

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1051
HAWAII
LATITUDE 20 ° 30' TO 21 ° 30'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Ka Lae o Ka Ilio (Maui Island, Hawaiian Government Survey, 1885).—On southern shore of Maui, in Kaupo District, near the end of a long rocky point of same name, 1 mile due south of the Catholic Church building, in the land of Kaalelehinale. Marked by an iron stake let into the rock, and inclosed by a block of concrete.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KA LAE O KA ILIO
ESTABLISHED BY: Hawaiian Govt. YEAR: 1885 STATE: Hawaii
RECOVERED BY: C. T. Husemeyer YEAR: 1950 COUNTY: Maui

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

The station was recovered as described and in good condition. A standard bronze station disk was set in a concrete post in the exact position as was occupied by the original iron pin. Two reference marks were established. A new description follows—

The station is located on the most southerly point of Ka Lae O Ka Ilio, which lies about 1 mile south of the Kaupo Catholic Church.

To reach from the Kaupo School; go westerly, on the graded road, for 1.55 miles; turn left, pass through a locked board gate. (key to gate at house on left) and go south, on a track road, for 1.0 mile; bear to the right and cross over a gully, then to the left, down the ridge for about 0.25 mile to the end of the cape and the station.

The station is a standard disk, stamped KA LAE O KA ILIO 1950, set in the top of a square concrete post which projects about 8 inches.

The underground station is a standard disk, stamped KA LAE O KA ILIO 1950 set into a mass of concrete which is 40 inches below the surface of the soil.

Reference mark number 1 is a standard disk, stamped KA LAE O KA ILIO NO 1 1950, set into a drill hole in a boulder which projects about 1 foot and is about 4 feet lower than the station.

Reference mark number 2 is a standard disk, stamped KA LAE O KA ILIO NO 2 1950, set into a drill hole in a boulder which projects about 1 foot and is about 2 feet higher than the station.

NOTE	OBJECT	BEARING	FEET	METERS	DIRECTION
12e	PUU MANEONEO 2				
12e	E. M. No. 1	NNW	24.842	7.572	00 00 00
	Kaupo, Spire (Kaupo Cath. Ch.)	N	1.0 mile		58 02 48
12e	R. M. No. 2	WSW	24.085	7.341	78 56 00.2
					322 51 02

Form 526
(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KA LAE O KA ILIO
ESTABLISHED BY: H.G.S. YEAR: 1885 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 by C.T.H. in 1950. The graded road mentioned in the directions for reaching the station is State Highway 31 and the key to the board gate mentioned may be secured at the Kaupo Ranch Office as the house near the gate was vacant at the time of this recovery.

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

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KA LAE O KA ILIO

STATE: HAWAII

YEAR: 1885

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 37 17.943	ELEVATION:	22.3 METERS
GEODETIC LONGITUDE:	156 08 34.026		73 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ S. ANGLE
HI 2	5102	679,146.17	105,002.98	+ 3 11 34

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PUU MANEONEO 2	106 49 02.4	106 37 58	5102

QE 292

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1051

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

KA LAE O KA ILIO (continued)

FORM 324a
(5-18-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KA LAE O KA ILIO
ESTABLISHED BY: HGS YEAR: 1885 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		1.3 METERS,		HEIGHT OF LIGHT ABOVE STATION MARK		METERS	
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION							
OBJECT	BEARING	DISTANCE		DIRECTION			
		FEET	METERS				
PUU MANEONEO 2 -----1950	DISTANCE	and DIRECTION----		00 00 00.0			
R.M. No. 1	NNW	24.842	7.572	58 02 48			
Kaupo, Spire(Kaupo Cath. Ch.)	N			76 56 00.2			
R.M. No. 2	WSW	24.085	7.341	322 51 02			
PUU MANEONEO 2 1950 -----1968	DISTANCE	and DIRECTION----		00 00 00.0			
R.M. NO. 1	NNW	24.850	7.575	58 03 33			
Kaupo, Catholic Church, steeple	N			76 55 59.7			
R.M. NO. 2	WSW	24.075	7.339	322 50 50			

Station was recovered and all marks found in good condition. The reference marks were described in reverse in 1950, but the distances and directions were listed correctly. A complete description follows:

Station is located about 13-1/2 miles southwest of Hana, 2 miles southwest of Kaupo, and 1 mile south of Highway 31, on the extreme south tip of Kailio Point, on the west side of Kamanawa Bay.

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

State Highway 37 for 0.9 mile; take right fork and follow Highway 31 for 18.9 miles to board gate on right, at Kaupo Ranch corrals. (Key was obtained at the Kaupo Ranch). Pass through gate and go south for 0.35 mile; take right fork and follow jeep road south for 0.85 mile to station.

Station mark is a standard disk stamped "KA LAE O KA ILIO 1950", set in the top of an 8-inch-square, concrete monument projecting 6 inches from ground. It is about 25 feet north from edge of bluff and has a cairn built over it.

Reference mark number one is a standard disk stamped "KA LAE O KA ILIO NO 1 1950", cemented in a drill hole in a 10-inch bedrock outcrop projecting 8 inches from ground. It is 10 feet southwest of edge of bluff and about 3 feet higher than station mark.

Reference mark number two is a standard disk stamped "KA LAE O KA ILIO NO 2 1950", cemented in a drill hole in a 2-foot square black rock projecting 6 inches from ground. It is 3.8 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.

USCOMMA-DC 27175-1

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

THIRD

ORDER

GEODETIC LATITUDE: 20° 39' 36.92 GEODETIC LONGITUDE: 156 04 58.69	ELEVATION METERS FEET
--	-----------------------------

STATE COORDINATES (feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ S' ANGLE
HI 2	5102	695,550.80	119,094.35	+ 0 12 21

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

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

QD 168

QD 168

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1053
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Kahului (Maui Island, F. W. Perkins, 1899; J. C. Gauger, 1912).—On north-west coast of Maui, in Wailuku District, on the most northeastern of the permanent sandstone hills lying between Kahului and Wailuku. Traveling sand-dunes surround the signal hill, but the latter is the most conspicuous hill in the vicinity. Marked by a bronze nail cemented into a 12 by 12 inch block of concrete projecting about 3 inches above the ground.

RECOVERY NOTE, TRIANGULATION STATION.

NAME OF STATION: **KAHULUI** STATE: **Hawaii** COUNTY: **Maui**
ESTABLISHED BY: **F.W.P.** YEAR: **1899** LOCALITY: **WAILUKU DISTRICT**
RECOVERED BY: **K.T. ADAMS** YEAR: **1929**
Detailed statement as to the fitness of the original description: **Found as described.**

The hill, 124 feet in elevation, on which the station is located is 1.1 mile southwest of the post office and railway station in Kahului. The hill itself is bare with everything else in the immediate vicinity covered with kiawe or Algeraba bushes. The hill and a clear way to it may be readily observed by climbing half way up the water tank tower on the grounds of the California Packing Corporation's Plant.

Form 526
(11-8-55)
U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **KAHULUI**
ESTABLISHED BY: **F.W.P.** YEAR: **1899** STATE: **Hawaii**
RECOVERED BY: **W.R.P.** YEAR: **1960** COUNTY: **Maui**

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

The station was not recovered. The area in which the station was located is near a new housing development. A new station, Kahului Hill HGS, 1953 has been established in the same general area.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **KAHULUI**
ESTABLISHED BY: **F.W.P.** YEAR: **1899** 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:

A trial point was established in the vicinity and the location of the station determined by inverse computation from this point, but the station was not found, and is believed to be destroyed. It was also previously reported lost.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAHULUI**

STATE: **HAWAII**

YEAR: **1899**

THIRD

-ORDER

SOURCE: **G-52183**

GEODETTIC LATITUDE:	20 52 56.339	ELEVATION:	37	METERS
GEODETTIC LONGITUDE:	156 28 47.788	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ BI ANGLE °
HI 2	5102	563,742.61	199,426.16	+ 0 04 00

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

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

QF 024

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1054
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION Kahului Airport Control

NAME OF STATION: Tower, beacon YEAR: 1960 STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: W.R.Porter

Description, including sketch of object:

The station is the center of the revolving aero beacon on top of the control tower at the Kahului Airport. The beacon flashes green and white and is shown in the Light List, Pacific Coast, 1960 as " No. 2932 - Kahului Aero Lt."

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Kahului Airport Control Tower, beacon
ESTABLISHED BY: W.R. Porter YEAR: 1960 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1969 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was identified by angle and recovered. Located at the Kahului Airport.

Station is center of revolving light, alternate white and green, on top of the control tower building, a tall, square, tan structure. A large, orange, pipe antenna structure is centered vertically above the revolving light.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHULUI APT CONTROL TWR BCN

STATE: HAWAII

YEAR: 1960

THIRD

ORDER

SOURCE: G-12717

GEODETIC LATITUDE:	20 °53 '47.115	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 24.007		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	577,365.45	204,566.58	+ 0 04 51

* 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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1055
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE,
U. S. OCEANIC AND ATMOSPHERIC SURVEY,
Form 528.

RECOVERY NOTE, TRIANGULATION STATION.

R

NAME OF STATION: KAHULUI BANK CUPOLA STATE: HAWAII COUNTY: MAUI
ESTABLISHED BY: J.C. GAUGER YEAR: 1912 LOCALITY: WAILUKU DISTRICT
RECOVERED BY: K.T. ADAMS YEAR: 1929

Detailed statement as to the fitness of the original description: The cupola, painted yellow, of the two-story wooden building, hip roofed with dormer windows, located at the corner of Warf and Main Streets in the town of Kahului. The building is now painted brown. A Masonic lodge occupies the upper floor and the Baldwin Bank occupies the lower floor.

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

11-7062

NAME OF STATION: KAHULUI BANK CUPOLA

STATE: HAWAII

YEAR: 1912

THIRD

—ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 ° 33' 42.31	ELEVATION:	METERS
GEODETIC LONGITUDE	156 28 07.97		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5132	567,512.67	204,068.77	+ 3 04 14

* 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

QD 066

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1056
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

Kahului Harbor Entrance, East
NAME OF STATION: Breakwater Lt. YEAR: 1960 STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: W.R.Porter

Description, including sketch of object:

The station is the center of the navigation light set on top of the iron pipe projecting from the pyramidal concrete house at the offshore end of the east breakwater at the harbor entrance. It is shown in the Light List, Pacific Coast 1960 as " No. 2928"

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Kahului Harbor Entrance, East Breakwater Light
ESTABLISHED BY: W.R. Porter YEAR: 1960 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located on the northwest, offshore, end of the east breakwater at entrance to Kahului Harbor. Station is center of light on top of a 4-inch iron pipe that projects about 5 feet above the top of a white, tapering, concrete structure about 8 feet high and 6 feet square at the base.



FORM C&GS-526 (11-65)
USCGM&DC 19305-P65

U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHULUI HARBOR ENT E BRKWTR LT

STATE: HAWAII

YEAR: 1960

THIRD

ORDER

SOURCE: G-12717

GEODETIC LATITUDE	20 54 13.916	ELEVATION	METERS
GEODETIC LONGITUDE	156 28 27.581		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ G1 ANGLE *
HI 2	5102	565,649.38	207,255.31	+ 0 04 07

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE # OR Δ G1 FORMULA NEGLECTING THE SECOND TERM.

