

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 221593 STATION 1101  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 30' TO 160° 00'  
DIAGRAM NF 4-6 KAUAI

Form 525b  
(11-8-55)

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

### TRAVERSE

### DESCRIPTION OF ~~TRIANGULATION~~ INTERSECTION STATION

NAME OF STATION: Sandia 1 Launcher

CHIEF OF PARTY: D.J. Florwick YEAR: 1964 STATE: Hawaii COUNTY: Kauai

Description, including sketch of object: The station is located in the Atomic Energy Commission security area, 0.3 mile north of the main gate and 95 feet east of the west security fence.

A traverse connection was made to triangulation station SANDIA 1964, distance being 5.912 meters (19.396 feet) northeast of station SANDIA 1964. The mark is the center of the base of SANDIA NO 1 Launcher.

Described by \_\_\_\_\_

Comm-DC 24313

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SANDIA 1 LAUNCHER

STATE: HAWAII

YEAR: 1964

THIRD

ORDER

SOURCE: G-13405

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	22° 03' 44.5930	ELEVATION:	METERS
GEODETIC LONGITUDE:	159° 47' 04.8041		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE *
HI 4	5104	405,599.92	83,296.90	- 0° 06' 25"

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

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

POSITION DETERMINED BY TRAVERSE FROM STATION SANDIA

QF 421

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

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221593 STATION 1102  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 30' TO 160° 00'  
DIAGRAM NF 4-6 KAUAI

## ADJUSTED HORIZONTAL CONTROL DATA

Form 525b  
(11-8-66)

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

TRAVERSE

### DESCRIPTION OF TRIANGULATION INTERSECTION STATION

NAME OF STATION: Sandia 2 Launcher

CHIEF OF PARTY: D.J. Florwick YEAR: 1964 STATE: Hawaii COUNTY: Kauai

Description, including sketch of object: The station is located in the Atomic Energy Commission security area, 0.3 mile north of the main gate and 116 feet east of the west security fence.

A traverse connection was made to triangulation station SANDIA 1964, distance being 58,079 meters (190,547 feet) east-southeast of station SANDIA 1964. The mark is the center of the base of Sandia NO 2 Launcher.

Described by \_\_\_\_\_

COMB-DC 34313

NAME OF STATION: SANDIA 2 LAUNCHER

STATE: HAWAII

YEAR: 1964

THIRD

ORDER

SOURCE: G-13403

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	22° 03' 44.0918	ELEVATION:	METERS
GEODETIC LONGITUDE:	159° 47' 02.9669		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ or ANGLE *
HI 4	5104	403,772.65	83,240.00	- 0° 06' 24"

\* 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
POSITION DETERMINED BY TRAVERSE FROM STATION SANDIA			

QF 422

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 221593 STATION 1103  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 30' TO 160° 00'  
DIAGRAM NF 4-6 KAUAI

FORM 343  
(9-18-69)

U. S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: SANDS

STATE: Hawaii

COUNTY: Kauai

CHIEF OF PARTY: D.J. Florwick

YEAR: 1964

DESCRIBED BY: R.K. Moore

NOTE *	HEIGHT OF TELESCOPE ABOVE STATION MARK	METERS.1	HEIGHT OF LIGHT ABOVE STATION MARK	METERS.
1b	SURFACE-STATION MARK	DISTANCE	DIRECTIONS TO AZIMUTH MARK, REFERENCE MARKS AND PROMINENT OBJECTS WHICH CAN BE SEEN FROM THE GROUND AT THE STATION	
7a	UNDERGROUND-STATION MARK			
	OBJECT	BEARING	DISTANCE	DIRECTION
			FEET	METERS
11a	CANUTE (H&N)			0 00' 00.00
11a	RM 1	NNE	29.310	8.933
11a	RM 2	SE	29.725	9.061
	Bonham Auxiliary Landing Field, Control Tower	S	(Approx. 0.2 mile)	195 40 04.7

Detailed description:

The station is located about 9.5 miles west of the town of Waimea, about 0.2 mile north of the control tower on Bonham Auxiliary Landing Field, about 0.5 mile east of the Pacific Ocean, about 0.4 mile southwest of the north end of the runway and on the southwest side of Bonham Auxiliary Landing Field.

To reach the station from the main gate at Bonham Auxiliary Landing Field, go north on a macadam road for 0.65 mile to a T-road left. Turn left on a macadam road and go west for 0.25 mile to a track road right. Continue southerly on main road for 0.4 mile to the station on the left.

The station mark, a standard disk stamped SANDS 1964, is set in the top of a 12-inch round concrete block and projecting 6 inches above the ground. It is 155 feet west-northwest of the west edge of the runway and 5 feet north-northeast of the north edge of the ramp leading off the west side of the runway.

