

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1001
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 555
 Rev. Aug. 1962

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: AIRPORT RP STATE: Hawaii COUNTY: Maui
 Island: Molokai
 Described by: J. R. S.

CHIEF OF PARTY: H. J. Seaborg

Year: 1962

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.63 METERS.1

HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	BEARING	DISTANCE		DIRECTION
				feet	meters	
1b	Surface-station mark,					
7a	Underground-station mark					
		HAUAKEE 2 1962				00 00 00.00
desc		Molokai Airport Beacon	N	(0.4 mile)		127 34 23.5
desc		Azimuth Mark (MOLO (USN))	NW	(0.3 mile)		159 33 46.5
desc		RM 1	E	147.75	45.034	170 50 29
Desc		RM 2	S	84.16	25.652	270 55 59

Station is located airline 7.5 miles northwest of Kaunakakai, 0.3 southwest of the Molokai Airport Terminal Building.
 To reach the station from the junction of State Highways 45 & 46 just south of the post Office in Kaunakakai, go westerly on State Highway 46 for 7.1 miles to a fork and sign "Mauna Loa" Molokai Airport, turn right and follow the Airport road 0.9 mile to the Molokai Airport Terminal Building, pass through the gate on the southwest end of the building and go southwest along the taxi-way for 0.3 mile to the station. Location of the station was determined according to specifications for the location of an Airport reference point as stated in Airport Survey instructions.

Station mark is a standard disk stamped, AIRPORT RP 1962, set in the top of a concrete post that is flush with the surface of the taxi-way, 54.5 feet northwest of the yellow line of the taxi-way.
 Reference mark No. 1 is a standard disk stamped, AIRPORT RP NO 1 1962, cemented in a drill hole in a concrete foundation of an abandon runway light.
 Reference mark No. 2 is a standard disk stamped, AIRPORT RP NO 2 1962, cemented in a drill hole in a concrete foundation of an abandon runway light.
 To reach the Azimuth Mark from the junction of the Molokai Airport road and State Highway 46 continue straight ahead on State Highway 46 for 0.4 mile to the mark on the left.
 The Azimuth mark is a U.S. Navy Hydrographical Survey bronze disk, stamped Molo 1961, set in concrete flush with the pavement, 88 feet north of the north edge of Highway 46, 29 feet east of the west side of the taxi strip.

* 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.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: AIRPORT RP

STATE: HAWAII

YEAR: 1962

SECOND

ORDER

SOURCE: G-12734

GEODETIC LATITUDE:	21° 09' 21.397	ELEVATION	155	METERS
GEODETIC LONGITUDE:	157° 05' 56.926	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ ◊ ANGLE*
HI 2	5102	352,632.45	298,975.33	- 0 09' 22"

* 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
AZ MK MOLO NHS	256° 04' 41.5	256° 14' 03"	5102

QF 291

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 UM

QUAD 211572 STATION 1001

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

AIRPORT RP (continued)

FORM 526
(11-8-65)

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

R

NAME OF STATION: AIRPORT RP
ESTABLISHED BY: H. J. Seaborg YEAR: 1962 STATE: Hawaii
RECOVERED BY: E. P. Cline YEAR: 1964 COUNTY: Maui Island: Molokai

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

Station was recovered and all marks found in good condition although the station is on the southeast side of the taxi-way, instead of the northwest side as the original description states. Two additional discrepancies in bearings were noted. A complete description follows:

Station is located about 6-1/2 miles airline northwest of Kaunakakai, on the Molokai Airport, midway along the northwest side of the main runway and opposite the middle of the southeast side of the triangle formed by the intersection of the two runways and a short taxi-way running northwest.

To reach station from the Molokai Airport Terminal building, go southwest along the main taxi-way for 0.3 mile to station on left, between the taxi-way and runway.

Station mark is a standard disk stamped "AIRPORT RP 1962", set in the top of a 10-inch-square, concrete monument flush with macadam surface. It is 54.5 feet southeast of center-line of taxi-way.

Both reference marks were found as described.

The azimuth mark was found as described but is east-northeast of the station instead of northwest as described in 1962.

The airport beacon is northeast of station instead of north.

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: AIRPORT RP
ESTABLISHED BY: H. J. S. YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
RECOVERED BY: P. D. C. YEAR: 1976 COUNTY: Maui

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

At Molokai Airport

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

The station mark, Reference Marks 1 and 2 were recovered as described and in good condition. The azimuth mark was 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

QUAD 211572 STATION 1002
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

Amikopala (Molokai Island, Hawaiian Government Survey; R. W. Woodworth, 1925.)—This station has been destroyed in the cultivation of the surrounding fields for pineapple growth.
 (11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: AMIKOPALA

ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii

RECOVERED BY: H.J.Seaborg YEAR: 1962 COUNTY: Maui
 Island: Molokai

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

Only description available was one obtained from the State of Hawaii Survey Office, which stated that the station was marked by a pile of stones. A search was made but no cairn or mark recovered. This vicinity is now pineapple land and the station is presumed destroyed. Also, reported destroyed in 1925 by R.W.W.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: AMIKOPALA

STATE: HAWAII

YEAR: 1925

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 21 07 52.188	ELEVATION: 410 METERS
GEODETIC LONGITUDE: 157 11 33.484	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE*
HI 2	510z	320,745.86	290,070.52	- 0 11 23

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

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

* 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

QI 568

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1003
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

SEE STATION MAUNA LOA HGS

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: BENCH MARK NR MAUNA LOA
 STATE: HAWAII YEAR: 1962 SECOND ORDER

SOURCE: G-12734
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 21° 08' 43.437	ELEVATION: 421.0 METERS
GEODETIC LONGITUDE: 157° 09' 35.449	1381 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE °
HI 2	5102	331,936.37	295,205.57	- 0° 10' 41"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
POSITION DETERMINED BY TRAVERSE FROM STATION MAUNA LOA HGS			
QF 329			

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1004
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

CLIFF (Maui County, Hawaii, C.T.H., 1950)--Station is located near the NE corner of Molokai Island, at Ililo Point, on a rounded hump covered with small stones, about 3000 ft. W of the point, about 1000 ft. S of the N shore, and about midway between two bombing targets. It is a 1-in. galvanized-iron pipe driven into the ground, projecting 8 in. and painted white. The center of the pipe is the station.

No reference marks were set.

FORM 2004
 (6-18-59)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: CLIFF
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii Island: Molokai
 RECOVERED BY: H.J.S. YEAR: 1962 COUNTY: Maui

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

The station is located near the northwest corner of Molokai Island near the extreme west end of Ililo Point, on a rounded hump covered with stones, about 3000 feet east of the point and about 1000 feet south of the north shore.

The station was recovered and found to be in good shape. A new to reach follows.

To reach the station from the junction of State Highways 45 & 46 just south of the Post Office in Kaunakakai, go westerly on State Highway 46 for 7.1 miles to a fork and sign "MAUNA LOA". Keep on State Highway 46 for 5.75 mile to a dirt crossroad and the top of the grade, and sign on the left " UNITED STATES COAST GUARD". Turn right and go northwest on the graded road through the pineapple field for 0.65 mile to a locked gate. Pass through the gate and follow the Coast Guard road for 4.15 miles to a broad gate, just after passing corrals and loading pens, continue on Coast Guard road for 0.65 miles to a fork, keep left fork leading to the Coast Guard Station for 1.3 miles to a concrete water tank on the right, continue on the Coast Guard road for 2.2 miles to a dim track road on the right, turn right and follow track for about 0.15 mile to the station on a small rock covered hill.

The station is a standard disk stamped, CLIFF 1950, set in the top of a six inch square concrete post that projects 6 inches.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: CLIFF
 ESTABLISHED BY: C. T. H. YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.L. Newsom YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai

7 1/2 miles NW of Mauna Loa

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

Station recovered in good condition as described.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: CLIFF

STATE: HAWAII

YEAR: 1950

THIRD

ORDER

SOURCE: G- 8448

GEODETIC LATITUDE: 21° 13' 28.18	ELEVATION: 40 METERS
GEODETIC LONGITUDE: 157 15 22.16	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ or ANGLE °
HI 2	5102	299,222.81	324,047.71	- 0 22' 48"

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

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

QE 029

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1005
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

FORM 349
 (11-8-68)

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

R

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

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

Only description available was one obtained from the State of Hawaii Survey Office, which stated that the station was marked by a 4 x 4 redwood post. A search of the vicinity revealed a 2-inch iron pipe driven into the ground and projecting about 2 feet above ground. Although there were no reference marks this is believed to be the original station location.

The point was marked with standard U.S. Coast and Geodetic Survey disks and stamped "HAHAEULE 2". See description to that station.

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

COGS-DC 343 14

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-SPI56

GEODETIC LATITUDE	21° 09' 50.24	ELEVATION	METERS
GEODETIC LONGITUDE	157° 00' 23.34		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	384,213.87	301,808.67	- 0° 07' 22"

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

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

QI 550

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1006
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **HAAHAEULE 2** STATE: **Hawaii** COUNTY: **Mau**
 Island: **Molokai**
 Described by: **R.F. Hanson**

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

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK	DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
		BEARING	DISTANCE		DIRECTION
DESC.	Surface-station mark, Underground-station mark		feet	meters	
	MAKAKUPAIA 2 1962				00 00 00.00
desc.	RM 2	SSE	20.96	6.390	69 23 32
desc.	RM 1	ENE	20.13	6.135	332 49 36

Detailed description

Station is located, airline, about 2-1/4 miles east-northeast of Kualapuu, 5 miles north-northeast of Kaunakakai, and 2-1/2 miles southwest of Kalaupapa, on the summit of a round-topped hill of 1674 feet elevation. This hill is heavily timbered with ironwood trees on the north half, the south half being bare and grassy. To reach from the main crossroad in Kualapuu, go east-northeast on State Highway 45 for 2.5 miles to end of paved road. Continue on graded highway for 0.2 mile to a paved side road sharp right. Turn right and go 0.05 mile to paved fork. Take left fork of 3 and go 0.05 mile to metal gate and end of truck travel. Pack west up along fence line about 75 yards to top of hill, then go left along edge of trees about 75 yards to station on summit just south of timber line.

Station mark is a standard disk stamped "HAAHAEULE 2 1962", braced to the top of a 1-1/2-inch iron pipe that is set in cement and projects 5 inches above ground.

It is 8 feet east-southeast of a triangle base on a 10-inch ironwood tree.

Reference mark one is a standard disk stamped "HAAHAEULE 2 NO 1 1962", braced to the top of a 1-1/2-inch iron pipe that is set in cement and projects about 6 inches above ground. It is 13 feet south of a large ironwood root and about 1 foot lower than station.

Reference mark two is a standard disk stamped "HAAHAEULE 2 NO 2 1962", braced to the top of a 1-1/2-inch iron pipe that is set in cement and projects about 8 inches above ground. It is on the north edge of pasture grass, 15.4 feet south of the triangle base and about 1 foot lower than the station.

Station PUU LUAHINE 1925 will serve as the azimuth mark.

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **HAAHAEULE 2**
 STATE: **HAWAII** YEAR: **1962** SECOND ORDER

SOURCE: **G-12734**

GEODETIC LATITUDE:	21° 05' 50.263	ELEVATION	510	METERS
GEODETIC LONGITUDE:	157° 00' 23.404	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	384,207.82	301,811.00	- 0° 07' 22"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
MAKAKUPAIA 2	313 35 14.6	313 42 37	5102

GF 305

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1007
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: HALE O LONO 2 STATE: Hawaii COUNTY: Maui
 Island: Molokai
 CHIEF OF PARTY: Harold J. Seaborg Year: 1962 Described by: R.F. Hanson

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
		DISTANCE		DIRECTION	
		feet	meters		
1b	Surface-station mark			00 00 00.00	
7a	Underground-station mark			60 30 12 -	
desc.	KOLO	SE	19.99	6.095	00 00 00.00
desc.	RM 1	W	36.05	10.990	197 40 38 -
12 a	RM 2				

Station is located, airline, about 4 miles southwest of the village of Mauna Loa and 4 miles east-southeast of Laau Point near a large, horizontal, silver tank on the edge of the bluff overlooking the sand loading dock of the H.C. & D. Company at Hale O Lono Point.

To reach station from the post office in Mauna Loa, go westerly on State Highway 46 for 0.25 mile to a graded side road sharp left, after rounding a right curve in the highway. Turn sharp left and go southwest for 1.0 mile to a T-junction. Turn right and go west on wide graded road for 0.4 mile to a fork. Take left fork, main cindered road, and go 0.5 mile to fence corner on left. Continue ahead for 0.25 mile to cindered side road left, 0.1 mile before a black water tank. Turn left and go southerly 0.15 mile to fence corner on left. Continue southerly along fence for 0.6 mile to fork. Take left fork, through gate, then take right fork and go 0.15

mile to locked board gate. Pass through gate and go 0.15 mile to fork. Take right fork straight ahead for 0.35 mile to T-road right. Turn right and go 0.4 mile to fork just after passing station HALENA on the left. Take left fork for 0.1 mile to junction with wide sand road. Turn left and go downgrade on sand road for 0.8 mile to fork. Take left fork and follow main road for 0.1 mile to a fork. Take right fork for 0.1 mile to station on right, just after passing large silver tank.

Station mark is a standard disk stamped "HALE O LONO 2 1962", set in the top of a 12-inch-diameter, concrete monument that projects 3 inches above ground. It is on road bank along southwest side of road; 75 feet south-southeast of the south-east end of the silver tank, 61.0 feet south-southeast of the northwest end of a concrete guard-rail, 1.7 feet west-southwest of the edge of the guard-rail, 3.6 feet south-southeast of a white witness post, and about 50 yards west of a wooden antenna pole.

Reference mark number one is a standard disk stamped "HALE O LONO 2 NO 1 1962", cemented in a drill hole in the top of the 8th section southeast from the northwest end of the concrete guard rail, projects 16 inches above ground and is about 1 foot higher than the station.

Reference mark number two is a standard disk stamped "HALE O LONO 2 NO 2 1962", cemented in a drill hole in a bedrock outcrop flush with ground. It is 52.0 feet south of northwest end of guard rail, 14 feet northeast of edge of bluff, 19 feet south-southeast of a keawe bush and about 4 feet lower than station.

Station HALENA will serve as the azimuth mark.

NOTE: Key for locked gate may be obtained from the Molokai Ranch office in Kaunakakai.

