OAN - Yebes station report
Cyberspace TOG meeting 29 April 2021

1   General status

The operational status in terms of personnel has not changed since the last TOG report, and the staff is working onsite. A new antenna operator, Sebastián Pérez-Flor has been incorporated to the RT40m staff, increasing to six the number of people on shifts.

Unfortunately, the radiotelescope suffered a severe damage on the elevation shutter covering the receiver's cabin during a strong snowstorm in January. The consequence is that the roof remained open to the sky, with the danger of electronics being exposed to the weather. Quick fix with a plastic cover being manually installed and removed has made it possible to observe in few occasions under good weather, but it was not possible to participate in the EVN 2021 Session I. The final repair consists on the complete replacement of the shutter. Originally planned for week 17, the job has been delayed by the installation company, and is now expected to take place during the first week of May.

2   VLBI Equipment

Details of the equipment used in EVN observations:

- DBBC2
    - 4 CoMo boards (Unica 4).
    - 4 ADB2.
    - 4 Core2.
    - Internal Fila10G.
    - Software available:
        - DDC:
            - v105_1 (June 10 2015). This firmware is used with channel bandwidth narrower than 4 MHz.

- v107 (beta 4)(June 7 2019). This firmware is used with 4 MHz channel bandwidth or wider.
    - PFB (hardly ever used):
        - v16_2 (October 13 2017).
    - Fila10G:
        - fila10g_v4_1 (reported as 2.8.0, October 20 2017).
- Flexbuffs
    - flexastro:
        - 36 disks of 10 TB capacity. Total capacity of 360 TB
        - Software version: jive5ab : 2.9.0 : 64bit : dev : flexastro
    - flexbuff:
        - 36 disks of 6 TB capacity. Total capacity of 216 TB

- We use a Harrobox running Debian Jessie (8.2) as a proxy between the FS and the DBBC to allow concurrent connections to DBBC2. JIVE correlator uses this feature to control the flow of data from the Fila10G when doing eVLBI. This host is in the public LAN but allows connections from the private LAN.

At present time RT40m's spare DBBC2 is on lend to Santa María station in Azores. A third Flexbuff system with 144 TB of capacity (36 disks of 4 TB each) has been devoted to correlation tasks.

A DBBC3-2L-2H which incorporates a power supply upgrade to support the most demanding firmware versions is available at Yebes. Unfortunately during the initial loading of firmware DDC version U_125 something went wrong and the system consequently failed to detect one of the processing units. This board was sent to Bonn for repair and is already back at Yebes. Final integration tests are still pending. The administrative process to upgrade the system to 6L-6H has been initiated and the order is expected to be placed in few weeks. With this upgrade the 40m telescope will be able to perform tri-band observations in dual polarization.

3 Field System
We run three FS computers:
- RT40m: FS version 9.13.2 on Debian 7.11 Wheezy, kernel 3.2.0-6-686-pae
- RT13.2m: FS version 9.12.11 on Debian Jessie 8.10, kernel 3.16.0-4-686-pa.
- A test computer which can be connected to any of the non-used backends. Debian Jessie and FS 9.11.19

4 EVN observations
Yebes' rt40m could not participate in any of the 2021-Session I observations due to the damage in the elevation shutter.

The last e-VLBI session observed was rm016b on December 1ˢᵗ, 2020.

5   Other VLBI observations

So far, Yebes' rt40m could not participate in any scheduled observation in 2021 due to the damage in the elevation shutter.

6   Continuous calibration

Continuous calibration mode (80 Hz applied to a noise diode) works in C, X and K bands.

7   Storage

We have purchased two Flexbuff units which will be populated with disks along this year, tentatively with 10 TB disks but the final decision has not been made. One of the units will be sent to JIVE. The current storage capacity at the station is 576 TB.

8   Spares

One Mark5B+ system together with some old DBBC2 pieces are available at the station.

9   Internet connection

Yebes is connected to RedIris, the spanish NREN using a 10 Gb/s dark fiber since May 2012. This year RedIRIS has initiated the tasks to upgrade their Point of Presence at Yebes Observatory to 100 Gbps, which is expected to be completed sometime this year.

10 40m radiotelescope

The construction of a new C/X band receiver is progressing well, and the receiver is scheduled to be installed on the telescope in July. This receiver will replace the current C band receiver, increasing simultaneous bandwidth to the range [4.5, 9]GHz, with a receiver temperature of 25 K. Another upgrade is the use of optical fiber to transmit the signal down to the backends room.

The breakdown period has being used for the maintenance of the W and Q receivers.

11 13.2 m radiotelescope

The VGOS compatible radiotelescope continues its routinely participation in the IVS VGOS program. Currently, a new VGOS receiver built in-house is being commissioned. This receiver will be shipped to Santa María to equip the RAEGE antenna at the island after the end of the validation period.

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