Reference mark number 1, a standard disk stamped SANDS NO 1 1964, is set in the top of a 12-inch square concrete block and projecting 1 inch above the ground. It is 155 feet west-northwest of the west edge of the runway and 34 feet north-northeast of the north edge of the ramp leading off the west side of the runway.

Reference mark number 2, a standard disk stamped SANDS NO 2 1964, is set in the top of a 12-inch square concrete block and projecting 2 inches above the ground. It is 125 feet west-northwest of the west edge of the runway and 3 feet north-northeast of the ramp leading off the west side of the runway.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SANDS

STATE: HAWAII

YEAR: 1964

SECOND

ORDER

SOURCE G-13405

GEODETIC LATITUDE:	22° 02' 40.5469	ELEVATION:	3.50 METERS
GEODETIC LONGITUDE:	159° 47' 35.1032		11.5 FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ or ANGLE *
HI 4	5104	403,555.73	76,834.13	- 0° 06' 25"

\* 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
CANUTE H N	177 54 00.7	178 00 26	5104

OF 415

\*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.

USCOMM-DC 37171-P89

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 221593 STATION 1103  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

SANDS (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: SANDS  
ESTABLISHED BY: D.J. Florwick YEAR: 1964 STATE: Hawaii BENCH MARK ALSO ☒  
RECOVERED BY: D. J. Florwick YEAR: 1965 COUNTY: Kauai  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: 8 miles  
HEIGHT OF TELESCOPE ABOVE STATION MARK 15 FEET. HEIGHT OF LIGHT ABOVE STATION MARK 14 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	
CANUTE (H&N) 1964				00 00 00.0
Reference Mark No. 1	NE	29.28	8.925	39 56 40
Reference Mark No. 2	SE	29.705	9.056	133 38 00
Bonham Auxiliary Landing Field	S	(0.8 mile)		195 40 05.7
Control Tower				

The station mark, reference mark No. 1 and reference mark No. 2 were recovered as described and found in good condition. The horizontal direction to reference mark No. 1 was found in error by 20 minutes. Following is a new description.

The station is located 8 miles northwest of Kekaha, 0.8 mile north of the control tower, 0.3 mile east of the Pacific Ocean, between the

runway and an abandoned parking area for airplanes which is now used as a launching area, at Bonham Auxiliary Landing Field.

To reach the station from the junction of State Highway 50 and 55 in the small village of Kekaha, go northwest on State Highway 50 for 6.55 miles to a fork in the road. Keep the left fork and go west on the oiled road for 0.4 mile to a crossroad at the main gate at Bonham Auxiliary Landing Field. Turn right and go north on an oiled road for 0.6 mile to a side road left. Turn left and go west and south on an oiled road for 0.4 mile to the northeast corner of the launching area. Continue straight ahead along the east edge of the launching area for 0.2 mile to the southeast corner of the area. Turn left for 66 feet to the station on the left as described.

The station mark, a standard disk stamped SANDS 1964, set in the top of a 12-inch cylindrical concrete monument which projects 5 inches above the surface of the ground. It is 141 feet west-northwest of the northwest edge of the runway, 66 feet east-southeast of a jog in the launching area and 4 feet north-northeast of the northeast edge of the launching area.

Reference mark No. 1, a standard disk stamped SANDS NO 1 1964, set in the top of a 12-inch square concrete monument which projects 1 inch above the surface of the ground. It is 138 feet west-northwest of the northwest edge of the runway, 70 feet east of a jog in the launching area and 33 feet north-northeast of the northeast edge of the launching area.

Reference mark No. 2, a standard disk stamped SANDS NO 2 1964, set in the top of a 12-inch square concrete monument which projects 1 inch above the surface of the ground. It is 112 feet west-northwest of the northwest edge of the runway, 95 feet east-southeast of a jog in the launching area and 4 feet north-northeast of the northeast edge of the launching area.

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: SANDS  
ESTABLISHED BY: D.J.F. YEAR: 1964 STATE: Hawaii BENCH MARK ALSO ☒  
RECOVERED BY: D.J.F. YEAR: 1965 COUNTY: Kauai  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN:  
HEIGHT OF TELESCOPE ABOVE STATION MARK 15 FEET. HEIGHT OF LIGHT ABOVE STATION MARK 15 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	
CANUTE (H&N) 1964				0 00 00.0
Reference Mark 3	NE	33.913	10.338	41 19 37
Reference Mark 2	SE	29.710	9.054	133 37 32
Reference Mark 2 to Reference Mark 3		45.984	14.015	

The station mark and reference mark No. 2 were recovered as described and found in good condition. Reference mark No. 1 was destroyed by construction equipment. The horizontal distance and direction to reference mark No. 2 were found to be correct. Reference mark No. 3 was established at this time.