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

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HALE O LONO 2
 STATE: HAWAII YEAR: 1962 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE	21° 05' 27.339	ELEVATION	45 METERS
GEODETIC LONGITUDE	157 15 09.656	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR ANGLE
HI 2	5102	300,226.74	275,527.13	- 0° 12' 39"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
HALENA	189° 37' 02.9"	189° 49' 42"	5102

4F 275

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 211572 STATION 1007

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

HALE O LONO 2 (continued)

FORM 526a
(2-18-58)

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

R

NAME OF STATION: HALE O LONO 2
ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii ISLAND: Molokai
RECOVERED BY: L.F. Woodcock YEAR: 1965 COUNTY: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.52 METERS. HEIGHT OF LIGHT ABOVE STATION MARK 0 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	
HALENA, 1962 RM 3	ENE	130.73	55.084	0° 0' 00" 63 55 34.0

Station and Reference mark number one were found in good condition. Reference mark number two was not recovered. One new reference mark was established. A complete description follows.

To reach station from Post Office in Mauna Loa, go northwesterly on State Highway 46 for 0.25 mile to a graded side road sharp left, after rounding a right curve in the highway. Turn sharp left and go southwest for 1.0 mile to a T-junction. Turn right and go west on wide graded road for 0.4 mile to a fork. Take left fork main cindered road,

and go 0.5 mile to a fence corner on left. Continue ahead for 0.25 mile to cindered side road left, 0.2 mile before a black water tank. Turn left and go southerly 0.15 mile to a fence corner on left. Continue southerly along fence for 0.6 mile to fork. Take left fork, through gate, then take right fork and go 0.15 mile to a locked iron pipe gate. Pass through gate and go 0.15 mile to fork. Take right fork straight ahead for 0.35 mile to a T-road right. Turn right and go 0.4 mile to a fork just after passing station HALENA on left. Take left fork for 0.1 mile to junction with wide sand road. Turn left and go downgrade on sand road for 0.8 mile to fork. Take left fork and follow main road for 0.1 mile to a fork. Take right fork for 0.1 mile to station on right, just after passing large silver tank.

Reference mark number three is a standard disk stamped "HALE O LONO 2 NO 3 1962." The mark is just east of the center of the point bounded by a concrete curb. It is cemented in a drill hole in a rock outcrop flush with the ground.

Key for locked gate may be obtained from Molokai Ranch Office in Kaunakakai.

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: HALE-O-LONO 2
ESTABLISHED BY: H. J. Seaborg YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
RECOVERED BY: R. L. Newsom YEAR: 1967 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: ISLAND: Molokai

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

Station mark and reference marks recovered in good condition as previously described.

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1008
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 526
 (REV. AUG. 1965)

NAME OF STATION: **HALEAHI** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Molokai**
 Described by: **J.R.S.**

CHIEF OF PARTY: **H.J. Seaborg** YEAR: **1962**

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	HEIGHT OF LIGHT ABOVE STATION MARK METERS.		DIRECTION
			feet	meters	
1b			1.40 METERS		
7a					
desc.	PUU LUAHINE 1915				00 00 00.00
	RM 2	NW	92.25	28.115	41 57 09
	RM 1	SW	63.68	19.413	329 26 24

Station is located in Kaunakakai, on the southeast corner of the Kaunakakai Grade School and about 100 feet northeast of the Kaunakakai Firehouse.

To reach the station from the junction of State Highways 45 & 46 just south of the Post Office in Kaunakakai, go easterly on State Highway 45 0.35 mile to the Kaunakakai Firehouse, turn left and go about 205 feet along the left side of a fence and the station.

The station mark is a standard disk stamped, HALEAHI 1962, set in the top of a concrete post that projects 1/2 foot, 205 feet north of the center of the Highway, 99 feet northeast of the northeast corner of the Fire Station, 4.7 feet west of the fence, 4.6 feet north of a white witness post.

RM No. 1 is a standard disk stamped, HALEAHI NO 1 1962, cemented in a drill hole of the concrete base of the south basketball goal post.

RM No. 2 is a standard disk stamped, HALEAHI NO 2 1962, cemented in a drill hole of the concrete base of the north basketball goal post.

Station PUU LUAHINE can be used as the azimuth.

FORM 526a
 (9-18-65)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **HALEAHI**
 ESTABLISHED BY: **H.J.S.** YEAR: **1962** STATE: **Hawaii**
 RECOVERED BY: **L.P.W.** YEAR: **1965** COUNTY: **Maui (Molokai Is.)**

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

The station was recovered as originally described in good condition.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **HALEAHI**

STATE: **HAWAII**

YEAR: **1962**

SECOND

SOURCE: **G-12734**

GEODETIC LATITUDE: 21° 05' 26.488	ELEVATION: 2 METERS
GEODETIC LONGITUDE: 157 01 12.257	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	∠ HOR Δ RI ANGLE °
HI 2	5102	379,521.01	275,207.34	- 0 07 36

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PUU LUAHINE	185 51 43.0	185 59 21	5102

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1009
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 50'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

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

NAME OF STATION: **HALENA** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Molokai**
 Described by: **J. R. S.**
 CHIEF OF PARTY: **H. J. Seaborg** YEAR: **1962**
 HEIGHT OF TELESCOPE ABOVE STATION MARK **1.47 METERS** HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	DISTANCE		DIRECTION!			
			feet	meters	°	'	"	
1b	Surface-station mark							
7a	Underground-station mark							
		PUNAKUA 2 1962	NW	81.24	24.763	00	00	00.00
12c		RM 2	NE	127.95	38.999	122	04	27
12c		PEM Haleolono (USGS)	NE	80.02	24.392	172	00	56
12c		RM 1						

Station is located, airline, about 3.75 miles southwest of the town of Mauna Loa, 4 miles east-northeast of Laau Point, 1.0 mile north of Hale O Lono Point on a small clear grassy knoll. This station was placed near the point that Station WALELE3 was located.

To reach the station from the Post Office in Mauna Loa, go westerly on State Highway 46 for 0.25 mile to a graded side road on the left, turn left and go southwest for 1.0 mile to a T-junction. Turn right and go west on wide graded road for 0.4 to a fork. Take left fork, main cinder road, and go 0.5 mile to fence corner on left. Continue ahead for 0.25 mile to cinder side road left, 0.1 mile before a black water tank. Turn left and go southerly 0.15 mile to fence corner on left. Continue southerly along fence for 0.6 mile to fork. Take left fork through gate then take right fork and go 0.15 mile to a lock board gate. Pass through gate and go 0.15 mile to a fork. Take right fork straight ahead for 0.35 mile to T-road right. Turn right and go 0.35 mile to the station on the left. The station is about 100 yards south of the road on flat grassy knoll.

The station is a standard disk stamped, **HALENA 1962**, set in the top of a concrete post that projects 2 inches, 3 feet southeast of a white witness post.

Reference mark No. 1 is a standard disk stamped, **HALENA NO 1 1962**, cemented in a drill hole in a round boulder that projects 1 foot.

Reference mark No. 2 is a standard disk stamped, **HALENA NO 2 1962**, cemented in a drill hole in a boulder that projects 1 foot.

PEM Haleolono is a standard Geological Survey Disk cemented in a drill hole in a boulder that projects 1 foot. Stamped 487

RECOVERY NOTE, TRIANGULATION STATION

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

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

3.7 Miles NE

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

Recovered in good condition as previously described.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: **G-12734**

GEODETIC LATITUDE	21° 06' 13.960	ELEVATION	147	METERS
GEODETIC LONGITUDE	157 15 01.238	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR ANGLE
HI 2	5102	301,041.15	280,228.16	- 0° 12' 37"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
PUNAKUA 2	83 12 58.6	83 25 36	5102

QF 281

R

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1010
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 50'
 DIAGRAM NF 4-16 MAUI

Form 526
 (11-8-65)

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

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

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

A stone with cross chiseled on top was re-covered and is believed to be the station mark. A complete description follows:
 Station is located, airline, about 5-1/2 miles east-northeast of Mauna Loa, 8-1/2 miles west-northwest of Kaunakakai, and 2 miles west of the Molokai Airport, on the summit of a lone hill of 750 feet elevation that has a lone, 30-foot pole bearing a red, aircraft warning light.

To reach from Molokai Airport, go west on Highway 46 for 4.45 miles to board gate on right. Pass through gate and follow track road for 1.1 miles to left curve of road. Go right, on bare red strip, for 0.15 mile to old board gate on left. Pass through gate and follow dim track road easterly for 0.4 mile to base of hill. Follow old bulldozed road up hill and along top for 0.25 mile to station by pole.

The mark is a 4-inch cross chiseled on the top of a 16-inch-diameter, flat rock that is setting on top of the ground in a slight depression, and is covered with a pile of boulders. It is 18 feet south of the lone pole.

Because of the unsuitable location of this mark a new station, HAUAKEA 2, was established. See description for that station.

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

COM-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: HAUAKEA HGS
 STATE: HAWAII YEAR: 1962 SECOND -ORDER

SOURCE: G-12734
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	21° 09' 33.987	ELEVATION	229	METERS
GEODETIC LONGITUDE:	157 07 54.342	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	341,522.24	300,277.04	- 0° 10' 04"

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

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

POSITION DETERMINED BY TRAVERSE FROM STATION HAUAKEA 2

QF 330

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1011
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 532
 Rev. Aug. 1960

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **HAUAKEA 2** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Molokai**
 Described by: **R.F. Hanson**

CHIEF OF PARTY: **Harold J. Seaborg** YEAR: **1962**
 Described by: **R.F. Hanson**

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK SURFACE-STATION MARK, UNDERGROUND-STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	HEIGHT OF LIGHT ABOVE STATION MARK METERS.		DIRECTION
			feet	meters	
4	1.52				
12	MAUNA LOA 1872 1926 RM 2	WSW 38.24 NW 19.9 NE (approx. 3 miles) S 19.48	11.655	00° 00' 00.00 12 03 30 97 54 31.4 207 19 59.6 308 40 20	
12	Waihuna, Aero Bn. Red Light MOLOKAI AIRPORT BEACON RM 1				

Station is located, airline, about 5-1/2 miles east-northeast of the village of Mauna Loa, 8-1/2 miles west-northwest of Kaunakakai, 2 miles west of the Molokai Airport and 3/4 mile north of State Highway 46, on the summit of a lone hill of 750 feet elevation. There is a lone pole on the summit of the hill which has a red aircraft warning light on its top.

To reach station from the junction of State Highways 45 & 46, just south of the post office in Kaunakakai, go westerly on State Highway 46 for 7.1 miles to a paved fork and sign "MAUNA LOA". Take left fork and go westerly on State Highway 46 for 3.3 miles to bottom of grade opposite the hill on right. Continue on the highway for 1.15 miles to side road right and board gate, by a power pole. Go right, passing through locked gate, and follow track road for 1.1 miles to a left curve in road. Turn right and go south on a bare red dirt strip for 0.15 mile to

old board gate on left at a T-fence. Pass through gate and pick way southeasterly cross-country up gradual slope for 0.25 mile to the beginning of a bare red dirt area. Follow northeast along the dirt strip for 0.35 mile to end of strip at base of hill. Follow old bulldozed strip northeast for 0.15 mile to top of hill. Bear right along top of hill for 0.1 mile to station by lone light pole.

Station mark is a station disk stamped "HAUAKEA 2 1962", cemented in a drill hole in a boulder that projects 4 inches above ground. It is about 6 feet northeast of a white witness post and 19.9 feet south-southeast of the light pole.

Reference mark number one is a standard disk stamped "HAUAKEA 2 NO 1 1962", cemented in a drill hole in a boulder.

Reference mark number two is a standard disk stamped "HAUAKEA 2 NO 2 1962", cemented in a drill hole in a boulder.

Station MAUNA LOA 1872 1926 will serve as the azimuth mark.

NOTE: The key to the locked gate may be obtained from the Molokai Ranch office in Kaunakakai.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **HAUAKEA 2**
 ESTABLISHED BY: **H.K. Seaborg** YEAR: **1962** STATE: **Hawaii** BENCH MARK(S) ALSO
 RECOVERED BY: **J.V.T.** YEAR: **1973** COUNTY: **Maui**

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

5 1/4 miles northeast of Mauna Loa

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

The station and both reference marks were recovered in good condition.
 The description of the station is accurate.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **HAUAKEA 2**
 STATE: **HAWAII** YEAR: **1962** SECOND ORDER

SOURCE: **G-12734**

GEODETIC LATITUDE:	21° 09' 33.960	ELEVATION:	229 METERS
GEODETIC LONGITUDE:	157° 07' 54.287	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE °
HI 2	5102	341,527.43	300,274.30	- 0° 00' 04"

* 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
MAUNA LOA	61 55 50.1	62 05 54	5102

QF 285

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1012
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 533
 Rev. Aug. 1946

DESCRIPTION OF TRIANGULATION STATION

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

CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.38 METERS.†	HEIGHT OF LIGHT ABOVE STATION MARK METERS.	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
			OBJECT	BEARING	DISTANCE feet meters	DIRECTION‡
4	Surface-station mark, Underground-station mark					
12c	KOLO RM 2	NW	28.13 (0.3 miles)	8.575	00 00 00.0 99 33 32	
17c	Azimuth mark	S			286 59 32.9	
12c	RM 1	SW	28.41	8.660	330 33 35	

Detailed description

Station is located, airline, about 3-1/2 miles southeast of the village of Mauna Loa, 6-1/2 miles west-northwest of Kaunakakai, 3/4 mile north of the coast line and 0.6 mile east of Hikauhi Gulch, on a rocky point of about 500 feet elevation on the south slope of the land rising up to Mauna Loa Hill to the north.

To reach station from the junction of State Highways 45 & 46, just south of the post office in Kaunakakai, go westerly on State Highway 46 for 2.45 miles to a concrete bridge on curve of highway. Continue on the highway for 0.1 mile to a reverse-Y on left. Turn sharp left and go south on old paved road for 0.15 mile to the second side road right. Turn right and go westerly on old track road for 1.15 miles to a fork. Take right fork and follow main road for 0.3 mile to a fork at cattleguard. Take right fork across cattleguard and go 0.1 mile to reverse-Y on the right. Angle left and go west for 0.65 mile to a fork. Take right fork and

continue ahead for 0.9 mile to fork. Take right fork along top of dike and go 0.8 mile to crossroad. Continue ahead on dike road for 0.55 mile to fork. Take right fork, off of dike, and go 0.7 mile to a metal gate. Pass through gate and continue for 1.7 miles to a board gate. Pass through gate and continue, passing a windmill, for 1.5 miles to a coconut grove on left. Continue for 0.6 mile to metal gate. Pass through gate and continue on track road for 0.15 mile to end of truck travel. Pack northerly through grove of keawe trees about 100 to base of ridge. Continue on old trail up along rocky ridge about 300 yards to azimuth mark on left. Continue on trail for about 0.3 mile to slight rocky knoll on slope and station by cairn.

