

SITE INFORMATION

Revised 12/17/97

Current Site Name: Mauna Kea
Location: Mauna Kea, Hawaii, HI
Site Number: 141
Geographic Region: Pacific
Tectonic Plate: Pacific

General Site Description: The station is located on the Island of Hawaii (Big Island), Hawaii. It is on the south slope of the dormant volcano, Mauna Kea, approximately 25 miles northwest of the city of Hilo, and 2.5 miles south of the Mauna Kea astronomical observatory complex at the summit of the mountain. Geodetic VLBI measurements are conducted using the VLBA telescope in a cooperative agreement with the site owners. A permanent GPS receiver of the IGS is also located at the site.

Local Geology: Not Available

Site Topo Map: USGS Quad - Mauna Kea (1982)



VLBA Telescope
GPS antenna in foreground



Mauna Kea VLBA Site

CONTACT INFORMATION

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Current Site Name: Mauna Kea
Location: Mauna Kea, Hawaii, HI
Site Number: 141

Site Ownership: USA (National Science Foundation)
Site Management: National Radio Astronomy Observatory (NRAO)
through Associated Universities Incorporated

Scheduling: Barry Clark
Address: NRAO/AOC
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Contact Person: Bill Hancock
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MONUMENT INFORMATION

Revised 12/17/97

Current Site Name: Mauna Kea
 Location: Mauna Kea, Hawaii
 Site Number: 141
 Number of Observing Monuments: 2
 Surveyed into National Network? Yes

 Monument Number: 7617
 Type of Monument: VLBA Antenna Reference Point
 Monument Inscription: None
 Systems using Monument: NRAO 25 Meter VLBA Antenna

 Latitude: N 19° 48' 04.96682"
 Longitude: W 155° 27' 19.80014"
 Elevation: 3735.831 meters
 Height above Ellipsoid: 3763.065 meters
 Geodetic Coordinate Source/Date: ITRF94 (1993)
 Geodetic Coordinate Datum/Ellipsoid: IERS
 Elevation Datum: HGVD

Source of Monument Geodetic Survey Ties: ATSC Jul 96

Differential Coordinates from 7617

Monument Number	Monument Inscription	X	Y	Z
MKEA	None (GPS)	-30.132	82.226	-5.908
-----	7617 RM 1	24.555	30.104	61.390
-----	7617 RM 2	34.905	-28.401	5.710
-----	7617 RM 3	-6.691	-0.041	-54.548

Monument Number	Monument Inscription	North	East	Up
MKEA	None (GPS)	-3.273	-87.313	-8.350
-----	7617 RM 1	69.563	-17.183	-11.985
-----	7617 RM 2	12.132	40.334	-16.839
-----	7617 RM 3	-53.390	-2.742	-12.736

MONUMENT INFORMATION

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Current Site Name: Mauna Kea
Location: Mauna Kea, Hawaii, HI
Site Number: 141
Monument Number: 7617

Monument Description: The mark for Station 7617 is a point represented by the perpendicular intersection of a plane through the elevation axis with the azimuth axis of the NRAO VLBA (Very Long Base Array) antenna. The point is not accessible and cannot be occupied. No survey disk or mark designates the point. It should be noted that the antenna elevation axis is offset by 3.133 meters (7 feet) from the azimuth axis.

Reference Mark 1 is a punchmark in the rounded top of a 0.014 meter diameter stainless steel rod set 0.10 meters below ground. (NOTE: the punchmark is not set exactly on the top center of the rod, but approximately 1 to 2 mm toward the north-east. The rod is set in concrete in the center of a 0.15 meter diameter PVC pipe which is encased in a 0.5 x 0.6 meter concrete monument. The monument is covered with 0.18 meters of soil to the top of an aluminum logo cover attached to the top of the PVC pipe. The logo cover is stamped "7617 RM1". The monument is located 10.16 meters north of the NRAO site north fence corner and 8.65 meters south of the NRAO north property corner (iron pipe). It is set at a distance of 71.6 meters and at a geodetic azimuth of 346.1 degrees from Station 7617.