The station is on the island of Kauai, about 10 miles northwest of the town of Kekaha and 1/4 mile east of the Pacific Ocean. It is at Bonham Auxiliary Landing Field, about 0.8 mile north of the control tower and 0.3 mile north-northeast of the main gate. To reach the station from the main gate at Bonham Auxiliary Landing Field, go west

and south on an oiled road for 0.4 mile. Turn sharp right and go northeast along an abandoned taxiway for 0.5 mile. Turn left and go north crossing the runway for 0.15 mile to the station.

The station mark, a standard disk stamped SANDS 1964, is set in the top of a 12-inch concrete cylinder which projects 5 inches above the surface of the ground. It is 139 feet northwest of the northwest edge of the runway and 3.8 feet northeast of the northeast edge of an abandoned aircraft parking area.

Reference mark No. 2, a standard disk stamped SANDS NO 2 1964, is set in the top of a 12-inch square concrete monument which is set flush with the surface of the ground. It is 110 feet northwest of the northwest edge of the runway and 2 feet northeast of the northeast edge of the asphalt.

Reference mark No. 3, a standard disk stamped SANDS NO 3 1964, is set in the top of a 10-inch square concrete monument which is set flush with the surface of the ground. It is 131 feet northwest of the northwest edge of the runway and 37-1/2 feet northeast of the northeast edge of the asphalt.

\* 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.

FORM CGS-526a (8-24-64)  
USCOMM-DC 6951-P64

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

(continued on next page)

# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 221593 STATION 1103  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

SANDS (continued)

FORM 526a  
(10-10-66)

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: SANDS  
ESTABLISHED BY: D.J.F. YEAR: 1964 STATE: Hawaii  
RECOVERED BY: D.M. Whipp YEAR: 1966 COUNTY: Kauai  
Island: Kauai

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
CANUTE (H&N) 1964				00 00 00.0
RM No. 3	NE	33.920	10.339	41 18 02
RM No. 2	SE	29.718	9.058	133 38 40
Bonham, ALF, Control Tower, 1964	SSW			195 40 06.8

Station mark and reference marks No. 2 and 3 were recovered in good condition. Reference mark number 1 has been destroyed and No. 3 was set by another party. A complete description follows:

Station is located 7 miles northwest of Kekaha, on Bonham Auxiliary Landing Field, 0.8 mile north-northeast of the control tower, and along the north side of a wide macadam ramp connecting the runway with an abandoned parking area.

To reach station from junction of State Highways 50 & 55 at Kekaha, go northwest on State Highway 50 for 7.0 miles; take left fork and go 0.4 mile to entrance to the landing field. Turn right, inside gate, and go

north for 0.6 mile to paved side road left. Turn left and go west for 0.4 mile to northeast corner of macadam parking area. Turn left and go south along left edge of macadam for 0.2 mile to intersection with the wide ramp. Turn left and go 60 feet to station on left.

Station mark is a standard disk stamped "SANDS 1964", set in the top of a 12-inch-diameter, concrete monument that projects 4 inches. It is 142 feet west of the corner of the intersection of the ramp and runway, 60.5 feet east of corner of intersection of ramp and parking area, and 14.5 feet north of edge of macadam ramp.

Reference mark number two is a standard disk stamped "SANDS NO 2 1964", set in the top of a 12-inch-square, concrete monument flush with ground, 12.4 feet north of edge of macadam ramp and 112 feet west of corner of intersection of runway and ramp.

Reference mark number three is a standard disk stamped "SANDS NO 3 1964", set in the top of a 12-inch-square, concrete monument flush with ground. It is in heavy grass area, at about same elevation as 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.

USCOMM-DC 27173-PSS

FORM 526a  
(10-10-66)

## RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: SANDS  
ESTABLISHED BY: D.J. Florwick YEAR: 1964 STATE: Hawaii  
RECOVERED BY: U.S. Navy YEAR: 1971 COUNTY: Kauai

OBJECT	BEARING	DISTANCE		DIRECTION
		FEET	METERS	
BONHAM 1961				00 00 00.00
Reference Mark No. 5	NE	27.835	8.485	175 55 29
Reference Mark No. 4	SE	36.460	11.113	276 27 50
DF Antenna	S	(approx. 0.7 mile)		335 30 20.6
R.M. 4 to R.M. 5		49.760	15.168	

The underground station mark was the only mark recovered. Heavy equipment had destroyed the surface station mark, reference mark No. 2 and reference mark No. 3. A new surface station mark, reference mark No. 4 and reference mark No. 5 were established at this time by the Geophysics Division of the Pacific Missile Range at Point Mugu, California. A new and complete description follows:

The station is located on the Barking Sands Pacific Missile Range Facility, about 0.3 mile southwest of the north end of the runway and 0.25 mile east of the beach.