Station mark is a standard disk stamped "HIKAUHI 1962", cemented in a drill hole in a 2-1/2-foot boulder that projects 8 inches above ground. It is 19.5 feet north of a 4-foot cairn, 17.5 feet east-southeast of a 6-foot bush and about 80 yards south of heavy brush growth.

Reference mark two is a standard disk stamped "HIKAUHI NO 2 1962", cemented in a drill hole in a 3-foot boulder that projects 1 foot above ground. It is about same elevation as station.

Reference mark one is a standard disk stamped "HIKAUHI NO 1 1962", cemented in a drill hole in a 2-foot boulder that projects about 1 foot above ground. It is 20 feet west of the cairn and about 3-1/2 feet lower than station.

The azimuth mark is a standard disk stamped "HIKAUHI 1962", cemented in a drill hole in a bedrock outcrop that projects about 4 inches above ground. It is on crest of ridge, 16 yards southwest of the trail and 20 feet north-northwest of a cairn.

NOTE: Packing time is about 1/2 hour.

* 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.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-12734

GEODETIC LATITUDE	21 06 19.050	ELEVATION	137	METERS
GEODETIC LONGITUDE	157 10 16.244	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE °
HI 2	5102	328,028.41	280,649.46	- 0° 10' 54"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
AZIMUTH MARK	356° 15' 14.1	356° 26' 08"	5102

QF 275

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1013
 HAWAII
 LATITUDE 21 ° 00' TO 21 ° 30'
 LONGITUDE 157 ° 00' TO 157 ° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

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

R

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAANA
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii
 RECOVERED BY: h.J. Seaburg YEAR: 1962 COUNTY: Maui Island-Molokai

NAME OF STATION: KAANA
 STATE: HAWAII YEAR: 1925 SECOND -ORDER

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

Only description available was one obtained from the State of Hawaii Survey Office, which stated that the station was originally marked by a pile of stones. A search was made but no cairn or mark was recovered and station is presumed to be lost.

A new station, PUNAKOU, was established in the vicinity. See description for that station.

SOURCE: G-SP156

GEODETIC LATITUDE:	21 ° 07' 45.441	ELEVATION:	383 METERS
GEODETIC LONGITUDE:	157 09 06.198	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ θ ANGLE *
HI 2	5102	334,687.45	289,345.41	- 0 10 30

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

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

* 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

Q1 571

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1014
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Kaoo (Molokai Island, Hawaiian Government Survey; R. W. Woodworth, 1925; C. L. Garner, 1926).—Near the northwest corner of Molokai, atop of a hill of the same name, rising prominently 2 miles east of Ilio Point, and ½ mile south of the north shore of the island. In 1925 three crosses were recovered cut in immovable deeply sunken rock, at the following distances, which agreed within 0.1 foot with the distances given in the original description. Nos. 1 to 2, 14.7 feet; Nos. 2 to 3, 12.96 feet; and Nos. 3 to 1, 16.6 feet. A half foot underground and less than 1 foot north of the center mark position were found a ⅝ by 12 inch iron bolt, and the steel tip of a surveyor's rod. A new mark was placed consisting of a standard United States Coast and Geodetic Survey bronze disk set in the top of a concrete post 8 inches square and projecting ¼ foot above the ground. Over this was placed a low cairn of rocks. The distances from the reference crosses are: From No. 1, 12.87 feet; from No. 2, 6.4 feet; from No. 3, 6.9 feet.

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 538
 (Rev. Feb. 1965)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAEO
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii
 RECOVERED BY: C.T. Husemeyer YEAR: 1950 COUNTY: Maui

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

Station recovered as described and in good condition.
 Station is located on property of the Molokai Ranch and a key to locked gates must be procured from their office.

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAEO
 STATE: HAWAII YEAR: 1925 SECOND ORDER
 SOURCE: G-12734

GEODETIC LATITUDE:	21° 12' 58.487	ELEVATION:	176	METERS
GEODETIC LONGITUDE:	157° 13' 54.621	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ or ANGLE °
HI 2	5102	307,494.37	321,021.50	- 0 12' 16"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β OR Δ or Δ² FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
LAINA KAA	278 42 34.6	278 54 51	5102

QF 286

(continued on next page)

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1014

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

KAEO (continued)

FORM 526a
 (5-15-59)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

R

RECOVERY NOTE, TRIANGULATION STATION

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

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.38 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	
LAINA (KAA) 1885-1962 (HGS)				00 00 00.00
Molokai VOR (MKK)	SE	(7.0 miles)		43 38 56.5
Water tank, Puu Apalu	S	(4.0 miles)		82 49 36.5
FM 2	SW	12.52	3.815	168 04 15
Ilio Pt. Coast Guard Loran Mast	W	(2.0 miles)		178 34 07.9
RM 1	NNE	33.51	10.215	312 53 22

Station mark was recovered and found to be in good condition.
 Two reference marks were established. A complete description follows.
 Station is located, airline, about 5 1/2 miles north-northwest of the village of Mauna Loa, 2 miles east of the extreme west tip of Ilio Point, and 0.3 mile south of the north shore of Molokai Island, on the summit of a rocky hill of 584 feet elevation, know as Kaeo Hill.
 To reach the station from the junction of State Highways 45 & 46 just south of the post office in Kaunakakai, go westerly on State Highway 46 for 7.1 miles to a fork and sign "MAUNA LOA". Keep on Highway 46 for 5.75 miles to a dirt crossroad at top of grade, and sign on right "UNITED STATES COAST GUARD". Turn right and go northwest on the Coast Guard road for 0.65 mile through the pineapple field to a locked gate. Pass through the gate and follow the Coast Guard road for 4.15 miles to a board gate, just past corrals, continue on the Coast Guard road for 0.65 mile to a fork, keep left fork leading to the Coast Guard Station for 1.3 miles to a concrete water tank on the right. Continue ahead 0.3 mile to a dim track road on the left, turn left and follow the track road for 0.1 mile to the top of the hill. The station is about 100 feet south of this point.
 Station is a standard Coast & Geodetic disk, unstamped, set in the top of a 8 inch square concrete post that projects 6 inches, 8 feet south of a 4x4 white witness post.
 Reference mark 1, is a standard disk, stamped, KAEO NO 1 1926 1962 cemented in a drill hole in a round boulder that projects about 18 inches.
 Reference mark 2, is a standard disk, stamped, KAEO NO 2 1926 1962, cemented in a drill hole in a large boulder that projects about 3 feet on the southwest side and about 1 foot on the northeast side, the reference is about level with the station.

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KAEO
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.L. Newsom YEAR: 1967 COUNTY: Maui

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 5 3/4 miles NW of Mauna Loa

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

Station recovered in good condition as described.

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1015
 HAWAII
 LATITUDE 21 ° 00' TO 21 ° 30'
 LONGITUDE 157 ° 00' TO 157 ° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

FORM 368
 (11-8-55)

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

R

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

Detailed statement as to the fitness of the original description, including marks found, stampings, changes made, and other pertinent facts:
 A search was made but no mark could be found. This vicinity is now pineapple field and the station is presumed to be destroyed.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHEKUPAPAU
 STATE: HAWAII YEAR: 1925 SECOND ORDER
 SOURCE: G-SP156

GEODETIC LATITUDE:	21 ° 08' 16.484	ELEVATION:	547	METERS
GEODETIC LONGITUDE:	157 12 33.794	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	315,044.62	292,541.13	- 0° 11' 45"

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

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

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

COM-DC 34314

QI 563

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1016
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

Kahualewa (Molokai Island, Hawaiian Government Survey; R. W. Woodworth, 1925).—On top and point of a narrow flat-topped ridge on the west side of Onopalani Gulch, in such a position as to see the outer half of the dock at Kolo Harbor. In 1925 a United States Geological Survey signal pole was found in position, and a 1-inch iron pipe driven firmly into the ground, projecting 1 foot above it.
 (11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: **YAMMERIA**
 ESTABLISHED BY: **R.W.W.** YEAR: **1925** STATE: **Hawaii**
 RECOVERED BY: **W.J.S.** YEAR: **1962** COUNTY: **Maui**
 Island: **Mo'orea**

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

The iron pipe mentioned in the description was recovered in good condition. The pipe projects about 10 inches. A small cairn of stones was placed around the pipe.

Station is located on a small rise on the west side of Onopalani Gulch, about 2.0 miles southeast of Mauna Loa, and about 1.2 miles north of the Kolo Wharf.

To reach the station from the post office in Mauna Loa, go 0.15 mile northeast to end of pavement, continue 1.8 miles northeast on graded road to fence corner and road on right, turn right go 0.2 mile to gate, pass through gate and pass small concrete block building and antenna pole on left, take track road 0.55 mile southwest to dirt fork in road just after crossing a pipeline, take right fork 0.2 mile northwest to a bladed road on right, turn left go 1.2 miles south on bladed road, leave road and go about 0.1 mile to end of track level at base of small rise and station about 300 feet south.

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAHUALEWA**
 STATE: **HAWAII** YEAR: **1925** SECOND ORDER

SOURCE: **G-SP156**

GEODETIC LATITUDE:	21° 06' 45.239	ELEVATION	242	METERS
GEODETIC LONGITUDE:	157 11 55.513	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE °
HI 2	5102	318,656.68	283,322.41	- 0° 11' 30"

* 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

Q1 567

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1017
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

Kakaako (Molokai Island, Hawaiian Government Survey; R. W. Woodworth, 1925).—This station has been destroyed by the cultivation of the surrounding fields for pineapple growth.

Form 326
 (11-8-55)

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

R

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

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

This station was reported destroyed in 1925
 when the land was developed for pineapple raising.
 A search in the vicinity was made and station is definitely gone.

* 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.

COBB-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION **KAKAAKO**
 STATE **HAWAII** YEAR **1925** SECOND ORDER

SOURCE **G-SP156**

GEODETIC LATITUDE: 21° 09' 14.487	ELEVATION: 253 METERS
GEODETIC LONGITUDE: 157° 12' 14.824	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	316,860.25	298,387.40	- 0° 11' 38"

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

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

QI 561

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211572 STATION 1018
HAWAII
LATITUDE 21° 00' TO 21° 30'
LONGITUDE 157° 00' TO 157° 30'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

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

NAME OF STATION: KAKALAHALE
ESTABLISHED BY: R.W.W.
RECOVERED BY: R.W.W.

YEAR: 1925 STATE: Hawaii
YEAR: 1962 COUNTY: Maui

Island: Molokai

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

Information obtained from the Office of State Surveyor indicated the original red wood post was replaced with a 2 1/2 inch iron pipe set in concrete with a 1 1/2 inch iron pipe projecting about 2 feet. This mark was recovered in good condition.

Station is located on a prominent hill, about 3.3 miles southeast of Kualapuu, about 2.6 miles east-northeast of Kaunakakai, and about 100 feet northwest of wooden water tank.

To reach the station from the junction of State Routes 45 and 46 at the post office in Kaunakakai, go 0.2 mile west on State Route 46 to road on right, turn right go 0.5 mile north and west to end of pavement, turn right go 2.3 miles northeast to fork in road, take left fork 0.1 mile to track road on right, turn right go 0.2 mile to gate in fence line, continue on road about 0.2 mile to end of truck travel and station about 100 feet northwest.

Form 526
(11-8-55)

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

NAME OF STATION: KAKALAHALE
ESTABLISHED BY: R.W.W.
RECOVERED BY: L.F. Woodcock

YEAR: 1925 STATE: Hawaii
YEAR: 1965 COUNTY: Maui

ISLAND: Molokai

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

Station was recovered as described in good condition.

* 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 343 14

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAKALAHALE
STATE: HAWAII

YEAR: 1925

SECOND ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21 07 31.79	ELEVATION:	590	METERS
GEODETIC LONGITUDE:	157 00 01.89	SCALED		FEET

STATE COORDINATES (FWS)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	386,214.72	287,835.34	- 0 07 13

* 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

Q1 455

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1019
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 503
 Rev. Aug. 1962

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KALA

STATE: Hawaii

COUNTY: Maui

Island: Molokai

Described by: R.F. Hanson

CHIEF OF PARTY: Harold J. Seaborg

YEAR: 1962

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.1	HEIGHT OF LIGHT ABOVE STATION MARK METERS.	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		
			OBJECT	BEARING	DIRECTION
desc.	Surface-station mark, Underground-station mark				
			feet	meters	
desc.	PUU ILOLI (HGS) 1885-1915				00 00 00.00
desc.	RM 2	NW	23.35	7.119	275 21 20
desc.	RM 1	ENE	22.78	6.942	356 53 17

Station is located about 7-1/2 miles airline west of Kaunakakai, along the south shore of Molokai and on the east side of a fence line that extends south into the water.

Detailed description:

To reach from the junction of State Highways 45 and 46, just south of the post office in Kaunakakai, go westerly on State Highway 46 for 2.5 miles to a concrete bridge on right curve. Continue for 0.1 mile to a reverse-Y on left at bottom of grade. Turn back sharp left and go south on old paved road for 0.15 mile to second side road right. Turn right and go west for 1.45 miles to fork. Take right fork, across cattleguard, and go 0.05 mile to reverse-Y on right. Angle left and go west for 0.65 mile to fork. Take right fork straight ahead for 0.9 mile to fork. Take right fork, along top of dike, for 0.8 mile to crossroad. Continue ahead on dike

road for 1.0 mile to fork. Take right fork, off of dike, and continue on track road for 0.7 mile to metal gate. Pass through gate and continue west for 1.65 miles to gate at fence corner. Jog left around fence corner and continue west along fence for 0.1 mile to fence corner. Turn left and go south along east side of fence line for 0.1 mile to shoreline and station.

Station mark is a standard disk stamped "KALA 1962", brazed to the top of a 1-inch iron pipe that is set in cement and projects 8 inches above ground. It is 4.4 feet east of fence line, 10.6 feet north-northeast of the north end of a wooden gate, 15 feet north of the extreme south tip of the grassy point, 1 foot south of a white witness post, 150 yards south-southwest of a windmill and about 4 feet higher than high water line.