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

QF 239

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1058
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM
NF 4-16 MAUI

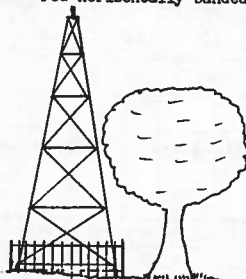
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 535 D

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

Kahului Harbor Entrance
NAME OF STATION: Range Rear Light YEAR: 1960 STATE: Hawaii COUNTY: Maui
CHIEF OF PARTY: W.R. Porter

Description, including sketch of object:

The station is the light atop the 90 foot high skeleton steel rear range structure located on Kane S t. and directly east of the Maui Pineapple Plant. The tower is painted in alternate red and white bands.
This light is shown in the Light List Pacific Coast 1960 as # 2927 - white and red horizontally banded skeleton tower, built 1930.



U. S. GOVERNMENT PRINTING OFFICE 16-60001-1

Described by

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Kahului Harbor Entrance Range Rear Light
ESTABLISHED BY: W.R. Porter YEAR: 1960 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located along the east side of Kane Street, across from the Maui Pineapple Cannery, and on the north side of the Assembly of God Church.
Station is the light mounted atop an 80-foot-high, skeleton steel tower, painted alternate red and white. Light is offset about 1 foot seaward from center of tower. There is now a rectangular, red and white day banner mounted on the makai side of the tower.

FORM C&GS-526 (11-58)
USC&GS-DC 18559-765

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHULUI HARBOR ENT RNG R LT
STATE: HAWAII YEAR: 1960

THIRD ORDER

SOURCE: G-12717

GEODETIC LATITUDE: 20 ° 53 ' 24.486	ELEVATION	METERS
GEODETIC LONGITUDE: 156 28 28.754		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE °
HI 2	5102	565,544.13	202,268.09	+ 0 ° 04' 07"

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

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

QF 238

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1059
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Kahului Harbor Entrance, West
Breakwater Lt. Year: 1960 STATE: Hawaii COUNTY: Maui
CHIEF OF PARTY: W.R. Porter

Description, including sketch of object:

The station is the center of the navigation light set on top of the iron pipe projecting from the pyramidal concrete house at the off-shore end of the west breakwater at the harbor entrance. It is shown in the Light List, Pacific Coast, 1960 as "No. 2929".

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Kahului Harbor Entrance, West Breakwater Light
ESTABLISHED BY: W.R. Porter YEAR: 1960 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located on the northeast, offshore, end of the west breakwater at entrance to Kahului Harbor. Station is center of light on top of a 4-inch iron pipe that projects about 5 feet above the top of a white, tapering, concrete structure about 8 feet high and 6 feet square at the base.



ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHULUI HARBOR ENT W BRKWTR LT
STATE: HAWAII YEAR: 1960 THIRD ORDER

SOURCE: G-12717

GEODETIC LATITUDE:	20 ° 54' 12.719	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 28 36.974		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	GEOD. Δ 01 ANGLE *
HI 2	5102	564,758.96	207,133.48	+ 0 04 04

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE GEOD. Δ 01 FORMULA NEGLECTING THE SECOND TERM.

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1060
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 00' TO 156° 30'
DIAGRAM NF 4-16 MAUI

U.S. DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
Form 555 b

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: KAHULUI, RADIO YEAR: 1950 STATE: Hawaii COUNTY: Maui
STATION KMVI, MAST
CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:

The station is the red light on the summit of the KMVI radio mast which lies in the easterly section of the town of Kahului.

It is a steel mast antenna, 450 feet high, resting on a concrete base about 50 feet north of the broadcasting station.

Form 526
(11-8-55)

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

NAME OF STATION: Kahului, Radio Station K M V I, Mast
ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii
RECOVERED BY: W.R.P. YEAR: 1960 COUNTY: Maui

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

The station was recovered in good condition as described*. It is the only antenna in the area and is painted in alternate red and white sections.

* Station is westernly not easternly as is shown in description.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Kahului, Radio Station KMVI, mast
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 identified by angle and recovered. Located on a hill, between Wailuku and Kahului, about 1/4-mile northwest of the Maui Hospital.

Station is a very tall, thin, skeleton steel antenna, painted alternate red and white, and is the only antenna in the area.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAHULUI, RADIO STATION KMVI MAST
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: Ja. V. D. YEAR: 1978 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: At Kahului

Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:
This intersection station was recovered in good condition. The station is located west of S. Papa Ave. at the end of Wahi Hoolaha St.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHULUI RADIO STA KMVI MAST

STATE: HAWAII

YEAR: 1950

THIRD

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 53' 25.975	ELEVATION	METERS
GEODETIC LONGITUDE: 156° 29' 19.769		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	560,706.65	202,412.75	+ 0° 03' 48"

* 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

QE 404

HORIZONTAL CONTROL DATA

1. NAME

2. ADDRESS

3. CITY

4. STATE

5. ZIP

6. PHONE

7. FAX

8. E-MAIL

9. COMMENTS

10. DATE

11. TIME

12. SIGNATURE

13. TITLE

14. ORGANIZATION

15. PROJECT

16. TASK

17. STATUS

18. PRIORITY

19. DEADLINE

20. BUDGET

21. COST

22. REVENUE

23. PROFIT

24. RISK

25. IMPACT

26. BENEFIT

27. COST-BENEFIT RATIO

28. RISK-BENEFIT RATIO

29. RISK-IMPACT RATIO

30. RISK-COST RATIO

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1062
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

U. S. COAST AND GEODETIC SURVEY
FORM 825
REV. AUG. 1962

NAME OF STATION: KAIHUA KALA 2 ✓ STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C.T.Husemeyer ✓ YEAR: 1950 ✓ Described by: G.B.G.
HEIGHT OF LIGHT ABOVE STATION MARK 1.22 METERS.

NOTE, 1	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.52 METERS, 1	HEIGHT OF LIGHT ABOVE STATION MARK 1.22 METERS, 1
2	Surface-station mark,	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

pipe		WHICH CAN BE SEEN FROM THE GROUND AT THE SURFACE				
		OBJECT	BEARING	DISTANCE		DIRECTION
				feet	meters	
pipe pipe	Surface-station mark					
	Underground station mark					
	OLOPAWA (HGS) ✓					0 00 00.0
	Reference mark No.1 ✓	W	18.97 ✓	5.783 ✓	297	20 05- ✓
	Reference mark No.2 ✓	NE	18.40 ✓	5.607 ✓	72	44 01- ✓

Old Description: "On the eastern end of East Maui, in central part of Hana District, southwest of Kauiki Hill, in the summit of a wooded hill, 2½ miles from the sea. Mark reported lost."

The station recovered in 1950 was a $1\frac{1}{2}$ inch iron pipe, projecting 1 foot. It is on the east end of the hill, slightly lower than the highest part. A standard station disk stamped KATHUAKALA 2 1950 is

Reference mark NO.1 is west of the station. A standard disk stamped KAIHUAKALA 2 NO 1 1950, cemented in the top of a 1½ inch iron pipe projecting 1 foot. northeast of the station. A standard disk

Reference mark No. 2 is northeast of the station. A standard disk stamped KAIHUA KALA NO 2 1950, cemented in the top of a 1 1/2 inch iron pipe projecting 14 inches.

To reach from the Hana Ranch Headquarters in Hana: pass through a long black gate at rear of buildings and drive to fence at upper end of pasture. From here pack westerly along old flume to an old cratered reservoir, continue westerly to top of first prominent hill and station.

NAME OF STATION: KAIHUALA 2

STATE HAWAII YEAR 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 44' 43.589 GEODETIC LONGITUDE: 156° 01' 31.088	ELEVATION: 749.1 METERS 2458 FEET
--	--------------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	719,143.86	150,109.79	+ 0° 13' 38"

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

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\theta \cos \Delta \phi$ FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
OLOPAWA	160 29 30.1	160 15 52	5102

QE 334

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

(Direction-angle measured clockwise, referred to initial station.
 16-50500-2 U. S. GOVERNMENT PRINTING OFFICE

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1063
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

U. S. COAST AND GEODETIC SURVEY
PORTAL 888
REV. AUG. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KAILUA STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C.T.Husemeyer ✓		YEAR: 1950 ✓		Described by: G.B.Grimm	
NOTE: 2	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.60 METERS.		HEIGHT OF LIGHT ABOVE STATION MARK 1.30 METERS.		
	Surface-station mark, DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS Underground-station mark WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
	OBJECT	BEARING	DISTANCE		DIRECTION:
			feet	meters	
	PIIHOLO (HGS) 1950				0° 00' 00.00
12c	R.M. No. 1	S ✓	13.99	4.264	82 05 18.1
	Paia mill H.C. & S Co. Stack	NW ✓	2 miles		242 17 21.72
	Haliimaile Village Flag Pole	N ✓	2 miles		257 04 39.38
12c	R.M. No. 2 ✓	N ✓	17.010	5.186	264 13 20.0

Located in northern Maui, in Makawao District, about 8 miles, airline east of Kahului, about 4 miles southeast of Paia, and about 0.5 miles north of the Haleakala highway, on a low rock outcrop in a pineapple field. The field is on a long gradual east and west slope and the mound is not noticeable from a distance.

Station is a standard disk set in rock outcrop at the highest point of the mound, stamped KAILUA 1949. The disk was set at the center of a chiseled cross in rock.

Reference mark No.1 is south of the station. A standard disk set in rock outcrop projecting about 8 inches above the ground, stamped KAILUA NO 1 1949.

Reference mark No.2 is north of the station. A standard disk set in rock outcrop flush with the ground, stamped KAILUA NO 2 1949.

To reach from the Post Office at Kahului: go easterly on main highway toward Paia for 3.1 miles, turn right as per sign Haleakala and go south east on Kula road for 5.0 miles to sign Haliimaile Village. Turn left and northerly on paved road for 0.75 miles to pole No. 14, turn right and go east on dirt road for 0.5 miles to green water tank, continue straight ahead up hill through pineapple field for 0.5 miles, then right on field road for about 100 yards to rock mound and station.

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

16-60228-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAILUA

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 ° 51' 15.828	ELEVATION: 586.8 METERS
GEODETIC LONGITUDE: 156 20 45.965	1269 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ θ 1 ANGLE *
HI 2	5102	609,452.25	189,557.46	+ 0° 06' 51"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PIIHOLO	268 40 55.0	268 34 04	5102

QE 376

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1063

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

KAILUA (continued)

FORM 526a
(8-18-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KAILUA
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 1.51 METERS.		HEIGHT OF LIGHT ABOVE STATION MARK METERS.		
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PIIHOLO (HGS) 1871 -----1950 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 1	S	13.99	4.264	82 05 18.1
R.M. No. 2	N	17.010	5.186	264 13 20.0
PIIHOLO (HGS) 1871-----1968 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 1	SSE	13.968	4.258	82 02 49
Paia Sugar Mill Stack	NW			241 59 57.3
R.M. No. 2	NNW	16.977	5.175	264 15 27
Tank, pineapple field	E	229.9		356 10 32

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

Station is located about 1-1/2 miles south of Haliimaile and 1-1/2 miles northwest of Pukalani, on a low, rounded, rocky knoll in pineapple field, at about 1269 feet elevation and 230 feet west of a silver tank. To reach station from the intersection of State Highways 32 and 35 in Kahului, go east on State Highways 32 and 36 for 3.3 miles to junction with

State Highway 37. Turn right, towards Haleakala, and go 4.8 miles to side road left, at sign "HALIIMAILE". Turn left and go 0.7 mile; turn right, at power pole No. 14, and go 0.45 mile through cane field to beginning of pineapple fields. Continue ahead through pineapple field for 0.6 mile to side road right and silver tank in the intersection, and station 230 feet west.

