

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1053
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

TRVERSE DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 653
 Rev. Aug. 1963

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

CHIEF OF PARTY: H. J. S.	YEAR: 1963	Described by: R. K. H.			
NOTE: 2	HEIGHT OF TELESCOPE ABOVE STATION MARK 1.6 METERS.1	HEIGHT OF LIGHT ABOVE STATION MARK METERS.			
NOTE	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	MAKA				0 00 00.0
	RM ? (BM KAHOOLAWE (USGS))	NE	11.44	3.487	143 17 27
	MOLOKINI ² , 1950	NE		11,800	145 13 12.1
	RM 1	S	56.27	17.150	257 24 51

Station is located on the highest knoll of Mt. Kaula on the northeast portion of Kahoolawe Island, 2.4 miles south of the northernmost part of the island, and 7.5 miles southwest of Molokini Island.

Station is most accessible from the north shore of the island where safe landings can be made on sandy beach at Kuleia Bay or other nearby bays. It is a 1½ hour pack directly up the slope to the station which shows as a prominent small knob and the highest peak visible from the beach.

Station mark, a standard disc in a drill hole with cement, stamped KAHOOLAWE₂ 1963, is level with surrounding ground and 10 feet west of the highest rock on the mountain.

Reference mark 1, a standard disc stamped KAHOOLAWE₂ 1963, set in a protruding section of bedrock in a drill hole with cement, is about 3 feet above surrounding ground, 10 feet below station.

Reference mark 2, a standard USGS bench mark disc, stamped KAHOOLAWE, 1444 feet above sea level, set with cement in a boulder, is on the highest point of the mountain and 2 feet above the station.

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

‡ Direction-angle measured clockwise, referred to initial station.
 16-60002-1 U. S. GOVERNMENT PRINTING OFFICE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHOOLAWE 2
 STATE: HAWAII YEAR: 1963 SECOND ORDER

SOURCE: G-13249

GEODETIC LATITUDE	20° 34' 05.4402	ELEVATION	437.4 METERS
GEODETIC LONGITUDE	156° 35' 22.7578		1455 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE*
HI 2	5102	526,343.78	85,299.53	+ 0° 01' 37"

* 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
MAKA	86 49 21.4	86 47 44	5102

UF 408

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1054
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 30'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAHOOLAWE HYDROGRAPHIC
 STATE: HAWAII YEAR: 1900 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 34 05.425	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 35 22.801		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	526,339.67	85,298.00	+ 0 01 37 *

* 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 north)	CODE

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 201564 STATION 1055
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 835 b DESCRIPTION OF TRIANGULATION INTERSECTION STATION

KAHOOLAWE ISLAND BLOCKHOUSE
 NAME OF STATION: LOOKOUT POST YEAR: 1963 STATE: Hawaii COUNTY: Maui
 Island: Kahoolawe

CHIEF OF PARTY: H. J. Seaborg

Description, including sketch of object:

The station is the center of the concrete block lookout post located on a small hill about one-half mile north of Smuggler Cove, on Kahoolawe Island, Hawaii. The structure is built with concrete and is approximately 10 feet high and 10 feet square.

NAME OF STATION: KAHOLAWE IS BLOCKHSE LO PGST
 STATE: HAWAII YEAR: 1963 SECOND ORDER

SOURCE: G-13245

GEODETIC LATITUDE	20° 31' 25.7332	ELEVATION	34	METERS
GEODETIC LONGITUDE	156° 41' 21.5583	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 2	5102	452,248.03	69,181.43	- 0° 00' 29"

* 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

QF 405

U. S. GOVERNMENT PRINTING OFFICE 16-60281-1

Described by

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1056
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 00'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 528
REV. AUG. 1963

DESCRIPTION OF ~~STATION~~ TRAVERSE STATION

NAME OF STATION: **KAOOLAWA** STATE: **Hawaii** COUNTY: **Maei**
SOUTHWEST POINT LIGHT Island: **Kahoowawe**
CHIEF OF PARTY: **H. J. Seaborg** YEAR: **1963** Described by: **M.L.G.**
HEIGHT OF TELESCOPE ABOVE STATION MARK **0.60** METERS.1 HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
		OBJECT	BEARING	DISTANCE feet meters	DIRECTION: 0 90 180 270
	Surface-station mark Underground-station mark				

Station is located on the southwest side of Kahoowawe Island on a point about half way between Walkahalulu Bay and Smuggler Cove.
Station is best reached by making skiff landing in Smuggler Cove and packing southeast about 1 mile to station.
The station is the point of the conical roof of the light on Kahoowawe Southwest Point Light. Kahoowawe Southwest Point Light has an overall height of 12.67 meters consisting of a wood frame tower 2.44 meters square at the base and 12.06 meters high surmounted by a 0.61 meter high light. There is a wood ladder leading to a walkway around the top of the tower. Beneath the tower is a house 1.83 meters high and 1.28 meters square. All wood construction is painted white.
There are no reference marks at this station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAOOLAWA SW POINT LIGHT**
STATE **HAWAII** YEAR **1963** SECOND **ORDER**

SOURCE: **G-13249**

GEODETIC LATITUDE:	20 ° 30' 15.8997	ELEVATION:	43.1 METERS
GEODETIC LONGITUDE:	156 40 09.1356		141 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β FOR Δ ϵ ANGLE*
HI 2	5102	499,131.57	62,539.15	- 0 00' 03"

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

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

QF 401

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1057
 HAWAII
 LATITUDE 20° 50' TO 21° 00'
 LONGITUDE 156° 50' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **KAHUA** STATE: **Hawaii** COUNTY: **MauI**
 Island: **Lanai**
 Described by: **R.F. Hanson**

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.†	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
		BEARING	DISTANCE		DIRECTION: ° / ' / "
			feet	meters	
	1.51				
	27M 1923 (USGS)	NW	19.004	5.793	00 00 00.0
	R.M. No. 2	SE	304.0	(92.659)	00 32 35 "
	Rain-trap (North corner)	S	18.805	5.732	148 24 58 "
	R.M. No. 1				190 30 47 "

Station is located about 5 miles airline north-northwest of Lanai City and 1-3/4 miles south-southeast of Wahie Point; about midway between Kahua Gulch and Kuahua Gulch, on grassy slopes of north side of the island, at about 850 feet elevation, near a large, corrugated metal rain-trap.

To reach station from the post office in Lanai City, go northwest on Lanai Avenue and follow Highway 44 northerly for 2.7 miles to two board gates on the left. Pass through the right one of the two gates, turn right, and follow old track road for 0.6 mile to a fork. Take left fork, straight ahead, for 0.1 mile to water trough. Continue on track road for 1.0 mile to board gate. Pass through gate and continue on track road for 1.25 miles to dim side road right. Turn right and follow road across large eroded area and then down grassy slope for 0.8 mile

to a small rain-trap (No. 24). Continue on track road for 0.15 mile to the large rain-trap on left. Bear left across grassy area for 0.05 mile to station.

Station mark is a standard disk stamped "KAHUA 1962", brazed to the top of a 1-1/2-inch iron pipe that is set in cement and projects 4 inches above ground. It is 50 yards east of a deep ravine, 117 yards north of a 2-inch pipeline that passes along the north and west sides of the island at an elevation of about 900 feet, 3.1 feet east of a white witness post, and 304.0 feet northwest of the north corner of the rain-trap.

Reference mark number one is a standard disk stamped "KAHUA NO 1 1962", brazed to the top of a 1-1/2-inch iron pipe that is set in cement and projects 6 inches above the ground. It is 19.2 feet south-southeast of the witness post and about 2 feet higher than the station mark.

Reference mark number two is a standard disk stamped "KAHUA NO 2 1962", brazed to the top of a 1-1/2-inch iron pipe that is set in cement and projects about 4 inches above ground. It is 18.7 feet north of the witness post and about 1-1/2 feet lower than the station mark.

* Refer to notes in manuals of triangulation and state publications of triangulation. † Direction-angle measured clockwise, referred to initial station.
 † To nearest meter only, when no trigonometric leveling is being done. 16-60209-1 U. S. GOVERNMENT PRINTING OFFICE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAHUA**
 STATE: **HAWAII** YEAR: **1962** SECOND - ORDER

SOURCE **G-13124**

GEODETIC LATITUDE: 20° 54' 02".494	ELEVATION: 275±1 METERS
GEODETIC LONGITUDE: 156° 50' 04".425	856 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	± IN Δ U ANGLE °
HI 2	5102	408,555.23	206,139.87	- 0 05 44 "

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE B O R Δ O FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
BM 27 M USGS	167 24 13.1	167 29 57	5102

QF 356

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1058
 HAWAII
 LATITUDE 20° 50' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 526
 Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **KAMAO**

STATE: **Hawaii**

COUNTY: **Maui**

Island: **Lanai**

Described by: **R. F. Hanson**

CHIEF OF PARTY: **Harold J. Seaborg**

YEAR: **1962**

HEIGHT OF TELESCOPE ABOVE STATION MARK **1.40 METERS**

HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	DISTANCE		DIRECTION
			feet	meters	
2	Surface-station mark, Underground-station mark				
12c	PUU MANU (HGS) 1879 1927	SE	14.96	4.560	00 00 00.0
12c	R.M. No. 1	NE	9.45	2.880	87 07 28'
	R.M. No. 2				355 31 26'

Station is located about 5 miles airline southeast of Lanai City and 1-1/2 miles north of Manele Bay; at about 1340 feet elevation, on the third knoll down from the northwest and highest end of a bare ridge. There is a higher ridge to the east and one of about the same elevation 1/4 mile to the west.

To reach station from the junction of Highways 44 and 441 at the south edge of Lanai City, go southerly on Highway 441 for 1.7 miles to paved fork. Take left fork for 1.5 miles to end of paved road; continue ahead on graded road for 0.2 mile to side road left. Continue ahead on graded road across pineapple field for 0.6 mile to T-intersection at south edge of field. Turn right and go along base of hill for 0.3 mile to steep side road left. Turn left and follow road south uphill for 0.15 mile to pineapple field. Fork left and go 50 yards to fork. Take right fork and go 0.05 mile to fork. Take right fork and follow track road diagonally across pine-

apple field southwest for 0.45 mile to crossroad. Bear left and follow track road south along grassy slope for 0.4 mile to southeast side of hill on right. Go left, leaving road, and pick way southeast across bare, red, eroded area for 0.35 miles to wash at base of ridge on left, just before reaching large, lone kiawe tree, and end of truck travel. Pack southeast up onto ridge and along crest for about 200 yards to station.

Station mark is a standard disk stamped "KAMAO 1962", cemented in a drill hole in a 2 foot diameter boulder that projects 3 inches above ground. It is 15 feet southeast of a lone kiawe bush.

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

Reference mark number two is a standard disk stamped "KAMAO NO 2 1962", cemented in a drill hole in a 4 x 4-foot boulder that projects 1-1/2 feet above ground. It is about 1 foot higher than the station mark.

Form 526
 (11-8-68)

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

NAME OF STATION: **KAMAO**

ESTABLISHED BY: **HJS**

RECOVERED BY: **EPC**

YEAR: **1962** STATE: **Hawaii**

YEAR: **1964** COUNTY: **Maui**

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAMAO**

STATE: **HAWAII**

YEAR: **1962**

SECOND ORDER

SOURCE: **G-13124**

GEODETIC LATITUDE: 20° 45' 59.060	ELEVATION: 409.7 METERS
GEODETIC LONGITUDE: 156° 53' 09.233	1344 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE
HI 2	5102	425,103.54	157,340.38	- 0° 34' 40"

* 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 MANU HGS	223 18 06.6	223 22 47	5102

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1059
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRAVERSE STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 532
 Rev. Aug. 1966

NAME OF PARTY: **KANELOA** STATE: **Hawaii** COUNTY: **MauI**
 Island: **Kahoolawe**
 Described by: **R.F. Hanson**
 CHIEF OF PARTY: **H.J. Seaborg** YEAR: **1963**
 HEIGHT OF TELESCOPE ABOVE STATION MARK **1.37** METERS.¹ HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE ²	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
		OBJECT	BEARING	DISTANCE	
			feet	meters	
12c	Surface-station mark				00 00 00.0
12c	Underground-station mark				
		BLACK 2			
		R.M. No. 1	NE 19.17	5.844	181 21 44
		R.M. No. 2	S 51.61	15.730	300 15 55

Station is located in the southeast part of Kahoolawe Island, about 1-3/4 miles west of Beck Cove, 1-1/4 miles east-northeast of Kamohio Bay and 1/2 mile north of a line extended between the north tip of Kamohio Bay and the south tip of Beck Cove, on a flat, boulder-covered hill at about 1100 feet elevation.

Station is best reached by making a skiff landing in Beck Cove; from here pack west-southwest up steep, rocky canyon about 3/4 mile to top, then bear slightly right and go west-northwest across bare red dirt area for about 1-1/4 miles to station just after crossing a deep canyon.