Reference mark number one is a standard disk stamped "KALA NO 1 1962", brazed to the top of a 1-inch iron pipe that is set in cement and projects 6 inches above the ground. It is 25 feet east of the fence line, 15 feet north of shore bank and about 6 inches lower than station.

Reference mark number two is a standard disk stamped "KALA NO 2 1962", brazed to the top of a 1-inch iron pipe that is set in cement and projects 6 inches above the ground. It is 1 foot east of the fence line, 2 feet north-northeast of the third fence post north of the wooden gate, and about 1 foot lower than the station.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KALA
 ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.L.N. YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai

7 1/2 Miles west of Kaunakakai

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

Station and all reference marks recovered as described.
 Description adequate and correct.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KALA

STATE: HAWAII

YEAR: 1962

SECOND

ORDER

SOURCE: G-12734

GEODETIC LATITUDE: 21° 05' 50.461	ELEVATION 1 METERS
GEODETIC LONGITUDE: 157 08 26.065	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE*
HI 2	5102	338,452.34	277,732.85	- 0 10 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
PUU ILOLI	242 10 21.2	242 20 35	5102

R

QF 255

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1020
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

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

R

NAME OF STATION: KALAMAULA
 ESTABLISHED BY: F.W.P. YEAR: 1900 STATE: Hawaii
 RECOVERED BY: H.J.S. YEAR: 1962 COUNTY: Maui
 Island: Molokai

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

The location of the station was plotted on a U.S. G.S. quadrangle and the area visited. A 2 inch iron pipe projecting about 8 inches was found. The character of the original mark and the year it was established is unknown. The pipe is probably in the same location as the original station but to verify this additional field work would have to be performed.

To reach the station from the junction of State Routes 45 and 46 at the post office in Kaunakakai, go 4.1 miles northwest on State Route 46 to a road on the right, turn right go 1.3 miles northeast on graded gravel road to track road on right, turn right go 1.9 miles east to dirt track road on right, turn right go 0.25 mile to fork in road, take right fork 0.4 mile to end of truck travel and station on the left about 400 feet south of the road. Station is on a small rise of land that is covered with scattered small rock outcrops and keawe trees.

* 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 343 14

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KALAMAULA
 STATE: HAWAII YEAR: 1900 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 21° 07' 30.60	ELEVATION:	METERS
GEODETIC LONGITUDE: 157 01 40.92		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	376,838.99	267,735.77	- 0° 07' 45"

* 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

Q1 465

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1021
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Form
 (11-66-55)

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

R

NAME OF STATION: KALUAKAWAHINE
 ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii
 RECOVERED BY: H.C.S. YEAR: 1962 COUNTY: Maui

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

The position of the station was plotted on a U.S. G.S. quadrangle. The area was visited and a thorough search of the area was made but no evidence of the station was found. It is suggested that the station be removed from the records.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KALUAKAWAHINE

STATE: HAWAII

YEAR: 1925

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21° 06' 37.572	ELEVATION:	152	METERS
GEODETIC LONGITUDE:	157 08 05.246	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	340,437.71	282,480.35	- 0° 10' 07"

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

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.

Coms 34914

QI 575

JUN 1976
 U. S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1022
 HAWAII
 LATITUDE 21 ° 00' TO 21 ° 30'
 LONGITUDE 157 ° 00' TO 157 ° 30'
 DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Kualapuu Aero YEAR: 1962 STATE: Hawaii COUNTY: Maui
 Beacon, Red Light Island-Molokai
 CHIEF OF PARTY: HJS

Description, including sketch of object:

Station is located about 4.5 miles northwest of Kaunakakai, about 2.7 miles east of the Molokai Airport, about 1.0 mile southwest of Kualapuu, and about 72.4 feet northeast of triangulation station of MIDDLE HILL.

Station is center of flashing red warning light atop a 28 foot wooden pole.

Light appears on C&GS Charts 4II6 and 4I20 as a landmark.

U. S. GOVERNMENT PRINTING OFFICE 16-66981-1

Described by

NAME OF STATION: KAULAPUU AERO BEACON RED LIGHT
 STATE: HAWAII YEAR: 1962 THIRD ORDER

SOURCE: G-12734
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	21 ° 09' 11.842	ELEVATION:	METERS
GEODETIC LONGITUDE:	157 03 14.588		FEET

STATE COORDINATES (F711)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	367,996.05	297,971.59	- 0 08 25

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From north)	PLANE AZIMUTH * (From south)	CODE
POSITION DETERMINED BY TRAVERSE FROM STATION MIDDLE HILL HGS			
QF 344			

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1023
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 30' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

FORM 526a
 (6-18-69)

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

R

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

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

SOURCE: G-SP156

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	

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

Station was searched for and a pipe was found, but it is not known if this is the station point. A complete description follows:

Station is located about 1-1/2 miles east-northeast of the village of Kualapuu, on the summit of a prominent tree-covered hill at the south edge of a golf course, and just east above an old dairy.

To reach from the main crossroad in Kualapuu, go east-northeast on State Highway 47 for 1.0 mile to a paved fork. Continue ahead on right fork, State Highway 47, for 0.45 mile to track road fork left, just before reaching a left fork with paved tracks. Turn left and go 0.15 mile to side road left at some white buildings. Go left for 0.05 mile to gate. Pass through gate and continue for 0.15 mile to side road right, at south edge of golf course. Turn right and go 0.1 mile to side road right. Turn right and follow track road winding up hill for 0.1 mile to top and end of road.

There is a cemetery plot just left of the end of the road, enclosed by a 50-foot square, wire mesh fence. A single headstone, inscribed "George Paul Cooke" is in the center of the plot. Six feet east of the headstone there is a 2-1/2 inch iron pipe which projects 4 inches above ground and is on the highest point of the hill. This pipe is similar to pipes with which the Hawaii Territorial Survey replaced the old redwood posts originally marking many of their stations, during the early 1930's. However, since there were no reference points established and also because of the heavy growth of trees up to 40 feet high covering the entire hill it is not possible to get a check on this point to determine if it is the original station point.

GEODETIC LATITUDE: 21° 09' 40.07	ELEVATION: METERS
GEODETIC LONGITUDE: 157° 00' 58.11	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE
HI 2	5104	380,920.69	300,789.70	- 0° 07' 34"

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

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

Q1 545

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

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

USCOMM-DC 27178-P69

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1024
 HAWAII
 LATITUDE 21 ° 00' TO 21 ° 30'
 LONGITUDE 157 ° 00' TO 157 ° 30'
 DIAGRAM NF 4-16 MAUI

Kaunakakai (Maui County, Hawaii,
 R. W. Woodworth, 1925).—On southern coast of Molokai at Kaunakakai
 village, east end of wharf, between the house of wireless operator and Mr. Dern's
 house, and between the road on the north and beach on south, but slightly closer
 to the road. Center marked by granite post with cross in top.

FD-50 (11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KAUNAKAKAI

ESTABLISHED BY: R.W.W. YEAR: 1925 STATE: Hawaii

RECOVERED BY: H.J.S. YEAR: 1962 COUNTY: Maui

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

The original granite post which marked the station was recovered but a section
 from the top of the post which contained the cross had been broken off and could not
 be found.

The visibility from the station
 is obstructed in all directions by buildings and trees.

Station is located about 0.1 mile south of the post office in Kaunakakai, about
 0.1 mile east of road leading to the wharf, and about 37 meters from the high water
 line.

Station is 82.3 feet south of the center line of street, 49.0 feet east of old
 fence line, 30.8 feet northeast of northeast corner of house, 22.0 feet northwest of
 southwest corner of storage shed in rear of car port, and 1.6 feet north of old grass
 covered foundation. A granite post with irregular top, about 6 inches square, and set
 about 16 inches below the surface.

To reach the station from the post office in Kaunakakai, go 0.2 mile south to
 street on left, turn left and go 0.1 mile east to station on right.

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAUNAKAKAI

STATE: HAWAII

YEAR: 1925

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21 ° 05' 21.719	ELEVATION:	1
GEODETIC LONGITUDE:	157 01 29.552	SCALED	METERS
			FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ IOR Δ θ I ANGLE *
HI 2	5102	377,885.96	274,729.62	- 0 ° 07' 44"

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

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

Q1 444

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1025
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 825 b

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: **Kaunakakai Harbor** YEAR: 1962 STATE: Hawaii COUNTY: Maui
 Entrance Range Front Lt. Island-Molokai
 CHIEF OF PARTY: HJS

Description, including sketch of object:

Station is located at Kaunakakai, about 1000 feet south of State Route 46, about 500 feet west of road leading to wharf, about 250 feet north of the shoreline.

Station is center of light atop a shelton steel tower erected on the top of a small concrete building setting on a concrete foundation. Light is painted black. Building and tower are painted white. Structure is about 27 feet high.

Light is listed as number 2955 in List of Lights and Other Marine Aids, Volume III, Pacific Coast and Pacific Islands.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **Kaunakakai Harbor Entrance Range Front Lt.**
 ESTABLISHED BY: **H.J.S.** YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: **R.L.N.** YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: **Island: Molokai**

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

Station was recovered as described.
 Light is listed as number 3684 in list of lights and other marine aids, Volume III, Pacific Coast and Pacific Islands.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAUNAKAKAI HARBUR ENT RNG F LT**
 STATE: **HAWAII** YEAR: **1962** THIRD ORDER

SOURCE: G-12734

GEODETIC LATITUDE:	21° 05' 27.236	ELEVATION:	METERS
GEODETIC LONGITUDE:	157° 01' 39.296		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ α ANGLE*
HI 2	5102	376,964.51	275,288.54	- 0 07 48

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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1026
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 538 D

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: **Kaunakakai Harbor** YEAR: 1962 STATE: Hawaii COUNTY: Maui
Entrance Range Rear Lt. Island-Molokai
 CHIEF OF PARTY: HJS

Description, including sketch of object:

Station is located at Kaunakakai, about 1000 feet north of the shoreline, about 350 feet west of road leading to wharf, and about 200 feet south of State route 46.

Station is center of light atop a shelton steel tower. A small concrete building is located under the center of the tower. Light is painted black. Tower and building is painted white. Light is listed as number 2956 in List of Lights and Other Marine Aids, Volume III, Pacific Coast and Pacific Islands.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **Kaunakakai Harbor Entrance Range Rear Lt.**
 ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.L.N. YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai

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

Station was recovered as described.
 Light is listed as number 3685 in list of Lights and Marine Aids, Volume III, Pacific Coast and Pacific Islands.

NAME OF STATION: **KAUNAKAKAI HARBOR ENT RNG R LT**
 STATE: **HAWAII** YEAR: 1962 THIRD ORDER

SOURCE: G-12734

GEODETIC LATITUDE:	21° 05' 32.184	ELEVATION:	METERS
GEODETIC LONGITUDE:	157 01 55.783		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	377,298.30	275,787.02	- 0 07' 46"

* 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

QF 338

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 21157Z STATION 1027
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

Kaupo (Maui County, Hawaii,
 R. W. Woodworth, 1925).—On western coast of Molokai, on knoll about 2½
 miles north of Laau Point, and 600 meters east by south from end of point, the
 outermost point seen from the extreme end of Laau Point. Knoll is smooth,
 of very gentle slope, and grass covered. Center mark a cross cut in rock. A
 semicircular cairn was erected on seaward side of mark and whitewashed. A
 road, leading from the south side of the Libby pineapple plantation, strikes the
 shore a half mile north of the station.

KAUPOA (Maui County, Hawaii, R.W.W., 1925; O.W.S., 1930)
 --Station is at the W end of
 Molokai Island. It was recovered as described. A cairn is built
 up over the station, which is a cross cut in the rock, and a sig-
 nal placed in the cairn.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION KAUPOA
 STATE HAWAII YEAR 1925 SECOND ORDER
 SOURCE G-12734

GEODETIC LATITUDE: 21° 08' 01.693	ELEVATION: 28 METERS
GEODETIC LONGITUDE: 157° 17' 40.810	SCALED FEET

RECOVERY NOTE, TRIANGULATION STATION

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

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
POOLAU				00 00 00.00
RM 1	SSE	32.48	9.898	139 45 42
Laau Pt. Light	SCW	(about 2.0 miles		157 07 27.8
RM 2	W	12.19	3.715	255 49 56

Station is located, airline, about 5 miles west of Mauna Loa,
 about 2 miles north of Laau point, on a small grass covered knoll. The
 original station was a chiseled cross in a boulder, the station was re-
 placed with a standard disk and two reference marks were set, a complete
 description follows.

To reach the station from the Post Office in Mauna Loa, go west on
 State Highway 46 for 0.25 mile to a graded side road on the left, turn
 left and go southwest for 1.0 mile to a T-junction, turn right and go
 0.4 mile to a fork. Take right fork and go 0.25 mile to station.
 POHAKULOA on the right, continue westerly for 1.6 miles to a locked
 gate, pass through gate and continue westerly for 0.4 mile to a wide
 sand road. Turn left and go 1.7 miles along sand road to a side road
 on the right, turn right and follow track road for 0.65 mile to a fork,
 Take left fork and go straight ahead 1.4 miles to a fork, take left
 fork and go 0.65 mile to a fork at a water tank. Take left fork and go
 west-northwest on track road for 0.55 mile to a T-junction at a beach
 house just ahead. Turn right and go northerly for 2.1 miles to a stake
 on the right, turn right and go cross country for 0.1 mile to a rock
 cairn at edge of trees. Pass to the left of the cairn and pick way
 through trees southeast for 0.1 mile to top of knoll and station.

The station is a standard disk stamped, KAUPUA 1915 1962, set in
 the top of a concrete post that projects 2 inches, and is on the high-
 est part of the hill.

Reference mark No. 1 is a standard disk stamped, KAUPUA NO 1 1915
 1962, cemented in a drill hole in a 2 foot round boulder that projects
 about 10 inches and about level with the station.

Reference mark No. 2 is a standard disk stamped, KAUPUA NO 2 1915
 1962, cemented in a drill hole in a boulder that projects about 1 foot.

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE °
HI 2	5102	285,973.76	291,155.82	- 0 13 35

* 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
POOLAU	224 46 13.5	224 59 49	5102

QF 278

*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.