Station mark is a standard disk stamped "KAILUA 1949", cemented in a drill hole in a bedrock outcrop projecting 6 inches above ground. It is 13 feet east of a small rain gauge and 3.5 feet northwest of a white witness post.

Reference mark number one is a standard disk stamped "KAILUA NO 1 1949", cemented in a drill hole in a large bedrock outcrop on the southeast edge of the knoll and is 1-1/2 feet lower than station mark.

Reference mark number two is a standard disk stamped "KAILUA NO 2 1949", cemented in a drill hole in a large, flat, 6 x 6-foot, grey, bedrock slab. It is 17 feet north of the rain gauge and 2.9 feet lower than station mark.

Tank is silver, of corrugated iron, 20 feet in diameter, about 13 feet deep, and sets on 4 steel legs. Top of tank is about 28 feet above ground.

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

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

USCOMMA-DC 27173-P88

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

ORDER

GEODETIC LATITUDE	20° 38' 34.41"	ELEVATION	METERS
GEODETIC LONGITUDE	156° 22' 14.98"		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR ANGLE
HI 2	5102	601,150.08	112,521.22	+ 0 06 16

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

CALCULATED BY THE $\rho \cos \theta$ FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEOCENTRIC AZIMUTH (From zenith)	PLANE AZIMUTH ⁺ (From zenith)	CODE

QD 154

Q0 i54

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1065
HAWAII
LATITUDE 20 ° 30' TO 21 ° 30'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KALAHAKU

STATE: HAWAII

YEAR: 1912

THIRD

ORDER

SOURCE: G-SP15c

GEODETTIC LATITUDE:	20 43 48.86	ELEVATION:	METERS
GEODETTIC LONGITUDE:	156 14 40.32		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10R Δ α ANGLE *
HI 2	5102	644,249.26	144,341.82	+ 0 08 58

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

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

QD 079

HORIZONTAL CONTROL DATA

Q 201561 STATION 1067
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 50' 23.92	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 07 30.88		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ or ANGLE
H1 2	5102	684,879.20	184,322.18	+ 0°11'33"

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

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE $\sin^2 \Delta$ FORMULA NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE

QD 096

Q0 096

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1068
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 00' TO 156° 30'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 525
REV. AUG. 1965

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KAMOA STATE: Hawaii COUNTY: Maui

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

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	METERS
1	3.41		

OBJECT	BEARING	DISTANCE	DIRECTION
		feet	meters
11a PALM WAI			
R. I. No. 2	NW	25.375	7.735
Kihai Radio Antenna (Station J/VH)	NW		
R. I. No. 1	SE	31.891	9.721

The station is located in pasture land which lies about 4 miles south of Kihai, about 0.5 mile southeast of Kalama Park, about 300 yards east of the highway which runs between Kihai and Old Lakana, about 200 yards northwest of a water tank, about 200 feet west of group of sheds and 1 foot west of a wire fence. Higher ground lies to the eastward of the station.

To reach from the post office at Kihai; go south, on the road which leads toward Old Lakana, for 3.7 miles; pass through Kalama Park and continue south, on the graded road, for 0.4 mile; turn left, pass through a gate and follow the track road northeast for 0.2 mile to a wire fence and the station.

The station is a standard disk, stamped KAMOA 1949, set in the top of a square concrete post which projects about 8 inches.

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

Reference mark number 1 is a standard disk, stamped KAMOA NO 1 1949, set in the top of a square concrete post which projects about 4 inches. It is located 5 feet west of a wire fence and about the same elevation as the station.

Reference mark number 2 is a standard disk, stamped KAMOA NO 2 1949, set in the top of a square concrete post which projects about 4 inches. It is located 5 feet west of a wire fence and about the same elevation as the station.

Form 525
(11-5-55)

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

NAME OF STATION: KAMOA
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 description is adequate. New directions for reaching the station follow:

From the Kihai Store and Post Office, go south along Highway 31 for 3.7 miles to Kalama Park. Continue 0.1 mile to Auhana Road. Turn left onto Auhana Road for 0.4 mile to a bridge over a wash. Continue ahead for about 100 yards to a dirt road right. Turn right and go 50 yards to a rough trail which crosses the dirt road and leads to a bank of transformers. From this corner and power pole # 53, go south along fence for about 120 yards to the station surrounded by a rough rock wall.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAMOA

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE G- 9511

GEODETIC LATITUDE	20 43 47.953	ELEVATION	25.5 METERS
GEODETIC LONGITUDE	156 26 52.952		84 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ANGLE
HI 2	5102	574,703.15	144,112.66	+ 0 04 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
PUU OLAI	2 04 01.0	1 59 22	5102

QE 317

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1068
LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

KAMOA (continued)

Form 526
(11-8-55)

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

R

NAME OF STATION: KAMOA
ESTABLISHED BY: C.T.H.
RECOVERED BY: L.F.W.
YEAR: 1950 STATE: Hawaii
YEAR: 1965 COUNTY: Maui

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

Station mark was recovered in good condition. Both reference marks had been dug up during pipeline operations and were lying near station. A new description follows: Station is located in pasture land about 4 miles south of Kihei, about 0.2 miles south of Kalama Park and about 0.2 miles east of the highway that runs between Kihei and Old Makena. To reach from the post office at Kihei, drive south on the highway that goes to Old Makena, for 3.7 miles; pass through Kalama Park and continue south for 0.2 miles to a dirt T-road left. Turn left onto the dirt road and go for about 0.2 mile. Turn right about 200 feet past the transformer station on the right side of the road on to path cleared for pipeline. Drive 200 feet along fence line to station which is 1 foot west of fence and 8 feet south of tree that is also on fence line. Station is a standard disk, stamped KAMOA 1949, set in top of a square concrete post projecting 8 inches.

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

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KAMOA
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		1.55 METERS.		HEIGHT OF LIGHT ABOVE STATION MARK		METERS.	
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION							
OBJECT	BEARING	DISTANCE		DIRECTION			
		FEET	METERS				
PUU OLAI (HGS) 1879	✓			00	00	00.0	
Molokini Lighthouse, 1950	SW			25	00	52.1	
McGregor Point Light, 1950	NW			122	41	37.6	
R.M. No. 4	NNW	24.443	✓	7.451	162	57	03
R.M. No. 3	SSE	27.988	✓	8.532	343	42	56

Station mark was recovered in good condition. Both reference marks have been destroyed so 2 new ones were established, and a witness post was set. A complete description follows: Station is located about 4 miles south-southeast of the Kihei post office, 2200 feet southeast of the south end of Kalama Park, at the east edge of a new sub-division, about 150 yards southeast of a new power sub-station, at about 84 feet elevation, and in a north-south fence line. To reach station from the post office at Kihei, go south on State Highway 31 for 4.0 miles to a crossroad. Turn left onto Walaka Street and go

0.2 mile to end of street on top of rise, at power pole No. 8. Go left along fence about 100 feet to station. Station mark is a standard disk stamped "KAMOA 1950", set in the top of an 8-inch-square, concrete monument that projects 4 inches. It is 136.0 feet north of power pole No. 8, 121 feet north of center line of Walaka Street, 110 feet west of an 8 x 8-foot, white, metal tank, 8.6 feet north-northeast of a 4-inch, concrete-filled, iron pipe that projects 30 inches from the ground, and 3-1/2 feet south of a white witness post. Reference mark number three is a standard disk stamped "KAMOA 1950 NO 3 1968", set in the top of a 10-inch-square, concrete monument that projects 6 inches. It is 1 foot west of the fence and about 0.1 foot lower than station mark. Reference mark number four is a standard disk stamped "KAMOA NO 4 1968", set in the top of an 8-inch-square, concrete monument that projects 7 inches. It is set in the fence line, 0.7 foot lower than station mark.

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

USCOM-DC 27173-P59

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1069
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

NAME OF STATION: KAMOLE

STATE HAWAII

YEAR 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 52' 53.25"	ELEVATION:	METERS FEET
GEODETIC LONGITUDE:	156° 20' 13.40"		

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR \angle
HI 2	5102	612,520.50	199,192.84	+ 0 07 03

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

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

QD 083

Q0 083

HORIZONTAL CONTROL DATA

END TEXT

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1070
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 533
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KANAHAU STATE: Hawaii COUNTY: Maui

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	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	
1	Surface-station mark, Underground-station mark					
	OBJECT					
12a	KOLEKOLE		SW	25.148	7.666	00 00 00
12a	R. M. No. 2					196 23 21
12a	R. M. NO. 1		NE	57.889	17.645	346 17 52

The station is located on the crest of the southwest ridge of Haleakala Volcano at an elevation of about 8800 feet and is about 3.5 miles southwest of the summit. The station hill is composed of cinders and drops off sharply to the southwest. A wire fence lies about 0.1 mile southwest of the station.

To reach from the Hawaii National Park Headquarters and Checking Station; go south and east, on the paved road, for 9.7 miles to the summit and the observation house; pass through a chain gate, to the right hand side of the parking area, and follow the paved road for 0.45 mile; continue straight ahead, on the graded road, for 0.15 mile; take the left hand fork and go southwest for 0.1 mile to the end of the road and the end of truck travel. From this point pack southwest, down grade, for about 2.5 miles to the station.

The station is a standard disk, stamped KANAHAU 1950, set into a drill hole in a buried boulder which is about flush with the ground.

Reference mark number 1 is a standard disk, stamped KANAHAU NO 1 1950, set into a drill hole in cinder outcrop which is flush with the surface of the ground. It is located near the crest of the ridge about 2 feet higher than the station.

Reference mark number 2 is a standard disk, stamped KANAHAU NO 2 1950, set into a drill hole in cinder outcrop which is flush with the surface of the ground. It is located about 5 feet east of a small bluff about 3 feet lower than the station.

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

! Direction-angle measured clockwise, referred to initial station.
16-62200-1 U. S. GOVERNMENT PRINTING OFFICE

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G- 9311

GEODETIC LATITUDE	20 41 32.981	ELEVATION	2637.4 METERS
GEODETIC LONGITUDE	156 17 54.712		8653 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	625,828.36	130,587.82	+ 0 07 48

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
PUU O KALI	115 51 14.5	115 43 26	5102

QE 293

(continued on next page)

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1070
LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

KANAHAU (continued)

U.S. DEPARTMENT OF COMMERCE

RECOVERY NOTE, TRIANGULATION STATION

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

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.5 METERS,		HEIGHT OF LIGHT ABOVE STATION MARK METERS.		
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PUU O KALI (HGS) 1879	NE	57.889	17.645	00 00 00.0
R.M. No. 1	NE	57.889	17.645	114 37 11
R.M. No. 2	SW	25.148	7.666	324 42 30
PUU O KALI (HGS) 1879	NE	57.848	17.633	00 00 00.0
R.M. No. 1	NE	57.848	17.633	114 35 59
POLIPOLI (HGS) 1879	WSW	25.063	7.640	307 53 24.9
R.M. No. 2	WSW	25.063	7.640	324 42 49

Station was recovered and all marks found in good condition. Slight differences were noted in distances to the RMs; they were double-checked and the 1969 distances are correct. A complete description follows:
Station is located along the high ridge running down to the southwest from the summit of Haleakala; about 2-1/4 miles southwest of the radar domes on the summit and 1/4-mile south of the Skyline Drive jeep road, on the last bare red hill along the ridge, at about 8653 feet elevation.