Station mark is a standard disk stamped "KANELOA 1963", cemented in a drill hole in the north section of a 2-1/2 x 5-foot boulder that projects 1 foot above ground and is separated into sections by a crack. It is about 40 yards south-southeast of a row of 5 small, sparse bushes which are the only vegetation in the vicinity, and 50 yards northwest of the rocky point of the hill where it begins to drop steeply down into the canyon.

Reference mark number one is a standard disk stamped "KANELOA NO 1 1963", cemented in a drill hole in a small boulder that projects 6 inches above ground. It is about 1 foot lower than station mark.

Reference mark number two is a standard disk stamped "KANELOA NO 2 1963", cemented in a drill hole in a 1 x 2-foot boulder that projects about 8 inches above ground. It is about 3 feet lower than station mark.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION **KANELOA**
 STATE **HAWAII** YEAR **1963** SECOND ORDER

SOURCE **G-13249**

GEODETIC LATITUDE:	20 32' 15.2878"	ELEVATION:	1053.3 METERS
GEODETIC LONGITUDE:	156 35 00.1577"		1053 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ or ANGLE *
HI 2	5102	528,456.93	74,187.58	+ 0 01' 45"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH [*] (From south)	CODE
BLACK 2	61 03' 29.0"	61 01' 44"	5102

QF 396

¹Refers to notes in manuals of triangulation and state publications of triangulation. ²Direction-angle measured clockwise, referred to initial station.
³To nearest meter only, when no trigonometric leveling is being done. 16-50229-1 U. S. GOVERNMENT PRINTING OFFICE

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1060
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Kanepuu (Lanai Island, Hawaiian Government Survey, 1879).—On Mount Kanepuu, a rounded summit in the northwestern part of Lanai, District of Kaa, about 3,600 meters east of the western line of the precipices along the western shore. Marked by redwood post and stone cairn. Reported destroyed.

RECOVERY NOTE, TRIANGULATION STATION

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

HEIGHT OF TELESCOPE ABOVE STATION MARK **1.61** METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.
 DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
POHOULA (HGS) 1879 1962	SSE	7.3	miles	00 00 00.0
Lanai VOR (LNY)	SSE	19.69	6.001	59 37 46.8
R.M. No. 2	NNE	13.15	4.010	107 11 06
R.M. No. 1				284 33 35

The original station, a 1-1/2-inch drill hole in a boulder, with a triangle chiseled around it, was recovered and found in good condition. A new station disk and two reference marks were established. A complete description follows:

Station is located about 5 miles airline northwest of Lanai City, on the summit of Kanepuu Hill, a bare, flat-topped hill of about 1800 feet elevation.

To reach station from the post office in Lanai City, go northwest on Lanai Avenue for 0.05 mile; turn left and go 0.15 mile to a crossroad. Turn right and go 0.5 mile to end of paved road. Continue ahead on wide, graded road for 0.8 mile to a crossroad. Turn right and follow main road through pineapple fields for 3.1 miles to end of fields. Continue ahead on dirt road for 0.95 mile to fork. Take right fork through ironwood trees for 0.75 miles to dim left fork, just before passing through a tree row which crosses road. Turn left and go 0.1 mile to a large corrugated metal rain-trap on right. Continue on track road for 0.3 mile to top of bare hill and station.

Station mark is a standard disk stamped "KANEPUU 1879 1962", cemented in a drill hole in a boulder that is 6 inches below ground surface. A triangle, 6 inches long on all sides, is chiseled into the rock around the mark. There are many small boulders laying around the immediate vicinity of the mark.

Reference mark number one is a standard disk stamped "KANEPUU NO 1 1879 1962", braced to the top of a 1-1/2-inch iron pipe that is set in cement and projects 3 inches above ground. It is about 1 foot higher than the station mark.

Reference mark number two is a standard disk stamped "KANEPUU NO 2 1879 1962", braced to the top of a 1-1/2-inch iron pipe that is set in cement and projects 8 inches above ground. It is about 1 foot higher than the station mark.

Station GALE 1927 will serve as the azimuth mark.

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

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

USCOMM-DC 27178-PSS

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KANEPUU**
 STATE: **HAWAII** YEAR: **1879** SECOND ORDER

SOURCE: **G-13124**

GEODETIC LATITUDE: 20° 52' 23.601	ELEVATION: 549.3 METERS
GEODETIC LONGITUDE: 156° 55' 05.592	1802 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ or ANGLE °
HI 2	5102	351,362.23	196,193.65	- 0 06 48

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
POHOULA	293 40 02.0	293 46 50	5102

QF 362

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1061
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

Kau (Lanai Island, F. G. Engle, 1927).—On west coast of Lanai, on a rocky cliff on south side of entrance to Kaunalapau Harbor, and about 235 meters south of lighthouse. Station is about 8 meters from edge of cliff and 100 feet above high water, and is best approached by landing in cove just south of lighthouse. Marked according to note 4, standard disk in bowlder. Two reference marks, note 12c, standard reference disks in bowlders, were set at the following distances and azimuths from the station: No. 1, 6.08 meters (19.9 feet), 208° 08'; No. 2, 16.53 meters (54.2 feet), 303° 25'.

(11-9-55)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: KAU
 ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui
 Island: Lanai

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

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

Station is located about 5-1/2 miles airline southwest of Lanai City and 1/2 mile south of the wharf at Kaunalapau Harbor, at about 100 feet elevation, on the cliff of the second prominent point south from the harbor. It is 1/4 mile south of the white navigation light which is on the first point on south side of harbor entrance.

To reach station from the wharf at Kaunalapau Harbor, walk southerly along rocky shoreline about 1/4 mile, just after crossing deep canyon climb up onto top of bluff and continue southerly about 1/4 mile to station.

Station mark is a standard disk stamped "KAU 1927", cemented in a drill hole in the west end of a long, narrow bedrock outcrop that projects 1-1/2 feet above ground and is 2 feet wide. It is 8 yards east of cliff edge and 10 yards north of edge of deep notch in the cliff-line.

Reference mark number one is a standard disk stamped "KAU 1927", cemented in a drill hole in a 2 x 3-foot boulder. It is about 4 feet higher than station.

Reference mark number two is a standard disk stamped "KAU 1927", cemented in a drill hole in a boulder at east point of the deep notch of cliffline.

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: Kau
 ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.L. Newsom YEAR: 1967 COUNTY: Maui
 Island: Lanai
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:

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

Station recovered as described by H. J. Seaborg in 1962.

A new "to reach" description follows:

Station is best approached by landing in small cove just south of Kaunalapau Lighthouse, scale cliff and go south along edge to reach station.

NAME OF STATION: KAU
 STATE: HAWAII YEAR: 1927 THIRD -ORDER

SOURCE: G-SP156

GEODETIC LATITUDE: 20° 47' 02.788	ELEVATION 15 METERS
GEODETIC LONGITUDE: 156 59 38.823	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ 10" Δ 01 ANGLE
HI 2	5102	388,145.09	163,832.52	- 0° 06' 58"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From 1927)	PLANE AZIMUTH (From 1927)	CODE
	0	0	

Q1 618

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1062
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 50' TO 157 ° 30'
DIAGRAM
NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAUAULA MAKAI
STATE: HAWAII YEAR: 1912 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 51 ' 22.70	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 39 53.40		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ρ HDRA ρ ANGLE *
HI 2	5102	500,625.95	189,941.78	+ 0 00 02

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ρ HDRA ρ FORMULA NEGLECTING THE SECOND TERM.

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

WD 012

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1063
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Kaunalapau Harbor, YEAR: 1962 STATE: Hawaii COUNTY: Maui
 Breakwater Light Island: Lanai
 CHIEF OF PARTY: H. J. Seaborg

Description, including sketch of object:

Station is located at Kaunalapau Harbor at the south end of rock breakwater on north side of entrance to harbor.

Station is center of 10X10 inch flashing green light atop a 6 inch iron pipe. Pipe is 10 feet high, painted white, and set in a 4X4 foot concrete foundation. Light is listed in List of Lights and Other Marine Aids, Volume III, Pacific Coast and Pacific Islands, as light number 2949.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: KAUNALAPAU HARBOR, BREAKWATER LIGHT
 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 Lanai

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

Recovered as described by H.J.S. in 1962. Station is in good condition.

R

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAUNALAPAU HARBOR BRKNTR LIGHT
 STATE: HAWAII YEAR: 1962 THIRD ORDER

SOURCE: G-13124

GEODETIC LATITUDE:	20° 47' 20.150	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 59 42.088		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLE *
HI 2	5102	387,838.85	165,584.82	- 0° 07' 00"

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

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

QF 381

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1064
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: **Kaunalapau Harbor, Standard Oil, North Tank** YEAR: 1962 STATE: **Hawaii** COUNTY: **Maui** Island: **Lanai**
 CHIEF OF PARTY: **H.J. Seaborg**

Description, including sketch of object: Station is the most northerly of a group of silver tanks of nearly the same size; the station being slightly larger in diameter. The tanks set in an L arrangement, with the long part laying east-west, and the station is north from the west end of the row. A very large diameter tank, but quite low and squat, sets inside the L of the other tanks. A metal stairway connects the top of this tank with the top of the station tank.

Station is 25 feet high and 12 feet diameter and lies about 150 yards north-east of the wharf at Kaunalapau Harbor.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KAUNALAPAU STANDARD OIL N TK**
 STATE: **HAWAII** YEAR: **1962** ORDER: **THIRD**

SOURCE: **G-13124**

GEODETIC LATITUDE:	20° 47' 26.454	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 59 35.764		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLE*
HI 2	5102	388,440.19	166,219.63	- 0° 06' 57"

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

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

QF 582

Described by

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1065
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Kaunalapau white light (Lanai Island, F. G. Engle, 1927).—On west coast of Lanai, on bluff at south side of entrance to Kaunalapau Harbor, about 110 feet above mean sea level. Station is white light on post, the lower part of which is surrounded by a white shed.

(11-8-65) RECOVERY NOTE, ~~TRIANGULATION~~ STATION INTERSECTION **R**

Kaunalapau,
 NAME OF STATION: White Light
 ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui
 Island: Lanai

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

Station was recovered. It is a 12-inch-diameter, white light mounted on top of a 6-inch pipe that projects 4 feet above the top of a 4 x 8-foot wooden booth that is painted white. Station is on the rocky bluff at south side of entrance to Kaunalapau Harbor and 64 yards southwest of a U.S. Lighthouse Service mark consisting of a steel pin set in the top of an 8-inch-square, concrete monument that has the letters "USLHS" inscribed in the cement.

RECOVERY NOTE, TRIANGULATION STATION **R**

Kaunalapau
 NAME OF STATION: White Light
 ESTABLISHED BY: F. G. E. YEAR: 1927 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: R.L. Newsom YEAR: 1967 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Lanai

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

Station was recovered and mark found. A complete description follows:

Station is a 12 in. diameter, white light mounted on top of a 6 in. pipe that projects 4 feet above the top of a 5X5-foot wooden booth that is painted white. Station is on the rocky bluff at south side of entrance to Kaunalapau Harbor and 64 yards SW of a U.S. Lighthouse Service mark consisting of a steel pin set in the top of a 6 in. square, concrete monument that has the letters "USLHS" inscribed in the cement. The monument is breaking up and weathering.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KAUNALAPAU WHITE LIGHT
 STATE: HAWAII YEAR: 1927 THIRD ORDER

SOURCE: G-13124

GEODETIC LATITUDE: 20° 47' 10.529	ELEVATION: METERS
GEODETIC LONGITUDE: 156° 59' 39.653	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ θ ANGLE*
HI 2	5102	388,067.88	164,593.50	- 0° 06' 55"

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

TOSTATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE

QF 388

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1066
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Kekaa (Maui Island, Hawaiian Government Survey, 1881).—On western shore of West Maui, in Kaanapali District, on a rocky promontory known as Black Rock or Shaws Hill, about 6,500 meters north of Lahaina Courthouse. Marked by a concrete post.

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

RECOVERY NOTE, TRIANGULATION STATION **R**
 NAME OF STATION: **Kekaa** STATE: **Hawaii** COUNTY: **Maui**
 ESTABLISHED BY: **Hawaiian G.S.** YEAR: **1881** LOCALITY: **Lahaina**
 RECOVERED BY: **C.A. Brown** YEAR: **1928**

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

New Mark: Same as Type A Hawaii Territory Survey Triangulation Station Monument, with this exception: Galv. pipe instead of bronze tablet and cast iron support plate.

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

RECOVERY NOTE, TRIANGULATION STATION **R**
 NAME OF STATION: **KEKAA** STATE: **Hawaii** COUNTY: **Maui**
 ESTABLISHED BY: **Hawa Govt Survey** YEAR: **1881** LOCALITY: **West Coast Maui.**
 RECOVERED BY: **O. W. Swainson** YEAR: **1931.**

Detailed statement as to the fitness of the original description:

Station found as described. Terr. Govt. has built concrete observing platform and signal over station mark.