To reach the station from the sentry post at the Main Gate of the Barking Sands Pacific Missile Range Facility, go northerly on Nohili Road for 0.5 mile. Turn left on Kalanamahiki Pl. No. and continue northerly for 0.6 mile. Turn left and go west and south on Palai Olani Road for 0.65 mile to an aircraft parking area and the station mark, on the left.

The station mark is a standard disk, stamped SANDS 1964 1971, set in the top of a 12-inch diameter concrete post that projects 5 inches above the surface of the ground. It is 135 feet west-northwest of the west edge of the runway and 5 feet north-northeast of the north edge of an asphalt aircraft parking area.

Reference mark No. 4 is a standard disk, stamped SANDS 1964 NO 4 1971, set in the top of a 12-inch diameter concrete post that projects 3 inches above the surface of the ground. It is 99 feet west-northwest of the west edge of the runway and 5 feet north-northeast of the north edge of the aircraft parking area.

Reference mark No. 5 is a standard disk, stamped SANDS 1964 NO 5 1971, set in the top of a 12-inch diameter concrete post that projects 5 inches above the surface of the ground. It is 135 feet west-northwest of the west edge of the runway and 33 feet north-northeast of the north edge of the aircraft parking area.

The DF Antenna is mounted in the center of the roof of the control tower and is the highest object in the immediate vicinity. It is a mast with an array of dipoles arranged radially around it near the top. Point observed was the top and center of the mast.

\*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-PSS

## HORIZONTAL CONTROL DATA

QUAD 221593 STATION 1104  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 30' TO 160 ° 00'  
DIAGRAM NF 4-6 KAUAI

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: SILVER  
STATE: HAWAII YEAR: 1967 SECOND

SOURCE: G-14044

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ = ANGLE °
H1 4	5104	403,431.87	74,182.21	- 0 06' 25"

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

NOTE: DISTANCE HAS BEEN COMPUTED BY THE $S = OR \Delta S$ FORMULA, NEGLECTING THE SECOND TERM.			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH * (From south)	CODE
CABLE	7 44 15.8	7 50 41	5104

To reach the station from the main gate at Bonham Auxiliary Landing Field, go west and south on an asphalt road for 0.15 mile to a fork in the road. Take the right fork and go south-southwest on the asphalt road for 0.15 mile to the station on the right.

The station mark, a standard disk stamped SILVER 1966, is set in the top of a 10-inch round concrete monument which projects 3 inches above the surface of the ground. It is 102 feet west of the center of the asphalt road, 37 feet north of a power pole and 3.3 feet northwest of a 4 x 4-inch white witness post and sign.

Reference mark No. 1, a standard disk stamped SILVER NO 1 1966, is set in the top of a 12-inch round concrete monument which projects 6 inches above the surface of the ground. It is 26 feet west of the center of the asphalt road and 2.5 feet west of the center of the

Reference mark No. 2, a standard disk stamped SILVER NO 2 1966, is set in the top of a 12-inch round concrete monument which projects 4 inches above the surface of the ground. It is 82 feet west of the center of the asphalt road and 2 feet north of a power pole.

\*Refers to notes in manuals of triangulation and state publications of triangulation. †Direction-angle measured clockwise, referred to initial station.

QF 562

(continued on next page)



# HORIZONTAL CONTROL DATA

by the  
NATIONAL GEODETIC SURVEY  
OLD HAWAIIAN DATUM

QUAD 221593 STATION 1104  
LATITUDE ° ' TO ° '  
LONGITUDE ° ' TO ° '  
DIAGRAM

SILVER (continued)

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: SILVER  
ESTABLISHED BY: W.S.S. YEAR: 1966 STATE: Hawaii BENCH MARK ALSO ☒  
RECOVERED BY: F. L. Jeffries YEAR: 1968 COUNTY: Kauai  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: On Barking Sands FMR Facility.  
HEIGHT OF TELESCOPE ABOVE STATION MARK 4 FEET. HEIGHT OF LIGHT ABOVE STATION MARK 4 FEET.

