

Robledo Station Report

EVN TOG Meeting Dec. 2009 Bonn, Germany

1. Hardware and Software issues.

Currently the DSN supports EVN, Global and SGP observations using the 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 JPL VLBI Mark5 software Correlator (JVC) is fully operational. This correlator is supporting JPL Reference Frame Calibration projects as Catalog Maintenance & Enhancement (CatM&E) and Clock Synchronizations (TEMPO). Old tape recording system has been removed.

2. Calibration issues at DSN.

a. Calibration signal. The status of the calibration signal control continues as last year. 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 for both polarizations is provided.

b. Pointing and Efficiency. Derived new L-band pointing models for DSS-63 and Q-band pointing for DSS-54. Robledo gain curves already provided are free of opacity corrections.

c. GPS data. The status is the same as last year. Although a GPS receiver and a frequency counter were installed in the MarkIV DAT we only provide gps-fmout values at start and end of observations. A station dependent software problem prevents us to provide gps-fmout data continuously during experiments.

3. Future Plans.

DSS-63 70 m antenna was stopped on May-July 2009, for *life extension* maintenance tasks, including the replacement of the four provisional elevation bearings and depot level maintenance. During this downtime period, DSS-63 was not be able to participate in 2009 EVN/Global session #2.

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. It will likely use the same digitizing front end as the WVSR and different candidates for the digital backend are currently being investigated. All the choices are being targeted to support Mark5C recording over 10GE interfaces. Some working prototypes in the lab could be ready within a year from now.

The different possibilities to upgrade our Mark5A recorders are being currently considered. Some R&D tests have been already performed to put Mark-5B data into the JPL software correlator. Solutions that do not imply an irreversible modification and can coexist with the Mark5A recorder seems to be preferable (Mark5C instead and Mark5B).

The Mark5 OS kernel is being upgraded, as well as the motherboard. Last version available of Mark5 software is being installed.

Within the next year the JPL Mark5 software correlator should be able to support Mark5A at 1Gbps. Currently supported data rate is 448Mbps.

Robledo e-VLBI plans: *last mile* Gbps coverage problem from Robledo to the Spanish Research and Educational Network (RedIRIS) not yet solved.

4. Robledo support to EVN observations.

For EVN session#3 2009 Robledo participated in three observations:

EC029B (L-band-LCP; DSS-63 70 m antenna): successful 1 Gbps Mark5 recording; system temperature file was derived using the *antabfs* application and sent to the EVN archive.

EM078 (L-band-LCP; DSS-63 70 m antenna): successful 512 Mbps Mark5 recording; system temperature file was derived using the *antabfs* application and sent to the EVN archive.

GB065B (Q-band-LCP): successful first Q-band observation with DSS-54 34m beam waveguide antenna and 512 Mbps Mark5 recording. System temperature file was derived using the *antabfs* application and sent to the EVN archive.

Best regards,

Esther Moll & Cristina Garcia

@mdsc.nasa.gov

@mdsc.nasa.gov

Madrid Deep Space Communication Complex -MDSCC-
Robledo Tracking Station

Tel +34-91-867-7130

Fax +34-91-867-7185