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

RECOVERY NOTE, TRIANGULATION STATION **R**
 NAME OF STATION: **KEKAA** STATE: **Hawaii**
 ESTABLISHED BY: **H.G.S.** YEAR: **1881** COUNTY: **Maui**
 RECOVERED BY: **C.T. Husemeyer** YEAR: **1950**

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.
 To reach from the Courthouse in Lahaina: go northerly on paved coast road for 4.5 miles, turn left, pass to right of large ware houses and go east for about 0.1 mile towards dock. From here pack south to top of low hill and station.

OBJECT	DISTANCE Miles	DIRECTION
WAIKULU 2	5	0 00 00.0
Stack, Pioneer Mill Co.	4.5	101 35 58.6
Stack, Pineapple Cannary, Lahaina	1.5	107 28 55.0
Stack, Central Power Co.	1.5	328 16 48.6

RECOVERY NOTE, TRIANGULATION STATION **R**

NAME OF STATION: **KEKAA**
 ESTABLISHED BY: **HGS** YEAR: **1881** STATE: **Hawaii** BENCH MARK(S) ALSO
 RECOVERED BY: **R.C. Munson** YEAR: **1969** COUNTY: **Maui**
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: **Island: Maui**

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

Station was destroyed in 1961 when a hotel was built on the hill. The Hawaii State Survey Dept. established a new station, HANAKAOO 1961, about 1 mile east-southeast just before the station was destroyed.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KEKAA**
 STATE: **HAWAII** YEAR: **1881** FIRST ORDER

SOURCE: **G- 9311**

GEODETIC LATITUDE: 20 55 49.829	ELEVATION: 27.6 METERS
GEODETIC LONGITUDE: 156 41 54.858	91 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ ANGLE
HI 2	5102	489,112.06	216,853.91	- 0 00 42

* 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
WAIKULU 2	237 59 18.7	238 00 00	5102

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1067
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION **KEKAALAAU**
 STATE **HAWAII** YEAR **1912** THIRD ORDER

SOURCE: **G-SP15c**

GEODETIC LATITUDE	20 57 33.49	ELEVATION	METERS
GEODETIC LONGITUDE	156 36 57.37		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR α ANG. ° "
HI 2	51Jc	517,309.06	227,354.15	+ 0' 01' 05"

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

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

QJ 025

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1068
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 00'
DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

KID (Maui County, Hawaii, J.F.P., 1904; O.W.S., 1932)
--No description of the station was furnished, but a large cairn of rocks was found at the probable station location. The following description can be used:
On the SW coast of Kahoolawe, 3/4 mi. NE of Kahoolawe Light, on the bluff line on the W side of Waikahalulu Bay.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION KID
STATE HAWAII YEAR 1904 THIRD ORDER

SOURCE G-SP156
 OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 ° 30' 39.12	ELEVATION	METERS
GEODETIC LONGITUDE	156 39 30.39		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ (OR Δ) ANGLE *
HI 2	5102	502,843.13	64,470.29	+ 0 00 11

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From $\alpha\alpha\alpha\alpha$)	PLANE AZIMUTH * (From $\alpha\alpha\alpha\alpha$)	CODE

QD 206

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1069
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.†	HEIGHT OF LIGHT ABOVE STATION MARK METERS.		DIRECTION!		
		feet	meters	0	1	2
Surface-station mark, Underground-station mark	1.44					
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			
	HONOPU			00	00	00.0
	R.M. No. 1	SW	28.32 8.630	236	56	26
	R.M. No. 2	NNE	16.17 4.929	356	15	45

Station is located about 4 miles airline southwest of Lanai City, 1-1/4 mile northeast of the wharf at Kaunalapau Bay, and 1 mile southeast of Kiei Bay; at about 700 feet elevation, on the flat, grassy slope along the south side of Kala-maiki Gulch and 1/4 mile northwest of Highway 44.

To reach station from the junction of Highways 44 and 441 at the south edge of Lanai City, go west on Highway 44 for 2.9 miles to sign "AIRPORT" at paved T-inter-section on left. Continue on the highway, downgrade, for 0.65 mile to paved fork left. Continue ahead on right fork, Highway 44, for 0.75 mile to dim track road right, at east end of guard rail on start of long left curve of highway. Go right on dim track road and go northwest down-slope for 0.3 mile to station.

Station mark is a standard disk stamped "KIEI 1962", brazed to the top of a 1-1/2-inch iron pipe that is set in cement and projects 3 inches above ground. It

is 4 feet south of a white witness post.

Reference mark number one is a standard disk stamped "KIEI NO 1 1962", brazed to the top of a 1-1/2-inch iron pipe that is set in cement and projects 6 inches above ground. It is about 2-1/2 feet lower than the station mark.

Reference mark number two is a standard disk stamped "KIEI NO 2 1962", brazed to the top of a 1-1/2-inch iron pipe that is set in cement and projects 3 inches above ground. It is at same elevation as station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION KIEI
 STATE HAWAII YEAR 1962 SECOND ORDER

SOURCE G-15124

GEODETIC LATITUDE	20 ° 47' 54.855	ELEVATION	214.3 METERS
GEODETIC LONGITUDE	156 58 45.236		703 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR ANGLE*
HI 2	5102	393,240.01	169,075.55	- 0° 06' 40"

* 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
HONOPU	175 49 43.4	175 56 23	5102

QF 374

* Refers 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.
 16-64202-1 U. S. GOVERNMENT PRINTING OFFICE

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1070
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 30'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Kilea (Maui Island, Hawaiian Government Survey; J. C. Gauger, 1912; R. W. Woodworth, 1925).—Near western coast of Maui, on cemetery hill at entrance to Olowalu Valley, near Hekili Point, back of Olowalu plantation, 1/2 mile north-east of Olowalu Mill. Station is on the west side of the graves on the hill, and is marked by a nail in a 4 by 4 inch redwood post set flush with surface of ground, and a cairn of stones piled over it. Old description gives mark as iron pin.

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM NO. 1346
 (REV. FEB. 1948)

RECOVERY NOTE, TRIANGULATION STATION

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

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

Station was recovered in good condition. The station has been remarked by the Pioneer Mills Survey Dept. with a 5 by 7 foot concrete monument 3 feet high with a 2 inch iron pipe in the center of top into which is fitted an iron target. This appears to be at the same location as old station. To reach from the Olowalu Store; go easterly on gravel plantation road for about 0.8 miles, turn right through a gate and circle to top of hill and station. The center of the iron pipe was used as station. No reference marks were set.

* Name of chief of party should be inserted here. The officer who actually visited the station should sign his name at the end of the recovery note.
 U. S. GOVERNMENT PRINTING OFFICE NOTE.—One of these forms must be used for every station recovered. 15-58823-9

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **KILEA**
 STATE: **HAWAII** YEAR: **1912** ORDER: **THIRD**

SOURCE: **G- 9511**

GEODETIC LATITUDE: 20° 45' 19.829	ELEVATION: 60.4 METERS
GEODETIC LONGITUDE: 156 37 14.201	264 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ ± ANGLE
HI 2	5102	515,728.15	177,547.47	+ 0 00' 59"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
LAUNIUPOKO	144 38 09.5	144 37 11	5102

QE 595

JUN 1978

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1071
HAWAII
LATITUDE 20° 30' TO 21° 00'
LONGITUDE 156° 30' TO 157° 00'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 655-D

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

Kuahua Beach, Shipwreck
NAME OF STATION: Sternhouse, Flagpole YEAR: 1962 STATE: Hawaii COUNTY: Maui
Island: Lanai
CHIEF OF PARTY: H.J. Seaborg

Description, including sketch of object:

Station is a large grey transport ship, aground in shallow water and setting
in an east-west direction, about 1/4 mile northeast from the mouth of Kuahua
Gulch and 1 mile west of station GIL 2 1962. Point intersected was flagpole
on sternhouse.

U. S. GOVERNMENT PRINTING OFFICE 16-56221-1

Described by _____

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: KUAHUA SHIPWRECK STERNHSE FP
STATE: HAWAII YEAR: 1962 THIRD ORDER

SOURCE: G-13124

GEODETIC LATITUDE	20° 55' 28.212	ELEVATION	METERS
GEODETIC LONGITUDE	156° 54' 47.391		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR $\Delta \theta$ ANGLE *
HI 2	5102	415,876.43	214,776.47	- 0° 05' 17"

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

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

QF 383

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1072
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 500
 Rev. Aug. 1963

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **LAE** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Lanai**
 Described by: **R.F. Hanson**
 CHIEF OF PARTY: **Harold J. Seaborg** YEAR: **1962** HEIGHT OF LIGHT ABOVE STATION MARK: **1.49** METERS.
 HEIGHT OF TELESCOPE ABOVE STATION MARK: **1.49** METERS.
 DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

NOTE*	Surface-station mark, Underground-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	BEARING	DISTANCE		DIRECTION!
				feet	meters	
12a	GIL 2		SSW	23.21	7.075	00 00 00.0
12a	R.M. No. 2		W	15.27	4.651	267 17 52
12a	R.M. No. 1					339 22 39

Station is located about 5-1/2 miles airline northeast of Lanai City and 3/4 mile southeast of old village of Maunalei; along the top of a flat-topped, grey coral ridge that runs up to the southwest from the seashore at Hi Point.

To reach station from the post office in Lanai City, go northerly on Highway 44 for 8.6 miles to end of paved road at sign "SHIPWRECK BEACH". Continue ahead on dirt road, Highway 44, for 1.05 miles to two "Highway 44", signs. Continue ahead for 0.15 mile to summit of grey ridge, about 60 feet above sea level, and end of truck travel. Pack southwest up along open, rocky area for about 300 yards to station.

Station mark is a standard disk stamped "LAE 1962", cemented in a drill hole in grey bedrock flush with general bedrock surface of ridge. It is in a small clear area that is surrounded with dense kiawe brush; 3 feet southeast of a cairn

and 11.0 feet north-northeast of a white witness post.

Reference mark number one is a standard disk stamped "LAE NO 1 1962", cemented in a drill hole in bedrock flush with surrounding area. It is 13.3 feet northwest of the witness post, 14.2 feet west-northwest of the cairn and about 1 foot higher than the station mark.

Reference mark number two is a standard disk stamped "LAE NO 2 1962", cemented in a drill hole in bedrock that projects about 3 inches above surrounding rock. It is 13 feet south-southwest of the witness post and about 1 foot higher than the station.

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

SOURCE: **G-13124**

GEODETIC LATITUDE	20° 55' 38.660	ELEVATION	40.8 METERS
GEODETIC LONGITUDE	156° 52' 37.839		134 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	PLANE AZIMUTH ANGLE*
HI 2	5102	428,146.22	233,726.21	- 0° 04' 30"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
GIL 2	133 23 30.0	133 28 00	5102

QF 55b

* Refers to notes in manuals of triangulation and state publications of triangulation. † Direction-angle measured clockwise, referred to initial station.
 † To nearest meter only, when no trigonometric leveling is being done. 16-50000-1 U. S. GOVERNMENT PRINTING OFFICE

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1073
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **LAHAINA**
 ESTABLISHED BY: **H.G.S.** YEAR: **1883** STATE: **Hawaii** BENCH MARK(S) ALSO
 RECOVERED BY: **R.C. Munson** YEAR: **1969** COUNTY: **Maui**
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: **Island: Maui**

R

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

Station was plotted on a topographic map and searched for, but not found. Some changes have been made in the waterfront bulkhead and it is believed the station is destroyed.

FORM CB-55-526 (1-55)
 USCOM-DC 1950-P-63

U. S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

NAME OF STATION: **LAHAINA**

STATE: **HAWAII**

YEAR: **1883**

SECOND

ORDER

SOURCE: **G-SP150**

GEODETIC LATITUDE:	20 ° 52' 32.61	ELEVATION	3	METERS
GEODETIC LONGITUDE:	156 40 54.01	SCALED		FEET

STATE COORDINATES (feet)				
STATE & ZONE	CODE	X	Y	# OR Δ = ANGLE *
HI 2	5102	494,878.27	196,995.32	- 0 00 15

* 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

QQ 401

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201504 STATION 1074
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 150° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION LAHAINA CHURCH
 STATE HAWAII YEAR 1900 THIRD ORDER

G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	20 52 39.29	ELEVATION:	VETERS
GEODETIC LONGITUDE	156 40 45.88		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	x	y	θ (DR Δ) ANGLE *
HI 2	5102	495,049.29	197,669.21	- 0° 00' 16"

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

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

00 017

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1075
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

LAHAINA COURTHOUSE (Maui Island, Hawaiian Government Survey, J. C. Gauger, 1912).—On western coast of Maui, in Lahaina District, station is a lofty flagpole in front of courthouse building in Lahaina.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAHAINA COURTHOUSE
 STATE: HAWAII YEAR: 1912 THIRD ORDER

SOURCE: G-SP15c

GEODETIC LATITUDE:	20° 52' 28.912	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 40 51.386		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ HOR Δ ϕ ANGLE*
HI 2	5102	495,127.07	196,622.20	- 0° 00' 18"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From 1021b)	PLANE AZIMUTH* (From 1021f)	CODE

QD 001

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1076
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 502 D

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: **Lahaina Light** YEAR: 1961 STATE: **Hawaii** COUNTY: **Maui**
 CHIEF OF PARTY: **H. J. Seaborg**

Description, including sketch of object:

The station is the center of the black painted light on top of a 30 foot high white concrete pyramidal tower on the waterfront at Lahaina. It is on the west side of the waterfront road, on the north side of the boat basin, northwest of the courthouse and west of the old hotel. It is obscured to the northeast and south by buildings and trees in the town.

