road graders.

GEODETTIC LATITUDE:	20° 49' 30.612	ELEVATION:	99	METERS
GEODETTIC LONGITUDE:	156 30 50.424	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	552,133.30	178,657.82	+ 0° 05' 15"

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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1138
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: RICE STATE: Hawaii COUNTY: Maui
 CHIEF OF PARTY: C. T. Husemeyer YEAR: 1950 Described by: C. J. Hoepfel
 HEIGHT OF TELESCOPE ABOVE STATION MARK 1.80 METERS.1 HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
		OBJECT	BEARING	DIRECTION
4	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			
			Distance	
			feet	meters
12c		WAILAKOA Lighthouse, McGregor Point	SE 12.031	00 00 00 30 53 36.0
12c		R. L. No. 1	SE 29.23	43 30 16 8.91
		R. L. No. 2	W	165 06 02

The station is located on the crest of a rocky, north-south ridge which lies about 11 miles southeast of Lahaina, about 7 miles south southwest of Wailuku, about 5 miles west of Kihel, about 1.0 mile northwest of McGregor Point, 0.3 mile south of a concrete water trough and 200 feet east of the edge of a steep gulch.

To reach from the post office at Wailuku; go westerly for one block; turn left, as per the sign reading Lahaina, and go south and west for 7.8 miles; turn right, pass through a board gate, into the Rice Ranch property, and follow the main traveled road, northerly, for 1.45 miles to the end of truck travel. From this point pack westerly (240 degrees magnetic) for about 0.3 mile to the edge of a steep gulch and the station.

The station is a standard disk, stamped RICE 1949, set into a drill hole in a boulder which projects about 1 foot.

Reference mark number 1 is a standard disk, stamped RICE NO 1 1949, set into a drill hole in a boulder which projects 2 inches and is located about 2 feet lower than the station.

Reference mark number 2 is a standard disk, stamped RICE NO 2 1949, set into a drill hole in a boulder which projects about 8 inches and is located at about the same elevation as the station.

(11-8-55)

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

R

NAME OF STATION: RICE
 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. A ten foot 2x2 pole was found over the station. The description is adequate.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: RICE
 STATE: HAWAII YEAR: 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 47' 38.522	ELEVATION: 364.1 METERS
GEODETIC LONGITUDE: 156 32 51.389	1195 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE ^a
HI 2	5102	542,564.39	167,340.74	+ 0° 02' 39"

^a 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
PAPAWAI	353 51 44.5	353 49 05	5102

QE 374

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1138

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

RICE (continued)

FORM 5:
 16-78-891

U.S. DEPARTMENT OF COMMERCE

RECOVERY NOTE, TRIANGULATION STATION

R

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

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PAPAWAI -----1950 DISTANCE	and DIRECTION			00 00 00.0
R.M. No. 2	W	29.23	8.91	91 22 09
R.M. No. 1	SE	12.031	3.691	329 47 23
PAPAWAI 1950 -----1969 DISTANCE	and DIRECTION			00 00 00.0
R.M. No. 2	W	29.212	8.905	91 19 27
R.M. No. 1	SE	12.113	3.693	329 49 20

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

Station is located about 7 miles southwest of Wailuku, 1-3/4 miles west of Maalaea Harbor, and 1 mile north-northwest of Papawai Point, on a sloping ridge, at about 1195 feet elevation, along the east side of Manawalnui Gulch, 1800 feet due south of a concrete water trough.

To reach station from the post office in Wailuku, go south on State Highway 30 for 7.0 miles to Maalaea Harbor; continue one the highway for

0.9 mile to board gate on right. Pass through gate and go up old track road for 1.85 mile to flat area, 0.15 mile before reaching concrete water trough. Go left, picking way down rocky slopes, for 0.35 mile to edge of gully on right, at about same elevation as station. Pack west-erly, across gully and around side of slope, for about 225 yards to station.

NOTE: A 4-wheel-drive vehicle is needed.