To reach station from the post office in Pukalani, go southeast on State Highway 37 for 0.35 mile; take left fork and follow highway for 28.4 miles to fork on summit of Haleakala, just past Red Hill; take left fork and go 0.8 mile to sign on left "SKYLINE DRIVE". Go left 0.1 mile to locked gate. (Key was obtained at State Forestry Office in Wailuku). Continue on the jeep road for 2.9 miles to base of hill on left, and end of truck travel. Pack southwest, up along ridge top for about 1/2-mile to station on last point.

Station mark is a standard disk stamped "KANAHAU 1950", cemented in a drill hole in a rock, 12 inches beneath ground surface. It is 40 feet southwest of a large, angular, grey, sandstone outcrop; there is a cairn and signal built over the mark.

Reference mark number one is a standard disk stamped "KANAHAU NO 1 1950", cemented in a drill hole in a lava outcrop that projects 10 inches from ground. It is 18 feet northeast of the prominent outcrop and about 2 feet higher than station mark.

Reference mark number two is a standard disk stamped "KANAHAU NO 2 1950", cemented in a drill hole in the sandstone of the hilltop. It is 5 feet southeast of edge of hill, 4 feet lower than station mark, and covered with a thin layer of dirt.

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

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

USCOM-DC 27175-P88

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KANAHAU
ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: C. L. Novak YEAR: 1975 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 21 miles SSE of Kahului

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

The station mark and reference marks 1 and 2 were recovered in good condition and the 1950 description is adequate with the following additions:

The station mark is 0.5 meter below the surface of the ground. To reach the station from a locked gate (a key may be obtained from the National Park Service) at the southwest edge of the Haleakala Science Reserve on the southwest rim of Haleakala Crater, using a vehicle with 4-wheel-drive, go southwest on a graded road down a ridge 2.6 miles to a curve to the right in the road. Pack east along a trail about 1/2 mile to the station site.

NOAA FORM 76-165
(12-72)
(OLD CASES 528)

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

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

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1071
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KANAHENA POINT LIGHT

STATE: HAWAII

YEAR: 1900

THIRD

ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 36 10.45	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 26 20.64		FEET

STATE COORDINATES (feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE *
HI 2	5102	577,838.78	97,959.68	+ 0 04 48 *

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

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

QD 144

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1072
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
POTTER 525 D

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

Kanaio
NAME OF STATION: Catholic Church Year: 1950 STATE: Hawaii COUNTY: Maui
Belfry
CHIEF OF PARTY: C.T. Husemeyer

Description, including sketch of object:

Located about 3 miles east of the Makena Post Office, on the old or upper road, on the south side of the road and surrounded by a stone fence. The building is of masonry construction, painted white. The belfry is on the west end of the building.

Form 526
(11-8-55) U. S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Kanaio, Catholic Church Belfry
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 except that the roof of the church and of the belfry are painted red.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Kanaio Catholic Church Belfry
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located about 2-1/2 miles southeast of the Ulupalakua post office and 1/4-mile north of State Highway 31, along old track road. Church is a white building with red roof, with steeple on west end. The steeple is a square structure with red pyramid roof.

NAME OF STATION: KANAIO CATHOLIC CHURCH BELFRY
STATE: HAWAII YEAR: 1950 THIRD ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 ° 37' 34.732	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 22 20.057		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR α ANGLE *
HI 2	5102	600,678.79	106,499.47	+ 0 06 13 "

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

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

QE 410

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201501 STATION 1073
HAWAII
LATITUDE 20 ° 39' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KANIAKANI

STATE: HAWAII

YEAR: 1904

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 40' 16.30	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 12 06.98		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ 1 ANGLE °
HI 2	5102	658,866.13	122,936.15	+ 0° 09' 51"

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

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

QD 164

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1074
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

NO TEXT

NAME OF STATION KAONJULU

STATE HAWAII

YEAR 1904

THIRD

-ORDER

SOURCE G-SP156
NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 44 35.15	ELEVATION	METERS
GEODETIC LONGITUDE	156 20 08.30		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ IOR Δ RI ANGLE *
HI 2	5102	613,107.28	148,935.63	+ 0° 07' 02"

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

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

QO 157

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1075
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY
Form 583
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KAPAUULA STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C.T. Husemeyer	YEAR: 1950	Described by: G.B.G.			
NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.07 METERS	HEIGHT OF LIGHT ABOVE STATION MARK 0.77 METERS				
pipe	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			
12a	OKOHOLA HGS 1950	NNW	20.33	6.196	0 00 00.00
pipe	Reference mark No.2	W	14.04	4.280	31 40 15.6
	Reference mark No.1				331 18 05.6

Located near the northeast coast of East Maui, in the Koolau District, on a low wooded hill about 10 miles, airline, west of Hana, about 1.5 in from the coast and about 0.5 miles above the highway, just west of a small creek.

The station is a standard disk cemented in a terra cotta pipe that projects 10 inches, stamped KAPAUULA 1950. Reference mark No 1 is west of the station. A standard disk cemented in a terra cotta pipe projecting 12 inches, stamped KAPAUULA NO 1 1950. Reference mark No 2 is north northwest of the station. A standard disk set in a rock ledge flush with the ground at the break off of the hill.

To reach from the Post Office at Hana: go west on coast highway for 11.4 miles, turn left into driveway at Irrigation Company house and go to gate at rear of house and ETT. From here pack west along ditch for about 0.1 miles to ridge at west side of second ditch bridge. Turn right and follow ridge south for about 0.4 miles to station at east edge of hill.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAPAUULA
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

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

Station is located about 10 miles west-northwest of Hana, 1200 feet south-southwest of the Koolau Ditch, and 1300 feet southeast of Pua Kaa Park, on a knoll of about 1496 feet elevation, on the brushy slopes above the Hana Highway. The station knoll has a cover of low brush and ferns, but no large trees.

To reach station from the post office in Hana, go west on State Highway 36 for 12.1 miles to side road left, just past a corrugated metal hut on left, and 0.4 mile before reaching Pua Kaa Park. Pack up old road to left about 200 feet to canal, then go left along canal about 200 yards to canal fork. Go right, up onto ridge and go about 1/4-mile to station. NOTE: Because of heavy fern cover on ridge station is difficult to reach.

Station mark is a standard disk stamped "KAPAUULA 1950", brazed onto the top of a 2-1/2-inch, iron pipe that projects 14 inches from ground. It is on the east point of the hill top.

FORM C&GS-526 (11-63)
USCOM-DC 14909-PSS

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAPAUULA

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 °48 '51.334	ELEVATION: 455.9 METERS
GEODETIC LONGITUDE: 156 07 30.901	1496 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	± OR Δ ± ANGLE °
HI 2	5102	684,908.59	174,680.79	+ 0 11 33

* 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
OKOHOLA	136 42 39.8	136 31 07	5102

QE 324

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1075

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

KAPAUULA (continued)

Reference mark number one is a standard disk stamped "KAPAUULA NO 1 1950", brazed onto the top of a 2-1/2-inch, iron pipe projecting 14 inches from ground, and 6 inches lower than station mark. It is 4.280 m (14.039 ft.) from station, in azimuth 108° 00' 46".

Reference mark number two is a standard disk stamped "KAPAUULA NO 2 1950", cemented in a drill hole in bedrock flush with ground on northwest edge of hill, 4 feet lower than station mark. It is 6.197 m (20.334 ft.) from station, in azimuth 168° 22' 56".

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1076
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAPUAI

ESTABLISHED BY: Hawaiian Govt. YEAR: 1877 STATE: Hawaii
RECOVERED BY: C.T.H. YEAR: 1950 COUNTY: Maui

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

Old description:- "In northern part of east Maui, on summit of hill of same name, 3 miles inshore, in Hamakualoa District, in land of Peahi, west of the Halehaku Gulch and near a graveyard. Marked by a concrete post". This is a smooth grass covered hill with a heavy growth of Guava trees on the summit.

Station was recovered in 1929 by the Hawaii Territorial Survey and remarked with a 3/4 inch pipe set in a concrete pier. Top of pier 5 inches below ground surface and covered with one inch of dirt. Over which was built a Type B Monument. The center of the 2 1/2 pipe in monument was used as station.

Reference mark No.1 is south of the station. A standard disk set in a boulder flush with the ground, stamped KAPUAI REF NO 1 1949.

Reference mark No.2 is west of the station. A standard disk set in a concrete post projecting 7 inches, stamped KAPUAI REF NO 2 1949.

To reach from the Post Office at Hailu: go east on Hana road for 2.7 miles to a 5 point crossroad, turn right through cut and go east for 1.8 miles to store. Continue ahead east for 0.6 miles to east side of hill then circle to left to summit of hill and station.

OBJECT	DISTANCE	DIRECTION
HUELO HGS 1950	Meters Feet	0°00'00.0"
Reference Mark No.1	S 5.772 18.94	103 21.53
Reference Mark No.2	W 6.139 20.14	199 58.38
Pauwela Point Light	WNW 4 miles	234 09 48.1
KULALI HGS Target	NW 1 mile	255 06 35.7

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 536
(Rev. Feb. 1968)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Kapuai

ESTABLISHED BY: Haw'n Gov Survey YEAR: 1877 STATE: Hawaii
RECOVERED BY: W. R. Porter YEAR: 1957 COUNTY: Maui

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

Recovered as described. Station in good condition. Area around station overgrown by guava bushes.

(continued on next page)

NAME OF STATION: KAPUAI

STATE: HAWAII

YEAR: 1877

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 °54' 22.878	ELEVATION	350.0 METERS
GEODETIC LONGITUDE	156 16 45.832		1148 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OF Δ & ANGLE *
HI 2	5102	632,181.75	208,279.59	+ 0 08 18

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
HAIKU	108 05 03.1	107 56 45	5102

QE 312

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1076

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

KAPUAI (continued)

Form 526
(11-8-55)

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

R

NAME OF STATION: KAPUAI
ESTABLISHED BY: H.G.S. YEAR: 1877 STATE: Hawaii
RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

The station was not visited but the Type B, Hawaiian Territory Survey Monument is clearly visible from the Hana Highway. Directions for reaching the station were verified to the base of the hill.

Form 526a
(9-16-60)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

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

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.0 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	
HAIKU (HGS) 1871 -----1950 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 1	S	18.94	5.772	256 26 28
R.M. No. 2	W	20.14	6.139	353 03 13
HAIKU (HGS) 1871 -----1968 DISTANCE and DIRECTION-----				00 00 00.0
Pauwela Point Lighthouse, 1950	NW			27 14 39.7
R.M. No. 1	S	18.832	5.741	256 22 32
R.M. No. 2	WNW	20.143	6.140	353 06 26

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

Station is located about 3 miles east-southeast of Haiku and 1/2-mile east-southeast of Ulumalu, on the summit of a prominent hill of about 1149 feet elevation, in pastureland. The top of the hill is covered with dense guava brush up to 20 feet high.