It is shown in the Light List, Pacific Coast, 1960 as "No. 2940 - Lahaina Light, White pyramidal concrete tower, built 1905, rebuilt 1916."

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **Lahaina Light**
 ESTABLISHED BY: **H. J. Seaborg** YEAR: 1961 STATE: **Hawaii** BENCH MARK(S) ALSO
 RECOVERED BY: **R. C. Munson** YEAR: 1969 COUNTY: **Maui**
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: **Island: Maui**

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

Station was recovered as previously described. Located in Lahaina at north end of the boat basin and across street from the Pioneer Inn. Station is the white light on top of a pyramidal, concrete tower about 30 feet high.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **LAHAINA LIGHT**
 STATE: **HAWAII** YEAR: 1961 THIRD ORDER

SOURCE: **G-12717**

GEODETIC LATITUDE: 20° 52' 31.328	ELEVATION: METERS
GEODETIC LONGITUDE: 156° 40' 53.164	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE °
HI 2	5102	454,958.45	196,865.97	- 0° 00' 15"

* 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 south)	CODE

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1077
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY Form 538 Rev. Aug. 1963		DESCRIPTION OF TRIANGULATION STATION			
NAME OF STATION: LAHAINA NORTHWEST BASE		STATE: Hawaii COUNTY: Maui			
CHIEF OF PARTY: C. T. Hisemeyer		YEAR: 1950		Described by: C. J. Hoepfel	
NOTE: 1	HEIGHT OF TELESCOPE ABOVE STATION MARK 5.67 METERS.†	HEIGHT OF LIGHT ABOVE STATION MARK METERS.			
7a	Surface-station mark	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
	Underground-station mark				
	OBJECT	BEARING	DISTANCE		DIRECTION:
			feet	meters	° ' "
	LAHAINA (HGS) 1912				00 00 00
11a	R. M. No. 1	SW	98.113	29.905	138 24 22
11a	R. M. No. 2	NW	81.396	24.811	296 06 20

The station is located in waste land which lies about 1.5 miles south-east of Lahaina, about 0.2 mile northeast of the highway, 100 yards south of a cemetery, about 125 feet north of a house, about 100 feet southwest of the railroad tracks, 35 feet east northeast of the intersection of a graded road and a driveway and 20 feet northeast of the center of a graded road.

To reach from the courthouse in the town of Lahaina, go southerly, on the road which leads toward Olowalu, for 0.75 mile; turn left, onto a graded road, and go easterly for 0.1 mile; turn right and go southeast for 0.1 mile to the station on the left hand side of the road.

The station is a standard disk, stamped LAHAINA NW BASE 1950, set in the top of a square concrete post which projects about 3 inches.

Reference mark number 1 is a standard disk, stamped LAHAINA NW BASE NO 1 1950, set in the top of a square concrete post which projects about 4 inches. It is located 32 feet northwest of the center of a graded road, 7 feet southwest of a concrete power pole and about 3 feet lower than the station.

Reference mark number 2 is a standard disk, stamped LAHAINA NW BASE NO 2 1950, set in the top of a square concrete post which projects about 4 inches. It is located in a private yard 20 feet southwest of the center of the graded road and about 2 feet lower than the station.

FC
 (11-8-55)

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

NAME OF STATION: LAHAINA NORTHWEST BASE
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii
 RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

The station was recovered. Reference marks 1 and 2 were not found. A new highway has been built through the area and it is believed that the reference marks were destroyed during construction. The station is in an area which has been cleared for the construction of the cemetery mentioned in the description.

Directions for reaching the station are adequate.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAHAINA NORTHWEST BASE

STATE: HAWAII

YEAR: 1950

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 51' 58.432	ELEVATION: 8.80 METERS
GEODETIC LONGITUDE: 156° 40' 18.169	28.5 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	§ 108 Δ §1 ANGLE *
HI 2	5102	458,276.94	193,546.85	- 0° 00' 07"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE § 108 Δ §1 FORMULA NEGLECTING THE SECOND TERM.

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
LAHAINA	181 18 35.3	181 18 42	5102

QE 360

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1077

LATITUDE 0 ' TO 0 '
 LONGITUDE 0 ' TO 0 '
 DIAGRAM

LAHAINA NORTHWEST BASE (continued)

FM 526a
 10-61

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

R

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

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.52 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.
 DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
LAINA (HTS) 1919	-----1950 DIRECTION-----			00 00 00.0
PAUPAU (HGS) 1879				46 29 31.5
LAINA (HTS) 1919	-----1969 DISTANCE and DIRECTION-----			00 00 00.0
R.M. No. 3	NNE	114.972	(35.044)	18 08 28
PAUPAU (HGS) 1879				46 29 33.4
R.M. No. 4	NW	103.485	(31.542)	322 58 52

None of the surface marks could be found, so a trial point was established in the vicinity by triangulating from LAINA and PAUPAU, and an inverse was computed. Upon digging down at the point indicated by the inverse, the old underground mark was found.

A new station mark was then plumbed over the underground mark, and 2 new reference marks were established. A complete description follows:
 Station is located about 1 mile southeast of Lahaina, along the northeast side of State Highway 30, at the southwest edge of a small plot

of State-owned land, usually weed-covered, at the southeast end of an old cemetery.

To reach station from the post office in Lahaina, go northeast on Papalaua St. for 0.2 mile; turn right and go southeast on State Highway 30 for 1.2 miles to Aholo Road, a crossroad. Continue ahead for 0.05 mile to station on left.

Station mark is a standard disk stamped "LAHAINA NW BASE 1950 1969", set in the top of an 18-inch-diameter, mass of concrete projecting 3 inches from ground. It is 48.0 feet northeast of center line of highway, 335 feet southeast of center line of Aholo Road, 105.4 feet southeast of power pole No. 5, 95 feet northwest of power pole No. 6, 170 feet southeast of present end of the old cemetery, and between two 2-1/2-inch pipes 4 feet high, painted yellow and white and setting 6 feet apart.

Underground mark is a standard disk stamped "LAHAINA NW BASE 1950", set in concrete 30 inches below ground level.

Reference mark number three is a standard disk stamped "LAHAINA NW BASE 1950 NO 3 1969", cemented in a drill hole in the south end of a short sidewalk at southeast corner of cemetery, 27 feet north-northwest of a power pole and 16 inches higher than station mark.

Reference mark number four is a standard disk stamped "LAHAINA NW BASE 1950 NO 4 1969", set in the top of a 10-inch-square, concrete monument that projects 6 inches from ground. It is 37.5 feet northeast of center line of highway, 1.7 feet southeast of power pole No. 5 and 1 foot lower than station mark.

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

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

USCOMM-DC 37173-PS

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1078
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 Form 525
 2d. July, 1969

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LAHAINA PIONEER SUGAR MILL STACK COUNTY: Maui
 CHIEF OF PARTY: O. W. Swainson, STATE: Hawaii LOCALITY: Lahaina.
 YEAR: 1931

	DISTANCES AND DIRECTIONS TO REFERENCE MARKS AND PROMINENT OBJECTS			
	OBJECT	DISTANCE	DIRECTION	AZIMUTH
Surface-station mark, Note,*				
Underground-station mark, Note,*				
Reference mark, Note,*				
Reference mark, Note,*				
Witness mark, Note,*				
Witness mark, Note,*				
Height of signal above station mark meters.				
Height of telescope above station mark meters.				

Detailed description:

Station is a prominent concrete stack, owned by Pioneer Mill Co., and located at Lahaina, Maui. Station located in 1900 was destroyed and new stack built in different location. This is an intersection station.

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

RECOVERY OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: LAHAINA, PIONEER SUGAR MILL, STACK YEAR: 1950 STATE: Hawaii COUNTY: Maui
 CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:
 The station is the top and center of the black concrete smoke stack at the Pioneer Sugar Mill in the town of Lahaina.
 It is located on the west side of the mill 45.6 feet northeast of the center of a graded road.
 The stack is 223 feet in height and 21 feet in diameter and was erected in 1928.

U. S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
 (11-3-55) RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Lahaina, Pioneer Sugar Mill, Stack
 ESTABLISHED BY: O.W.S. YEAR: 1931 STATE: Hawaii
 RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

The station was recovered in good condition as described by C.T.H. in 1950. The stack has been painted black with the white letters "Pioneer Mill Co. Ltd., 1928" on the west side.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

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

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

Station was recovered. Located at the Pioneer Sugar Mill at Lahaina. Station is the dull black concrete stack, about 220 feet high.

NOTE: There is a much shorter, brown metal stack a short distance to the east.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAHAINA PIONEER SUGAR MILL STK
 STATE: HAWAII YEAR: 1931 THIRD ORDER
 SOURCE: G- 9311

GEODETIC LATITUDE: 20° 52' 54.056	ELEVATION: METERS
GEODETIC LONGITUDE: 156° 40' 45.278	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	β OR Δ OR ANGLE*
HI 2	5102	455,706.49	199,163.00	- 0° 00' 16"

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

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

QE 423

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1079
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAHAINA PROTESTANT CHURCH
 STATE: HAWAII YEAR 1914 THIRD -ORDER

SOURCE G-SP150

GEODETIC LATITUDE	20 ° 52' 21.91	ELEVATION	METERS
GEODETIC LONGITUDE	156 40 34.51		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\rho \sin \Delta \theta$ ANGLE *
HI 2	5102	456,727.38	195,915.64	- 0 00 12 "

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

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

QD 015

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1080
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 150° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LAHAINA SOUTHEAST BASE / STATE: Hawaii COUNTY: Maui

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.†	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION		HEIGHT OF LIGHT ABOVE STATION MARK METERS.
		OBJECT	BEARING	
13	Surface-station mark,			
7a	Underground-station mark			
			DISTANCE	
			feet	meters
12c	LAHAINA NW BASE /			00 00 00
	R. M. No. 2 /	NW /	54.241 / 16.534 /	04 56 37 /
12c	R. M. No. 1 /	W /	33.671 / 10.562 /	300 51 46 /

The station is located on rocky ground which lies about 3.5 miles south southeast of Lahaina, about 2.5 miles north northwest of the village of Olowalu, about 100 feet northeast of the high tide mark, 82 feet southwest of telephone pole number 418-T, 47 feet south of the centerline of the highway and 9 feet northeast of a keawe tree.

To reach from the village of Olowalu; go northerly, on the highway toward Lahaina for 2.65 miles to the station on the left hand side of the road.

The station is a standard disk, stamped LAHAINA SE BASE 1950, set in the top of a square concrete post which projects about 1 foot.

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

Reference mark number 2 is a standard disk, stamped LAHAINA SE BASE NO 2 1950, set into a drill hole in a boulder which projects about 8 inches. It is located about 2 feet lower than the station and 45 feet southwest of the centerline of the highway.

* Refer to notes in manuals of triangulation and state publications of triangulation. † Direction-angle measured clockwise, referred to initial station. ‡ To nearest meter only, when no trigonometric leveling is being done. 16-60222-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAHAINA SOUTHEAST BASE
 STATE: HAWAII YEAR: 1950 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 50' 26.725	ELEVATION: 7.4 METERS
GEODETIC LONGITUDE: 156 39 07.390	24 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	504,990.11	184,294.64	+ 0° 00' 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
PAUPAU	190 07 06.3	190 06 47	5102

POSITION DETERMINED BY TRAVERSE FROM STATION LAHAINA NW BASE
 AND CHECKED BY ADDITIONAL OBSERVATIONS

QE 367

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

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1080

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

LAHAINA SOUTHEAST BASE (continued)

FORM 526a
 (9-18-69)

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

R

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

HEIGHT OF TELESCOPE ABOVE STATION MARK 1.4 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.
 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	
PAUPAU (HGS) 1879				00 00 00.0
R.M. No. 1	W	33.671	10.562	254 47 09
PAUPAU (HGS) 1879 -----1969 DISTANCE and DIRECTION-----				00 00 00.0
R.M. No. 3	SSE	9.690	2.954	166 00 37
R.M. No. 1	WSW	34.926	10.646	254 52 58

Station mark and RM No. 1 were recovered in good condition. RM No. 2 has been destroyed. A new reference mark, No. 3, was established and a witness post set. A difference of .048 meter was noted in the distance to RM No. 1; the 1969 distance is correct. A complete description follows: Station is located about 3 miles southeast of Lahaina and 1/2-mile southeast of Launiupoko Park, along southwest side of State Highway 30, on a low, brushy and rocky knoll that has a lone kiawe tree on it. To reach station from the post office in Lahaina, go northeast on Papalaua Street for 0.2 mile; turn right and go southeast on State Highway 30 for 3.6 miles to station on right.