Reference Mark 2 is a punchmark in the rounded top of a 0.014 meter diameter stainless steel rod set 0.07 meters below ground. The rod is set in concrete in the center of a 0.15 meter diameter PVC pipe which is encased in a 0.34 meter diameter concrete monument. The monument is covered with 0.05 meters of soil to the top of an aluminum logo cover attached to the top of the PVC pipe. The logo cover is stamped "7617 RM2". The monument is located 11.02 meters northeast of the NRAO site east fence corner and 17.48 meters northeast of the NRAO east property corner (iron pipe). It is set at a distance of 42.1 meters and at a geodetic azimuth of 73.2 degrees from Station 7617.

Reference mark 3 is a standard NASA-GSFC brass disk. The disk is counter-sunk 0.015 to 0.020 meters and epoxied into a 0.37 x 0.67 meter section exposed lava outcropping. The disk is stamped "7617 RM3". The lava outcrop is located at the northeast base of a long sloping ridge line consisting of jagged broken lava rocks. It is set 27.08 meters south of the NRAO site south fence corner and 1.48 meters southwest of the NRAO south property corner (iron pipe). It is located at a distance of 53.4 meters and at a geodetic azimuth of 182.9 degrees from Station 7617.

One additional survey monument is set inside the fenceline of the NRAO site. It was designated "VLBA BM". The station mark is a 0.050 meter diameter brass disk set flush in the center of a 1.00 meter diameter concrete monument. The monument slopes up from ground level to 0.04 meters above the ground at the brass disk. The disk is unstamped. It is located 38.5 meters southeast of the centerline of the NRAO site entrance road/gate. 2.28 meters southeast of fence pole #12 as counted from the entrance gate southeast fence pole and 1.12 meters north of fence pole #13. It is set 0.87 meters northeast of the fenceline.

MONUMENT INFORMATION

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Current Site Name: Mauna Kea
Location: Mauna Kea, Hawaii, HI
Site Number: 141
Monument Name: MKEA

Monument Description: The MKEA GPS station mark is the center of a 5/8" x 11 bolt that is welded to the top of a 4" (0.10m) diameter milled steel cap that extends 0.75" (0.02m) above the top of the cap. The milled top of the cap represents the elevation point. The steel cap is set at the top of a 4" (0.10m) diameter steel pipe that extends 1.47 meters above the ground and is set in concrete that extends 3.6 meters below the ground. The pipe has been painted brown. It is located 7.0 meters northwest of the centerline of the gravel road within the NRAO 15 foot (4.6 meter) utility easement area and 47 meters southwest of the NRAO VLBA antenna site gate. It is 3.381 meters northwest and 5.241 meters west of two 0.076 meter diameter steel guard poles. These poles set in concrete on the northwest edge of the gravel road are painted yellow and extend 0.11 meters above the ground. The two guard poles protect a 1.6 x 2.2 meter concrete pad (HELCO ELECTRIC) which is located 2 meters east of the station.

Footprint Information: No footprint monuments were set or surveyed for the Mauna Kea VLBA antenna site. GPS observations were made connecting the VLBA site, two additional survey monuments and a tidal bench mark.