To reach station from the intersection of Baldwin Ave. and State Highway 36 in Paia, go easterly on State Highway 36 for 9.5 miles to Holokai

Road. Turn right and go 0.7 mile to T-junction; keep ahead, on Highway 40, for 1.0 mile; turn left and go up lane for 0.3 mile to fork, with gates on both roads. Take left fork, through wire gate, and go 0.1 mile to fence. Turn back to left and go up steep hillside for 0.15 mile to end of flat area, near a fence corner. Cross fence and walk about 30 yards to station. A 4-wheel-drive vehicle is required for the hill.

Station is marked by a Type B signal, which has a 2-1/2-inch iron pipe in the center of a 12 x 12-inch concrete pier 2 feet tall, in the center of a 6-foot-square, concrete platform flush with ground. A red and white metal target is set into the pipe. Station is 78 feet northwest of the fence corner and 45 feet southwest of the south 1 of 2 grave headstones that set 15 feet apart.

Reference mark number one is a standard disk stamped "KAPUAI REF NO 1 1949", cemented in a drill hole in a 12-inch boulder flush with ground and 1-1/2 feet lower than top of station pipe.

Reference mark number two is a standard disk stamped "KAPUAI REF NO 2 1949", set in the top of an 8 x 10-inch concrete monument that projects 6 inches from ground and is 1-1/2 feet lower than top of station pipe.

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

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

USCOMMA-DC 27178-P88

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1077
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

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

RECOVERY
OF TRIANGULATION STATION

NAME OF STATION: KAPUKAULUA STATE: Hawaii COUNTY: Maui

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

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 2.52 METERS. HEIGHT OF LIGHT ABOVE STATION MARK 2.22 METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
	Surface-station mark	Underground-station mark	OBJECT	BEARING	DISTANCE feet meters	DIRECTION: ° ' " #
			KAUIKI HGS ✓			0 00 00.0
12c			Puu O Kahaula (target)	S ✓	2.5 miles	17 28 23.7
			Reference mark No.1 ✓	NW ✓	60.97 18.583	157 04 11-
12c			Reference mark No.2 ✓	SSE ✓	47.87 14.593	356 06 59-

Original description: "On eastern coast of east Maui, in northeastern part of Hana District, land of Honokalani, on a rocky point near the sea. Marked by an iron pin let into the rock."

The station was recovered by the Hawaiian Territorial Survey in 1929 and remarked with a Territory of Hawaii bronze tabled set in a concrete pier 2 inches above the ground, over which was built a Type A monument. It was described as about 3000 feet north of a cemetery at Wainapanapa and about 1500 feet north of a well defined small bay, on a point composed of Aa lava, and about 20 feet from bluff of sea.

The station was recovered as described.

Reference mark No.1 is northwest of the station. A standard disk set in a lava boulder projecting 3 feet. Stamped KAPUKAULUA NO 1 1950.

Reference mark No.2 is south southeast of the station. A standard Azimuth disk set in a lava boulder projecting 3 feet. Stamped KAPUKAULUA RM NO 2 1950.

To reach from the post office at Hana: go westerly on coast road for 2.7 miles, turn left and go north for 0.8 miles to end of road at sign Black Sands Beach. From here pack northerly along coast for about 0.3 miles to station.

FORM 526a
(9-5-56)

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

Name of Station: KAPUKAULUA
Established By: HGS Year: 1878 State: HAWAII
Recovered By: H. J. Seaborg Year: 1963 County: MAUI

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

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

The following changes should be made to the description: To reach from the post office at Hana, go westerly on state highway 36 for 2.7 miles. Turn right on to dirt road. Follow dirt road for 0.8 miles to end. Tourist sign points way to Wainapanapa Cave at this point. Thence pack along Black Sand Beach fishing trail for 0.3 miles to station.

(continued on next page)

NAME OF STATION: KAPUKAULUA

STATE: HAWAII

YEAR: 1878

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20 47 43.576	ELEVATION:	14.8 METERS
GEODETIC LONGITUDE:	156 03 14.363		49 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	8 "ON Δ" #1 ANGLE
HI 2	5102	726,351.75	168,298.96	+ 0 14 07

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE 8 "ON Δ" #1 FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PUU O KAHULA	351 37 03.6	351 22 57	5102

QE 332

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1077
LATITUDE ° ' TO ° '
LONGITUDE ° ' TO ° '
DIAGRAM

KAPUKAULUA (continued)

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

NAME OF STATION: KAPUKAULUA
ESTABLISHED BY: HGS YEAR: 1878 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		2.46 METERS,	HEIGHT OF LIGHT ABOVE STATION MARK		METERS.		
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION							
OBJECT	BEARING	DISTANCE		DIRECTION			
		FEET	METERS				
PUU O KAHULA -----1950	DISTANCE and DIRECTION---			00	00	00.0	
R.M. No. 1	S	60.97	18.583	139	35	47	
R.M. No. 2	SSE	47.87	14.593	338	38	35	
PUU O KAHULA (HGS) 1929 ---1968	DISTANCE and DIRECTION---			00	00	00.0	
R.M. No. 1	NW	60.846	18.547	139	36	21	
R.M. No. 2	SE	47.875	14.593	338	37	23	
Hana, Cross	SSE			359	24	18.8	

Station was recovered and all marks found in good condition. A complete description follows:
Station is located about 2-1/2 miles northwest of Hana and 1500 feet northeast of Waianapanapa Cave, on Pukaulua Point, at about 49 feet elevation, along a trail running along the rocky coast.

To reach station from the post office in Hana, go northwest on State Highway 36 for 2.85 miles to gravel side road right. Turn right and go 0.5 mile; turn left and go 0.2 mile to end of road at Waianapanapa Cave

site. Walk northerly along trail about 1/2-mile, beginning at the black sand beach at Pailoa Bay, to station.

Station mark is an unstamped HTS disk, set in concrete flush with ground, about 20 feet south of edge of bluff. A Type A signal is centered over the mark, with the 6-foot-square, concrete platform 3 feet above ground. A 2-1/2-inch iron pipe projects 15 inches from center of platform.

Reference mark number one is a standard disk stamped "KAPUKAULUA RM NO 1 1950", cemented in a drill hole in a 4 x 6-foot lava chunk that projects 3 feet from ground. It is 5.7 feet lower than station mark.

Reference mark number two is a standard disk stamped "KAPUKAULUA RM NO 2 1950", cemented in a drill hole in a lava rock projecting 3 feet above ground. It is 2.5 feet lower than station mark.

Hana Cross is a large, grey, concrete cross located on a lower summit on the east side of Puu o Kahaula, just west of Hana.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAPUKAULUA
ESTABLISHED BY: Hawaii Govt. SURV. YEAR: 1878 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: Ja. Vladimir Dykan YEAR: 1978 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 2 1/2 northwest of Hana

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 by R. C. Munson in 1968. The reference marks were not searched for.

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1078
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAUALUA

STATE: HAWAII

YEAR: 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 53' 50.37"	ELEVATION:	METERS FEET
GEODETIC LONGITUDE:	156° 13' 47.73"		

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ & ANGLE *
HI 2	5102	649,076.83	235,043.07	+ 0 09 21

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

FORMULA NEGLECTING THE SECOND TERM			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE

QO 091

Q0 091

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

THIRD

ORDER

NO OBSERVATION CHECK ON THIS POSITION

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ GR Δ B ANGLE
HI 2	5102	712,056.07	119,905.49	+ 0 13 08

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

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

Q0 170

Q0 170

Q 201561 STATION 1081
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

NO TEXT

NAME OF STATION: KAUMIKAOHU

STATE HAWAII

YEAR 1904

THIRD

-ORDER#

SOURCE: G-SP156
NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20° 40' 59.23	ELEVATION	METERS
GEODETIC LONGITUDE:	156 08 14.71		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (DIR Δ or ANGLE $^{\circ}$)
HI 2	5102	680,908.27	127,334.59	+ 0° 11' 13"

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

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

QD 165

Q0 165

NO ORIGINAL TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1082
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

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

Station was recovered but found to be in poor condition. It consists of a red brick pier, about 2 x 3-feet in size, projecting about 2-1/2-feet above ground, however most of the top layer of bricks is gone and no center point can be found.

Located about 1-3/4-miles southwest of Kaupo, on Kailio Point, about 385 feet from station KA LAE O KA ILIO (HGS) 1885, in azimuth 140° 39' 02", but not visible from there, and sets down on a bedrock ledge along west base of ridge, a few feet above sea level and about 60 feet lower than ridge line.

FORM C&GS-526 (11-65)
JSCOMM-DC 18509-P85

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

R

NAME OF STATION KAUPU

STATE: HAWAII

YEAR: 1887

SECOND

ORDER

SOURCE G-SP156

GEODETIC LATITUDE:	20 37' 20.98	ELEVATION SCALED	12	METERS FEET
GEODETIC LONGITUDE:	156 08 36.65			

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE
HI 2	5102	678,895.93	105,308.59	+ 0 11 03

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

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

QD 404

Q# 404

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1083
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 526

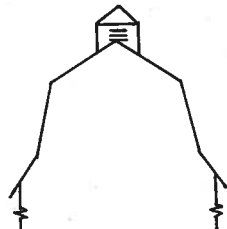
DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: KAUPU CATHOLIC CHURCH, STEEPLE
YEAR: 1950 STATE: Hawaii COUNTY: Maui
CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:

The station is the top of the steeple of the Kaupu Catholic Church which lies in the village of Kaupu about 200 feet southeast of the graded road.

The church is constructed of stone and cement and the steeple is located on the most westerly end of the roof. The roof is composed of corrugated iron, painted silver, and has a distinctive design which permits identification from a considerable distance. See roof sketch below--



U. S. GOVERNMENT PRINTING OFFICE 16-60821-1

Described by .

Form 526
(11-8-55)

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

R

NAME OF STATION: KAUPU, CATHOLIC CHURCH STEEPLE
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 graded road mentioned is State Highway 31.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

R

NAME OF STATION: Kaupu, Catholic Church, steeple
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located about 13 miles southwest of Hana and 1 mile west of the Kaupu Store, along south side of State Highway 31. The church is a cream-colored, rectangular structure, with silver-colored, corrugated metal roof, with steeple on west end. Steeple is a square one, with pyramid top, on which is a ball and a slender cross.

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

NAME OF STATION: KAUPU CATHOLIC CHURCH STEEPLE
STATE: HAWAII YEAR: 1950

THIRD ORDER

SOURCE G- 9311

GEODETIC LATITUDE:	20 38 13.477	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 08 30.159		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ S1 ANGLE *
HI 2	5102	679,495.41	110,607.08	+ 0 11 06

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

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

QE 411

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1084
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAUPA PROTESTANT CHURCH

STATE: HAWAII

YEAR 1904

THIRD

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 38 26.56	ELEVATION:	MEYERS
GEODETIC LONGITUDE:	156 06 53.72		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ B1 ANGLE *
HI 2	5102	688,650.83	111,957.39	+ 0 11 40 *

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE B OR Δ B1 FORMULA NEGLECTING THE SECOND TERM.