Station mark is a standard disk stamped "LAHAINA SE BASE 1950", set in the top of a 10-inch-square, concrete monument that projects 1 foot from ground. It is 47 feet southwest of center line of highway, 83.5 feet southwest, across highway, from telephone pole 318T, 15 feet southwest of edge of highway cutbank, 30 feet east-southeast of lone kiawe tree, 52 feet southeast of a dim track road, and 4 feet south of a white witness post. Reference mark number one is a standard disk stamped "LAHAINA SE BASE NO 1 1950", cemented in a drill hole in a 3-foot boulder that projects 1-1/2 feet from ground. It is about 50 feet northeast of water line, 18 feet south of a lone kiawe tree and 1.9 feet lower than station mark. Reference mark number three is a standard disk stamped "LAHAINA SE BASE 1950 NO 3 1969", cemented in a drill hole in a bedrock outcrop that projects 1 foot from ground and is 4 inches lower than station mark.

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

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

USCGM-OC 2717a-P99

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1081
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

COMMERCE RECOVERY NOTE, TRIANGULATION STATION **R**

U. S. COAST AND GEODETIC SURVEY
 FORM 505
 (REV. FEB. 1958)

NAME OF STATION: LAINA
 ESTABLISHED BY: O.W.S. YEAR: 1931 STATE: Hawaii
 RECOVERED BY: C. T. Husemeyer YEAR: 1950 COUNTY: Maui

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

The station was recovered in good condition. The station is marked with a 2 inch pipe set in a block of concrete. A new description follows:

The station is located on the summit and westerly rim of an extinct volcanic cone, named Puu Laina, which lies about 2 miles northeast of Lahaina, about 1.2 miles east of the seacoast and about 4 mile west of Crater Camp.

To reach from the courthouse in the town of Lahaina; go northerly, on the road toward Honokohau, for 1.8 miles; turn right and go easterly for 0.3 mile; cross over the railroad tracks and continue straight ahead, easterly, on the graded road, for 0.6 mile to a power house and a road intersection; continue straight ahead, up grade, for 0.35 mile; turn right and go south for about 100 yards to a concrete irrigation ditch and the end of truck travel. From this point pack southwesterly, up the long ridge, for about 300 yards to the summit and the station.

The station is the top and center of a 2 inch iron pipe which projects about 3 inches from the top of a mound of concrete.

OBJECT	BEARING	DISTANCE	DIRECTION
KEKAA			00 00 00
Lahaina Stack (Pioneer Mill Co)	S	1.5 miles	243 47 08.7
Mala, Stack (Baldwin Packers)	SW	1.2 miles	279 37 07.8

U. S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
 (11-5-55) RECOVERY NOTE, TRIANGULATION STATION **R**

NAME OF STATION: LAINA
 ESTABLISHED BY: O.W.S. YEAR: 1931 STATE: Hawaii
 RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

The station and the observing platform were recovered in good condition as described by C.T.H. in 1950 except that the station is now on the west side of a borrow pit, on the portion of the hill left after excavation, and may be reached by truck on the road which circles the pit from the end of truck travel given in the 1950 description. There is a small aluminum sheathed radio transmitter shed on the same knob. The railroad mentioned has been dismantled, the grade has been paved and is now a private road of the Pioneer Sugar Mill Co. at Lahaina.

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

(continued on next page)

COM-DC 34314

NAME OF STATION: LAINA

STATE: HAWAII

YEAR: 1951

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE:	20° 53' 57.257	ELEVATION:	198.0 METERS
GEODETIC LONGITUDE:	156 40 15.278		650 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	Bearing Angle
HI 2	510z	498,551.42	205,535.26	- 0° 00' 06"

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE B-COR Δ R FORMULA NEGLECTING THE SECOND TERM

TO STATION OR OBJECT	GEODETIC AZIMUTH (From zenith)	PLANE AZIMUTH* (From zenith)	CODE
MANINI	208 30 34.6	208 30 41	5102

QE 364

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1081

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

LAINA (continued)

FORM 526a
 (2-12-55)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: **LAINA**
 ESTABLISHED BY: **O.W.S.** YEAR: **1931** STATE: **Hawaii**
 RECOVERED BY: **R.C. Munson** YEAR: **1969** COUNTY: **Maui**
 Island: **Maui**

HEIGHT OF TELESCOPE ABOVE STATION MARK **2.3** METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.
 DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
MANINI (HGS) 1881				00° 00' 00.0"
R.M. No. 1	NE	25.987	7.921	34° 08' 51"
PAUFAU (HGS) 1879				78° 21' 46.9"
R.M. No. 2	SW	13.763	4.195	214° 31' 08"

Station mark was recovered in good condition. Two new reference marks were established. A complete description follows:

Station is located about 1-1/2 miles northeast of Lahaina and 500 feet northwest of Crater Reservoir, on Puu Laina, a prominent hill of about 650 feet elevation that has a radio hut and antenna on it.

To reach station from the post office in Lahaina, go northeast on Papalaua Street for 0.2 mile; turn left and go northwest on State Highway 30 for 1.2 miles; turn right and go northeast on Wahikuli Rd. for 0.3 mile to main cane-field crossroad. Continue ahead on field road for 1.0 mile to side road right, at power line. Turn sharp right and go 0.05 mile; take left fork and follow main road 0.2 mile to station.

Station is marked by a 2-inch iron pipe projecting 5 inches from the center of a 30-inch-diameter concrete dome 8 inches high, with "LAINA HTS 3-14-19" inscribed in it. A Type A signal is centered over the mark, with the 6-foot-square, concrete platform 4 feet above ground. A red and white metal target extends 6 feet above platform. Station is 45 feet southwest from edge of cinder quarry cliff, 17 feet north of an old military observation post, and 50 feet north of a wooden antenna pole and small, metal radio hut.

Reference mark number one is a standard disk stamped "LAINA HTS 1919 NO 1 1969", cemented in a drill hole in red bedrock projecting 2 inches from ground. It is 15 feet southwest of edge of cinder quarry cliff and 0.4 foot lower than station mark.

Reference mark number two is a standard disk stamped "LAINA HTS 1919 NO 2 1969", cemented in a drill hole in a 12-inch boulder that projects 4 inches from ground. It is 7 feet northwest of northwest corner of the observation post and 16 inches lower than station mark.

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

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

USCOMM-DC 27173-P88

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1082
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 526
 Rev. Aug. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LAN (USN) STATE: Hawaii COUNTY: Maui
 Island: Lanai
 Described by: R. F. Hanson

CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	HEIGHT OF LIGHT ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION			
Surface-station mark, Underground-station mark	1.62 METERS.†	METERS.†	OBJECT	BEARING	DISTANCE feet meters	DIRECTION †
			HII (Dole)	SE	14.73	00 00 00.0
			R.M. No. 2	N	4.491	79 18 36
			R.M. No. 1		20.25	29 41 30

Detailed description
 Station is located about 3-1/4 miles airline southwest of Lanai City, near the east-northeast end of the hard-surfaced parking ramp on property of the Lanai Airport. To reach station from the junction of Highways 44 and 441 at the south edge of Lanai City, go westerly on Highway 44 for 2.9 miles to sign "AIRPORT", and side road left. Turn left and go south-southeast on hard-surfaced road for 0.5 mile to fork, where right fork turns right toward airport office. Continue ahead on left fork, which turns right, towards freight building, and go about 100 yards to the end of airplane parking ramp and station.
 Station mark is a U.S. Navy Hydrographic Survey bronze disk stamped "LAN 1961" set in cement in the hard-surfaced parking area, 79.6 feet southeast of the south-east corner of the freight building, 21 feet northwest of southeast corner of parking ramp and 57 feet south-southeast of intersection of narrow blacktop road with the parking ramp.

Reference mark number one is a standard disk stamped "LAN USN NO 1 1962", set in cement in a hole in the hard-surfacing of the ramp.
 Reference mark number two is a standard disk stamped "LAN USN NO 2 1962", set in cement in a hole in the hard-surfacing of the ramp. It is about 1 foot north of south side of ramp.

Form 526
 (11-8-55)

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

R

NAME OF STATION: LAN (USN)
 ESTABLISHED BY: H. J. S. YEAR: 1962 STATE: Hawaii
 RECOVERED BY: D. M. Whipp YEAR: 1965 COUNTY: Maui
 Island: Lanai

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

Station was recovered and all marks found in good condition, however it will be destroyed by grading during the airport improvement construction at Lanai Airport, so a new station, LAN 2, was established nearby in August, 1965. 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: LAN USN
 STATE: HAWAII YEAR: 1962 SECOND ORDER
 SOURCE: G-13124

GEODETIC LATITUDE	20° 47' 29.295	ELEVATION	357.0 METERS
GEODETIC LONGITUDE	156 57 08.677		1302 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# IOR Δ ± ANGLE *
HI 2	5.02	402,396.82	160,479.79	- 0° 06' 05"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
HII DOLE	240 17 51.7	240 23 57	5102

QF 364

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1083
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

U. S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC SURVEY
 FORM 535
 REV. AUG. 1968

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LAN 2 STATE: Hawaii COUNTY: Maui
 CHIEF OF PARTY: D.M. Whipp YEAR: 1965 Described by: Lanai Island R.F. Hanson

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	HEIGHT OF LIGHT ABOVE STATION MARK METERS		DIRECTION			
			feet	meters	°	'	"	
1b	Surface-station mark, Underground-station mark							
11b	HII (DOLE) 1962	ESE	8.761	2.671	00	00	00.0	
11b	RM No. 1	WNW	8.151	2.485	236	48	10	

Detailed description

Station is located about 3-1/4 miles airline southwest of Lanai City, at the Lanai Airport, near the north corner of the macadam, aircraft-tiedown area.

To reach station from the junction of State Highways 44 & 441 at the south edge of Lanai City, go southwest on State Highway 44 for 2.9 miles to sign "AIRPORT", and side road left. Turn left and go 0.5 mile to fork. Take left fork, straight ahead, then bear right and go southwest 100 yards to north corner of tiedown area and station.

Station mark is a standard disk, stamped "LAN 2 1965", set in the top of a 12-inch-diameter, concrete monument flush with the macadam surface, 7 feet southwest of edge of macadam, 4 feet northwest of the end tiedown of a row of tiedowns, 41 feet east of the east corner of a metal, warehouse building, and 95 yards northeast of the present airport terminal building.

Reference mark number one is a standard disk stamped "LAN 2 NO 1 1965", set in the top of an 8-inch-diameter, concrete monument that is flush with the macadam surface, 3 feet southwest of edge of macadam and at same elevation as station.

Reference mark number two is a standard disk stamped "LAN 2 NO 2 1965", set in the top of a 10-inch-diameter, concrete monument that is flush with the macadam surface. It is at same elevation as station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAN 2
 STATE: HAWAII YEAR: 1965 SECOND ORDER

SOURCE: G-12664
 NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 20° 47' 29.711	ELEVATION: 396 METERS
GEODETIC LONGITUDE: 156 57 08.973	SCALED FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	402,368.81	166,521.81	- 0° 06' 05"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
HII DOLE	240 27 06.3	240 33 11	5102

POSITION DETERMINED BY TRAVERSE FROM STATION HII DOLE

QF 574

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

(continued on next page)

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1083

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

LAN 2 (continued)

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: LAN 2
ESTABLISHED BY: D.M. Whipp YEAR: 1965 STATE: Hawaii BENCH MARK ALSO
RECOVERED BY: J.V. Teater YEAR: 1973 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 3 1/4 miles SW of Lanai City.
HEIGHT OF TELESCOPE ABOVE STATION MARK FEET. HEIGHT OF LIGHT ABOVE STATION MARK FEET.

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
This station was not occupied at this time and the distances or directions to the marks was not verified.				

The station mark and reference marks 1 & 2 were recovered and found to be in good condition. Changes at the airport requires a new description.

The station is located about 3 1/4 miles southwest of Lanai City, at the Lanai Airport, about 600 feet south of the terminal building, and near the north corner of an abandoned paved aircraft tie-down area.

To reach the station from the junction of State Highways 44 and 441 at the south edge of Lanai City, go southwest on State Highway 44 for 2.9 miles to a paved road left, at sign "AIRPORT". Turn left and go 0.55 mile to a farm road on the right, just before entering the airport parking area. Turn right and follow the farm road for 0.1 mile to where it curves away from the airport ramp area. Leave the road and continue ahead on the grass for about 300 feet to the second paved strip on the right. Turn right and go about 250 feet to the old tie-down ramp and the station mark on the left.

The station mark, a standard disk stamped LAN 2 1965, is set in the top of a concrete post flush with the paved surface. It is 141.0 feet northeast of an anemometer, 7 feet southwest of the edge of pavement, and 4 feet northwest of the end tie-down bracket.

