

Gilmore Creek Geophysical Observatory

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Abstract

The following report provides a general technical description and operational overview of the Gilmore Creek Geophysical Observatory located near Fairbanks, Alaska.



Figure 1. NOAA/NASA Data Acquisition and Geophysical Observatory. Fairbanks, Alaska

1. GCGO at Fairbanks

Gilmore Creek Geophysical Observatory (GCGO) is located 22 km NorthEast of Fairbanks, Alaska. The observatory is co-located with the NOAA weather satellite command and data acquisition station. The station sits on an 8,500 acre reservation that is mostly undeveloped wilderness. Ten antennas are in operation. The GCGO telescope can be seen in the photo as the last antenna on the right in the valley. GCGO was instrumented by NASA's Crustal Dynamics Project in the mid 80's for the Alaskan mobile VLBI campaign and used as the base station for those geodetic measurements [1]. The GCGO is part of the NASA Space Geodesy program in cooperation with the U.S. Naval Observatory.

Table 1. Address of GCGO near Fairbanks.

Gilmore Creek Geophysical Observatory NOAA/NESDIS FCDAS 1300 Eisele Road Fairbanks, AK 99712 http://www.fcdas.noaa.gov
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2. Technical Parameters of GCGO

The 26 meter telescope, Monument Number 4047, X-East Y-North, Latitude N 64° 58' 43.81288" and Longitude E 147° 29' 42.18552" Height 306.418 meters is hydraulically operated

and controlled by a Modcomp computer system (see table 2). The DAT rack is a VLBA terminal and recorder (thin tape). The X/S band microwave receiver has a cryogenic low noise front end. VLBI Field System version 9.4.14 is used with a PC. Hydrogen Maser NR 5 is the time standard with an HP Cesium for the telescope computer. A CNS (TAC) receiver is monitored by the TAC32 software for GPS offset measurements. The station also runs two NASA/JPL Rogue receivers 8100 running JPL VO5 scintillation software. UCLA maintains the HIPAS receive system located in the GCGO. The Institut Geographique National in France operates their new DORIS beacon that is located near the NOAA VHF transmitter building.

3. Staff of the Gilmore Creek facility, Fairbanks, Alaska

GCGO is co-located with the NOAA data acquisition facility. The NOAA Manager is Jim Budd. The site is operated by the Lockheed Technology Services Group with Doug Ooms as Lockheed Project Manager and Roger Kermes, Lockheed Operational Manager. R. Strand and S. Caskey are assigned to GCGO technical staff with T. Knuutila, Z. Padilla, H. Grotsema, and D. Eubanks assisting. The telescope hydraulic system is maintained by M. Meindl, A. Sanders and F. Holan.



Figure 2. GCGO Ops crew Knuutila, Caskey, Strand

4. Status of Gilmore Creek Geophysical Observatory

GCGO will be observing eight sessions per month on average, with 102 sessions scheduled for year 2001. We observe NEOS every other week and IRIS once a month. CORE observing with R&D, APSG, CRF and Survey completes the program. Several dewar swaps were made during this reporting period. One 28V DC power supply failed in the DAR. The major data loss was

the failure of the Y axis hydraulic pump on the telescope in Aug 2000. Field System software development continues by Ed Himwich, NVI, Inc., using the station's DAT racks and telescope for testing.

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

Parameter	GCGO
owner and operating agency	NOAA/NASA
year of construction	1962
receiving feed	primary focus
diameter of main reflector	26 meters
focal length	10.9728 meters
surface accuracy of reflector	889 mm rms
X Y mount	1 degree per second
S-band	2.2 – 2.4, <i>GHz</i>
T_{sys}	62 <i>K</i>
$SEFD(CASA)$	650 <i>Jy</i>
G/T	35.3 <i>dB/K</i>
X-band	8.1 – 8.9, <i>GHz</i>
T_{sys}	58 <i>K</i>
$SEFD(CASA)$	550 <i>Jy</i>
G/T	44.5 <i>dB/K</i>

Table 3. VLBI observing at Gilmore Creek between 03/01/98 and 03/01/99.

Year 1999 Experiments assigned to GCGO - 93 Observations scheduled - 23817 Observations recorded - 23353 Efficiency - 98.05%
Year 2000 Experiments assigned to GCGO - 67 Observations scheduled - 20613 Observations recorded - 19605 Efficiency - 95.11%

5. Outlook

Increased observing for 2001 is scheduled.

References

- [1] C.Ma,J.Sauber,L.Bell,T.Clark,D.Gordon,W.Himwich, and J.Ryan Measurement of Horizontal Motion in Alaska Using VLBI 1990, In:Journal of Geophysical Research, vol 95, No.B13, Pg 21991-22011, December 10,1990