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

QD 167

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1085
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

NO TEXT

NAME OF STATION: KAWALO A

STATE HAWAII

YEAR 1904

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 41' 31.51	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 00 39.31		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ #1 ANGLE *
HI 2	5102	724,136.86	130,745.80	+ 0 ° 13' 54 "

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

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

QD 174

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

201561 STATION 1086
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 00' TO 156° 30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Keakaamanu (Maui Island, Hawaiian Government Survey, 1878; J. C. Gauger, 1912).—At the eastern end of Maui, in Hana District, on the summit of a conspicuous hill on the southern boundary of the land of Haneoo. The hill can be most readily approached from the northeast. Marked (in 1912) by a 2-inch galvanized iron pipe set in a block of concrete.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
PORTAL 058
(Rev. Feb. 1968)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Keakaamanu

ESTABLISHED BY: Hawaiian Govt. YEAR: 1878 STATE: Hawaii

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

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

Neither the 1878 nor the 1912 stations were recovered. In 1878 the station was marked by a redwood post and cairn and in 1912 it was reported marked with a 2 inch iron pipe which was set in a block of concrete. At the time of this 1950 survey, a 1 inch iron pipe set into a cylindrical concrete post was recovered, however this post was loose in the soil and at a forty five degree tilt. The concrete cylinder was straightened and a standard disk, stamped KEAKAAMANU 1950, was set in the center of the pipe.

* 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.

10-55429-6

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KEAKAAMANU

STATE: HAWAII

YEAR: 1878

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE	20° 43' 46.43"	ELEVATION	381	METERS
GEODETIC LONGITUDE	156° 00' 37.50"	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE *
HI 2	5102	724,253.57	144,363.15	+ 0 13' 56"

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

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

QO 113

HORIZONTAL CONTROL DATA

1. Name of Project
2. Name of Engineer
3. Name of Designer
4. Name of Checker
5. Name of Approver

6. Name of Client
7. Name of Contractor
8. Name of Subcontractor
9. Name of Supplier
10. Name of Manufacturer

11. Name of Installer
12. Name of Maintainer
13. Name of Operator
14. Name of Inspector
15. Name of Auditor

16. Name of Reviewer
17. Name of Approver
18. Name of Approver
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147. Name of Approver
148. Name of Approver
149. Name of Approver
150. Name of Approver

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

0 201561 STATION 1087
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

U. S. LAND AND MARINE SURVEY
Form 535
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

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

CHIEF OF PARTY: C. T. Husemeyer	YEAR: 1950	Described by: C. J. Hoeppel
NOTE: 1h	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.65 METERS.1	HEIGHT OF LIGHT ABOVE STATION MARK METERS.
Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	
OBJECT	BEARING	DISTANCE
		feet meters
KALUKI (HGS) ✓		00 00 00
ALUA FLAG 2 ✓	E	45 03 54.71
Puuiiki, Spire (Puuiiki Catholic Church) ✓	SSE	119 45 55.9-
pipe R. M. No. 1 ✓	SW ✓	19.619 ✓ 5.946
pipe R. M. No. 2 ✓	NW ✓	23.090 ✓ 7.350 - 277 46 00 ✓

The station is located on the northerly summit of a fern and brush covered hill, named Keakaamanu, which lies about 2.5 miles southwest of Hana and 2.0 miles west of Alau Island. A tree row, running north and south, crosses over the summit of the station hill and the mark is set 6 feet north of the northernmost tree.

This station was originally established by the Hawaii Government Survey in 1878 and was marked by a redwood post and cairn. In 1912 the station was remarked with a 2 inch pipe set in a block of concrete. At the time of this 1950 survey, a 1 inch pipe set into a cylindrical concrete post was recovered, however, this post was loose in the ground and at a forty five degree tilt. The concrete cylinder was straightened and a standard disk was set in the center of the pipe.

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

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

Reference mark number 2 is a standard disk, stamped KEAKAAMANU NO 2 1950, set in the top of a 2 1/2 inch iron pipe which projects about 2 feet. It is located at the northerly edge of the hill about 2 feet higher than the station.

* Refer to notes in manuals of triangulation and state publications of triangulation. 1 Direction-angle measured clockwise, referred to initial station.
1 To nearest meter only, when no trigonometric leveling is being done. 10-56200-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KEAKAAMANU 2

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 °43' 46.303	ELEVATION	380.9 METERS
GEODETIC LONGITUDE	156 00 37.279		1250 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	PLANE AZIMUTH * OR Δ 01 ANGLE *
HI 2	5102	724,274.60	144,350.43	+ 0° 13' 56"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
POHUE	345 24 10.1	345 10 14	5102

QE 337

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1087

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

KEAKAAMANU 2 (continued)

FORM 3200
(8-18-68)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KEAKAAMANU 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		1.5 METERS		HEIGHT OF LIGHT ABOVE STATION MARK		METERS	
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION							
OBJECT		BEARING	DISTANCE		DIRECTION		
			FEET	METERS			
POHUE -----1950 DISTANCE		AND DIRECTION-----			00	00	00.0
R.M. No. 1		SW	19.519	5.946	69	30	02
R.M. No. 2		NW	23.090	7.350	153	31	32
POHUE 1950 -----1968 DISTANCE		and DIRECTION-----			00	00	00.0
R.M. No. 1		SW	19.445	5.927	69	32	52
R.M. No. 2		NW	23.075	7.034	153	31	20
Puukii, Catholic Church, spire, 1950 SSE					355	31	34.2

Station was recovered and all marks found in good condition. An error was found in the published distance to RM No. 2 in meters, apparently a misreading of the tape, because the distance in feet checked closely. The distances were double-checked and the 1968 listing is correct. A complete description follows:

Station is located about 2 miles southwest of Hana and 1 mile east of State Highway 31, on the summit of a brushy hill of about 1250 feet elevation that has a prominent row of large eucalyptus trees running over

the summit in a north-south line.

To reach station from the post office in Hana, go south on State Highway 31 for 1.6 miles to wire gate on right. Pass through gate and pick way up through pasture land for 1.0 mile to end of truck travel at fence line by the tree row. Pack southerly, generally along the tree row, for about 1/3-mile to top and station. About a 1-hour pack due to brush.

Station mark is a standard disk stamped "KEAKAAMANU 1950", set in the top of a 6-inch-diameter, concrete cylinder that projects 3 inches from the ground. It is in a small bare area on the north point of the hill, 6 feet north of the northernmost tree of the large trees on the hill.

Reference mark number one is a standard disk stamped "KEAKAAMANU NO 1 1950", set in the top of a 2-1/2-inch iron pipe that projects 12 inches from ground. It is 2 feet higher than station mark.

Reference mark number two is a standard disk stamped "KEAKAAMANU NO 2 1950", set in the top of a 2-1/2-inch iron pipe that projects 14 inches from ground. It is 2-1/2 feet higher than station mark.

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

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

USCOMM-OC 27178-P88

Q 201561 STATION 1088
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

Keanae Uka (Maui Island, Hawaiian Government Survey).—Near northeast coast of East Maui, in Koolau District, back of Keanae, about 700 feet inland from the government road, on a high ridge near a white tomb. Marks, a concrete post with cross in top, and a cairn.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **KEANAE UKA**
 ESTABLISHED BY: **J.C.G.** YEAR: **1912** STATE: **Hawaii**
 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:

Located along the northeast coast of the eastern part of the island, at Keanae, on the timbered ridge, about 700 feet south from State Highway 36, 380 feet south of the power line, and at about 400 feet elevation, along the east side of the ridge top.

To reach station from the main intersection in Paia, go east on State Highway 36 for 26.7 miles to Camp Keanae on left, and end of truck travel. Pack southerly up steep hill about 350 feet to power line on crest of hill, then continue south up along hill about 400 feet to station.

Station is marked by a cross in the top of a 6-inch-square concrete post projecting 2 inches from ground. It is 16 feet west from east edge of flat top of hill and 60 feet south of a stone-bordered depression, which is probably the point once occupied by the old white tomb mentioned in the old description. There is a small cairn over the mark.

FORM C&GS-526 (1-65)
USCOMM-DC 16502-P69

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1088
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION. KEANAE UKA

STATE HAWAII

YEAR 1912

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 20 51 '37.84 GEODETIC LONGITUDE: 156 09 13.02	ELEVATION: 125 SCALED METERS FEET
---	---

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	675,166.98	191,748.55	+ 0° 10' 58"

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

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

QD 095

90 095

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1089
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: KEOKEA, KULA SANA YEAR: 1950 STATE: Hawaii COUNTY: Maui
TORIUM, LIGHTNING ROD
CHIEF OF PARTY: C. T. Hansen, Jr

Description, including sketch of object:

Description, including sketch of object:

The station is the top of the lightning rod on the summit of the roof of the Kula Sanatorium in the village of Keokez.

The rod projects from the roof of a cupola and is 76 feet above the

RECOVERY NOTE, TRIANGULATION STATION
INTERSECTION

NAME OF STATION: Keokea, Kula Sanatorium, lightning rod
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Recovered as described in 1950, in good condition.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KEOKEA KULA SANATORIUM LT ROD

STATE HAWAII

YEAR 1950

THIRD

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 42 16.335	ELEVATION	METERS
GEODETIC LONGITUDE	156 21 36.448		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (DD Δ M) ANGLE $^{\circ}$
HI 2	5102	604,767.38	134,918.02	+ 0 ⁰ 06 30

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

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

QE 416

QE 416

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1090
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION KEONENELU

STATE HAWAII

YEAR 1904

THIRD

ORDER

SOURCE G-SP156

GEODETIC LATITUDE	20 39 21.77	ELEVATION.	METERS
GEODETIC LONGITUDE	156 22 27.95		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ϕ ANGLE *
HI 2	5102	559,909.65	117,297.13	+ 0 06 11 "

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

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

QD 150

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1092
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

FORM 524a
(9-18-69)

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

NAME OF STATION: KIHEI
ESTABLISHED BY: F.W.P. YEAR: 1900 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: Maui

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
RICE 1950				00 00 00.0
McGregor Point Light, 1950-----COMPUTED				350 00 44.9
RICE 1950 -----1968 DISTANCE and				00 00 00.0
R.M. No. 1	ESE	15.370	4.685	184 53 32
McGregor Point Light, 1950	W			350 00 44.5

After establishing a trial point in the vicinity by triangulation from stations PUU HONA, MAUI SOUTH BASE, and McGregor Point Light 1950, a mark consisting of a 4-inch cross chiseled in a rock, below ground surface was recovered at the distance and angle indicated by inverse from the trial point. An angle check, with instrument set over the cross, proved this to be the old station. Station was then marked with a standard disk, and 1 reference mark was established. A complete description follows:

Station is located about 1/2-mile southeast of the Kihei post office and 700 feet east-northeast of Kenolio Street, near the center of a long, narrow plot of land, on the west slope of a slight, boulder-covered knoll. To reach station from the post office at Kihei, go southeast on Kenolio Street for 0.65 mile; turn left into driveway of home and follow track road for 0.15 mile to station.

Station mark is a standard disk stamped "KIHEI 1900 1968", cemented in a drill hole, at center of old chiseled cross, in the top of an 8-inch boulder flush with ground. It is 12 feet southwest of a row of guava trees, 83 feet southeast of the end tree of a long row of Mango trees, 156.0 feet south of north boundary fence of the property, and 554.0 feet due west of Power pole No. 9, which sets at the southeast corner of the property along Kihei Heights Rd.

Reference mark number one is a standard disk stamped "KIHEI 1900 NO 1 1968", cemented in a drill hole in a flat, 5-foot-diameter boulder that projects 1 foot from ground. It sets in the row of guava trees and is 1 foot higher than station mark.