HEIGHT OF TELESCOPE ABOVE SURFACE OF GROUND

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	
CABLE 1964				00 00 00.0
Reference Mark No. 2	S	35.01'	10.670'	4 26 09'
Reference Mark No. 1	NE	104.14'	(31.742)	249 04 35'
RM 1 To RM 2		123.25'	(37.567)	

The station mark, reference mark No. 1, reference mark No. 2 were recovered as described and found in good condition. The horizontal distance and direction to both reference marks were checked and verified. Following is a new and complete description.

The station is located at the Pacific Missile Range Facility, Barking Sands, 0.3 mile northwest of the Main Gate, 0.1 mile northeast of the Administration Building and 200 feet southeast of an asphalt strip which parallels the northeast runway.

To reach the station from the main gate at Pacific Missile Range Facility, Barking Sands, go west and north on Ola Ka Moi Road for 0.5 mile to the station on the left.

The station mark, a standard disk stamped SILVER 1966, is set in the top of a 10-inch round concrete monument which projects 3 inches above the surface of the ground. It is 102 feet west of the center of Ola Ka Moi Road and 3.3 feet northwest of a white witness post and sign.

Reference mark No. 1, a standard disk stamped SILVER NO 1 1966, is set in the top of a 12-inch round concrete monument which projects 6 inches above the surface of the ground. It is 26 feet west of the center of the road and 3.5 feet west of a yellow fire hydrant.

Reference Mark No. 2, a standard disk stamped SILVER NO 2 1966, is set in the top of a 12-inch round concrete monument which projects 8 inches above the surface of the ground. It is 82 feet west of the center of the road.

## RECOVERY NOTE, TRIANGULATION STATION

R

NAME OF STATION: SILVER  
ESTABLISHED BY: W.S.S. YEAR: 1966 STATE: Hawaii BENCH MARK ALSO ☒  
RECOVERED BY: P.M.R. (U.S.N.) YEAR: 1972 COUNTY: Kauai  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: On Barking Sands FMR Facility.  
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	
CABLE 1964 RM 1		104.13 '	(31.739) '	0 00 00.0 249 04 40

The underground station mark and reference mark 1 were recovered in good condition. The surface station mark and reference mark 2 had been destroyed. A new surface station mark was established directly above the old underground mark. It is a 12-inch square concrete monument which projects about 18 inches above the ground surface and has a standard triangulation station disk (Coast and Geodetic Survey), stamped SILVER 1966 1972. No new reference mark was established. The route to the station has not changed.

The new elevation for SILVER 1966 1972 is 4.634 meters or 15.202 feet.

\* 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.

FORM CGCS-526a (12-68)  
USCOMM-DC 36291-708

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

QUAD 221593 STATION 1105  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 155 ° 30' TO 160 ° 00'  
DIAGRAM NF 4-6 KAUAI



## HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
OLD HAWAIIAN DATUM

QUAD 221593 STATION 1106  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 30' TO 160 ° 00'  
DIAGRAM NF 46 KAUAI

FORM 343  
(9-10-58)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

## DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: TACAN STATE: Hawaii COUNTY: Kauai  
CHIEF OF PARTY: F.L. Jefries YEAR: 1968 DESCRIBED BY: A.K.R.

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: TACAN

STATE: HAWAII

YEAR: 1968

SECOND

-ORDEP

SOURCE: G-14107

GEODETIC LATITUDE: 22° 02' 26.73561 GEODETIC LONGITUDE: 159 47 16.68791	ELEVATION: 7.40 METERS 24.3 FEET
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STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	B OR Δ or ANGLE
HI 4	5104	402,467.21	75,439.47	- 0° 06' 29"

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

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

QF 607

QF 637

The station is located on the Barking Sands Pacific Missile Range Facility, in a narrow area between the beach and the runway, about 0.5 mile north of the runway.

Detailed description: To reach the station from the sentry post at the main gate of the Barking Sands Pacific Missile Range Facility, go northerly along Kalanamahiki Place North for 0.55 mile to a road on the left. Turn left and go west on Palai Olani Road for 0.25 mile to a triangular intersection. Turn left and go south and southeast on Palai Olani Road for 0.4 mile to a road on the right, just before reaching the runway. Turn right and continue southerly on Oio Road for 0.2 mile to a road on the right and the 3000-foot marker of the runway on the left. Turn right and go west for 0.1 mile to the end of the road and the station mark on the left. A brass disk stamped TACAN 1968.

The station mark is a plain brass disk, stamped TACAN 1968, cemented in a drill hole in the concrete roof of an old air-raid shelter. It is 80 feet south of the center of the door to the revetment, 18.5 feet east-southeast of the center of the door to the air-raid shelter, 10.4 feet east of the west edge of the roof of the shelter, 5.8 feet north of the south edge and 4.5 feet south of the north edge.