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1028
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Kihaapilani (Maui County, Hawaii, 1915; E. R. Hand, C. L. Garner, 1926).—Old Hawaiian Government Survey station. Near southwest point of Molokai, on a small sharp hill of same name about 1 mile east of Laau Point. Hill is eroded on north side showing red, but remainder is grass covered. In 1915 the Laau Point Light bore S. 60° W. 1,040 meters. Around the station is a wall which was white-washed, as were many boulders lying about. In 1915 no post was found, only a short section of pipe embedded in the dirt was in approximate position with regard to three reference marks on heavy boulders. Mark was set by them, as follows: No. 1, 6.22 feet; No. 2, 4.35 feet; No. 3, 6.0 feet. Distances between reference marks as follows: Nos. 1 to 2, 10.64 feet; Nos. 2 to 3, 8.05 feet; and Nos. 3 to 1, 8.4 feet. In 1925 station re-marked with standard United States Coast and Geodetic Survey station mark set in a concrete monument standing 1 foot above ground.

ADJUSTED HORIZONTAL CONTROL DATA

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

GEODETIC LATITUDE:	21° 06' 20.522	ELEVATION	65	METERS
GEODETIC LONGITUDE:	157 17 54.359	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ θ) ANGLE*
HI 2	5102	284,647.45	280,993.24	- 0° 13' 39"

* 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
KAUPOA	187 12 27.9	187 26 07	5102

QF 277

(continued on next page)

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1028

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

KIHAAPILANI (continued)

Form 526a
 (9-18-59)

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

R

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

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.25 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	
KAUPOA 1915-1962				00 00 00.0
R.M. No. 1	ESE	18.164	5.337	102 59 52
Laau Point Lighthouse	WSW	About 0.6	mile	244 29 53.6
R.M. No. 2	WNW	20.08	6.121	282 44 57

Station mark was recovered and found to be in good condition. Two reference marks were established. A complete description follows:

Station is located, airline, about 6 miles west-southwest of the village of Mauna Loa, 1 mile east of Laau Point and 0.6 mile east-northeast of the Paau Point lighthouse, on a low, red, rocky knoll of about 212 feet elevation.

To reach from the post office in Mauna Loa, go west on State Highway 46 for 0.25 mile to a graded side road sharp left, after rounding a right curve in the highway. Turn left and go southwest for 1.0 mile to a T-junction. Turn right and go west on wide graded road for 0.4 mile to a fork. Continue west on right fork for 0.25 mile to station POHAKULOA on the right. Continue westerly on graded road for 1.05 miles, cross wash and continue west on road along fence line for 0.5 mile to a locked gate. Pass through gate and continue for 0.4 mile to a T-intersection just left of a castleguard. Turn left and follow wide sand road for 1.7 miles to a track road right, at top of grade. Turn right and go westerly for 0.65 mile to a fork. Take left fork for 0.15 mile to a crossroad at a stake. Turn left for 20 yards then take right fork and go southwesterly on main road for 0.6 mile to grove of trees on right, where fence on left begins to bear away from road. Continue ahead on main road for 1.2 miles to two cisterns on left. Continue ahead for 0.25 mile to fork. Take right fork and go 0.15 mile to 2 triangle blazes on trees on left. Turn right, leaving road, and go northerly through trees for 50 yards to rocky knoll and station.

Station mark is a standard disk, unstamped, set in the top of an 8-inch-square concrete monument that projects 8 inches above ground. It is 5.1 feet east-northeast of a white witness post.

Reference mark number one is a standard disk stamped "KIHAAPILANI NO 1 1926 1962", cemented in a drill hole in a large boulder that projects about 3 feet above ground. It is on the southeast end of the knoll and at about the same elevation as the station.

Reference mark number two is a standard disk stamped "KIHAAPILANI NO 2 1926 1962", cemented in a drill hole in a large bedrock outcrop that projects about 2 feet above ground. It is on the west point of the knoll and about 2 feet lower than the station.

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

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

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

USCGM-DC 27178-P88

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1029
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

KILOHANA (Maui County, Hawaii, R.W.W., 1925; Hawaiian Territorial Survey, 1930) --Station is located in Palaau Forest Reserve, Molokai Island, near the road to Pali overlooking the Leper Settlement.

Found all three witnesses on stones, and the rusty pipe at the station agreeing fairly well with the recorded distances from the stones, the intersections from the crosses differing about 0.2 ft. Built a concrete monument and set a Hawaii Territory Survey standard bronze disk at the mean of the intersections.

Superstructure, type B1, on boulder concrete, about 6 in. above ground surface, with edges extending 9 in. below ground, 9 in. thick all around. Old witness crosses were left exposed to view.

Excellent situated station, accessible by automobile; many important stations are visible, but subject to very strong winds much of the time.

(O.W.S., 1931)--

The station is located about 2 mi. SW of the town of Kaluapapa, on the E most twin peak.

(11-8-65)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KILOHANA

ESTABLISHED BY: R.W.W.

RECOVERED BY: [Signature]

YEAR: 1925 STATE: Hawaii

YEAR: 1965 COUNTY: Maui

Island: Molokai

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

good condition.

Station was recovered in good condition. Station is located on the southeast one of two densely wooded hills, about 3.5 miles northeast of Honolulu, about 1.8 miles southwest of Kaluapapa, and about 0.5 mile south of the const. The trees on the hill are about 35-40 feet in height.

To reach the station from the post office in Honolulu, go 0.3 mile east on State Route 43 to junction with State Route 47, turn left to 4.3 miles north on State Route 47 to entrance to Palaau State Park on left, turn left to 0.6 mile west on road thru park to end of truck travel at turn around in road. From here pack about 0.05 mile southwest to top of hill and station.

State survey monument, Type B now over station.

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

COMB-D-34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KILOHANA

STATE: HAWAII

YEAR: 1925

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21° 10' 41.131	ELEVATION	506	METERS
GEODETIC LONGITUDE:	157° 00' 30.633	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ FOR Δ & ANGLE *
HI 2	5102	383,534.67	306,944.86	- 0° 07' 25"

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

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

Q1 525

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1030
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 822
 Rev. Aug. 1962

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: KOLO

STATE: Hawaii

COUNTY: Maui
 Island: Molokai

CHIEF OF PARTY: H. J. Seaborg

YEAR: 1962

Described by: J. R. S.

NOTE.	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	METERS.			
8a	Surface-station mark Underground-station mark	1.40	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		
12a	HALE O LONO 2 1962	NW	15.06	4.590	00 00 00.00	
12a	RM 2	NE	55.51	16.920	27 28 49 -	
12a	RM 1				137 49 41 -	

Station is located, airline, about 3.5 miles southeast of the town of Mauna Loa, 0.75 mile northeast of Kolo Wharf, 0.5 mile north of the south shoreline of Molokai Island. On a small rocky knoll.
 To reach the station from the junction of State Highways 45 & 46, just south of the Post Office in Kaunakakai, go westerly on State Highway 46 for 2.55 mile to a reverse-Y on the left. Turn sharp left and go south on old paved road for 0.15 mile to the second side road on the right. Turn right and go westerly on track road for 1.15 miles to a fork. Take right fork and follow main road for 0.3 mile to a fork at cattleguard. Take right fork across cattleguard and go 0.1 mile to a reverse-Y on the right. Angle left and go west for 0.65 mile to a fork. Take right fork and continue ahead for 0.9 mile to a fork. Take right fork along top of

dike and go 0.8 mile to crossroad. Continue ahead on dike road for 0.55 mile to fork. Take right fork, off of dike, and go 0.7 mile to a metal gate. Pass through gate and continue for 1.7 miles to a board gate. Pass through gate and continue, passing a windmill, for 1.15 miles to a coconut grove on the left, continue for 0.6 mile to metal gate. Pass through gate and continue on track road for 1.9 miles to where the drainage from a gully crosses the road and a rock cliff on the left side of the road that is about 40 feet high. From here pack up the wash for about 75 yards then bear right and go up the ridge to the top from here pack north for about 0.5 mile to a small rocky knoll.

The station is a standard disk stamped, KOLO 1962, cemented in a drill hole in the north end of a rock outcrop, 7.5 feet north of a rock carin.

Reference Mark No. 1 is a standard disk stamped, KOLO NO 1 1962, cemented in a drill hole in a 4 X 4 rock outcrop that projects about 4 inches and about 3 feet lower than the station.

Reference mark No. 2 is a standard disk stamped, KOLO NO 2 1962, cemented in a drill hole in a rock outcrop.

HALE O LONO 2 1962 can be used as the azimuth.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KOLO
 ESTABLISHED BY: H. J. Seaborg YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R. L. Newsom YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island Molokai

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

Station and reference marks were found in good condition as previously described.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KOLO

STATE: HAWAII

YEAR: 1962

SECOND

ORDER

SOURCE: G-12734

GEODETTIC LATITUDE:	21° 05' 58.864	ELEVATION:	82	METERS
GEODETTIC LONGITUDE:	157 11 13.041	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10R Δ 01 ANGLE °
HI 2	5102	322,645.81	278,630.07	- 0° 11' 14"

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

TO STATION OR OBJECT	GEODETTIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
HALE O LONO 2	81 55 55.4	82 07 09	5102

QF 274

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 214572 STATION 1031
 HAWAII
 LATITUDE 21 ° 00' TO 21 ° 30'
 LONGITUDE 157 ° 00' TO 157 ° 30'
 DIAGRAM NF 4-16 MAUI

Kopala (Molokai Island, Hawaiian Government Survey; R. W. Woodworth, 1925).—This station has been destroyed in the cultivation of the surrounding fields for pineapple growth.

FORM 528
 (11-5-55)

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

R

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

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

The site was visited and found to be planted in pineapples. Station is presumed lost.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KOPALA

STATE: HAWAII

YEAR: 1925

SECOND

-ORDER

SOURCE: G-SP156

GEODETIC LATITUDE	21 ° 07 ' 55.940	ELEVATION	390	METERS
GEODETIC LONGITUDE	157 12 09.363	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ OR ANGLE *
HI 2	5102	317,350.43	290,460.43	- 0 ° 11 ' 56 "

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From 1925)	PLANE AZIMUTH * (From 1925)	CODE

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

COSG-DC 34314

Q1 565

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1032
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

FORM 328
 (11-8-65)

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

R

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

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

A search was made but no mark could be recovered.
 The hill now has an F.A.A. omni-range installation on the summit and the station
 is believed to have been destroyed during construction.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-SP156

GEODETIC LATITUDE: 21° 08' 28.133	ELEVATION: 457 METERS
GEODETIC LONGITUDE: 157° 10' 12.590	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	328,415.65	295,672.47	- 0 10' 54"

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

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

* No. of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.
 NOTE.—One of these forms must be used for every station recovered. COMB-DC 34314

QI 570

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1033
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 835
 Rev. Aug. 1965

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LAAU

STATE: Hawaii

COUNTY: Maui

Island: Molokai

Described by: R.F. Hanson

CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK Surface-station mark, Underground-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			
			BEARING	DISTANCE		DIRECTION
			feet	meters		
2		1.57 METERS.				
12a	KAUPOA 1915-1962				00 00 00.0	
12c	R.M. No. 1		SSW 15.98	4.867	167 12 07	
	R.M. No. 2		NW 18.98	5.785	292 31 33	

Station is located on Laau Point about 6-3/4 miles airline west-southwest of the village of Mauna Loa, 0.3 mile northwest of the Laau Point lighthouse and along the east side of a track road, on the northeast boundary of the Laau Point Coast Guard reservation and on a bedrock ledge about 4 feet higher than the road.

To reach station from the post office in Mauna Loa, go west on State Highway 46 for 0.25 mile to a graded side road sharp left, after rounding a right curve in the highway. Turn sharp left and go southwest for 1.0 mile to a T-junction. Turn right and go west on wide graded road for 0.4 mile to a fork. Take right fork for 0.25 mile to station POHAKULOA on the right. Continue ahead for 1.05 mile, cross wash and continue westerly for 0.5 mile to locked gate. Pass through gate and continue ahead for 0.4 mile to T-junction just left of a cattleguard. Turn left and go 1.7 miles on wide sand road to track side road; right at top of grade. Turn

right and go westerly for 0.65 mile to fork. Take left fork for 0.15 mile to a crossroad at stake. Keep straight ahead for 1.25 miles to fork. Take left fork and go 0.65 mile to fork at a water tank on right. Take left fork and go 0.55 mile to T-junction. Turn left and go 0.05 mile to fork opposite a house on left. Take right fork and follow rough track road southerly along coast for 1.75 miles to station on left.

Station mark is a standard disk stamped "LAU 1962", cemented in a drill hole in bedrock ledge. It is 45 feet east of center line of track road, 7.1 feet east of a white witness post, and across road from an old stone enclosure in bushes.

Reference mark number one is a standard disk stamped "LAU NO 1 1962", cemented in a drill hole in same bedrock ledge as station and is at same elevation as station.

Reference mark number two is a standard disk stamped "LAU NO 2 1962", cemented in a drill hole in a large boulder that projects 1 foot above ground. It is 26 feet east of center line of track road, 11.8 feet northwest of the witness post and about 4 feet lower than station.

Station KAUPOA 1925 will serve as the azimuth mark.

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LAAU

ESTABLISHED BY: H.J.S.

YEAR: 1962

STATE: Hawaii

BENCH MARK(S) ALSO

RECOVERED BY: R.L.N.

YEAR: 1967

COUNTY: Maui

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

Island: Molokai

8 Miles W.S.W. of Mauna Loa.
 Detailed statement as to the fitness of the original description; including marks found, stampings, changes made, and other pertinent facts:

Station was recovered in good condition as previously described.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAAU

STATE: HAWAII

YEAR: 1962

SECOND

ORDER

SOURCE: G-12734

GEODETIC LATITUDE: 21° 06' 18.752	ELEVATION SCALED 15 METERS FEET
GEODETIC LONGITUDE: 157 18 41.722	

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE*
HI 2	5102	280,165.62	280,792.27	- 0 13 56

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
KAUPOA	209 02 07.8	209 16 04	5102

QF 279

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1034
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: LAUU POINT LIGHT YEAR: 1962 STATE: Hawaii COUNTY: Maui
 Island-Molokai
 CHIEF OF PARTY: HJS

Description, including sketch of object:

Station is located on Laau Point at the Southwest corner of Molokai Island.

Station is center of light atop a shelton steel tower erected on the top of a small concrete building setting on a concrete foundation. Structure is about 18 feet high and painted white. Light is painted black.

Light is listed as number 2958 in List of Lights and Other Marine Aids, Volume III, Pacific Coast and Pacific Islands.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LAUU POINT LIGHT BENCH MARK(S) ALSO
 ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii
 RECOVERED BY: R.L.N. YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai

8 Miles W.S.W. of Mauna Loa

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

Station was recovered in good condition as previously described.