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

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

USCOMA-DC 2717a-P88

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIHEI

STATE: HAWAII

YEAR: 1900

THIRD

ORDER

SOURCE: G- 1432

GEODETIC LATITUDE:	20 °46' 52.682	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 27 37.027		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	S OR Δ S' ANGLE °
HI 2	5102	570,459.56	162,744.55	+ 0 04 24

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
RICE	99 °24' 59.2	99 °20' 35	5102

QF 121

QO 124

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

0 201561 STATION 1094
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 00' TO 156 ° 30'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIHEI STACK-PIPE

STATE: HAWAII

YEAR: 1900

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 47' 20.055	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 27 45.679		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# HOR Δ # ANGLE *
HI 2	5102	569,675.09	165,505.19	+ 0 04' 21"

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

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

QD 123

HORIZONTAL CONTROL DATA

NO. 1234

1. Name of Project

2. Date of Survey

3. Name of Surveyor

4. Name of Station

5. Name of Instrument

6. Name of Observer

7. Name of Recorder

8. Name of Checker

9. Name of Approver

10. Name of Station

11. Name of Instrument

12. Name of Observer

13. Name of Recorder

14. Name of Checker

15. Name of Approver

16. Name of Station

17. Name of Instrument

18. Name of Observer

19. Name of Recorder

20. Name of Checker

21. Name of Approver

22. Name of Station

23. Name of Instrument

24. Name of Observer

25. Name of Recorder

26. Name of Checker

27. Name of Approver

28. Name of Station

29. Name of Instrument

30. Name of Observer

31. Name of Recorder

32. Name of Checker

33. Name of Approver

34. Name of Station

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1095
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 555
Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KIKALAPUU

STATE: Hawaii

COUNTY: Maui

CHIEF OF PARTY: C.T. Husemeyer

YEAR: 1950

Described by: G.B.G.

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK
4	1.72 METERS	1.42 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
		feet meters
PUU O KALI (HGS) 1950		0 00' 00.0"
R.M. No. 2	W	32.46 9.892
R.M. No. 1	NNE	69.42 21.189
Holy Ghost Catholic Church, Kula	S	2 miles
		150 51 53.5
		312 45 18.3

Located in the west part of East Maui in the Makawau District, along the Kahului-Waiakoa highway, about 1.5 miles north of the Waiakoa Post Office, on the west end of a low bare ridge west of the highway. On property of H.W. Rice.
Station is a standard disk set in the center of a cross in a buried boulder projecting two inches above the ground, stamped KIKALAPUU 1950. The cross is now covered by the disk. It was probably a Plantation survey station.
Reference mark No. 1 is north northeast of the station. A standard disk set in a boulder projecting 4 inches above the ground, stamped KIKALAPUU NO 1 1950.
Reference mark No. 2 is west of the station. A standard disk set in a boulder flush with the ground, stamped KIKALAPUU NO 2 1950.

Detailed description

* 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. 16-50000-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIKALAPUU

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 47' 07.081	ELEVATION: 755.4 METERS
GEODETIC LONGITUDE: 156 19 48.006	2478 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	615,001.52	164,272.12	+ 0 07 10

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
PUU O KOHA	136 10 25.0	136 03 15	5102

QE 299

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1095

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

KIKALAPUU (continued)

FORM 526a
(8-18-69)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KIKALAPUU
ESTABLISHED BY: C.T. Hugemeyer YEAR: 1950 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
County: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK		HEIGHT OF LIGHT ABOVE STATION MARK		METERS.	
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION					
OBJECT	BEARING	DISTANCE		DIRECTION	
		FEET	METERS		
PUU O KOHA (HGS) 1929 R.M. No. 4	NNE	73.096	22.280	00 60	00 02 26
Waiakoa, Holy Ghost Catholic Church, spire, 1950	S			223	55 10.8
R.M. No. 3	WNW	32.533	9.916	326	50 33

Station mark was recovered in good condition. Both reference marks have been destroyed, so two new ones were established, and a witness post was set. A complete description follows:

Station is located about 3-1/2 miles south of Pukalani, on a small grassy hill in pasture, between old and new State Highways 37, at about 2478 feet elevation.

To reach station from the post office at Pukalani, go southeast on State Highway 37 for 0.35 mile; take right fork and continue on State Highway 37 for 2.3 miles to crossroad; turn left and go uphill for 0.15

mile; turn right and go south on old highway for 0.6 mile to Kimo Drive on left. Continue ahead for 0.5 mile to board gate on right, between power poles No. 79 and 80. Pass through gate and go northwest about 100 yards to station.

Station mark is a standard disk stamped "KIKALAPUU 1950", cemented in a drill hole in the 8 x 10-inch top of a boulder that projects 2 inches from ground. It is about 200 feet west of the old highway, overlooking the new highway about 100 feet lower to west, and 2 feet southwest of a white witness post.

Reference mark number three is a standard disk stamped "KIKALAPUU 1950 NO 3 1968", cemented in a drill hole in a 3-foot-diameter bedrock outcrop that projects 6 inches from ground. It is 3.7 feet lower than station mark.

Reference mark number four is a standard disk stamped "KIKALAPUU 1950 NO 4 1968", cemented in a drill hole in a 2 x 4-foot bedrock outcrop that projects 1 foot from ground. It is in the north end of a brush patch and is 6.3 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.

USCOMNAV-DC 37178-P&I

NO TEXT

by the
National Ocean Survey
OLD HAWAIIAN DATUM

ADJUSTED HORIZONTAL CONTROL DATA

ORDER

GEODETTIC LATITUDE:	20° 48' 52.32"	ELEVATION:	METERS
GEODETTIC LONGITUDE:	156 04 37.34		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	701,374.16	175,138.03	+ 0 12 34

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

SUBSTITUTE THE SECOND TERM FOR THE FIRST, AND THE SECOND TERM FOR THE FIRST, AND THE SECOND TERM FOR THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE

QD 100

Q0 100

HORIZONTAL CONTROL DATA

DATE: 10/10/54
TIME: 10:00
LOCATION: 1000000
ELEVATION: 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

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NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000

NO. 1000000



HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1097
HAWAII
LATITUDE 20°30' TO 21°00'
LONGITUDE 156°00' TO 156°30'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 530
Rev. Aug. 1965

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KIPAHULU CATHOLIC CHURCH
CHURCH
Hawaii County, Maui

CHIEF OF PARTY: C.T. Husemeyer	YEAR: 1950	Described by: G.B.G.
NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 1.67 METERS.	HEIGHT OF LIGHT ABOVE STATION MARK 1.37 METERS.	
1a	Surface-station mark, Under-ground-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
		feet
		meters
		DIRECTION:
12c	OHAI HGS 1877	0 00 00.0
12c	Reference mark No.1	123 08 00-✓
12c	Kipahulu stack, abandoned mill	217 49 55.1
12c	Reference mark No.2	231 57 06-✓
		SE ✓ 25.29 ✓ 7.705 ✓
		SW ✓ 0.5 miles
		SW ✓ 14.09 ✓ 4.064 ✓

Old description: "On southeastern coast of Maui, on platform of ancient heiau, in Grant 1657, in Kakalahale, 2.8 feet west of the wall 12.8 feet east of the corner of stone house, and southeast of the church.

Station recovered was a 1/2 inch iron pipe set flush in the top of a concrete block flush with the surface CATH CHURCH RESET 1910 was inscribed in the block. Present measurements check with the old. No record is available as to who reset the station.

A standard disk stamped KIPAHULU CATH CHURCH 1950 was cemented in the 1/2 inch pipe and the concrete block was smoothed over.

Reference mark No.1 is southeast of the station. A standard disk stamped KIPAHULU CATH CHURCH NO 1 1950, set in a buried boulder flush with the ground, 10 feet west of the wall.

Reference mark No.2 is southwest of the station. A standard disk stamped KIPAHULU CATH CHURCH NO 2 1950 set in the bottom stone of the foundation at the northeast corner of the old stone house.

To reach from the Post Office at Hana: go southerly on coast highway for 10.5 miles, turn left on narrow lane and go east for 0.15 miles to old church and station.

For
(11-8-55)

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

NAME OF STATION: KIPAHULU CATHOLIC CHURCH
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. To reach the station from the present Catholic Church in Kipahulu, go east along State Highway 31 for about 0.1 mile to a grown over lane leading south. Go south on lane to site of old cemetery and turn east along old wall. The station is on the west side of a north-south wall and south of the east-west wall.

The description is adequate with the addition noted above.

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

Comm-DC 34314

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIPAHULU CATHOLIC CHURCH

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20°39'31.554	ELEVATION:	65.2 METERS
GEODETIC LONGITUDE	156°03'08.024		214 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	710,062.54	118,591.73	+ 0 13' 00"

* 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
PUHILELE	320 41 43.4	320 28 43	5102

QE 384

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1097

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

KIPAHULU CATHOLIC CHURCH (continued)

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

NAME OF STATION: KIPAHULU CATHOLIC CHURCH
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 1.63 METERS,		HEIGHT OF LIGHT ABOVE STATION MARK METERS		
DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PUHILELE -----1950 DISTANCE	and DIRECTION-----			00 00 00.0
R.M. No. 1	SE	25.29	7.705	19 30 24
R.M. No. 2	SW	14.09	4.064	128 19 30
PUHILELE 1950-----1968 DISTANCE	and DIRECTION-----			00 00 00.0
R.M. No. 1	SSE	25.343	7.725	19 28 01
R.M. No. 2	W	13.323	4.061	128 20 14

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

Station is located about 8 miles southeast of Hana and 0.4 mile east of the Kipahulu Ranch Headquarters, at the Kanekaula Heiau, near stone wall at northeast end of the flat rock-covered area in front of old stone house base.

To reach station from the post office at Ulupalakua, go southeast on State Highway 37 for 0.85 mile; take right fork and follow State Highway 31 east for 26.9 miles to the Kipahulu Ranch Headquarters on left.

Continue ahead for 0.4 mile to wire gate on right. Pass through gate and go 0.1 mile to end of track road at heiau, and station.

Station mark is a standard disk stamped "KIPAHULU CATH CHURCH 1950", set in the center of a 30-inch-diameter mass of concrete flush with rocks, 3 feet southwest of stone wall and 13 feet east of the southeast corner of the 18 x 34-foot stone wall enclosure (old house base).

Reference mark number one is a standard disk stamped "KIPAHULU CATH CHURCH NO 1 1950", cemented in a drill hole in a boulder flush with surrounding rocks, 10 feet southwest of the stone wall and 1.2 feet lower than station mark.

Reference mark number two is a standard disk stamped "KIPAHULU CATH CHURCH NO 2 1950", cemented in a drill hole in large boulder in base of southeast corner of the stone house base. It projects 16 inches above ground and is 1 foot higher than station mark.

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

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

USCOMM-DC 27173-P88

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1098
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 00' TO 156 ° 30'
DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: KIPAHULU, OLD SUGAR MILL, 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 concrete smokestack which is located at the abandoned ruins of the old Kipahulu Sugar Mill. It lies about 200 feet west of the road which runs between Hana and Kaupo, about 100 feet south of the shops and sheds of the Ulupalakua Ranch Headquarters and just west of the concrete boiler house.

The stack is constructed of cement and is 7 feet in diameter and 92 feet in height.