No azimuth mark or reference marks were established.

\*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.

USCOMM-DC 27171-P89



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
NORTH AMERICAN 1927 DATUM

QUAD 221593 STATION 1108  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 30' TO 160° 00'  
DIAGRAM NF 4-6 KAUAI

Tit (Kauai Island, F. G. Engle, 1927).—On north coast of Kauai, a high tit on the seaward end of a prominent ridge about midway between Wainiha Bay and Kaliu Point. The point is easily seen from Hanalei Bay, but fades into background when directly offshore from station. Not marked.

Form 528  
(11-8-55)  
U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY

## RECOVERY NOTE, TRIANGULATION STATION INTERSECTION

R

NAME OF STATION: Tit  
ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii  
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai  
Island: Kauai

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

Station was identified by angle at station HANALEI and is in good condition. A small rock projection, better described as a nipple, at the 1600-foot elevation on north end of the rugged, high ridge on west side of Wainiha River, and about 1/4-mile south from shoreline.

\* 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: TIT

STATE: HAWAII

YEAR: 1927

THIRD ORDER

SOURCE: G-SP156  
NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE	22° 15' 07.16	ELEVATION	METERS
GEODETIC LONGITUDE	159° 34' 22.07		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE
H1 4	5104	475,375.15	139,980.99	- 0 01 39

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

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

Q1 155

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
NORTH AMERICAN 1927 DATUM

QUAD 221593 STATION 1109  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 155 ° 30' TO 160 ° 00'  
DIAGRAM NF 4-6 KAUAI

TRAVERSE  
DESCRIPTION OF STATION

NAME OF STATION: TM Antenna

CHIEF OF PARTY: P.C. Johnson YEAR: 1967 STATE: Hawaii COUNTY: Kauai

Description, including sketch of object: 0.15 mile southwest along an asphalt road from the Main Gate to Barking Sands Pacific Missile Range Facility; thence 0.6 mile south along the left fork to a crossroad; thence 0.1 mile south on a paved road.

The station is the center of a large dish antenna, mounted on the top of a cylindrical pedestal painted white in color and 25 feet in height.

A connection was made to triangulation station CANE 1965. Distance being 51.786 meters or 169.90 feet north of triangulation station CANE 1965.

FORM CG5-525b (12-68)  
USCONM-DC 30290-P08

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

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: TM ANTENNA

STATE: HAWAII

YEAR: 1967

THIRD

ORDER

SOURCE: G-14044

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	22 ° 01' 47.8345	ELEVATION:	
GEODETIC LONGITUDE:	159 47 04.8294	METERS	
		FEET	

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	# OR Δ & ANGLE °
HI 4	5104	403,575.57	71,514.95	- 0 06 24

\* 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

POSITION DETERMINED BY TRAVERSE FROM STATION CANE

QF 587

QUAD 221593 STATION 1110  
HAWAII  
LATITUDE 22 ° 30' TO 22 ° 30'  
LONGITUDE 159 ° 30' TO 160 ° 00'  
DIAGRAM NF 4-6 KAUAI

### ADJUSTED HORIZONTAL CONTROL DATA

FORM 525  
(9-18-89)

U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY

### DESCRIPTION OF TRIANGULATION STATION

NAME OF STATION: TM Boresight Antenna      STATE: Hawaii      COUNTY: Kauai  
CHIEF OF PARTY: P.C. Johnson      YEAR: 1967      DESCRIBED BY: J.E.S.

NAME OF STATION: TM BORESIGHT ANTENNA

STATE: HAWAII

YEAR: 1967

**SECOND ORDER**

SOURCE: G-14044

GEODETIC LATITUDE: 22° 02' 09.8931 GEODETIC LONGITUDE: 159 47 02.9873	ELEVATION 5 METERS SCALED FEET
--	-----------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ (OR $\Delta$ & $\theta$ ) ANGLE
HI 4	5104	403,753.03	73,740.53	- 0° 06' 24"

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

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

QF 585

QF 585

The station is located on the Barking Sands Pacific Missile Range Facility, about 0.3 mile south of the main gate, 0.25 mile northeast of the control tower and 0.1 mile west of the east boundary of the base.

To reach the station from the Main Gate of the Barking Sands Pacific Missile Range Facility, go southwest on an asphalt road for 0.15 mile to a fork. Take the right fork and continue southwest on an asphalt road for 0.2 mile to a road on the left, just before reaching the ESSA Weather Bureau building. Turn left and go east on a gravelled road for 0.1 mile to the station on the right.

The station is the tip of a flat, triangular antenna mounted near the top and on the south side of a 100-foot, 3-legged tower that is painted alternately red and

white. A temporary point was plumbed under the tip of the antenna and the station was occupied from the ground.