Reference mark 1, a standard disk stamped LAN 2 NO 1 1965, is set in the top of a concrete monument that is flush with the paved surface. It is 3 feet southwest of the edge of paving and same elevation as the station mark.

Reference mark 2, a standard disk stamped LAN 2 NO 2 1965, is set in the top of a concrete monument that is flush with the paved surface. It is 12 feet southwest of the edge of paving and the same elevation as the station mark.

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: LAN 2
ESTABLISHED BY: D.M. Whipp YEAR: 1965 STATE: Hawaii BENCH MARK(S) ALSO
RECOVERED BY: J.V. Dykan YEAR: 1978 COUNTY: Maui

AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: At Lanai Airport

Detailed statement as to the contents of the original description, including marks found, changes made, and other pertinent facts:
Station, RM#1 recovered as described.

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1084
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 00'
DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 526 (11-8-55)

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: **Lanai City, Dole Corp., Water Tank** YEAR: 1962 STATE: Hawaii COUNTY: Maui Island: Lanai
CHIEF OF PARTY: **H.J. Seaborg**

Description, including sketch of object:

Station is a large, silver tank about 25 feet in diameter and 15 feet high. It is located about 1-3/4 miles southeast of Lanai City, on the south tip of Hii Flats and on the point of the rim overlooking the mouth of Kapohaka Gulch to the south-southeast. Point intersected was small knob on top.

Form 526
(11-8-55)

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

RECOVERY NOTE. TRIANGULATION STATION

NAME OF STATION: **Lanai City, Dole Corp., Water Tank**
ESTABLISHED BY: **HJS** YEAR: 1962 STATE: Hawaii
RECOVERED BY: **EPC** YEAR: 1964 COUNTY: Maui

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

The station was recovered as described in the original description.

* 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: **LANAI CITY DOLE CORP TANK**
STATE: **HAWAII** YEAR: 1962 THIRD ORDER

SOURCE: **G-13124**

GEODETIC LATITUDE: 20 ° 38' 38.178	ELEVATION: METERS
GEODETIC LONGITUDE: 156 54 00.771	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE *
HI 2	5102	420,235.90	173,400.78	- 0 04 59 *

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

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

QF 384

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1085
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAU
 STATE: HAWAII YEAR: 1900 ORDER: THIRD
 SOURCE: G-SP156

GEODETIC LATITUDE	20 47 41.753	ELEVATION	METERS
GEODETIC LONGITUDE	156 30 56.890		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ρ (OR Δ) ANGLE*
HI 2	5102	551,530.20	167,674.37	+ 0 03 13

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ρ (OR Δ) 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 201564 STATION 1086
 HAWAII
 LATITUDE 20° 30' TO 21° 30'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

Launiupoko (Maui Island, Hawaiian Government Survey, 1879;
 R. W. Woodworth, 1925).—On western coast of West Maui, in Lahaina
 District, about 3 miles southeast of Lahaina Landing, on south side of Launiupoko
 Valley, on the southwest side of and 10 feet below the summit of the conspicuous
 chalky hill called Puu Mahanalua Nui or Launiupoko Hill. Marked by con-
 crete post with cross in top set flush with surface of ground and surmounted by
 a cairn of stones.

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

RECOVERY NOTE, TRIANGULATION STATION

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

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

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

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: Launiupoko STATE: Hawaii COUNTY: Maui
 ESTABLISHED BY: H.G.S. YEAR: 1879 LOCALITY: West coast Maui.
 RECOVERED BY: O. W. Swainson YEAR: 1931

Detailed statement as to the fitness of the original description:

Station has been remarked with Hawaiian Government disc, and has a concrete observing
 platform and steel target above it.

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 (REV. FEB. 1948)

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LAUNIUPOKO
 ESTABLISHED BY: H.G.S. YEAR: 1879 STATE: Hawaii
 RECOVERED BY: C.T. Husemeyer YEAR: 1950 COUNTY: Maui

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

Station was recovered as described.
 To reach from the Village of Olowalu; go northwesterly on highway
 toward Lahaina for 3.0 miles, turn right at large rock pile and go
 northeast on main road for about 1.0 mile. From here station lies about
 140° magnetic. Pack southeast about 0.4 to top of hill and station.

OBJECT	DISTANCE	DIRECTION
OLOWALU	Miles	0 00 00.0
Stack, Pioneer Mill Co. NW	4	151 05 48.8
Kilea (HGS) Target SE	2	342 02 17.1

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

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: LAUNIUPOKO

STATE: HAWAII

YEAR: 1875

FIRST

ORDER

SOURCE: G- 9311

GEODETIC LATITUDE: 20° 50' 36.733	ELEVATION: 246.5 METERS
GEODETIC LONGITUDE: 156° 38' 12.260	805 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE
HI 2	5102	510,219.07	185,305.07	+ 0° 00' 36"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE
OLOWALU	342 35 32.8	342 34 55	5102

QE 370

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1086

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

LAUNIUPOKO (continued)

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

(11-8-55)

R

NAME OF STATION: LAUNIUPOKO
ESTABLISHED BY: H.G.S. YEAR: 1879 STATE: Hawaii
RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

The station was recovered in good condition. A type A, Hawaiian Territory Survey observing stand is over the mark. Directions for reaching the station are adequate except that the distance from Olowalu should be traveled on the Pioneer Sugar Mill Co. private road and the turn to the right should be made on the 4th field road past the waste area adjacent to the paved company road. Follow the field road to the edge of the cane, then cross two cattle guards at corral. Follow rough dirt road to gate, leave truck and pack south to top of hill and station plainly visible from the road at LAHAINA S.E. BASE 1950.

RECOVERY NOTE, TRIANGULATION STATION

R

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

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

Station was recovered in good condition. Located about 4 miles southeast of Lahaina, 2 miles north-northwest of Olowalu Store, and 0.7 mile northeast of State Highway 30, on the summit of Puu Mahanalua Nui, a bare, brown hill of about 809 feet elevation that has a power line crossing it.

To reach station from the post office in Lahaina, go northeast on Papalaua St. for 0.2 mile; turn right and go southeast on State Highway 30 for 3.1 miles to Launiupoko Park on right. Take left fork and go 0.1 mile on cane road; turn left and go upgrade for 1.4 miles to power line crossing and end of truck travel. Pack southerly through kiawe flats, about 1/2-mile to station.

Station is marked with an HTS disk, unstamped, set in a 12-inch-square concrete monument flush with ground. A Type A signal is centered over the mark, with the 6-foot-square, concrete platform 3-1/2 feet above ground. A red and white metal target extends 6 feet above platform. Station is about 200 yards southwest of the power line.

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1087
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 528
 Rev. Aug. 1965

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LEHUA STATE: Hawaii COUNTY: Maui
 Island: Lanai Described by: R.F. Hanson

CHIEF OF PARTY: Harold J. Seaborg YEAR: 1962
 HEIGHT OF TELESCOPE ABOVE STATION MARK 1.39 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		
12c	Surface-station mark	PILANI R.M. No. 2 R.M. No. 1	W ENE	30.112'	9.178'	00 00 00.0
	Underground-station mark			15.347'	4.678'	147 35 21. 299 39 13'

Station is located about 4-1/2 miles airline southeast of Lanai City, at about 2600 feet elevation, on the southeast end of the range of high mountains of the island; on a small grassy hummock along the east side of the graded road which runs the length of the mountain range.

To reach station from the junction of Highways 44 and 441, at the south edge of Lanai City, go southerly on Highway 441 for 1.7 miles to a paved fork. Take left fork and go 1.15 miles to end of paved road. Continue on graded road for 0.2 mile to side road left. Turn left and go 0.5 mile to crossroad at edge of pineapple field. Continue ahead on graded up draw, and southeast up side of hill, for 1.8 miles to fork at edge of pineapple field on top of mesa. Take right fork along edge of field for 0.35 mile to crossroad. Turn right, through a gate, and follow main road south for 0.45 mile to top of grade in a saddle. Turn left and

follow graded road up along ridge for 1.3 miles to station on right.

Station mark is a standard disk stamped "LEHUA 1962", braced to the top of a 1-1/2-inch iron pipe that is set in cement and projects 3 inches above ground. It is 4.8 feet east-southeast of a white witness post, 14.0 feet east of center line of road, 4.3 feet southwest of a Hawaii Visitors Bureau sign "KAHOOLAWE ISLAND", 27 feet south of a bulldozed drainage course that crosses the road, and about 200 yards northeast of a group of Norfolk Island Pines.

Reference mark number one is a standard disk stamped "LEHUA NO 1 1962", cemented in a drill hole in a 16-inch boulder that projects 4 inches above ground. It is in a slight, bare saddle on the station hummock; 11.5 feet east-northeast of the sign "KAHOOLAWE ISLAND" and about 1 foot lower than the station.

Reference mark number two is a standard disk stamped "LEHUA NO 2 1962", braced to the top of a 1-1/2-inch iron pipe that is set in cement and projects 6 inches above ground. It is on a grassy point; 18 feet west of center line of road, 7 feet south of edge of drainage course, and about 2 feet higher than the station.

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

Form 528
 (11-3-55)

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

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: LEHUA
 ESTABLISHED BY: HJS YEAR: 1962 STATE: Hawaii
 RECOVERED BY: EPC YEAR: 1964 COUNTY: Maui

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

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE G-13124

GEODETIC LATITUDE	20° 47' 43.307	ELEVATION	821.1 METERS
GEODETIC LONGITUDE	156 51 42.687		2654 FEET

STATE COORDINATES (feet)				
STATE & ZONE	CODE	X	Y	∠ OR ∠ ∠ ANGLE °
HI 2	5102	433,329.30	167,847.35	- 0° 04' 10"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
PILANI	306 45 34.9	306 49 45	5102

OF 371

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1088
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION LEW
 STATE HAWAII YEAR 1900 THIRD ORDER

SOURCE G-SP156

GEODETIC LATITUDE:	20° 47' 53.016	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 30 34.586		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	553,645.30	168,812.72	+ J 05 21"

* 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

90 120

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1089
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 536
 REV. AUG. 1963

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: LIHA STATE: Hawaii COUNTY: Maui

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

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 1.37 METERS.	
			feet	meters
2				
		OBJECT	BEARING	DIRECTION
12a		THIRTY	WSW	0 00 00.0
		R.M.No. 2	42.78	117 31 48
12a		R.M.No. 1	30.23	300 13 09
			13.040	9.211

Located on the west side of West Maui, Lahaina District, about 4.5 miles, airline, southeast of Lahaina and about 2 miles in from the coast, on a prominent rock outcrop on a sharp ridge, about 500 feet lower in elevation than the top of the main ridge and about 0.3 miles in distance.

Station is at the highest point of the center one of three prominent outcrops. A standard disk cemented in bedrock. Stamped LIHA 1949.

Reference mark No.1 is east northeast of the station. A standard disk set in bedrock, stamped LIHA NO 1 1949.

Reference mark No.2 is west southwest of the station. A standard disk set in bedrock, stamped LIHA NO 2 1949.

To reach from the Post Office at Wailuku: go south and west on Lahaina highway for 16.6 miles to Olowalu Village, continue ahead for 3.0 miles, turn right at south side of large rock pile and go easterly for 1.8 miles to large reservoir in canyon and ETT. From here pack right across canyon then left up steep ridge to top, then right down ridge for 0.3 miles to station.

Detailed description

* Refer to notes in manuals of triangulation and state publications of triangulation. † Direction-angle measured clockwise, referred to initial station.
 ‡ To nearest meter only, when no trigonometric leveling is being done. 16-60202-1 U. S. GOVERNMENT PRINTING OFFICE

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G- 9311

GEODETIC LATITUDE	20° 51' 05.002	ELEVATION:	1119.0 METERS
GEODETIC LONGITUDE:	156 36 27.482		3671 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE*
HI 2	5102	520,156.15	188,159.91	+ 0° 01' 16"

* 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
THIRTY	302 34 06.4	302 32 50	5102

QE 366

HORIZONTAL CONTROL DATA

by the
 NATIONAL GEODETIC SURVEY
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1089

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

LIHA (continued)

RECOVERY NOTE, TRIANGULATION STATION

R

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

DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION				
OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
THIRTY -----1950 DISTANCE	and DIRECTION			00 00 00.0
R.M. No. 2	WSW	42.78	13.040	117 31 48
R.M. No. 1	ENE	30.23	9.211	300 13 09
-----1969 DISTANCE				
R.M. No. 2		43.330	13.207	
R.M. No. 1		30.198	9.204	

Station was recovered and all marks found in good condition. A discrepancy was noted in the distance to RM No. 2. The angles to RMs were not checked due to cloud cover. A different route was tried to reach station, and found to be much easier, due to completely avoiding the dense fern on the 1950 pack route. A complete description follows:

Station is located about 5 miles east-southeast of Lahaina and 3 miles north-northeast of Olowalu, on a prominent rock knob at about 3671

feet elevation, along the ridge running up along the south side of Lau-niupoko Gulch, and is about 1/2-mile southwest of Lihau, a hill of 4197 feet elevation. The station point has a low covering of fern.