For
(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KIPAHULU, OLD SUGAR MILL 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 old concrete stack was recovered in good condition. The road between Hana and Kaupo is now State Highway 31. The description is adequate and complete.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

NAME OF STATION: Kipahulu, Old Sugar Mill, stack
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located about 8 miles southwest of Hana, at the Kipahulu Ranch Headquarters, about 200 feet northwest of State Highway 31, at the old, concrete and brick, mill foundation.
Station is center of top of the grey, concrete stack 7 feet in diameter and 92 feet high.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIPAHULU OLD SUGAR MILL STACK

STATE: HAWAII

YEAR: 1950

THIRD

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20 ° 39' 25.548	ELEVATION	METERS
GEODETIC LONGITUDE: 156 03 31.676		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ ± ANGLE *
H1 2	5102	707,818.61	117,977.32	+ 0 ° 12' 52"

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

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

QE 414

REPORT ON CONTROL DATA

DATE: 10/10/68
BY: J. H. HARRIS
FOR: [illegible]

PROJECT: [illegible]

REVISION: [illegible]

10/10/68

10/10/68

10/10/68

REPORT ON CONTROL DATA

1. INTRODUCTION

The purpose of this report is to provide a summary of the control data for the [illegible] project.

The data was collected from [illegible] and is presented in the following sections.

2. SUMMARY OF DATA

The data was collected from [illegible] and is presented in the following sections.

3. ANALYSIS OF DATA

The data was analyzed using [illegible] and the results are presented in the following sections.

4. CONCLUSIONS

The data indicates that [illegible] and the results are presented in the following sections.

5. REFERENCES

The following references were used in the preparation of this report:

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1099
HAWAII
LATITUDE 20 °30' TO 21 °00'
LONGITUDE 156 °00' TO 156 °30'
DIAGRAM NF 4-16 MAUI

Kipahulu Protestant Church (Maui Island, Hawaiian Government Survey, 1881).—In the district of Kipahulu, Land of Halemano, about 175 feet south of the Protestant Church, and near the brink of the sea "pali." Center marked by copper triangle buried in ground, over which was placed an iron pipe in vertical position with a horizontal cross piece. Three bottles were buried pointing toward the mark.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 536
(Rev. Feb. 1965)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KIPAHULU PROTESTANT CHURCH
ESTABLISHED BY: Hawaiian Govt. YEAR: 1881 STATE: Hawaii
RECOVERED BY: C. T. Husemeyer YEAR: 1950 COUNTY: Maui

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

The station was recovered, as described, in good condition. A standard station disk, stamped KIPAHULU PROT CH 1950, was plumbed over the original underground mark. Two reference marks were established and reference mark number 1 was occupied during this 1950 survey. A new description follows--

The station is located in the village of Kipahulu and lies about 200 feet south of the Kipahulu Protestant Church and 3 feet west of the sea bluff.

The station is a standard disk, stamped KIPAHULU PROT CH 1950, set in the top of a square concrete post which projects about 4 inches.

The underground station is a copper triangle, with a hole punched in its center, which is buried 40 inches below the surface of the soil.

Reference mark number 1 is a standard disk, stamped KIPAHULU PROT CH NO 1 1950, set in the top of a square concrete post which projects about 4 inches. It is located 10 feet west of the sea bluff and 7 feet southwest of a rock wall at about the same elevation as the station.

Reference mark number 2 is a standard disk, stamped KIPAHULU PROT CH NO 2 1950, set in the top of a square concrete post which projects about 5 feet. It is the most easterly of two posts which originally hung the gate to the cemetery. It is located about 5 feet higher than the station.

NOTE	OBJECT	BEARING	FEET	METERS	DIRECTION
11a	R. M. No. 2		37.72	11.498	00 00 00
11a	R. M. No. 1		78.689	24.002	126 00 54

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

NAME OF STATION: KIPAHULU, PROTESTANT CHURCH
ESTABLISHED BY: H.G.S. YEAR: 1881 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 by C.T.H. in 1950.

To reach the station from Kipahulu, Old Sugar Mill Stack, go west along State Highway 31 for 0.1 mile to a dirt road south to Kipahulu School. Turn left on dirt road for 0.1 to a fork. Take left fork for about 200 yards to old church. Leave truck and go south to cemetery and through cemetery for about 200 yds to R.M.1 in top of concrete gate post. Station may be located from the R.M. but care should be exercised in probing through the underbrush as the edge of the precipitous cliff is obscured by overgrowth.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIPAHULU PROT CH

STATE: HAWAII

YEAR: 1881

SECOND

-ORDER

SOURCE: G- 9311

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	20 39 14.629	ELEVATION	45	METERS
GEODETIC LONGITUDE:	156 03 28.949	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ OR ANGLE °
HI 2	5102	708,081.72	116,876.63	+ 0° 12' 53"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From 1983)	PLANE AZIMUTH (From 1983)	CODE

POSITION DETERMINED BY TRAVERSE FROM STATION KIPAHULU CH RM1

QE 429

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561 STATION 1099

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

KIPAHULU PROTESTANT CHURCH (continued)

Underground mark is a triangular copper plate, 4 inches on each side, with a hole in center. It is set in a small mass of concrete about 30 inches below ground level.

FORM 528a
(9-18-60)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KIPAHULU PROTESTANT CHURCH
ESTABLISHED BY: HGS YEAR: 1881 STATE: Hawaii
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
Island: Maui

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
R.M. No. 2	NW	37.885	11.548	00 00 00.0
R.M. No. 3	ESE	50.367	15.353	125 39 47

The only mark recovered in good condition was RM No. 2. The surface station mark and RM No. 1 have been removed, apparently by bulldozing. The old underground mark was recovered at the approximate published distance from RM No. 2.

A new surface mark was set, plumbed over the underground mark, and a new reference mark, number 3, was established at the approximate position where RM No. 1 was located. The station mark is so near the edge of a 195-foot cliff that it would be difficult and hazardous to occupy, and all lines are blocked by large trees, so no attempt was made to move the station. A complete description follows:

Station is located about 8-1/2 miles southwest of Hana, 1000 feet south of the Kipahulu Ranch Headquarters, and 168 feet south of the old Kipahulu Protestant Church, in a heavily-wooded area at edge of cliff overlooking Papaloa Bay.

To reach station from the post office at Ulupalakua, go southeast on State Highway 37 for 0.85 mile; take right fork and follow Highway 31 for 26.7 miles to board gate on right, at sign "KIPAHULU HAWAIIAN CHURCH". Pass through gate and go south 0.15 mile; turn left and go 0.1 mile to the church; pass around right side of church and go about 50 yards, then go right, up across pasture about 75 yards to station at edge of cliff.

Station mark is a standard disk stamped "KIPAHULU PROT CH 1881 1968", set into the top of a 2-1/2-inch pipe set in concrete and projecting 8 inches. It is 3 feet north of cliff edge, 37.7 feet south of a cemetery fence, 37.9 feet southeast of the concrete gatepost with RM No. 2 in it, 19 feet south of a date palm, and 4 feet southwest of a white witness post.

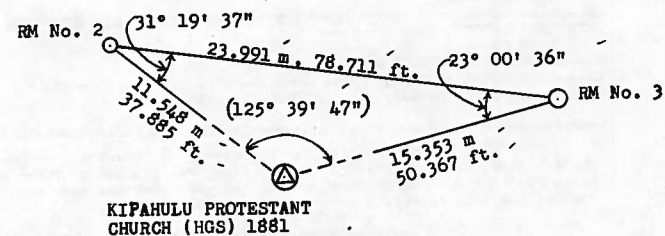
Reference mark number two is a standard disk stamped "KIPAHULU PROT CHURCH NO 2 1950", cemented in a drill hole in the top of an 8-inch-square, concrete gatepost 5 feet tall, which is the south 1 of 2 posts that set 12 feet apart. It is 2 feet south of the cemetery fence and 5.6 feet higher than station mark.

Reference mark number three is a standard disk stamped "KIPAHULU PROT CH HGS 1881 NO 3 1968", set in the top of a 12-inch-square, concrete monument that projects 4 inches. It is 78 feet east-southeast of the gatepost with RM No. 2 in it, 38.6 feet south of the cemetery fence, 10 feet north of cliff edge, and 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.

USCOMMA-DC 37178-P88



HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

Q 201561 STATION 1100
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 00' TO 156° 30'
DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: R. M. 1 STATE: Hawaii COUNTY: Maui

CHIEF OF PARTY: C. T. Husemeyer YEAR: 1950 Described by: C. J. Hoepfel
NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 5.54 METERS.1 HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE	11a	Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	BEARING	DISTANCE		DIRECTION
					feet	meters	
	11a	KA LAE O KA ILIO (HGS)					00 00 00
	11a	KIPAHULU PROT. CH. (HGS)		W	50.36	15.352	08 18 28
	11a	R. M. NO. 1		W	78.699	24.002	31 06 32

The station is located in the village of Kipahulu and lies about 200 feet east of the Kipahulu Protestant Church, 10 feet northwest of the sea bluff and 7 feet southwest of a rock wall.

The station is a standard reference mark bronze disk, stamped KIPAHULU PROT CH NO 1 1950, set in the top of a square concrete post which projects about 4 inches.

KIPAHULU PROT CH (HGS) is a standard station bronze disk set in the top of a square concrete post which projects about 4 inches. It is located 3 feet from the edge of the sea bluff at about the same elevation as the station.

Reference mark number 2 is a standard disk, stamped KIPAHULU PROT CH

NO 2 1950, set in the top of a square concrete post which projects about 5 feet. It is in the most easterly of two posts which originally hung the gate to the cemetery. It is located at about the same elevation as the station.

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

NAME OF STATION: KIPAHULU, PROTESTANT CHURCH, R.M. 1
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. It is located in heavy brush and on the south side of the cemetery which is south of the church.

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

Coast-DC 3431

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KIPAHULU PROT CH RM 1
STATE: HAWAII YEAR: 1950 FIRST ORDER

SOURCE G- 9311

GEODETIC LATITUDE	20° 35' 14.748	ELEVATION	58.7 METERS
GEODETIC LONGITUDE	156° 03' 28.434		193 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ρ OR Δ OR ANGLE
HI 2	5102	708,130.58	116,888.82	+ 0 12 53

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
KA LAE O KA ILIO	67 55 02.0	67 42 09	5102

QE 347

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201561

STATION 1100

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

KIPAHULU PROTESTANT CHURCH R.M. 1 (continued)

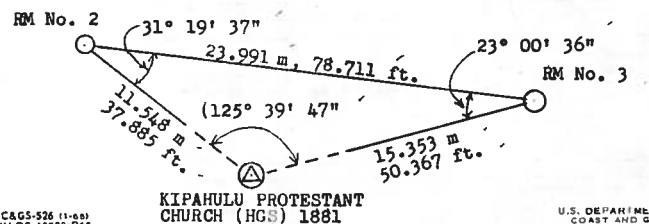
RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KIPAHULU PROTESTANT CHURCH R.M. No. 1
ESTABLISHED BY: C.T. Husemeyer YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO ☐
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

R

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

Station has been destroyed. A new reference mark, number 3, was established at the approximate point where No. 1 was, however it was not tied to other triangulation stations because all lines are blocked by large trees.



FORM C&GS-526 (1-68)
USCOMM-OC 18509-P&H

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY