

Goddard Geophysical and Astronomical Observatory

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Abstract

This report summarizes the technical parameters and the technical staff of the VLBI system at GGAO. It also gives an overview of VLBI activities during the previous year. The outlook lists the tasks planned for 1999.

1. GGAO at Goddard

The Goddard Geophysical and Astronomical Observatory consists of a radio telescope for VLBI, several SLR sites including a 48" telescope for developmental Satellite Ranging, a GPS timing and development lab, meteorological sensors and a H-maser clock. In addition, we are a fiducial IGS site with several IGS receivers.

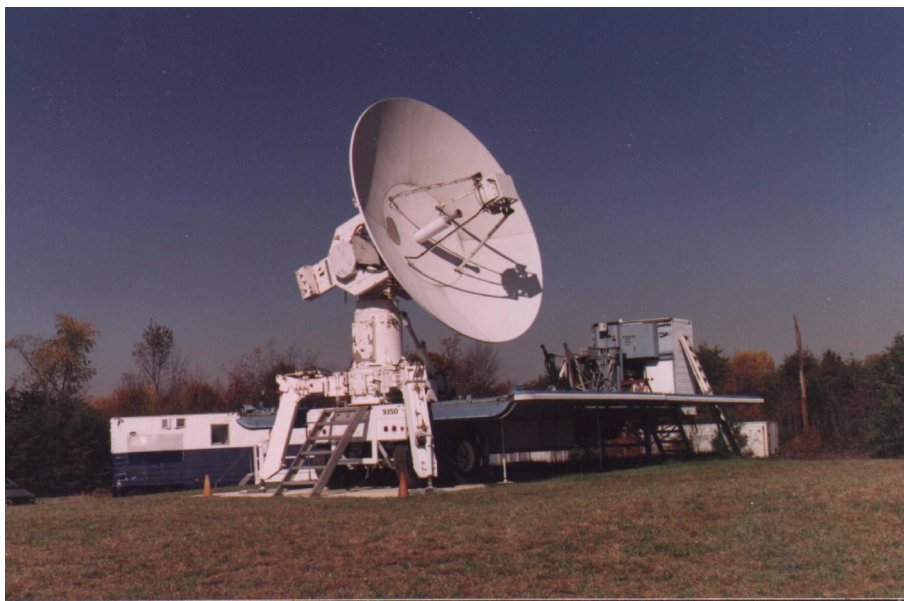


Figure 1. MV-3 VLBI antenna at GGAO.

GGAO is located on the east coast of the United States in Maryland. It is about 15 miles NNE of Washington D.C. in Greenbelt, Maryland.

2. Technical Parameters of the VLBI Antenna at GGAO

The radio telescope for VLBI at GGAO (MV3) was originally built as a mobile or transportable station. It was previously known as Orion and was part of the original CDP. It is now being used as a fixed site having been moved to Goddard and semi-permanently installed here since the spring of 1991. The design criteria were

Table 1. Location and addresses of GGAO at Goddard.

Longitude	76.8265° W
Latitude	39.0219° N
MV3 Code 299.0 Goddard Space Flight Center, (GSFC) Greenbelt, Maryland 20771	
http://www.gsfc.nasa.gov	

- transportability on two tractor trailers utilizing a 5 meter dish size to maximize receive and mobility considerations,
- setup of the radio telescope within eight hours (although it has been used as a fixed site since the spring of 1991).

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

Table 2. Technical parameters of the radio telescope of GGAO for geodetic VLBI.

Parameter	GGAO-VLBI
owner and operating agency	NASA
year of construction	1982
diameter of main reflector d	5m
azimuth range	0 ... 540°
azimuth velocity	3°/s
azimuth acceleration	1°/s ²
elevation range	0 ... 90°
elevation velocity	3°/s
elevation acceleration	1°/s ²
X-band	8.18 – 8.98 GHz
<i>receiving feed</i>	<i>Cassegrain focus</i>
T_{sys}	24 K
<i>Bandwidth</i>	800 MHz, -2dB
G/T	32.1 dB/K
S-band	2.21 – 2.45 GHz
<i>receiving feed</i>	<i>primary focus</i>
T_{sys}	19 K
<i>Bandwidth</i>	240 MHz, -2dB
G/T	21.2 dB/K
VLBI terminal type	Mark IV
recording media	thin-tape only
Field System version	9.3.25

3. Technical Staff at GGAO

The GGAO VLBI facility gains from the experiences of the Goddard VLBI group. GGAO is a NASA R&D and facility, operated under contract by AlliedSignal Technical Services Corporation (ATSC).

Table 3 lists the GGAO station staff that are involved in VLBI operations.

Table 3. Staff working at the MV3 VLBI station at GGAO.

Name	Background	Dedication	Company
Rawland Covey	engineering technician	100%	ATSC
Jay Redmond	engineering technician	20%	ATSC

4. Status of MV3 at GGAO

GGAO participated in several VLBI experiments which are listed in Table 4. In addition to the scheduled experiments listed in the table MV3 has participated in several unscheduled experiments for VLBI developmental purposes and various other developmental activities.

Table 4. Participation of GGAO in VLBI Experiments from February 1, 1998 to March 1, 1999.

Date	Experiment
1998-02-09	RDV07
1998-04-15	RDV08
1998-06-24	RDV09
1998-08-10	RDV10
1998-09-01	NA279
1998-10-01	RDV11
1998-10-06	NA284
1999-02-02	NA301

5. Outlook

GGAO will continue to support both scheduled experiments and developmental activities. Our scheduled experiments have been shifted from the RDV's to the NEOS-A throughout 1999.

The plan for 1999 consists of:

1. Continuing testing of PC-FS version 9.3.25 based on Linux kernel 2.0.
2. Testing of the Mark IV decoder prototype.
3. Continuing with research on Mark IV development.
4. Continually striving to improve the performance of the entire receive system.