To reach station from the post office in Wailuku, go south on State Highway 30 for 15.5 miles to Olowalu Store; continue ahead on the highway for 0.15 mile to sign on right "PETROGLYPHS". Go right, on cane field road, for 0.75 mile to side road left, just past the petroglyph site. Go left for 0.15 mile to end of truck travel at Olowalu Shaft and a power sub-station. Pack northerly about 1/2-mile, through kiawe area, to open, red flat, where power line crosses. Continue ahead, northerly, into the point of the large canyon about 3/4-mile distant, where a very steep, sharp ridge can be seen running straight up to station. Pack up this ridge to station. About a 5-hour pack.

Station mark is a standard disk cemented in a drill hole in a small bedrock outcrop about flush with ground. The disk was reportedly stamped "LIHA 1949", but it has been rubbed by a signal pole and all that is now legible is the number "9". The mark is just inside an area covered with 2-foot-high fern. A small cairn and signal were put up.

Reference mark number one is a standard disk stamped "LIHA NO 1 1949" cemented in a drill hole in a 3-foot boulder that projects 1 foot above ground, and is about 1 foot lower than station mark.

Reference mark number two is a standard disk stamped "LIHA NO 2 1949", cemented in a drill hole in a 6-foot bedrock slab that projects 2 feet above ground. It is about 7 feet lower than station mark.

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

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1090
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 00'
DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

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

SOURCE: G-SP156

GEODETIC LATITUDE: 20 ° 51' 11.45	ELEVATION:	METERS
GEODETIC LONGITUDE: 156 36 38.21		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ ANGLE *
HI 2	5102	519,138.43	188,810.09	+ 0 ° 01' 12 "

* 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

90 011

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1091
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DESCRIPTION OF TRIANGULATION STATION

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 523
 Rev. Aug. 1966

NAME OF STATION: **LOPA** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Lanai** Described by: **R.F. Hanson**

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

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.†	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	°	'	"
4	Surface-station mark						
	Underground-station mark						
12a	PUU NENE	NE	15.17	4.625	00	00	00.0
12a	R.M. No. 2	SW	10.42	3.173	121	39	20
12a	R.M. No. 1				332	48	29

Station is located about 7-1/4 miles airline east of Lanai City, 1/4 mile west of the easternmost point of the island, and 1/4 mile north of Lopa Gulch; on a small, kiawe-covered hill of about 100 feet elevation.

To reach station from the post office in Lanai City, go northerly on Highway 44 for 8.6 miles to end of paved road. Continue on dirt road, Highway 44, for 6.5 miles to old Kecomuku Village. Continue ahead for 1.0 mile to fork. Take left fork and follow road along shoreline for 1.1 miles to house in clearing on right. Continue on the road for 1.6 miles to a white sand bank on left, and end of truck travel. Pack westerly across tree-covered, slightly sloping flat land for about 300 yards to small hill and station.

Station mark is a standard disk stamped "LOPA 1962", cemented in a drill hole in bedrock. It is about 8 feet north-northeast of a cairn.

Reference mark number one is a standard disk stamped "LOPA NO 1 1962", cemented in a drill hole in a bedrock outcrop that projects about 8 inches above ground. It is about 3 feet higher than the station.

Reference mark number two is a standard disk stamped "LOPA NO 2 1962", cemented in a drill hole in a 3 x 5-foot bedrock outcrop that projects about 6 inches above ground. It is at same elevation as station.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **LOPA**
 STATE: **HAWAII** YEAR: **1962** SECOND ORDER
 SOURCE: **G-13124**

GEODETIC LATITUDE	20° 48' 58.193	ELEVATION	30.5 METERS
GEODETIC LONGITUDE	156 48 44.255		100 FEET

STATE COORDINATES (feet)				
STATE & ZONE	CODE	X	Y	B OR Δ 91 ANGLE †
HI 2	5102	450,265.72	175,384.81	- 0° 35' 06"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH † (From south)	CODE
PUU NENE	96 13 41.8	96 16 48	5102

QF 368

* 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.
 16-60002-1 U. S. GOVERNMENT PRINTING OFFICE

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1092
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 525
 Rev. Aug. 1965

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **LOW 2** STATE: **Hawaii** COUNTY: **Maui**
 Island: **Kahoolawe**
 Described by: **M.L.G.**

CHIEF OF PARTY: **R. J. Seaborg** YEAR: **1963**

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK METERS.†	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	HEIGHT OF LIGHT ABOVE STATION MARK METERS.		DIRECTION: ° / ' / "
			feet	meters	
2	Surface-station mark, Underground-station mark				
		OBJECT	BEARING		
12a		KAHOOLOWE 2			00 00 00.0
		R.M. No. 1	S	18.76	5.715
12c		R.M. No. 2	W	86.03	26.221
					310 08 36.3
					51 50 29.1

Detailed description

Station is located on the northeast side of Kahoolawe Island on the crest of the north rim of Kealiialuna Crater at about 800 feet elevation. It is about 0.8 mile south of the north tip of the island and about 1.1 miles west of Hakiowa Point. Looking west from Hakiowa Point the station is located on the northern most and lowest of two distinct peaks.

Station is best reached by making skiff landing on the large sandy beach about 0.9 mile north of Hakiowa Point, then packing southwesterly for about 0.7 mile to the station on the nearest peak.

Station mark is a standard triangulation disk stamped "LOW 2 1963", cemented in a drill hole in a 3 x 3-foot outcrop of bedrock that projects about 6 inches. It is on the highest point of an area that is clear of Keawe brush yet covered with small rocks.

Reference mark number one is a standard disk stamped "LOW 2 NO 1 1963", set in a drill hole in a 2 x 2-foot section of exposed bedrock flush with the ground and is about 3 feet below the elevation of the station mark.

Reference mark number two is a standard disk stamped "LOW 2 NO 2 1963", set flush in a drill hole in the top of a 5-foot-diameter boulder that projects about 1 foot and is about 6 feet below the elevation of the station mark.

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

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION **LOW 2**

STATE **HAWAII**

YEAR **1963**

SECOND

—ORDER

SOURCE **G-13249**

GEODETIC LATITUDE	20° 35' 43.0060	ELEVATION	235.0 METERS
GEODETIC LONGITUDE	156 34 23.5983		771 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ OR ANGLE *
HI 2	5102	531,955.52	95,145.68	+ 0° 01' 58"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH* (From south)	PLANE AZIMUTH* (From south)	CODE
KAHOOLAWE 2	29 43 51.9	29 41 54	5102

QF 411

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1093
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

Lump (Kahoolawe Island, J. F. Pratt, 1904).—On the southern shore of Kahoolawe Island, on a hilltop at the point southeast of the eastern of the two deep coves on the south side of the island, and 220 meters from the edge of the bluff. The bluff at the southeast point of the island bears N. 79° 30' E. (mag.). Marked by a cross cut in the flat face of a rock buried 16 inches below surface of ground.

LUMP (Maui County, Hawaii, J.F.P., 1904; O.W.S., 1932)
 --Station was visited, but no definite station point was recovered. A thorough search was not made for the point. A 6-ft. cairn of rocks, with a 2- by 2-in. center pole, was erected over the spot which appeared to be the point from evidence of signal building material on the ground.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION LUMP
 STATE HAWAII YEAR 1904 THIRD ORDER
 SOURCE G-SP156

GEODETIC LATITUDE	20° 30' 51.980	ELEVATION	188	METERS
GEODETIC LONGITUDE	156 35 20.103	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	RIGHT ANGLE*
HI 2	5102	526,605.33	65,781.95	+ 0° 01' 38"

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

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

QD 184

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201504 STATION 1095
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: **MAKA**

STATE: **HAWAII**

COUNTY: **MAUI**

CHIEF OF PARTY: **H. J. S.**

YEAR: **1963**

Described by: **R. K. H.**

HEIGHT OF TELESCOPE ABOVE STATION MARK **1.68** METERS.† HEIGHT OF LIGHT ABOVE STATION MARK METERS.

NOTE*	HEIGHT OF TELESCOPE ABOVE STATION MARK	DISTANCES AND DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	DISTANCE		DIRECTION †	
			feet	meters		
2	Surface-station mark, Underground-station mark					
12a	WET ₂ 1963 (on N shore of island) R.M. 1	E	64.48	4200 19.655	0 00 12 34	00.0 54
	KAHOOHLANE _g 1963 (on Mt. Moaula)	E		7600	25 00	23.9
	COB ₂ 1963 (on prominent hilltop)	SE		2000	71 59	37.8
12a	R.M. 2	S	55.85	17.023	105 22	40

Station is located on Makaalae Point of Kahoolawe Island. The mark is a standard disc stamped MAKA 1963 and set with cement in bedrock, level with surrounding ground. The station is on the northernmost portion of the point on level ground and 20 feet south of the top edge of the 30 foot bluff which rises vertically from the HWL. MAKA is 15 feet east of former triangulation station TRAY which is marked by a pole held against the side of a large boulder (5 feet in diameter) by a pile of smaller rocks.

To reach the station landings can be made on a sandy beach just to the west of the station in the lee part of a protected cove. From here it is a 10 minute hike to the station.

Station mark, stamped MAKA 1963, is located on level ground. There are several large boulders near the station. No underground or witness marks were established.

Reference mark 1 is a standard disc stamped MAKA 1963 No 1 and set with cement in bedrock approximately level with the station. The mark is just on the other side of a small ravine about 8 feet deep and located on the top of a protruding section of bedrock.

Reference mark 2 is a standard disc stamped MAKA 1963 No 2 and set with cement in bedrock approximately level with the station. The mark is located in the center of 3 foot in diameter patch of bedrock which is level with surrounding ground.

* Refer to notes in manuals of triangulation and state publications of triangulation. † Direction-angle measured clockwise, referred to initial station.
 † To nearest meter only, when no trigonometric leveling is being done. 16-50227-1 U. S. GOVERNMENT PRINTING OFFICE

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: **MAKA**

STATE: **HAWAII**

YEAR: **1963**

SECOND

ORDER

SOURCE: **G-13249**

GEODETIC LATITUDE	20° 33' 51.7174	ELEVATION	5.8 METERS
GEODETIC LONGITUDE	156° 39' 44.1682		32 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ IOR Δ α † ANGLE *
HI 2	5102	501,504.38	83,908.87	+ 0° 00' 06"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
WET 2	241 47 26.6	241 47 21	5102

QF 405

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1096
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

ADJUSTED HORIZONTAL CONTROL DATA

DEPARTMENT OF COMMERCE
 U. S. COAST AND GEODETIC SURVEY
 FORM 532
 Rev. Aug. 1962

RECOVERY
 DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: MANINI STATE: Hawaii COUNTY: Maui

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

NOTE: HEIGHT OF TELESCOPE ABOVE STATION MARK 2.55 METERS. HEIGHT OF LIGHT ABOVE STATION MARK METERS.

OBJECT	BEARING	DISTANCE		DIRECTION
		feet	meters	
PAUPAU (HGS) 1912				00 00 00
LAIHA (HGS) 1912	2.5 miles S			40 50 42.67
Stack, Central Power Co.	2.5 miles SW			118 41 22.8

This station was established by the Hawaiian Government Survey in 1882 and no record of the original mark is available. In 1928 this station was re-covered by Mr. C. A. Brown, of the Pioneer Sugar Company, and the mark was reported as being a pipe set in the ground. Also in 1928 a stone and concrete platform, 5 feet square and 4 feet high, was erected over the station. At the time of the 1950 survey the lower (original) pipe was found tilted and loose in the soil; consequently, the upper pipe, which is set in concrete, was used as the station. A new description follows.

The station is located on the westerly slope of a long cultivated ridge and lies about 4.5 miles northeast of Lahaina, about 3 miles east of Aakaa Point, about 0.7 mile west of the Forest Reserve Boundary, about 200 feet west of a reservoir and 30 feet west of a gravel road.

To reach from the Courthouse in the town of Lahaina; go west and north, on the road which leads toward Honolulu, for 5.0 miles; turn right and go easterly for 1.3 miles; continue straight ahead, on a dirt road, for 0.1 mile; cross over the railroad tracks and go easterly, on the main traveled road, for 0.8 mile; turn left and follow the irrigation ditch, northerly, for 0.2 mile; turn right and follow the concrete power poles, easterly, for 0.4 mile; turn left and go north for 0.1 mile; pass the power house and continue north for 0.55 mile; pass through a board gate, at a small corral, and go easterly, up grade, for 0.5 mile to the station on the right.

The station is the top and center of a 2 1/2 inch iron pipe which projects about 8 inches from the top of a stone and concrete platform which is about 5 feet square and 4 feet high.

