

Kokee Park Geophysical Observatory

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Abstract

This report summarises the technical parameters and the technical staff of the VLBI System located on the Island of Kauai. Included is an overview of the VLBI activities up to March, 1999.

1. KPGO

Kokee Park Geophysical Observatory first participated in VLBI operations as part of the GAPE experiments in 1984. At that time the station was part of the STDN (Satellite Tracking Data Network). The 9-m system was modified by installing a focal point receiver, hydrogen maser, data acquisition terminal, tape drive and computer system. This was operational for the summer of 1984. The system was removed after the GAPE '84 experiments and reinstalled again for summer of 1985. It wasn't until 1986 that we became a continuous participant in VLBI operations.

In October 1989 NASA phased out the STDN operation on Kauai and the station was transferred to the Crustal Dynamics Project at Goddard Space Flight Center. The station started weekly operation for the U.S. Naval Observatory as part of the NAVNET network.

Early in 1992 construction of USNO's present 20-meter antenna was started. The foundation work was completed in Aug 1992 and the structure was started in September just as Hurricane "Iniki" struck on September 11, 1992. Installation was completed in 1993 and first light was in June 1993. Later the use of the 9-meter system was discontinued.

Kokee Park Geophysical Observatory is located on the Island of Kauai in the Hawaiian Islands.

Table 1. Location and Addresses of Kokee Park Geophysical Observatory

Longitude	159.665° W
Latitude	22.126° N
Kokee Park Geophysical Observatory	
P.O. Box 538	
Waimea, Hawaii 96796	
USA	

2. Technical Parameters of the VLBI System at KPGO

The receiver is of NRAO (Green Bank) design (dual polarization feed using cooled 15 K HEMT amplifiers). The DAR rack and tape drive were supplied through Green Bank. The antenna is of the same design and manufacture as ones at Green Bank and Ny Ålesund.

The technical parameters of the radio telescope are summarized in Table 2.

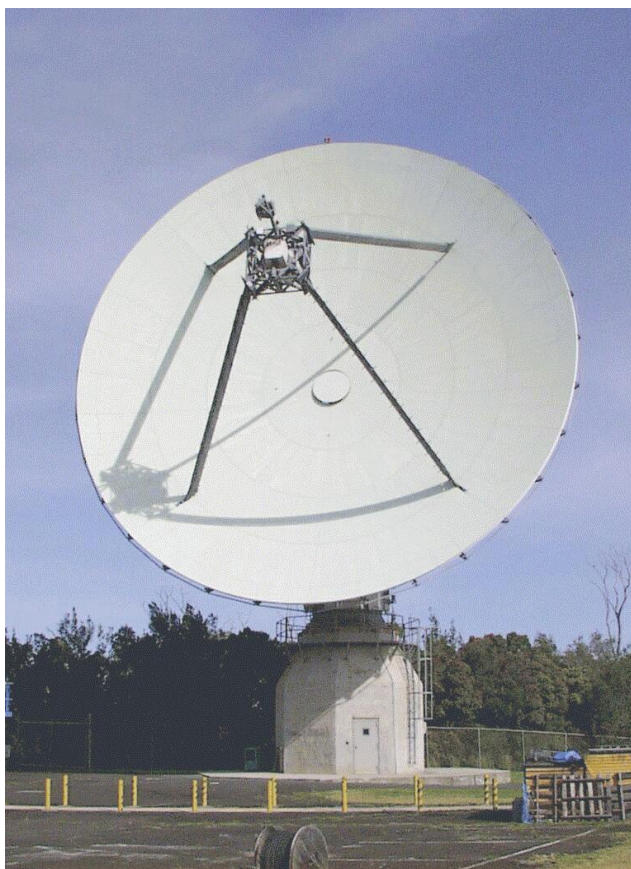


Figure 1. Kokee Park Geophysical Observatory 20m Antenna.



Figure 2. Kokee Park also hosts other systems; PRARE, DORIS Beacon, and IGS (Turbo-Rogue).

3. Technical Staff of the VLBI system at KPGO

The staff at Kokee Park consists of six people who are employed by AlliedSignal Technical Services Corp. under contract to NASA for the operations and maintenance of the Observatory.

Table 2. Technical parameters of the radio telescope at KPGO.

Parameter	Kokee Park
owner and operating agency	USNO-NASA
year of construction	1993
radio telescope system	Az-El
receiving feed	primary focus
diameter of main reflector d	20m
focal length f	8.58m
f/d	0.43
surface contour of reflector	0.020inchesrms
azimuth range	0...540°
azimuth velocity	2°/s
azimuth acceleration	1°/s ²
elevation range	0...90°
elevation velocity	2°/s
elevation acceleration	1°/s ²
X-band (reference $\nu = 8.4GHz$, $\lambda = 0.0357m$)	8.1 – 8.9 GHz
T_{sys}	40 K
$S_{SEFD}(CASA)$	900 Jy
G/T	45.05 dB/K
η	0.406
S-band (reference $\nu = 2.3GHz$, $\lambda = 0.1304m$)	2.2 – 2.4 GHz
T_{sys}	40 K
$S_{SEFD}(CASA)$	665 Jy
G/T	35.15 dB/K
η	0.539
VLBI terminal type	VLBA
recording media	thin-tape only
Field System version	9.3.17

4. Status of KPGO

Kokee Park has participated in many VLBI experiments since 1984. We started observing with GAPE and are continuing until now with NEOS and CORE. We also participate in the RDV experiments.

Kokee Park also hosts other geodetic measurement systems, including PRARE, a DORIS beacon, and a Turbo-Rogue GPS receiver. Kokee Park is an IGS station. These three systems are shown in Figure 2.

5. Outlook

USNO will be upgrading the present DAR to Mark IV this calendar year.