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  
NORTH AMERICAN 1927 DATUM

QUAD 221593 STATION 1111  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 30' TO 160° 00'  
DIAGRAM NF 4-6 KAUAI

DESCRIPTION OF TRAVERSE STATION

NAME OF STATION: TM Target Board

CHIEF OF PARTY: P.C. Johnson YEAR: 1967 STATE: Hawaii COUNTY: Kauai

Description, including sketch of object: 0.15 mile southwest along an asphalt road from the Main Gate to Barking Sands Pacific Missile Range Facility, thence 0.2 mile southwest along the right fork, thence 0.1 mile east along a graveled road.

The station is a 4-foot square metal target, painted black and white and is 94 feet above the surface of the ground on a 3-legged red and white painted metal tower.

A traverse connection was made to triangulation station TM Boresight Antenna. Distance being 2.1789 meters or (7.149) feet northwest of station TM Boresight Antenna.

FORM C&GS-525b (12-65)  
USCOMM-DC 38260-P85

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

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: TM TARGET BOARD

STATE: HAWAII

YEAR: 1967

THIRD

ORDER

SOURCE: G-14044

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE: 22° 02' 09.5636	ELEVATION: METERS
GEODETIC LONGITUDE: 159 47 02.9942	FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\beta$ OR $\Delta$ OR $\alpha$ ANGLE °
HI 4	5104	403,752.39	73,747.64	- 0° 06' 24"

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

TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH (From south)	CODE
POSITION DETERMINED BY TRAVERSE FROM STATION TM BORESIGHT ANT			

QF 566

QF 526



# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
NORTH AMERICAN 1927 DATUM

QUAD 221593 STATION 1113  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 30' TO 160 ° 00'  
DIAGRAM NF 4-6 KAUAI

Wainiha (Kauai Island, O. B. French, 1910).—In northwest Kauai, on the summit of the Wainiha Pali called Palikea, at the point where the "pali" turns sharply from a northeasterly direction to north, just above the power house. Station is in the middle of a small rounding bushy summit; there is another summit of same elevation 50 or 75 meters to the north which has a conspicuous tree on it. Approached down the "pali" from the east end of the Kaunuohua Ridge (Station Pali); very difficult. There is also said to be an old native trail leading up the "pali" from the power house. Station marked by bottle set in ground with neck flush with surface. Reference marks were set as follows: No. 1, lihue stump, 3 inches diameter, 2½ feet high, approximately west, 2.2 feet; No. 2, lihue stump, 3 inches diameter, 2½ feet high, approximately east, 2.7 feet.

RECOVERY NOTE, TRIANGULATION STATION

NAME OF STATION: WAINIHA  
ESTABLISHED BY: O.B.F. YEAR: 1910 STATE: Hawaii BENCH MARK(S) ALSO ☐  
RECOVERED BY: D.M. Whipp YEAR: 1966 COUNTY: Kauai  
AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN: Island: Kauai

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

Extensive digging was done but the bottle marking the station could not be found. Because of the isolated location it is unlikely that the station is destroyed. It would be difficult to attempt recovery of the point by angle check because of the almost continual cloud cover on the ridge.

The station peak was reached from the Wainiha Valley side, where a trail runs up a steep ridge about 1/2-mile north from the power station. Two days clearing is required to open trail along ridge line to station peak. A difficult, 6-hour pack after trail is cleared.

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: WAINIHA

STATE: HAWAII

YEAR: 1910

SECOND

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22 ° 11 ' 14.812	ELEVATION:	583	METERS
GEODETIC LONGITUDE:	159 34 57.115	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ θ: ANGLE *
HI 4	5104	472,076.05	128,645.65	- 0 ° 01 ' 52 "

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

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



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  
NORTH AMERICAN 1927 DATUM

QUAD 221593 STATION 1115  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 30' TO 160° 00'  
DIAGRAM NF 4-6 KAUAI

### TRAVERSE

DESCRIPTION OF ~~111593~~ STATION

NAME OF STATION: Weather Vane 203

CHIEF OF PARTY: W.S. Simmons YEAR: 1966 STATE: Hawaii COUNTY: Kauai

Description, including sketch of object: 15.5 miles north along State Highway 55 from the junction of State Highway 50 and 55 in Kekaha, thence 4.5 miles west along an asphalt road.

A traverse connection was made to triangulation station HELO, distance being (30.224 meters), 99.160 feet southeast. The point traversed to a punch mark in the center of a portable weather vane.