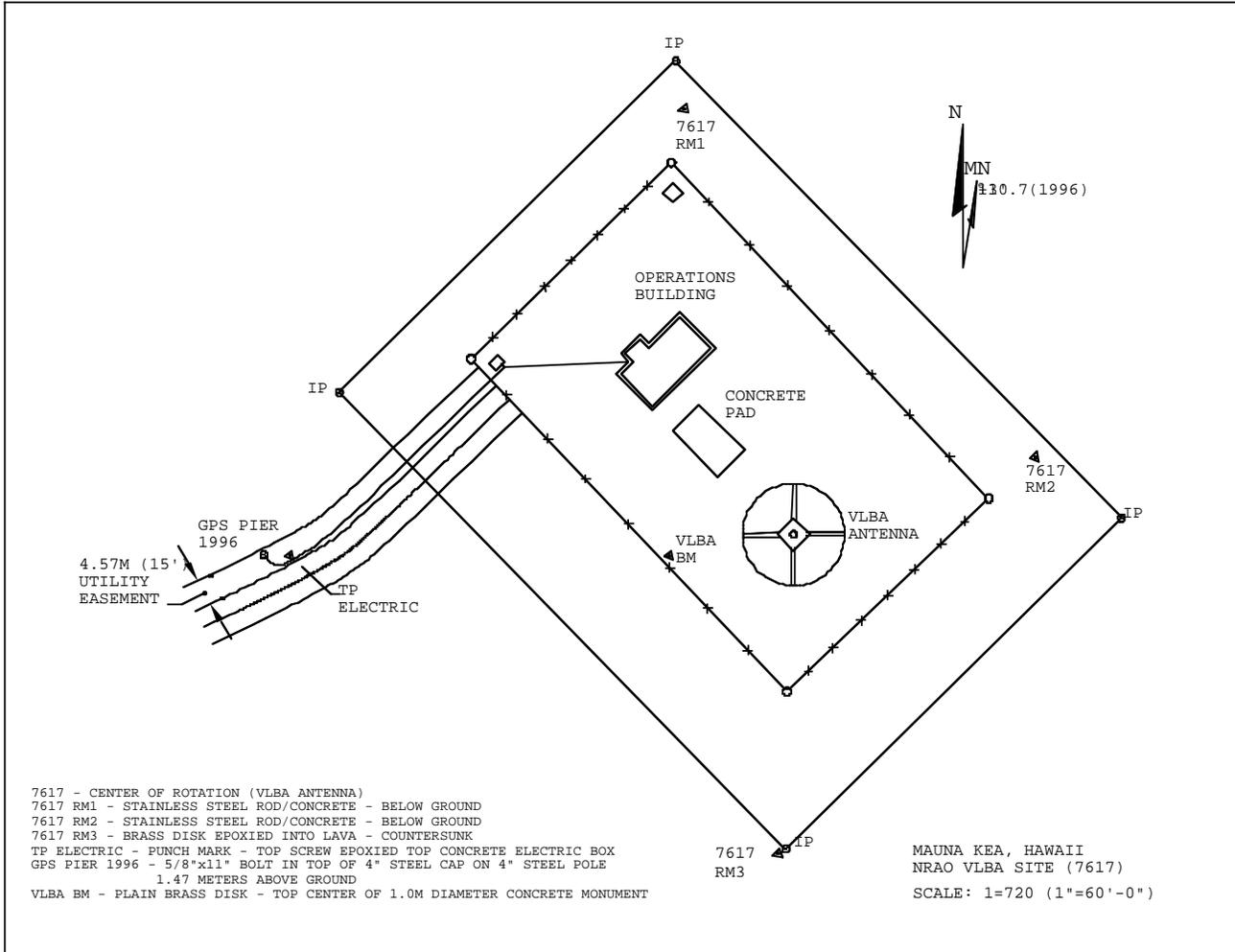
The U.S. Geological Survey (USGS) marker "**HVO 88-14**", located at the summit of Mauna Kea approximately 0.5 miles west of the Mauna Kea Astronomical Observatory Complex; "**LYMAN NO 2 1977**", a National Geodetic Survey, (NGS) monument located in Hilo, Hawaii; and "**Pier 3**", a National Ocean and Atmospheric Administration / National Ocean Survey (NOAA/NOS) tidal bench mark located in the Port of Hilo, were connected to the Mauna Kea VLBA station "**7617 RM 1**" by a GPS survey. This GPS data is archived in the Crustal Dynamics Data Information System while the coordinate data / descriptions of the survey monuments can be obtained from the establishing agency.

Archive of Site Survey Data: The survey field records; photographs; computations and adjustments are currently archived by the NASA-SLR Survey Section, Allied Signal Technical Services Corporation.

SITE SKETCH

Revised 12/17/97

Current Site Name: Mauna Kea
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 Site Number: 141



HORIZON PROFILE

Revised 12/17/97

Current Site Name: Mauna Kea
Location: Mauna Kea, Hawaii, HI
Site Number: 141
Monument Name: MKEA

OCCUPATION HISTORY

Revised 12/17/97

Current Site Name: Mauna Kea
Location: Mauna Kea, Hawaii, HI
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SLR Occupations

Monument Number	Occupying System	Occupation Designator	Starting Date	Ending Date
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No Previous Occupations

VLBI Occupations

Monument Number	Occupying System	Occupation Designator	Starting Date	Ending Date
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7617	VLBA	76175501	01-Jan-90	---
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GPS Occupations

Monument Name	Starting Date	Ending Date	Network
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MKEA	27-Sep-96	-----	IGS
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Footprint Surveys

Survey	Starting Date	Source
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No footprint surveys were completed. See the station description notes for geodetic ties to other local geodetic stations.