R

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

SOURCE: G-12734

GEODETIC LATITUDE: 21° 06' 10.340	ELEVATION	METERS
GEODETIC LONGITUDE: 157° 18' 28.504		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR α ANGLE °
HI 2	5102	281,413.80	279,938.45	- 0° 13' 51"

* 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

QF 339

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1035
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Laina (Kaa) (Maui County, Hawaii, H.G.S., 1885; C.L. Garner, 1926)
 —On the highest point of a prominent conical reddish hill in the north-western part of the island. It is the higher and more easterly of the two prominent cone-shaped hills in the vicinity. The marks recovered were post set in ground and cairn of rocks. It was re-marked with a standard United States Coast and Geodetic Survey triangulation disk set in a pad of cement.

(R.D. King, 1932)—The original redwood post, marking the station on the NW coast of the island, was recovered and replaced by a 1-1/2-in. galvanized pipe packed by tamped rock. Angular measurements checked with the U.S.C.&G.S. records. The U.S.C.&G.S. disk was not found.

NOTE—The above was copied from Circular Letter No. 9, Molokai Triangulation Stations.

FORM 5400
 (9-18-69)

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LAINA (KAA)
 ESTABLISHED BY: H.G.S. YEAR: 1885 STATE: Hawaii Island: Molokai
 RECOVERED BY: H.J.S. YEAR: 1962 COUNTY: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.34 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	
MOOMOMI				00 00 00.00
RM 1	SSE	16.73	5.099	57 19 15
RM 2	SW	13.42	4.092	149 05 27

The station is located, airline, about 6.0 miles north of Mauna Loa, 4.0 miles east of Ilio Point. On the highest point of a prominent conical hill.

To reach the station from the junction of State Highways 45 & 46, just south of the Post Office in Maunakakai, go westerly on State Highway 46 for 7.1 miles to a fork and sign "Mauna Loa". Keep on Highway 46 for 5.75 miles to a dirt crossroad at top of grade, and sign on the right "UNITED STATES COAST GUARD". Turn right and go north-west on the Coast Guard road for 0.65 mile through the pineapple field to a locked gate. Pass through the gate and follow the Coast Guard road for 4.15 miles to a board gate, just past corrals and loading pens, continue on Coast Guard road for 0.65 mile to a concrete water tank and a fork. Turn right and follow the track road 0.25 mile to a concrete block building, keep to the right of the building and follow track road north-northeast for 0.45 mile to a fence corner and gate, keep left of the fence and follow fence line across country for 0.3 mile to the end of truck travel. From here pack up the hill about 100 yards to the station.

The station mark is a standard disk stamped, LAINA KAA 1932 1962, brazed to the top of a 2 inch iron pipe that is set in concrete and projects 1 foot.

Reference mark No. 1 is a standard disk stamped, LAINA KAA NO 1 1932 1962, cemented in a drill hole in bedrock that is flush with the surface of the ground.

Reference mark No. 2 is a standard disk stamped, LAINA KAA NO 2 1932 1962, cemented in a drill hole in bedrock that projects about 4 inches.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAINA KAA
 STATE: HAWAII YEAR: 1885 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE: 21° 12' 42.367	ELEVATION: 201 METERS
GEODETIC LONGITUDE: 157° 12' 02.485	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10R Δ θ1 ANGLE*
HI 2	5102	318,098.86	319,358.18	- 0° 11' 36"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
MOOMOMI	280 33 15.6	280 44 52	5102

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1036
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Mauna Loa (Molokai Island, Hawaiian Government Survey, 1872; C. L. Garner, 1926).—On the summit of Mauna Loa, in the center of the western part of Molokai. In 1926 the station was searched for and no trace of the original mark, a copper bolt, recovered. A concrete reservoir stands on the top of the hill, in excavating for which the station was probably destroyed. There is a United States Geological Survey bench mark near the highest part of the summit.

MAUNA LOA (Maui County, Hawaii, Hawaiian Government Survey, 1872; O.W.S., 1931) ---
 Station was not visited. The highest point of mountain was used for hydrography.

(Hawaiian Territorial Survey, 1932)—Station is on the summit of Mauna Loa, in the center of the W part of Molokai. The original mark, A-A-A on a large rock, was found although the copper bolt, referred to in the original description, was not found.

Type A monument and target signal was erected over the re-located original point, which point was marked by a brass disk of the Hawaii Territory Survey set in concrete.

The hill, Mauna Loa, is locally known as Puu Nana. The concrete reservoir and 2 large steel water tanks stand on the top of this hill. There is a U.S.G.S. bench mark about 33 ft. W of the reestablished station, and the road leading to Libby McNeill and Libby's Camp passes about 150 ft. S of the station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MAUNA LOA
 STATE: HAWAII YEAR: 1872 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE:	21° 08' 43.505	ELEVATION	418	METERS
GEODETIC LONGITUDE:	157° 09' 35.118	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	δ OR Δ or ANGLE *
HI 2	5102	331,967.72	295,212.33	- 0 10 40

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
MIDDLE HILL	265 32 54.3	265 43 34	5102

QF 271

(continued on next page)

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1036

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

MAUNA LOA (continued)

Form 526
 (8-18-85)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MAUNA LOA
 ESTABLISHED BY: Hawaii Govt. Surv. YEAR: 1872 STATE: Hawaii Island: Molokai
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 2.90 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	
MIDDLE HILL (HGS) 1885				00° 00' 00.00
MOLOKAI VOR (MCK)	SW	(approx 1 mile)		161 30 06.2
BM 1381 (USGS)	SW	32.07	9.776	172 01 28 -

The station mark was recovered and found in good condition. A complete description follows:

Station is located, airline, about 9-3/4 miles west-northwest of Kaunakakai, 3-1/2 miles east-northeast of the town of Mauna Loa, and 4 miles west-southwest of the Molokai Airport, on the northeast point of the high mesa that lies between Mauna Loa and the airport. It is 3/4 mile northeast of, and slightly lower than the highest point of the mesa, which has an omni-range installation on its summit.

To reach station from the junction of State Highways 45 & 46, just south of the post office in Kaunakakai, go westerly on State Highway 46 for 7.1 miles to fork and sign "MAUNA LOA". Turn left and follow State Highway 46 for 5.75 miles to a dirt crossroad at top of grade, and sign on right "UNITED STATES COAST GUARD". Turn left and go southerly on road through pineapple field for 0.2 mile to gate on right, at north end of grove of trees. Bear right, through gate, and follow graded road for 0.4 mile to a T-intersection. Go left, passing through a board gate, and go easterly for 0.2 mile to a locked board gate. Pass through gate and bear left on track road for 50 yards to station.

Station mark is a Hawaii Territory Survey bronze disk, unstamped, cemented in a drill hole in bedrock flush with the ground, at the west edge of a 3-foot-square boulder that projects 3 feet above the ground and has "AAA" chiseled into its top in large letters. The mark is 27 feet west of the west end of a large, rectangular pond and 51.0 feet east-northeast of the northeast corner of a square, 8-foot-high, concrete reservoir.

NOTE: The original station mark, a copper bolt, was never recovered and the above described mark was established by the Hawaii Territorial Survey by observations from trial points near the original location to determine original point.

In 1932 the Hawaii Territorial Survey constructed a stone and concrete structure, known as a Type A Superstructure, over the mark. This structure consists of a 6-foot-square concrete platform, 6 inches thick, supported at an elevation of 5-1/2 feet above ground by stone and concrete walls at the north and south sides. A large red-and-white, removable metal target, plumbed over the mark, extends about 6 feet above the platform.

U.S.G.S. Bench Mark 1381 will serve as a reference mark. It is a bronze disk stamped "1381", cemented in a drill hole in a 2-foot-diameter boulder that projects 6 inches above ground. It is located in weeds at west edge of a bare dirt area, 33 feet west of station.

NOTE: Key to locked gate may be obtained at Molokai Ranch office in Kaunakakai.

*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.

Form 526
 (11-8-85)

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

R

NAME OF STATION: MAUNA LOA
 ESTABLISHED BY: Haw. Gov. Surv. YEAR: 1872 STATE: Hawaii Island: Molokai
 RECOVERED BY: E.P. Cline YEAR: 1964 COUNTY: Maui

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

The station mark and USGS benchmark 1381 were recovered and found in good condition as described in 1962.

*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.

CGM-DC 34314

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1037
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MIDDLE HILL
 STATE: HAWAII YEAR: 1885 SECOND ORDER
 SOURCE: G-12734

GEODETIC LATITUDE: 21° 05' 11.161	ELEVATION: 510 METERS
GEODETIC LONGITUDE: 157° 03' 14.828	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	367,975.16	297,902.93	- 0 08 23 "

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
PUU KAPELE	138 54 24.6	139 02 48	5102

MIDDLE HILL (Maui County, Hawaii, H.G.S., 1885; E.R.H., 1915)--
 In central Molokai, on a prominent symmetrical hill in the great
 saddle of Molokai, between Mauna Loa at the west end of island
 and the mountains at the east end. Station is about midway be-
 tween the north and south coasts. Originally marked by a copper
 triangle buried under redwood post and cairn of stones. Three
 reference marks were made on rocks, each 6 feet from the station,
 and bearing, respectively, north, S. 60° W., and S. 60° E. from
 the station. (Not visited in 1915, but above taken from 1915 record.)

MIDDLE HILL (Maui County, Hawaii, H.G.S., 1885;
 Hawaiian Territorial Survey, 1930)
 --Station is in Land of Niihau, Molokai, on a very prom-
 inent hill called Kualapuu.
 Found original subsurface mark, a solid brass triangle, 1/4
 in. thick, sides 5 in. long, which had been broken by some sub-
 sequent surveyor in driving a 1-1/4-in. pipe, striking almost the
 center of it. Witness stones all missing, but correctness of lo-
 cation unquestioned. Have used it many times.
 Built concrete monument, 10- by 10-in., 18 in. below surface
 of ground, with Hawaii Territory Survey bronze disk at about
 ground level, and Type B1 superstructure with edges extending 1 ft.
 below ground level and 1 ft. thick all around.
 This is a very important and visible station for all of cen-
 tral Molokai.

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 211572 STATION 1037

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

MIDDLE HILL (continued)

FORM 526a
(9-18-60)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

R

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MIDDLE HILL
ESTABLISHED BY: HGS. YEAR: 1885 STATE: Hawaii Island: Molokai
RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PUU KAPELE (HGS) 1885 MOLOKAI AIRPORT BEACON	W	(3.0 miles)		08 00 00:00 321 05 45.4

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

Station is located, airline, about 4-1/2 miles northwest of Kaunakakai, 1 mile west-southwest of the village of Kualapuu, and 3 miles east of the Molokai Airport, on the summit of a prominent, grassy hill of 1017 feet elevation and known as Kualapuu. It is surrounded by pineapple fields.

To reach station from the junction of State Highways 45 & 46 just south of the post office in Kaunakakai, go westerly on State Highway 46 for 4.4 miles to the junction of State Highway 47 by Holomua School on the right. Turn right and go northeast on State Highway 47 for 0.9 mile to a graded side road left at a power line. Turn left and follow road northwest along power line for 0.45 mile to fork. Take right fork, leaving power line, and follow road around right side of hill and along edge of pineapple fields for 0.55 mile to dim left fork, where main road makes a jog left then right. Take dim left fork southwest and south up around side of hill for 0.3 mile to top and station.

Station mark is a Hawaii Territorial Survey bronze disk, unstamped, set in the top of a concrete monument about 6 inches below ground surface.

The Hawaii Territorial Survey has constructed a "Type B-1" Superstructure over the mark. This consists of a 6-foot-square concrete platform flush with the ground and extending about 1 foot below ground level. In the center of the platform there is a concrete pedestal, with 2-1/2-inch iron pipe in center, projecting 2 feet above the platform. This pipe allows an instrument to be plumbed over the mark and also serves as a socket to support a removable, red-and-white, metal target which extends about 8 feet above the platform. Access to the mark is gained by a small depression, or tunnel, which runs north and south under the pedestal.

Station Puu LUAHINE 1925 will serve as the azimuth mark.

Form 526
(11-9-55)

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

R

NAME OF STATION: MIDDLE HILL
ESTABLISHED BY: HAW. Gov. Sur. YEAR: 1885 STATE: Hawaii Island: Molokai
RECOVERED BY: E.P. Cline YEAR: 1964 COUNTY: Maui

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

Station was recovered as described.

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1038
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

MOLOKAI NORTH BASE (Maui County, Hawaii, Hawaiian Government Survey, 1885; Hawaiian Territorial Survey, 1932)
 --The original station is marked by a "T" on a copper bolt set into a granite post. Station is now marked by a Type A monument, over the original station. The top of the concrete platform is 3 ft. higher than the original station.
 The station is situated on the S slope of a knoll called Puu-o-Pipika.
 There is an observation triangulation sheet in the H.T.S. files.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MOLOKAI NORTH BASE
 STATE: HAWAII YEAR: 1885 SECOND ORDER
 SOURCE: G-12734

GEODETIC LATITUDE: 21 08 52.707	ELEVATION 421 METERS
GEODETIC LONGITUDE: 157 06 57.776	SCALED FEET

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOLOKAI NORTH BASE
 ESTABLISHED BY: HCB YEAR: 1885 STATE: Hawaii
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui Molokai Island

HEIGHT OF TELESCOPE ABOVE STATION MARK 2.86 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

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

Station is located, airline, about 7 miles northwest of Kaunakakai and 1 mile west-southwest of the west end of the Molokai Airport, on the south slope of a low knoll known as Puu Pipika, about 300 yards south of Highway 46.

To reach from the junction of Highways 45 and 46, just south of the post office in Kaunakakai, go westerly on Highway 46 for 7.1 miles to junction with the airport road on the right. Continue ahead on Highway 46 for 2.35 miles to the station knoll in pasture land on the left. Continue ahead on the highway for 1.15 miles to board gate on left. Pass through gate and follow track road west-southwest for 0.1 mile to fork. Take left fork and go 0.1 mile to a 3-way fork at a board gate on the right fork. Go sharp left on the extreme left fork of the 3 and go straight east on this grassy track road for 1.3 miles to fork at west side of a deep wash. Keep ahead on the left fork, crossing the wash, for 0.05 mile to a side road left. Go left on track road for 0.25 mile to station on south slope of knoll.