FORM C&GS-525b (1-68)  
USCOMM-DC 10510-P68

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

### ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: WEATHER VANE 203

STATE: HAWAII

YEAR: 1967

THIRD

-ORDER

SOURCE: G-13403

NO OBSERVATION CHECK ON THIS POSITION

GEODETIC LATITUDE:	22° 07' 58.7545	ELEVATION:	METERS
GEODETIC LONGITUDE:	159 43 31.3692		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE*
HI 4	5104	423,715.10	108,910.55	- 0° 05' 06"

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

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

QF 527

## HORIZONTAL CONTROL DATA

QUAD 221593 STATION 1116  
HAWAII  
LATITUDE 22 ° 00' TO 22 ° 30'  
LONGITUDE 159 ° 30' TO 160 ° 00'  
DIAGRAM NE 4-6 KAUAI

### ADJUSTED HORIZONTAL CONTROL DATA

The weather vane is mounted at the top of a 10-foot pole that is braced by an aluminum tripod. Point observed was the top and center of the pole.

COMM-DC 34313

### ADJUSTED HORIZONTAL CONTROL DATA

GEODETIC LATITUDE: 22° 07' 43.9579 GEODETIC LONGITUDE: 159 43 07.4083	ELEVATION: _____ METERS _____ FEET
--	---------------------------------------

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	$\theta$ OR $\Delta$ OR ANGLE
HI 4	5104	425,965.77	107,414.14	- 0° 04' 57"

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

PLANE AZIMUTH HAS BEEN COMPUTED BY THE FOLLOWING FORMULA: $\text{GEODETIC AZIMUTH} + \text{REFLECTION} + \text{REFRACTION} + \text{SAGITTA CORRECTION}$			
TO STATION OR OBJECT	GEODETIC AZIMUTH (From south)	PLANE AZIMUTH* (From south)	CODE

QF 528

QF 528

# HORIZONTAL CONTROL DATA

by the  
National Ocean Survey  
NORTH AMERICAN 1927 DATUM

QUAD 221593 STATION 1117  
HAWAII  
LATITUDE 22° 00' TO 22° 30'  
LONGITUDE 159° 30' TO 160° 00'  
DIAGRAM NF 4-6 KAUAI

Wes (Kauai Island, F. G. Engle, 1927).—On north shore of Kauai, on west side of Hanalei Bay, on a knoll covered with grass and brush. Station is about 1 1/4 miles northwest of the village of Hanalei, and is between the government highway and the coast. Marked according to note 4, a standard disk in boulder. Reference marks, note 12c, standard reference disks in boulders, were set at the following distances and azimuths from the station: No. 1, 3.54 meters (11.6 feet), 294° 36'; No. 2, 5.44 meters (17.8 feet), 335° 47'; No. 3, 6.42 meters (21.1 feet), 31° 25'.

Form 528  
(11-8-55)

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

R

NAME OF STATION: WES  
ESTABLISHED BY: F.G.E. YEAR: 1927 STATE: Hawaii  
RECOVERED BY: D.M. Whipp YEAR: 1965 COUNTY: Kauai  
Island: Kauai

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

Station mark and reference mark No. 1 have been destroyed by a wash; the station mark was found, set in a small boulder laying nearby. The reference mark was not found.

Reference marks number 2 and 3 were recovered in good condition. Located on Makahoe Point on west side of Hanalei Bay, about 1-1/2 miles northwest of Hanalei, on open, grassy knoll about 65 yards east of point where the highway makes a hairpin left turn around point of ridge.

To reach from the post office in Hanalei go northwest on State Highway 56 for 2.1 miles to start of hairpin turn and end of truck travel. Pack east on trail through brush about 65 yards to top of knoll.

Reference mark number two is a standard disk stamped "WES 2 1927", cemented in a drill hole in a 6 x 8-inch rock projecting 1 inch. It is 6 feet south of the trail, 40 feet east of high point of knoll, and hidden by grass and ferns.

Reference mark number three is a standard disk stamped "WES 3 1927", cemented in a drill hole in an 8-inch boulder projecting 2 inches. It is 7 feet south of the trail, 24 feet east of high point of knoll, and hidden by dense, small brush.

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

COM-DC 343

## ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION: WES

STATE: HAWAII

YEAR: 1927

THIRD

ORDER

SOURCE: G-SP156

GEODETIC LATITUDE:	22° 13' 01.083	ELEVATION:	30	METERS
GEODETIC LONGITUDE:	159 31 14.699	SCALED		FEET

STATE COORDINATES (Feet)				
STATE & ZONE	CODE	X	Y	θ OR Δ OR ANGLE *
HI 4	5104	492,980.98	139,362.32	- 0° 00' 28"

\* 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