Robledo Station Report

EVN TOG Meeting April 2009
Torun, Poland

1. Hardware and Software news.

Current DSN K-band receiver is able to support the new VLBA frequency (23.8 GHz): on-axis feed instantaneous 18-26 GHz dual polarization, 3 channel HEMT low noise amplifier, and down-converter with tunable LO, with bandwidth currently limited to 70MHz on each polarization.

DSS-54 (34m) antenna time has been already allocated for participation in EVN 7mm observations. Robledo Q-band receiver has on-axis feed instantaneous 39-49 GHz dual polarization, 2 channel HEMT low noise amplifier, and down-converter with tunable LO, with bandwidth currently limited to 70MHzon each polarization.

The DSN supports EVN, Global and SGP observations using Field System version FS-9.9.0 and the Mark5A recorders. Our current Mark5 s/w version is the following:

> DTS_id? 0 : Mark5A : 2005y147d17h : 1 : Mark560a : 1 : 1 : 2.7x : 0xb8 : 0x19 ;
> mk5/!OS_rev1? 0 : "Linux version 2.4.20-8 (bhcompile@porky.devel.redhat.com) (gc" ;
> mk5/!OS_rev2? 0 : " version 3.2.2 20030222 (Red Hat Linux 3.2.2-5)) #1 Thu Mar 13 17:54:28 EST 2003" ;
> mk5/!SS_rev1? 0 : "BoardType PCI-816VXF2, SerialNum 8270, ApiVersion 5.21, ApiDateCode Apr 7 2005" ;
> mk5/!SS_rev2? 0 : "FirmwareVersion 10.84, FirmDateCode Apr 06 2005, MonitorVersion 6.02, XbarVersion 3.18, AtaVersion 1.05, UAtaVersion 0.00, DriverVersion 623" ;
> form/m,16,1:2,off,,3,pass,41,0x44,okay

The Robledo R&D Mark5A recorder has been upgraded with a new motherboard and Debian Etch OS has been already installed. We are waiting for the new release of Mark5

software. Once it is released, all DSN Mark5A recorders will be upgraded to that version and Debian Etch OS will be installed.

Since October 08 the DSN supports all VLBI projects with Mark5 only, incluing the JPL Reference Frame Calibration projects. The MarkIV tape drives are being removed during Spring 09.

During this year the DSN has performed several 1Gbps recording tests, that were correlated using the JPL Mark5 software correlator.

2. Calibration issues at the DSN.

a. Calibration signal. The EAC software automatically controls the calibration signal (noise diode) during the observations in order to provide system temperature monitoring, at only one frequency band or polarization (in case of dual observations), except for K-band observations that Tsys is provided for both polarizations. System temperature file is derived using the *antabfs* application and sent to the EVN archive after every observation.

b. Pointing and Efficiency. Derived new rxg file for L-band with new Tcal versus frequency values for February 09 session. Robledo K-band gain curves provided in the past were not free of opacity corrections. For next EVN observing session K-band gain curve will be provided free of opacity corrections.

c. GPS data. Although a GPS receiver and a frequency counter were installed in the MarkIV DAT we only provide gps-fmout values at start of the observations. A station dependent software problem continues preventing us to provide gps-fmout data continuously during experiments.

d. uvflag information. Requested by JIVE correlator to provide uvflag information from EVN session#3 2008. To comply with this request it has been developed a script to provide antenna status information in flagr notation in the experiment logs, apart from the usual DSN /onsource/ notation. Logs from October 08 and February 09 observing sessions have been adjusted to flagr notation, and using scripts uvflg.pl and uvflgplot.pl, the uvflag files have been successfully generated, and sent to JIVE correlator.

3. Future Plans.

A K-band upgrade will be implemented first at Canberra during next year, later at Robledo. It will provide horn switching capability and will consist on the installation of a 4 channel HEMT, full band polarization orthomode transducers, and calibration signal on both feeds, with 1GHz bandwidth on each polarization.

DSS-63 70m antenna will be stopped again next May-July 09, for *life extension* maintenance tasks, including the replacement of the four provisional elevation bearings and depot level maintenance. During this downtime period, DSS-63 will not be able to participate in EVN/Global session #2 09.

DSS-54 34m antenna will be stopped from July-September 09 for a 26GHz receiver installation. It will be able to participate in 7mm NME observations during next EVN session #3 09.

DAT modernization task: The DSN will upgrade the MARKIV DATs with hardware similar to the Wide band VLBI Science Receiver (WVSR). The WVSR is a digital front-end developed at JPL, currently used to support spacecraft navigation at the DSN and for Radio Science JPL projects. The new DAT should be ready by 2011.

DSN Field System operational version will be updated from FS-9.9.0 to FS-9.10.3, first at the JPL scheduler processor (next summer) and later at the DSN stations.

4. Robledo support to EVN observations.

For EVN session#3 2008 Robledo participated in three observations:

EK026 (L-LCP): successful 256Mbps Mark5A recording; L-band RFI affected some of the channels.

EF021B (L-LCP): successful 1Gbps Mark5A recording; L-band RFI affected some of the channels; 2 scans were lost due to antenna problems.

GW019B (X-Dual): successful 1Gbps Mark5A recording; system temperature provided only for X-LCP.

For EVN session#1 2009 Robledo participated in one observation:

EP064C (L-LCP): successful 1Gbps Mark5A recording, some bits lost; L-band RFI affected some of the channels;2 scans lost due to a problem with the schedule provided by the PI.

Best regards,

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