The station mark is a 3/4-inch brass plug cemented in a drill hole in a rock that is surrounded by other rocks cemented in place. The Hawaii Territorial Survey has constructed a "Type A" monument over the mark. This consists of a 6-foot-square, concrete platform, supported 4 feet above the ground by rock-and-mortar walls at its east and west sides. A 2-1/2-inch iron pipe is centered over the mark and passes through the center of the concrete platform, projecting 1 foot above it. This pipe permits an instrument to be plumbed over the mark and also serves as a socket which supports a removable, red-and-white, pipe target that extends 8 feet above the concrete platform.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOLOKAI NORTH BASE
 ESTABLISHED BY: H.G.S. YEAR: 1885 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: E. Pursel Jr. YEAR: 1969 COUNTY: Maui Island of Molokai
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 5.0 miles southeast of Kualapuu

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

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	346,864.55	296,096.60	- 0° 09' 44"

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

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

QF 253

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1039
 HAWAII
 LATITUDE 21° 00' TO 21° 50'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

FORM 326a
 (6-18-69)

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

R

NAME OF STATION: MOLOKAI SOUTH BASE
 ESTABLISHED BY: HGS YEAR: 1885 STATE: Hawaii Island: Molokai
 RECOVERED BY: H.J. Seaberg YEAR: 1962 COUNTY: Maui

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

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PUU ILOLI (HGS) 1885-1915				00 00 00.00
RM 2	WSW	7.77	2.370	17 20 55
RM 1	E	8.22	2.504	240 09 15
MOLOKAI AIRPORT BEACON	NE	(approx.)	(2.5 mile)	173 56 34.8

Station mark was recovered and found to be in good condition. Two reference marks were established. A complete description follows:

Station is located, airline, about 6 miles west-northwest of Kaunakakai, 4-1/2 miles west-southwest of Kualapuu and 2 miles south-southwest of the Molokai Airport along the south side of a dim track road in an open grassy area of several acres on an otherwise keawe-covered low, flat ridge.

To reach from the junction of State Highways 45 & 46 just south of the post office in Kaunakakai, go westerly on State Highway 46 for 7.1 miles to a paved fork and sign "MAUNA ICA". Take left fork and follow State Highway 46 west for 3.1 miles to board gate on left. Pass through gate and follow track road west-southwest for 0.1 mile to fork. Take left fork and go 0.1 mile to a 5-way fork at a board gate on the right fork. To sharp left on the extreme left fork of the 3 and go straight east on this grassy track road for 1.3 miles to fork at west side of a deep wash. Take right fork and go southeast along edge of wash for 1.0 mile to dim side road right, at north corner of open grassy area. Turn right and follow dim road westerly for 0.2 mile to a large 5 x 8-foot red boulder. Turn left and follow dim road southerly for 0.05 mile to station at dim T-junction of track roads.

Station mark is a 3/4-inch brass plug with cross on top, set into the top of an 8-inch-square, concrete monument that projects 6 inches above ground. It is 9 feet southeast of center line of track road, 15 feet north-northeast of small wash, 5.0 feet north of a white witness post and between two large red boulders.

Reference mark number one is a standard disk stamped "MOLOKAI S BASE NO 1 1932 1962", cemented in a drill hole in a 1-1/2 x 3-foot red rock outcrop which is the center l of 3. It projects 1 foot above ground and the mark is about 6 inches higher than the station.

Reference mark number two is a standard disk stamped "MOLOKAI S BASE NO 2 1932 1962", cemented in a drill hole in a 4 x 7-foot red boulder that projects 2 feet above ground. It is 8 feet southeast of the center line of the track road, 6.8 feet west of the witness post and about 10 inches higher than the station.

Station MIDDLE HILL 1915 will serve as the azimuth mark.

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MOLOKAI SOUTH BASE
 ESTABLISHED BY: HGS YEAR: 1885 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: P. D. C. YEAR: 1978 COUNTY: Maui

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

About 6 miles WNW of Kaunakakai

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 as described and in good condition.

NAME OF STATION: MOLOKAI S BASE
 STATE: HAWAII YEAR: 1885 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE: 21° 07' 54.880	ELEVATION: 72 METERS
GEODETIC LONGITUDE: 157 06 22.585	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ or ANGLE °
HI 2	5102	350,179.56	290,252.72	- 0° 09' 31"

* 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
PUU ILOLI	26 37 35.0	26 47 06	5102

QF 300

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1040
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 502
 Rev. Aug. 1965

DESCRIPTION OF TRIANGULATION STATION

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

CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962

NOTE* HEIGHT OF TELESCOPE ABOVE STATION MARK 1.46 METERS.1 HEIGHT OF LIGHT ABOVE STATION MARK 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			
			OBJECT	BEARING	DISTANCE feet meters	DIRECTION: ° ' "
2	Surface-station mark, Underground-station mark					
12c			PUU KAPELE 1885 (HGS)	NE	27.22 8.298	00 00 00.00
12c			RM 1	S	20.05 6.113	23 48 58
17c			Azimuth mark	S	(0.5 mile)	106 26 55.6

Station is located, airline, about 6-1/2 miles northeast of the village of Mauna Loa, 5 miles west-northwest of the post office at Hooilehua, 1/4 mile east of the east end of Moomomi Bay, and 1/2 mile northeast of Moomomi Road, on a low rise that is covered with black rocks.

To reach from the post office at Hooilehua, go north for 0.05 mile to a crossroad. Turn left and go west on State Highway 48 for 3.2 miles to end of paved road. Continue west on graded road for 1.05 miles to locked gate and sign "MOOMOMI", etc. Pass through gate and continue west on track road for 0.2 mile to northwest end of corrals. Continue on road, bearing left for 0.1 mile to a crossroad. Turn right and go northwest for 1.0 mile to azimuth mark on left, 45 yards before reaching a fork. Take right fork and go 0.3 mile to fork. Take right fork and go 0.2 mile to fork at red house. Take right fork and go 0.15 mile to fork. Take right fork,

up onto bench, and go 0.25 mile to rocky knoll on right and station.

Station mark is a standard disk stamped "MOOMOMI 1962", cemented in a drill hole in bedrock that projects 2 inches above ground. It is 18 feet south of north end of knoll, 5.7 feet north of a white witness post, 105 feet south of track road and 250 feet south of the shoreline cliff.

Reference mark number one is a standard disk stamped "MOOMOMI NO 1 1962", cemented in a drill hole in a 5-foot-diameter bedrock outcrop that projects 16 inches above ground and has a concave top.

Reference mark number two is a standard disk stamped "MOOMOMI NO 2 1962", cemented in a drill hole in a bedrock outcrop that projects 3 feet above ground. It is at the east side of a higher pile of rocks and 14.6 feet west of the witness post.

The azimuth mark is a standard disk stamped "MOOMOMI 1962", cemented in a drill hole in a red, 1 x 2-foot bedrock outcrop that projects 3 inches above ground. It is 45 yards southeast of road fork, 3 feet southwest of a 2 x 4 stake, 18 feet northeast of the center line of the track road and 19 feet northwest of a prominent, pointed-top rock about 3 feet high.

NOTE: Key for locked gate may be obtained at the Hawaiian Homes Commission office between Kualapuu and the post office at Hooilehua.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: MOOMOMI
 ESTABLISHED BY: H.J.S. YEAR: 1962 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.L.N. YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Molokai

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

Station recovered in good condition as previously described.

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-12734

GEODETIC LATITUDE: 21° 12' 05.321	ELEVATION: 18 METERS
GEODETIC LONGITUDE: 157° 08' 30.689	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ ± ANGLE °
HI 2	5102	338,127.66	315,556.46	- 0° 10' 19"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
AZIMUTH MARK	22° 42' 59.6	22° 53' 18"	5102

QF 288

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1041
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

Napuukulua (Molokai Island, Hawaiian Government Survey; E. R. Hand, 1915).—In the western end of Molokai, on the lower and northwestern of two hills of same name, in the center of a small "heiau" (temple) about 2,900 meters from the west shore of the island. These two hills show up prominently against the sky from the vicinity of the great sand beach which is 3 miles south of Ilio Point, and are 3 miles east of the center of beach. Marked by post and cairn, and three reference marks, each a cross on rock, at following distances from station: No. 1, 18.5 feet; No. 2, 15.7 feet; and No. 3, 18.3 feet. The distances between reference marks are as follows: Nos. 1 to 2, 31.2 feet; Nos. 2 to 3, 27.5 feet; and Nos. 3 to 1, 32 feet. In 1925 the center post could not be found, but the three reference crosses on heavy boulders were readily found, but the distances between them showed such discrepancies that a new mark which was put in was called *Na Puu Kulua 2*. (See description of that station.)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NAPIUKULUA
 STATE: HAWAII YEAR: 1915 ORDER: SECOND ORDER
 SOURCE: G-SP150

GEODETIC LATITUDE:	21° 09' 45.890	ELEVATION:	166	METERS
GEODETIC LONGITUDE:	157 14 07.219	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	306,232.66	301,592.97	- 0 12 19"

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

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

QI 562

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1042
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

Na Puu Kulua 2 (Molokai Island, R. W. Woodworth, 1925).—In the same position, very closely, as *Napuukulua*, which was searched for and only the reference marks found, the center post being completely gone. The three reference marks, crosses on heavy boulders, showed such discrepancies in the distances between them as compared with the original distances that a new mark put in was called *Na Puu Kulua 2*, and the old station considered lost. The station is on the northwestern of the two hills of the same name standing together 1½ miles inland from the west coast of Molokai. These hills show up prominently from the vicinity of Papohaku beach, and the ruins of the "heiau" (temple) on the northwest hill, in the center of which is the station, show up square and boxlike against the horizon. Station marked by a standard disk station mark set in top of an iron pipe which is firmly embedded in a mass of concrete and the large rocks of the temple, the mark being flush with the top of the temple. The present distances between the reference marks are: Nos. 1 to 2, 31.65 feet; Nos. 2 to 3, 24.05 feet; and Nos. 3 to 1, 33.14 feet. The azimuths and distances of these marks from the new station are as follows: No. 1, 156° 17', 5.565 meters (18.26 feet); No. 2, 292° 35', 4.870 meters (15.98 feet); and No. 3, 22° 43', 5.485 meters (18.00 feet).

NA PUU KULUA 2 (Maui County, Hawaii, R.W.W., 1925; Hawaiian Territorial Survey, 1932)
 --Mark was found as stated in the description. Ties check. Station is now marked with a Type B monument.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NA PUU KULUA 2
 STATE: HAWAII YEAR: 1925 SECOND ORDER

SOURCE: G-12734

GEODETIC LATITUDE:	21° 09' 45.879	ELEVATION	166	METERS
GEODETIC LONGITUDE:	157 14 07.180	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ ± ANGLE*
HI 2	5102	306,236.35	301,591.85	- 0 12' 19"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POHAKULOA	1 22 27.1	1 34 46	5102

QF 28

(continued on next page)

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1042

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

NA PUU KULUA 2 (continued)

FORM 526a
 (2-18-68)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

R

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: NA PUU KULUA 2
 ESTABLISHED BY: R.W. Woodworth YEAR: 1925 STATE: Hawaii Island: Molokai
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.78 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	
POHAKULOA (HGS) 1885				00 00 00.00
Ilio Pt. Coast Guard, Loran Mast	NW	(about	4.0 miles)	157 12 10.2
Puu Apalu Tank				186 15 58.7
Cross on Boulder	SSW	17.96		21 11 50
Cross on Boulder	NW	18.21		154 56 05
Cross on Boulder	ESE	15.90		291 17 19

Station mark was recovered and found to be in good condition. Three reference crosses on stones were also recovered. A complete description follows:

Station is located, airline, about 2-1/4 miles northwest of the village of Mauna Loa, 4-1/2 miles south-southeast of Ilio Point, and 6-1/2 miles northeast of Laau Point; on the summit of the northwest and slightly lower one of two similar hills that set about 1/4 mile apart. There is an old building on the southeast hill.

To reach station from the post office in Mauna Loa, go west on State Highway 46 for 0.3 mile to a side road left about 100 yards north of end of guard rail on curve. Turn sharp left and follow graded road southwest for 1.0 mile to T-intersection. Go right and follow cinder road for 0.4 mile to fork. Take right fork and go 0.25 mile to station POHAKULOA on the right. Continue westerly on graded road for 1.05 miles, cross wash and continue on graded road along fence line for 0.5 mile to a locked gate. Pass through gate and continue for 0.4 mile to a T-intersection just left of a cattle guard. Turn right, across cattle guard, and follow wide sand road for 1.5 miles to a dirt crossroad. Turn right and go northwest for 1.2 miles to a side road left. Continue straight ahead for 0.9 mile to a cross road. Turn right and follow track road east and southeast upgrade for 1.85 miles to a fork just before reaching fence line. Take left fork along left side of fence and go 0.55 mile to a fork. Continue ahead on right fork for 50 yards to another fork. Take left fork, passing around right side of hill with building on it, for 0.35 mile; turn left off of road and go crosscountry 0.15 mile to top of hill and station.

Station mark is a standard disk, unstamped, set in the top of a concrete monument. The Hawaii Territorial Survey has built a type "B" Superstructure over the mark. This consists of a 6-foot-square concrete platform projecting about 2 feet above ground. A red and white metal target sets over the mark and extends about 8 feet above the platform.

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

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

USCGM-DC 27178-P69

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1043
 HAWAII
 LATITUDE 21 ° 00' TO 21 ° 30'
 LONGITUDE 157 ° 00' TO 157 ° 30'
 DIAGRAM NF 4-16 MAUI

Nat (Molokai Island, R. W. Woodworth, 1925).—On the southern shore of Molokai, about 1¼ miles west of Kaunakakai Wharf, and about ¼ mile west of the only coconut grove in the vicinity. Station is on a stretch of marshy tide-flat about 1 foot above ordinary high water and 40 meters south from the tree line. Marked by a standard United States Coast and Geodetic Survey bronze disk set in top of a 6-inch square concrete post which projects one foot above surface of ground. Kaunakakai wireless mast is distant about 1½ miles, in azimuth 297° 47' from the station.

(11-8-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: NAT

ESTABLISHED BY: R.W.W.

RECOVERED BY: H.J.S.

YEAR: 1925 STATE: Hawaii

YEAR: 1962 COUNTY: Maui

Island: Molokai

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

Station and reference marks were searched for but not recovered.