Station mark is a standard disk stamped "RICE 1949", cemented in a drill hole in a flat boulder projecting 1 foot from ground. It is 60 feet east of rim of deep gulch. There is a cairn and signal over the mark.

Reference mark number one is a standard disk stamped "RICE NO 1 1949", cemented in a drill hole in a 12-inch bedrock outcrop that projects 2 inches from ground, and is 2 feet lower than station mark.

Reference mark number two is a standard disk stamped "RICE NO 2 1949", cemented in a drill hole in a 30-inch-diameter, bedrock outcrop that projects 6 inches from ground, and is 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.

USCOMMA-DC 27178-P89

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1139
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 236
 (Rev. Feb. 1965)

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: S
 ESTABLISHED BY: C.T. Husemeyer Year: 1950 STATE: Hawaii COUNTY: Maui

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

Located on the north coast of West Maui, Wailuku District, on the land of Kahakuloa, about one mile southeast of the village of Kahakuloa, on the point of a low brush covered ridge, and about 0.3 miles west of the road where it makes a U curve around a deep canyon. Station recovered was a 2 inch galvanized iron pipe projecting about 1 foot and surrounded by mound of large rocks. This was replaced with a standard disk set in a buried boulder projecting about 8 inches. Stamped S 1949.

Reference mark No. 1 is south of the station. A standard disk set in a buried boulder flush with the ground. Stamped S NO 1 1949.

Reference mark No. 2 is west of the station. S atandard disk set in a buried boulder flush with the ground. Stamped S NO 2 1949.

To reach from the Post Office in Kahului go northeast on coast road toward Kahakuloa for 13.6 miles to a small green house on left. Turn left into yard then on trail through brush for about 0.3 miles to foot of ridge and ETT. From here pack westerly along ridge for about 0.5 miles to second point and station.

OBJECT	DISTANCE	DIRECTION
HAUNAIKO	feet meters	0 00 00.0
R.L. No. 1 S	16.38 4.994	212 55 16.1
R.M. No. 2	21.39 6.522	310 27n 20.6
Light House, Kahalele Pt.	4 miles	357 13 10.08

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: S
 STATE: HAWAII YEAR: 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20° 59' 05.721	ELEVATION:	345.2 METERS
GEODETIC LONGITUDE:	156 33 06.096		1133 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ANGLE
HI 2	5102	539,221.76	236,670.91	+ 0 02 28

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From 1022b)	PLANE AZIMUTH (From 1022b)	CODE
KAHAKULOA	189 38 42.0	189 36 14	5102

QC 383

(continued on next page)

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1139

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

S (continued)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: S
 ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK ALSO
 RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui
 HEIGHT OF TELESCOPE ABOVE STATION MARK 1.41 FEET. HEIGHT OF LIGHT ABOVE STATION MARK FEET.

DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
KAHAKULOA (HGS) 1882 -----1950 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 1	S	16.38	4.994	166 33 17
R.M. No. 2	W	21.39	6.522	264 05 21
KAHAKULOA (HGS) 1882 -----1969 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 1	S	16.375	4.992	166 42 52
R.M. No. 2	W	21.392	6.521	264 04 52

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

Station is located about 7 miles north-northwest of Wailuku and 1 mile south of Kahakuloa Village, on the northeast edge of a brushy hill, at about 1133 feet elevation, along Kaukini Ridge, and is just 10 feet inside the brush from bare northeast side of the hill. An old, washed-

out, jeep road passes just below the station.

To reach station from the junction of Main and Market Streets in Wailuku, go north on Market Street, continuing on State Highway 33, for 3.6 miles to Waihee Village; continue on the highway for 8.9 miles to a wire gate on left, at sharp left curve of road, and power pole No. 31. Pass through gate and go up pasture slope for 0.3 mile to end of road at a power line. Pack up washed-out jeep road about 1/3-mile to station.

Station mark is a standard disk stamped "S 1949", cemented in a drill hole in the top of an 8 x 10-inch boulder that projects 8 inches from ground. A large pile of grey boulders is built up over the mark, and may be seen from outside the brush line by peering through the underbrush.

Reference mark number one is a standard disk stamped "S NO 1 1949", cemented in a drill hole in a boulder flush with ground. It is 14 inches higher than station mark and usually covered with dirt and leaves.

Reference mark number two is a standard disk stamped "S NO 2 1949", cemented in a drill hole in a 12-inch boulder top flush with ground. It is 0.15 foot lower than station mark and usually covered with dirt and leaves.

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

JUN 1978

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1140
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 505
Rev. Aug. 1963

DESCRIPTION OF ~~TRAVEL~~ TRAVEL STATION

NAME OF STATION: **SEE 2** STATE: **Hawaii** COUNTY: **Mau**
CHIEF OF PARTY: **H. J. Seaborg** YEAR: **1963** Island: **Kahoolawe**
Described by: **M.L.G.**
HEIGHT OF TELESCOPE ABOVE STATION MARK **1.46 METERS.†** HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	BEARING	DISTANCE		DIRECTION‡		
				feet	meters	0	1	2
2	Surface-station mark, Underground-station mark							
12c		ERR 2	NE	36.16	11.020	00	00	00.0
12c		R.M. No. 1	S	82.69	25.203	298	09	57.4
		R.M. No. 2				298	12	05.8

Detailed description
Station is located near the west end of Kahoolawe Island about 2 miles northeast of Kealahiki Point and 0.8 mile south of Honokaa Bay near the western edge of a grass covered hill about 440 feet in elevation.
Station is best reached by making a skiff landing in Honokaa Bay and packing southerly about 0.8 mile to the station.
Station mark is a standard triangulation disk stamped "SEE 2 1963", cemented in a drill hole in a 1 x 1-foot exposed section of bedrock flush with the ground. It is about 50 feet east of a large outcrop of bedrock that projects 5 feet and about 10 feet west of a 2 x 4 board driven in the ground with rocks piled around it.
Reference mark number one is a standard disk stamped "SEE 2 NO 1 1963", cemented

in a drill hole in a rock 18 inches in diameter that projects about 6 inches and is at about the same elevation as the station mark.
Reference mark number two is a standard disk stamped "SEE 2 NO 2 1963", cemented in a drill hole in the top of the west end of a 4-foot-diameter boulder that projects about 1 foot and is at about the same elevation as the station mark.

* 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.

16-54820-1 U. S. GOVERNMENT PRINTING OFFICE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **SEE 2**
STATE: **HAWAII** YEAR: **1963** SECOND ORDER

SOURCE: **G-13245**

GEODETIC LATITUDE: 20° 32' 55.3660	ELEVATION: 132.7 METERS
GEODETIC LONGITUDE: 156° 40' 37.8538	435 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	PLANE ANGLE*
HI 2	5102	496,402.51	76,206.07	- 0 00 13

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
ERR 2	51 11 45.8	51 11 59	5102

QF 404

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1141
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SHED
 STATE: HAWAII YEAR: 1900 THIRD -ORDER

SOURCE: G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 ° 46' 45.28	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 32 28.38		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	542,854.06	161,969.35	+ 0 ° 02' 40"

* 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 118

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1142
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SHY
 STATE: HAWAII YEAR: 1904 ORDER: THIRD

SOURCE: G-SP156

GEODETIC LATITUDE	20° 33' 39.162	ELEVATION	METERS
GEODETIC LONGITUDE	156 40 14.419		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	498,629.83	82,642.18	- 0 00 05

* 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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1143
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SITE
 STATE HAWAII YEAR 1914 THIRD ORDER

SOURCE: G-SP150

GEODETIC LATITUDE:	20° 53' 18".232	ELEVATION:	METERS
GEODETIC LONGITUDE:	156° 41' 20.311		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ρ 10R Δ ρ 1 ANGLE *
HI 2	5102	452,384.81	201,598.48	- 0° 00' 29"

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

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

QQ 021

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1144
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 585
 Rev. Aug. 1968

TRaverse DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: SOUTH CRATER 2 STATE: Hawaii COUNTY: Maui
 Island: Kahoolawe
 Described by: R. F. Hanson
 CHIEF OF PARTY: H. J. Seaborg YEAR: 1963

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.64 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			
			BEARING	DISTANCE		DIRECTION‡
	OBJECT		feet	meters		
2	Surface-station mark, Underground-station mark					
	BLACK 2				00 00 00.0	
12a	R.M. No. 1	SSW	55.61	16.950	33 38 31	
12a	R.M. No. 2	WNW	53.88	16.425	117 49 37	

Station is located about 1-1/4 miles airline north-northwest of Kamohio Bay, at about the center of Kahoolawe Island, at the west end and highest point of a red, rocky hill of about 1161 feet elevation and known as Puu Moiwai.
 Station is best reached by making a skiff landing in Ahupu Bay, about midway along the north shoreline of the island, and packing southeast up along brushy ridge between Ahupu and Ahupuiki Gulches for about 2-3/4 miles to top of red ridge and station.
 Station mark is a standard disk stamped "SOUTH CRATER 2 1963", cemented in a drill hole in red lava bedrock flush with the ground. It is about 50 yards southwest of, and above, a heavy growth of

large keawe trees.

Reference mark number one is a standard disk stamped "SOUTH CRATER 2 NO 1 1963", cemented in a drill hole in the southwest end of a bedrock ledge that projects 3 feet. It is 15 yards southeast of crest of ridge and about 3-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "SOUTH CRATER 2 NO 2 1963", cemented in a drill hole in a 15-foot-diameter, flat, bedrock outcrop that projects about 2 feet. It is about 4-1/2 feet lower than station mark.

* 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.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SOUTH CRATER 2
 STATE: HAWAII YEAR: 1963 SECOND ORDER

SOURCE: G-13249

GEODETIC LATITUDE: 20 ° 32' 44.2793	ELEVATION: 351.7 METERS
GEODETIC LONGITUDE: 156 36 30.6100	1154 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ ± ANGLE *
HI 2	5102	519,899.32	77,108.73	+ 0 01 14 "

* 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
BLACK 2	353 48 22.5	353 47 08	5102

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1145
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

TRAVERSE DESCRIPTION OF TELESCOPE STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 533
 Rev. Aug. 1963

NAME OF STATION: **SOUTH HILL 2** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Kahoolawe**
 Described by: **J. R. L.**
 CHIEF OF PARTY: **H. J. S.** YEAR: **1963**
 HEIGHT OF TELESCOPE ABOVE STATION MARK **1.67** METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	DISTANCE		DIRECTION †		
			feet	meters	°	'	"
2	Surface-station mark Underground-station mark						
		OBJECT	BEARING				
		SOUTH CRATER 2			00	00	00.0
12c		R.M. No. 2	SW	76.88	23.431	170	39 22
12c		R.M. No. 1	N	70.62	21.526	320	03 59

Station is located on a small hill which is about 2½ miles from Smuggler Cove and ¼ mile northwest from the head of Waikahalula Bay. The hill is covered with large boulders.

Station is best reached by making a skiff landing in Smuggler Cove at the west end of Kahoolawe Island then packing east about ½ mile to the old road which runs northeast. Follow the old road 1 mile then turn east cross-country 1 mile to the hill and the station.

Station mark is a standard triangulation disk stamped SOUTH HILL 2 1963 cemented in a drill hole in a 7 x 5-foot exposed section of bedrock that projects 1½ feet above the ground.

Reference mark number one is a standard disk stamped SOUTH HILL 2 NO 1 1963,

cemented in a drill hole in a boulder which is 5 feet in diameter. It is about 2 feet below the elevation of the station.

Reference mark number two is a standard disk stamped SOUTH HILL 2 NO 2 1963, cemented in a drill hole in a 2 x 2½-foot boulder which projects 6 inches above the ground and is 3 feet below the elevation of the station

Detailed description

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

† Direction-angle measured clockwise, referred to initial station.
 16-58289-1 U. S. GOVERNMENT PRINTING OFFICE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **SOUTH HILL 2**
 STATE: **HAWAII** YEAR: **1963** SECOND ORDER

SOURCE: **G-13249**

GEODETTIC LATITUDE	20° 31' 18.3324	ELEVATION	162.6 METERS
GEODETTIC LONGITUDE	156° 39' 08.3505		5.3 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	H OR Δ OR ANGLE †
HI 2	5102	504,905.26	68,434.46	+ 0° 00' 18"

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

TO STATION OR OBJECT	GEODETTIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
SOUTH CRATER 2	239 56 54.4	239 56 36	5102

QF 400

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1146
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **STACK**
 STATE: **HAWAII** YEAR: **1900** ORDER: **THIRD**

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

GEODETIC LATITUDE:	20 52' 27.09	ELEVATION:	
GEODETIC LONGITUDE:	156 40 17.28	METERS	
		FEET	

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	498,361.33	196,438.19	- 0° 00' 06"

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

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

QD 015

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1147
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

SEE STATION WAIKULU 2

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SURVEY MARK NR WAIKULU 2
 STATE: HAWAII YEAR: 1950 SECOND ORDER

SOURCE: G- 9511
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20° 58' 02.049	ELEVATION	454	METERS
GEODETIC LONGITUDE	156 38 09.920	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLE *
HI 2	5102	510,432.46	230,233.79	+ 0° 00' 39"

* 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
POSITION DETERMINED BY TRAVERSE FROM STATION WAIKULU 2			
QE 435			

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1148
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

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

GEODETIC LATITUDE:	20° 58' 48.93	ELEVATION:	304	METERS
GEODETIC LONGITUDE:	156° 32' 13.90	SCALE:		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ or ANGLE *
HI 2	5102	544,169.26	234,980.60	+ 0° 02' 47"

* 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

QD 007

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1149
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 535
 Rev. Aug. 1966

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: THIRTY STATE: Hawaii COUNTY: Maui

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

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			
			DISTANCE		DIRECTION	
			feet	meters		
1	Surfaces-station mark					
	Underground-station mark					
	OBJECT	BEARING				
	ANU				00 00 00	
12c	R. M. No. 2	S ⁷	20.768	6.330	55 17 05	
12c	R. M. No. 1	LINE	14.375	4.382	297 22 24	

The station is located in sloping pasture land which lies about 8 miles east southeast of Lahaina, about 7.5 miles west northwest of Kihei, about 4 miles northwest of McGregor Point, about 0.5 mile east of the Lahaina and Wailuku Districts boundary line, about 0.5 mile south of the Forest Reserve fence and about 0.2 mile east of the rim of Ukamehame Gulch. Higher ground is to the north of the station. The station site is covered with boulders which project as high as 4 feet.

To reach from the post office at Wailuku; go westerly for one block; turn left, as per the sign reading "Lahaina" and go south and west for 7.8 miles; turn right, pass through a locked gate (key for this gate may be obtained from the foreman of the Rice Ranch who lives in the village of Laalaea) and go northerly, up a steep grade, for 2 miles to a concrete water trough; bear to the right and follow the graded

road northerly, cross over a steep gulch, bear left up the long, grass covered ridge for 2.7 miles; pass to the left hand side of Puu Anu and follow the dim track road northerly, for 0.7 mile; pass through the gate in the forest reserve fence and follow the dim track road north and west for 0.3 mile to the edge of the canyon rim and the end of truck travel. From this point pack southwest for about 0.2 mile; pass through a gate in the forest reserve fence and follow the canyon rim, southerly, for about 0.2 mile to an iron pipe; bear left and follow the gentle slope down hill, keeping above the heads of several small gulches, for about 0.4 mile to the rocky ground and the station.

The station is a standard disk, stamped THIRTY 1949, set into a drill hole in a large flat boulder which projects about 1 foot.

Reference mark number 1 is a standard disk, stamped THIRTY NO 1 1949, set into a drill hole in a boulder which projects about 3 feet. It is located about 4 feet higher than the station.

Reference mark number 2 is a standard disk, stamped THIRTY NO 2 1949, set into a drill hole in a boulder which projects about 1 foot. It is located 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.
 ‡ To nearest meter only, when no trigonometric leveling is being done.

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(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION THIRTY
 STATE HAWAII YEAR 1950 FIRST ORDER

SOURCE G-9311

GEODETIC LATITUDE	20° 49' 32.814	ELEVATION	562.6 METERS
GEODETIC LONGITUDE	156 33 54.013		3224 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	± OR Δ ± ANGLE °
HI 2	5102	534,717.71	178,866.24	+ 0° 02' 10"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
ANU	274 47 03.8	274 44 54	5102

QE 572

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1149
 LATITUDE ° ' TO ° '
 LONGITUDE ° ' TO ° '
 DIAGRAM

THIRTY (continued)

FORM 526a
 (6-1969)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: THIRTY
 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 1.4 METERS, HEIGHT OF LIGHT ABOVE STATION MARK METERS.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
ANU -----1950 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 2	SW	20.768	6.330	55 17 05
R.M. No. 1	NNE	14.375	4.382	297 22 24
ANU 1950 -----1969 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 2	SW	20.710	6.313	55 17 36
R.M. No. 1	NNE	14.250	4.344	297 23 12

Station was recovered and all marks found in good condition. Discrepancies were noted in the distance to both RMs; they were double-checked, and the 1969 distances are correct. A complete description follows:

Station is located about 6 miles southwest of Wailuku and 4 miles east-northeast of Olowalu, on a sloping, brushy ridge in pasture land about 1/4-mile north of a large power line, on the east side of Ukumehame Gulch and bordered on the east by Papalaua Gulch. Station is at about

3224 feet elevation and is 100 yards west of a track road.

To reach station from the post office in Wailuku, go south on State Highway 30 for 7.0 miles to Maalaea Harbor; continue on the Highway for 0.9 mile to board gate on right. Pass through gate and go up old track road for 4.4 miles to base of Puu Anu; continue on the road for 0.8 mile to wire gate. Pass through gate and go ahead for 0.2 mile; keep ahead, on right fork, for 0.25 mile to fork; take right fork and go along rim and up grade for 0.35 mile to side road left. Go left down along ridge for 0.4 mile; go right, leaving the road just before dropping down onto last bench where power line is, and go west across brush area for 100 yards to station. NOTE: A 4-wheel-drive vehicle is required.

Station mark is a standard disk stamped "THIRTY 1949", cemented in a drill hole in the center of a flat, 4 x 6-foot boulder that projects 1 foot from ground.

Reference mark number one is a standard disk stamped "THIRTY NO 1 1949", cemented in a drill hole in a 3-foot boulder that projects 3 feet from ground. It is 4 feet higher than station mark.

Reference mark number two is a standard disk stamped "THIRTY NO 2 1949", cemented in a drill hole in a 3 x 4-foot boulder that projects 16 inches from ground, and is 3-1/2 feet lower than station mark.

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

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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1150
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: TRAY

STATE: HAWAII

YEAR: 1904

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 33' 51.562	ELEVATION:	METERS
GEODETIC LONGITUDE:	156° 39' 44.243		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE*
HI 2	5102	501,497.28	83,893.19	+ 0° 00' 00"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From 0000)	PLANE AZIMUTH* (From 0000)	CODE

QD 211