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

(continued on next page)

NAME OF STATION: MANINI
 STATE: HAWAII YEAR: 1882 FIRST ORDER

SOURCE: G- 9311

GEODETIC LATITUDE	20 ° 55' 55.107	ELEVATION	584.3 METERS
GEODETIC LONGITUDE	156 39 07.146		1261 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ OR ANGLE °
HI 2	5102	505,010.25	217,425.50	+ 0 ° 00' 19"

* 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
PAUPAU	347 40 14.9	347 39 56	5102

QE 363

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

HORIZONTAL CONTROL DATA

by the
NATIONAL GEODETIC SURVEY
OLD HAWAIIAN DATUM

QUAD 201564

STATION 1096

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

MANINI (continued)

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

R

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

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
PAUPAU (HGS) 1879	WNW	43.109	13.141	00 00 00.0
R.M. No. 1				118 10 50
Puukolii, Central Power Co., stack, 1950	WNW	39.316	11.984	118 41 17.5
R.M. No. 2	N			184 57 49

Station was recovered in good condition. Two reference marks were established. A complete description follows:
Station is located about 4 miles northeast of Lahaina, 1-1/2 miles east of Puukolii Village, and 3 miles east of the Kaanapali Hotel, at about 1263 feet elevation, on a brushy hillside surrounded by cane fields.
To reach station from the post office in Lahaina, go northeast on Papalaua St. for 0.2 mile; turn left and go northwest on State Highway 30 for 4.35 miles to crossroad; turn right, on Puukolii Road, and go 1.3 miles to center of Puukolii Village; bear right and go 0.05 mile to a T-junction out by pumping station in cane fields. Turn left and go 0.25

mile to fork. Take left fork and go 1.05 mile to 2nd canal crossing and crossroad. Turn left and go 0.5 mile to side road right. Turn right and go upgrade for 0.3 mile to side road right; go right for 60 yards, then take left fork and go up steep road along edge of cane field for 0.15 mile to wire gate on right, and station in the brushy pasture.

Station is marked by a 2-1/2-inch iron pipe projecting 5 inches from the top of a 16-inch-square, concrete block that projects 5 inches from ground. A type-A signal is centered over the mark, with the 6-foot-square concrete platform 4 feet above ground. A red and white metal target extends 7 feet above the platform. Station is 66 feet southwest of the wire gate and 35 feet southeast of a long row of very large boulders.

Reference mark number one is a standard disk stamped "MANINI HGS 1882 NO 1 1969", cemented in a drill hole in the top of a 5-foot-diameter boulder that projects 4 feet above ground. The mark is 2 feet lower than station mark.

Reference mark number two is a standard disk stamped "MANINI HGS 1882 NO 2 1969", cemented in a drill hole in the south end of a 4 x 6-foot boulder projecting 2 feet above ground. It is in the row of boulders and is 1.7 feet lower than station mark.

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

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

USCOMM-DC 27175-P88

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1097
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 00'
DIAGRAM NF 4-16 MAUI

Manui (Lanai Island, F. G. Engle, 1927).—On west coast of Lanai, on rocky point on south side of Kalamaiki Gulch, about $\frac{3}{4}$ mile north of Kaunalapau Harbor. Station is about 10 meters back from edge of cliff and about 30 feet above high water. Best approached by landing in small bight between Kalamaui and Kalamaiki Gulches. Marked according to note 4, standard disk in bowlder. Reference marks, note 12c, standard reference disks in bowlders, were set at the following distances and azimuths from station: No. 1, 8.98 meters (29.46 feet), $329^{\circ} 06'$; No. 2, 12.56 meters (41.21 feet), $16^{\circ} 37'$.

(11-5-55)
RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MANUI
ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii
RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTY: Maui
Island: Lanai

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

Station was recovered and all marks found in good condition, however there is a discrepancy in the stamping of the marks. A complete description follows:

Station is located on the west coast of Lanai Island, about $\frac{3}{4}$ mile north of Kaunalapau Harbor, on the rocky point on the south side of Kalamaiki Gulch, about 30 feet above sea level.

To reach station from the wharf at Kaunalapau Harbor, pack northerly along coast-line for about $\frac{3}{4}$ mile.

Station mark is a standard disk stamped "MANIU 1927", cemented in a drill hole in bedrock about 10 yards east of edge of cliff.

Reference mark number one is a standard disk stamped "MANIU 1927", cemented in a drill hole in a 2-foot boulder that projects 20 inches above ground. It is about 35 feet southeast of northwest edge of cliff.

Reference mark number two is a standard disk stamped "MANIU 1927", cemented in a drill hole in a 6 x 8-foot bedrock ledge that projects about 3 feet above ground. It is about 10 feet east of edge of cliff.

FORM 524a
(9-5-56)

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

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

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

Station recovered as described in good condition.

R

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MANUI

STATE: HAWAII

YEAR: 1927

THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20 ° 47 ' 55.490	ELEVATION	30	METERS
GEODETIC LONGITUDE:	156 59 34.471	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# (OR Δ) ANGLE °
HI 2	5102	388,568.79	169,148.86	- 0° 06' 57"

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

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201504 STATION 1098
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

NO ORIGINAL TEXT

MAUNA OUNE (Maui County, Hawaii, J.B.M., 1914; O.W.S., 1931)
 --Station was not visited, but the signal could be seen.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION MAUNA OUNE
 STATE HAWAII YEAR 1914 THIRD ORDER

RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: MAUNA OUNE
 ESTABLISHED BY: J.B.M. YEAR: 1914 STATE: Hawaii
 RECOVERED BY: H.J. Seaborg YEAR: 1962 COUNTRY: Maui
 ISLAND: Lanai

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

Station was recovered. A complete description follows:

Station is located about 6 miles airline east-southeast of Lanai City and 1-1/4 miles west of the mouth of Awehi Gulch; on the summit of a hill of about 1008 feet elevation that is shown on U.S.G.S. topo map as Mauna O Umi. It appears bare from a distance, but has a covering of low brush.

To reach station from the junction of Highways 44 and 441 at the south edge of Lanai City, go south on Highway 44 for 1.7 miles to fork. Take left fork and go 1.4 miles; take T-road left and go 0.5 mile to crossroad. Continue ahead, southeasterly up side of hill for 1.8 miles to fork. Take right fork along edge of pineapple field for 0.35 mile to crossroad. Turn right and follow graded road south for 0.45 mile to top of ridge in saddle. Turn left and follow road up along ridge for 1.6 miles to side road right. Turn right and follow old washed out road downgrade for 2.8 miles to station on summit of brushy hill.

Station mark is a 6-inch-square, concrete post, with a large cross in its top, projecting 8 inches above ground. The mark was under a cairn and is leaning slightly.

No reference marks were found.

* 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.

G-SP156
 NO OBSERVATION CHECK ON THIS POSITION

GEODETTIC LATITUDE	20 47 55.14	ELEVATION	METERS
GEODETTIC LONGITUDE	156 50 10.65		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	RIGHT ANGLE
HI 2	5102	442,063.01	169,031.36	- 0 05 37

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

TO STATION OR OBJECT	GEODETTIC AZIMUTH (From North)	PLANE AZIMUTH (From South)	CODE

Q1 612

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

HORIZONTAL CONTROL DATA

by the
National Ocean Survey
OLD HAWAIIAN DATUM

QUAD 201564 STATION 1099
HAWAII
LATITUDE 20 ° 30' TO 21 ° 00'
LONGITUDE 156 ° 30' TO 157 ° 00'
DIAGRAM NF 4-16 MAUI

MAR 1981

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

DESCRIPTION OF TRIANGULATION STATION

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

STATE: Hawaii COUNTY: Maui
YEAR: 1931 LOCALITY: McGregor Point.

DISTANCES AND DIRECTIONS TO REFERENCE MARKS AND PROMINENT OBJECTS			
OBJECT	DISTANCE	DIRECTION	AZIMUTH

Station Tower is on McGregor Point at the west side of Maalaea Bay. It is an old U.S. Lighthouse Service concrete structure about 20ft high and about 6 ft. square at the base. This structure was formerly a light, but is not in use now. On chart 4130 it is shown as a shaft and was located by topography.

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

RECOVERY OF TRIANGULATION INTERSECTION STATION

TOWER
NAME OF STATION: (McGregor Point Light) YEAR: 1950 STATE: Hawaii COUNTY: Maui
CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:

The station is the top and center of the old lighthouse which is located on McGregor Point in western Maui.

It is a square concrete structure 18 feet high and has a base of 5.5 feet.

It rests of a flat concrete base, 2 meters square, about 50 feet back from the edge of the sea bluff.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: TOWER
ESTABLISHED BY: O.W.S. YEAR: 1931 STATE: Hawaii
RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

This station was recovered in good condition. It is identical with McGregor Point Lt., located by C.T.H. in 1950 and is shown as McGregor Point Daybeacon in the Light List, Pacific Coast, 1960 on Page 288, following No. 2936.

TOWER
NAME OF STATION: (McGregor Point Light) INTERSECTION
ESTABLISHED BY: C.T. Husemeyer YEAR: 1931 STATE: Hawaii BENCH MARK(S) ALSO
RECOVERED BY: R.C. Munson YEAR: 1968 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Maui

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

Station was recovered. Located on southwest part of the island, on McGregor Point, about midway between Papawai Point and the Maalaea boat harbor, about 53 feet above sea level, near edge of sea bluff, about 175 feet southeast of an FAA electronics hut.

Station is the center of the green light mounted on top of a white, tapering, concrete tower with a 6-foot-square concrete platform on top. The light extends about 3 feet above the platform and is 18 feet above ground.

RECOVERY NOTE, TRIANGULATION STATION INTERSECTION/

TOWER
NAME OF STATION: McGregor Point Light
ESTABLISHED BY: C.T.H. YEAR: 1931 STATE: Hawaii BENCH MARK(S) ALSO
RECOVERED BY: E. Pursel Jr. YEAR: 1969 COUNTY: Maui
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 1.3 miles southwest of Maalaea

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.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION TOWER

STATE HAWAII

YEAR 1931

THIRD

ORDER

SOURCE: G-12717

GEODETIC LATITUDE: 20 ° 46 ' 50.428	ELEVATION: METERS
GEODETIC LONGITUDE: 156 31 32.652	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ ϕ ANGLE °
HI 2	5102	548,141.62	162,493.10	+ 0 03' 00"

* 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

QF 243

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1099
 HAWAII
 LATITUDE 20 ° 30' TO 21 ° 00'
 LONGITUDE 156 ° 30' TO 157 ° 00'
 DIAGRAM NF 4-16 MAUI

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

DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: MCGREGOR POINT LIGHT YEAR: 1950 STATE: Hawaii COUNTY: Maui
 CHIEF OF PARTY: C. T. Husemeyer

Description, including sketch of object:

The station is the top and center of the old lighthouse which is located on McGregor Point in western Maui.

It is a square concrete structure 18 feet high and has a base of 5.5 feet.

It rests on a flat concrete base, 2 meters square, about 50 feet back from the edge of the sea bluff.

Form 525
 (11-8-55)

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

NAME OF STATION: Mc Gregor Point Light
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii
 RECOVERED BY: H.J.S. YEAR: 1961 COUNTY: Maui

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

This station was recovered in good condition. It is identical with TOWER 1931 and is shown as McGregor Point Daybeacon in the Light List, Pacific Coast, 1960 on Page 288 following No. 2936. The description is adequate.

RECOVERY NOTE, TRIANGULATION STATION
 INTERSECTION

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

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

Station was recovered. Located on southwest part of the island, on McGregor Point, about midway between Papawai Point and the Maalaea boat harbor, about 53 feet above sea level, near edge of sea bluff, about 175 feet southeast of an FAA electronics hut.

Station is the center of the green light mounted on top of a white, tapering, concrete tower with a 6-foot-square concrete platform on top. The light extends about 3 feet above the platform and is 18 feet above ground.

RECOVERY NOTE, TRIANGULATION STATION
 INTERSECTION/

NAME OF STATION: MCGREGOR POINT LIGHT
 ESTABLISHED BY: C.T.H. YEAR: 1950 STATE: Hawaii BENCH MARK(S) ALSO
 RECOVERED BY: E. Fursel Jr. YEAR: 1969 COUNTY: Maui
 AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 1.3 miles southwest of Maalaea

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.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MC GREGOR POINT LIGHT
 STATE: HAWAII YEAR: 1950 THIRD ORDER

SOURCE: G-12717

GEODETIC LATITUDE:	20 ° 46 ' 50.428	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 31 32.652		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	ϕ OR Δ ± ANGLE*
HI 2	5102	548,141.62	162,493.10	+ 0 ° 03' 00"

* 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

QF 243

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

HORIZONTAL CONTROL DATA

by the
 National Ocean Survey
 OLD HAWAIIAN DATUM

QUAD 201564 STATION 1100
 HAWAII
 LATITUDE 20° 30' TO 21° 00'
 LONGITUDE 156° 30' TO 157° 00'
 DIAGRAM NF 4-16 MAUI

NO TEXT

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: MIDDLE OF ROOF
 STATE: HAWAII YEAR: 1912 THIRD ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	20° 58' 42.186	ELEVATION:	METERS
GEODETIC LONGITUDE:	156 32 19.697		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR α ANGLE °
HI 2	5102	543,620.46	234,299.74	+ 0° 02' 45"

* 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

00 027