The location of the station was plotted on a U.S.G.S quadrangle and the area visited. Station is probably still in place but the area is covered with high grass, brush, and trees.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: NAT

STATE: HAWAII

YEAR: 1925

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21 ° 06' 06.661	ELEVATION:	1	METERS
GEODETIC LONGITUDE:	157 03 02.622	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLE °
HI 2	5102	369,083.55	279,284.81	- 0 08 18

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

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

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

COM-DC 34314

Q1 482

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1044
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

OLELEUWE (Maui County, Hawaii, R.W.W., 1925;
 Hawaiian Territorial Survey, 1932)
 --The original station was marked by a redwood post and
 staff in 1885, and this was replaced by a 2-in. pipe in 1924 by
 H.T.S.

The station is, at present, marked with a Type B monument and
 is situated on a hill called Eleueweue, a red-topped hill on the
 edge of a gulch on the boundary of Hoolehua and Naiwa, 1200 ft. N
 of the N boundary of Lot 1 of the Hoolehua-Palaau Homesteads, and
 1-1/2 mi. NW of the California Packing Co. village. The placing
 of the monument has brought the concrete platform to a point 1 ft.
 lower than the old station mark, although as the redwood post
 was completely rotted when replaced by the pipe in 1924, this dif-
 ference in elevation is only estimated.

There is a triangulation sheet on the station in the H.T.S.
 files.

(11-8-85)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: OLELEUWE

ESTABLISHED BY: R.W.W.

RECOVERED BY: H.J.S.

YEAR: 1925 STATE: Hawaii

YEAR: 1962 COUNTY: Maui

Island: Molokai

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

Station was recovered in good condition.

Station is located on a prominent grass covered hill, about 3.2 miles southwest
 of Kalaupapa, about 2.1 miles east-northeast of Hoolehua, about 1.3 miles north of
 Hualapuu, about 1.2 miles south of the coast, and about 0.3 mile east of two large
 concrete water reservoirs.

To reach the station from the post office in Hualapuu, go 0.7 miles west on State
 Route 43 to road on right, turn right and take right fork, go 0.75 mile northwest to
 fork in road, take right fork 0.15 mile to gate in fence line at end of cultivated
 pineapple field, pass through gate and go 0.5 mile northwest to field road on left at
 end of fenceline along west side of road, turn left and take field road 0.25 mile to
 end of truck travel at a north-south fenceline. From here pack about 0.3 mile south
 to highest part of hill and station. About a 15 minute pack.
 State survey monument, Type B now over station.

Form 526
 (11-8-85)

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

R

NAME OF STATION: OLELEUWE

ESTABLISHED BY: R.W.W.

RECOVERED BY: E.P. Cline

YEAR: 1925 STATE: Hawaii

YEAR: 1964 COUNTY: Maui

Island: Molokai

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

Station was recovered as described.

* 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 343 14

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION OLELEUWE

STATE: HAWAII

YEAR: 1925

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	21° 13' 24.51"	ELEVATION:	METERS
GEODETIC LONGITUDE:	157° 02' 21.62"		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) (ANGLE)
HI-2	5102	373,026.97	305,291.52	- 0° 08' 05"

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

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

Q1 544

JUN 1978

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 211572 STATION 1045
HAWAII
LATITUDE 21 ° 00' TO 21 ° 30'
LONGITUDE 157 ° 00' TO 157 ° 30'
DIAGRAM NF 4-16 MAUI

Pap (Molokai Island, R. W. Woodworth, 1925).—On the western end of Molokai, on the back of the long sand ridge built up between Papohaku beach and a long grass meadow, about ¼ mile south of the rocky bluff at Puu o Kaiaka. Station is 200 meters south of the northerly limit of the meadow, in such location that the high-water line of the aforementioned bluff is in range with the 100-foot cliff a half mile farther north. Marked by a concrete post, 1 foot square, with standard disk in top, see note 1a. Both post and disk are marked "1925." Post projects about 4 inches above ground.

PAP (Maui County, Hawaii, R.W.W., 1925; O.W.S., 1930)

--Station is on the W coast of Molokai Island. It was recovered as described, except that the post is now about flush with the top of the ground. A signal was placed about 1/2 m. S of the station. The sand ridge is grassy on the E side and sparse grass on the W side.

(11-8-65)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: PAP

ESTABLISHED BY: R.W.W.

YEAR: 1925 STATE: Hawaii

RECOVERED BY: H.J.S.

YEAR: 1962 COUNTY: Maui

Island: Molokai

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

The station was searched for but not recovered.

The location of the station was plotted on a U.S.G.S. quadrangle and the area visited. The sand hill is now covered with brush and trees. The station may still be in place but is covered by sand.

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

COMB-DC

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PAP

STATE: HAWAII

YEAR: 1925

THIRD

ORDER

SOURCE: G-SP156

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 21 ° 10 ' 24.92	ELEVATION SCALED 8 METERS
GEODETIC LONGITUDE: 157 15 34.46	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	297,989.85	305,561.27	- 0 12 51*

* 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

QI 591

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1046
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

SEE STATION HALENA

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: PBM HALELOLO USGS
 STATE: HAWAII YEAR: 1962 SECOND ORDER

SOURCE: G-12734
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	21° 00' 15.106	ELEVATION:	148.28 METERS
GEODETIC LONGITUDE:	157 15 00.661		486.5 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	301,096.21	280,343.59	- 0° 12' 56"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POSITION DETERMINED BY TRAVERSE FROM STATION HALENA			
QF 534			

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1047
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

SEE STATION PUU LUAHINE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION PBM MAUNAHUI USGS
 STATE HAWAII YEAR 1962 SECOND ORDER

SOURCE G-12734
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	21° 07' 56.604	ELEVATION	369	METERS
GEODETIC LONGITUDE:	157 00 55.895	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	361,107.41	290,349.94	- 0 07 33

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

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

POSITION DETERMINED BY TRAVERSE FROM STATION PUU LUAHINE

QF 335

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1048
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Pohakuloa (Maui County, Hawaii, H.G.S., 1885; R. W. Woodworth, 1925).—In southwest Molokai, on a hill of the same name, halfway between the Ka Lae o Kaau Lighthouse and the summit of Mauna Loa. It is within the Libby-McNeill-Libby pineapple plantation, at the westerly limit of their fields, near a cattle corral. Station marked by a cross cut on a medium sized rock. No reference marks were found in 1925, when it was reported that the ground around the station mark showed considerable evidences of erosion and stream flow, indicating that the station may have shifted position to westward. It was further reported that the station would soon be removed as the field was being put under cultivation and the few rocks in it removed.

POHAKULOA (Maui County, Hawaii, H.G.S., 1885; Hawaiian Territorial Survey, 1932)

--The original station was marked by a "+" cut in the rock. It is now marked by a Type A monument. The elevation was raised 3 ft. to the top of the concrete platform from the original mark.

It is situated on a hill of the same name, halfway between Ka Lae o Kaau Lighthouse and the summit of Maunaloa. It is within the Libby, McNeill and Libby pineapple fields, near a cattle corral.

There is a triangulation sheet on this station in the H.T.S. files.

(11-8-65)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: POHAKULOA

ESTABLISHED BY: H.G.S.

YEAR: 1885 STATE: Hawaii

RECOVERED BY: H.J.S.

YEAR: 1962 COUNTY: Maui H. I. 2.48m

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

The station was recovered in good condition as described in recovery note by Hawaiian Government Survey in 1932.

To reach the station from the post office at Mauna Loa, go 0.3 mile west and north on State Route 46 to road on left, turn left go 1.2 miles to end of road, turn right go 0.4 mile west to fork in road, take right fork 0.2 mile west to station on the right in an uncultivated grassy area. State Survey monument, type A, now over station.

OBJECT	BEARING	DISTANCE	DIRECTION
HALENA			0° 00' 00"
Laau Point Light	SW	5.0 miles	40 32 03.4
Puu Apalu, Tank	N	3.5 miles	153 47 16.8

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

COM-DC 34314

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: POHAKULOA
 STATE: HAWAII YEAR: 1885 SECOND: ORDER:
 SOURCE: G-12734

GEODETIC LATITUDE: 21° 07' 57.753	ELEVATION: 248 METERS
GEODETIC LONGITUDE: 157 14 10.456	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (H Δ) ANGLE
HI 2	5102	305,679.91	288,665.28	- 0 12 19

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE θ (H Δ) θ' FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
HALENA	29 37 47.3	29 50 06	5102

QF 282

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1049
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

POHAKUNUI (Maui County, Hawaii, Hawaiian Government Survey, 1888; Hawaiian Territorial Survey, 1932)
 --The station was originally marked by a 4- by 4-in. redwood post with a staff. The redwood post was replaced with a 2-in. pipe in 1924 by the H.T.S. Station is now marked by a Type B monument.

The station is situated on the summit of the hill of the same name, 300 ft. from the edge of the seacoast, and about 1000 ft. E of the E boundary of Lot 1 of the Hoolehua-Palaau Homesteads.

There is a triangulation sheet for this station in the H.T.S. files.

(11-9-88)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: POHAKUNUI

ESTABLISHED BY: Gov't. of H.

YEAR: 1888 STATE: Hawaii

RECOVERED BY: H.T.S.

YEAR: 1962 COUNTY: Maui

H.I. 1.66m

Island: Molokai

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

Condition.

Station was recovered in condition.
 Station is located on a low but prominent hill between two deep gulches, about 4.3 miles west of Kalaupapa, about 3.8 miles northeast of Hoolehua, about 2.3 miles north-northwest of Kulaupuu, and about 200 feet south of the coast.

To reach the station from the post office in Kulaupuu, go 0.9 mile northwest on State Route 48 to junction with State Route 432, turn right go 1.3 miles northwest on State Route 432 to gravel road on right, go right 0.65 mile northwest to fork in road, take right fork 0.05 mile to locked gate, continue on track road through pasture about 0.8 mile northeast, east, and southeast to end of truck travel at the east end of east-west fence line. From here pack across deep gulch to the east and go northwest to summit of hill and station. A 10-15 minute pack.

State survey monument, Type B now over station.

Form 528
 (11-9-88)

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

R

NAME OF STATION: POHAKUNUI

ESTABLISHED BY: Haw. Gov. Surv. Year: 1888 State: Hawaii

RECOVERED BY: E.P. Cline Year: 1964 County: Maui

Island: Molokai

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

Station was not visited but the Hawaii Territorial Survey "Type B" signal was seen and observations made on it.

* 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 343 14

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION POHAKUNUI

STATE HAWAII

YEAR 1888

SECOND

ORDER

SOURCE: G-12734

GEODETIC LATITUDE	21° 11' 15.691	ELEVATION	262	METERS
GEODETIC LONGITUDE	157 03 11.128	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β (OR Δ) ANGLE *
HI 2	5102	368,353.99	310,466.72	- 0 08 23

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

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

QF 294

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 211572 STATION 1050
 HAWAII
 LATITUDE 21° 00' TO 21° 30'
 LONGITUDE 157° 00' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 535
 Rev. Aug. 1963

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: POOLAU STATE: Hawaii COUNTY: Maui
 Island: Molokai
 CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962 Described by: R.F. Hanson
 HEIGHT OF TELESCOPE ABOVE STATION MARK 1.50 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	HEIGHT OF LIGHT ABOVE STATION MARK		METERS.
			feet	meters	
2	Surface-station mark, Underground-station mark				
		OBJECT	BEARING	DISTANCE	DIRECTION
12c		NA PUU KALUA 2 1925			00° 00' 00.00
17c		RM 2	W	28.46	225 16 17
		Azimuth mark	NW	(0.5 mile)	255 46 31.7
		Molokai USCG Loran mast, Ililo Pt.	N		300 57 16.2
		Water tank, Puu Apalu	NE		341 58 59.6
12 c		RM 1	NNE	53.13	350 02 31

Station is located, airline, about 4 miles west-northwest of the village of Launa Loa, 4 miles northeast of Laau Point, 3/4 mile east-southeast of Poolau Point and in the northeast side of the old Navy bombing range along the northwest side of a track road.

To reach from the post office in Launa Loa, go west on State Highway 46 for 0.25 mile to a graded side road sharp left, after rounding a right curve in the highway. Turn left and go southwest 1.0 mile to a T-junction. Turn right and go west for 0.4 mile to a fork. Take right fork and go 0.25 mile to station FOHAKULOA on the right. Continue westerly for 1.05 miles, cross wash and continue on graded road along fence for 0.5 mile to locked gate. Pass through gate and continue westerly for 0.4 mile to a T-junction just left of a cattleguard. Turn right, across cattleguard, and go 1.4 miles to dirt crossroad. Turn left and go southerly on track road for 0.2 mile to

a fork. Take right fork, main road, and continue ahead for 0.15 mile to fork. Take right fork and go 0.15 mile to fork. Take right fork and go 0.6 mile to side road left at some posts. Turn left and go southwesterly for 0.15 mile to station on right.

Station mark is a standard disk stamped "POOLAU 1962", cemented in a drill hole in a large, flat, red bedrock outcrop that projects about 4 inches above ground. It is 6.7 feet north of a white witness post, 21.0 feet west-northwest of the center of a 60-foot-long dirt bank, 35 feet west-northwest of center line of track road, about 250 yards southeast of a concrete cistern, 200 yards south of old concrete foundation and about 1/4 mile east-southeast of center of bomb range.

Reference mark number one is a standard disk stamped "POOLAU NO 1 1962", cemented in a drill hole in red boulder at about same elevation as station.

Reference mark number two is a standard disk stamped "POOLAU NO 2 1962", cemented in a drill hole in a boulder at about same elevation as the station.

The azimuth mark is a standard disk stamped "POOLAU 1962", cemented in a drill hole in a bedrock outcrop on a low rocky knoll, 180 feet southwest of a track road, 0.1 mile west-northwest of concrete cistern and 5 feet northeast of a 3-foot cairn. To reach azimuth mark from station, go northeast on track road for 0.15 mile. Turn left and go westerly on track road for 0.15 mile to concrete cistern. Continue on road for 0.1 mile, then walk cross-country southwest for 180 feet to azimuth mark.

* 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.
 16-58302-1 U. S. GOVERNMENT PRINTING OFFICE

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-12734

GEODETIC LATITUDE:	21° 09' 02.118	ELEVATION	44 METERS
GEODETIC LONGITUDE:	157° 16' 36.919	SCALED	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR ANGLE
HI 2	5102	292,046.34	297,229.06	- 0° 13' 13"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
AZIMUTH MARK	148 27 56.2	148 41 09"	5102

QF 280