

Minutes

Dr. Walter Alef

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Date: 21.12.2010
Time: 16:00 CET
Location: Teleconference
Attended by: A. Whitney, G. Tuccari, J. Romney, M. Lindqvist, R. Procas, C. Walker,
A. Szomoru, M. Kettenis
Chair: W. Alef
Minutes: W. Alef

Subject: US-EVN teleconference

1. US progress report

A. Whitney:

- The RDBE hardware is ready. It has been tested with 2 x 512 MHz IF bandwidth. Output with two single 500 MHz channels and 4 Gbps total data rate was successful. In the same mode using 4 IFs an output data rate of 8 Gbps was realized for the tests described below. The best tested PFB firmware which offers channelization of the 2 x 512 MHz in 2 x 16 x 32 MHz sub-bands works on the RDBE and will be used by NRAO.
- A 12m antenna at Goddard is nearly finished (VLBI2010). As an alternative to the 11-feed which is difficult to connect to amplifiers an antenna development by Weinreb at JPL looks promising. It can more easily be connected.
- An investigation on the characteristics of an 8 Gbps real-time data recording system developed by a small company in Boston was started. Their system (XCube) does, in software, much of the disk array management that Conduant does in hardware and firmware. So far the results look promising, but more tests on the robustness of recordings under conditions of single disk failure have to be done still. Up to 24 disks are written in parallel. It might be possible to retrofit old modules to make them compatible with that system, but the module PCB board would have to be exchanged. A gradual transition might be possible.

J. Romney:

- NRAO's aim is to get operational at 2 Gbps soon. The backend is the RDBE with – at the moment – the PFB firmware mentioned above. A channel-selection capability is under development to support various alternative groupings of the fixed 16 x 32-MHz sub-bands available from the best-tested PFB firmware. This will optimize use of the available frequency space with the initial, limited 2-Gbps recording capacity.
- The 4-Gbps capability is still the project goal. Alternatives to realize this include the native-SATA 4-Gbps module and chassis backplane under development by Conduant, the XCube system mentioned above, and dual recorders at the stations and the correlator inputs.

- The DDC (digital down converter) is not yet ready, but progress has been made.
- The Mark 5C is close to being operational. A major problem was fixed by Conduant, but a few minor issues remain.
- 5 to 6 antennas have the old and the new backends. This is limited by the availability of Mark 5 recorders as a Mark 5A and a Mark 5C are needed. It is hoped that outside funding can provide more Mark 5s so that the remaining antennas can be equipped with the new backends in parallel to the old ones. The next call for proposals (January 2011) will announce the possibility for 2 Gbps for observing in about summer of 2011.
- Further production of RDBEs has been taken over by Digicom, the company that also produces the ROACH boards. Orders for complete RDBEs are now being accepted.
- A. Deller is working on the phasing of the EVLA.

C. Walker:

- An MRI proposal for buying a large number of disks was successful. About 500 k\$ have to be spent by April 2011.

2. EVN progress report

G. Tuccari:

- The first DBBCs with PFB (2 x 16 x 32 MHz) and DDC are operational in the field. The systems have been tested in the lab with 2 Gbps with Mark 5B+/C recorders. The Mark 5C requires output via the FiLA10G board. A data-rate of 4 Gbps was realized with a PC (Mark 5C non-bank mode not available). The data format is Mark 5B.
- Geodetic setups with 500 and 1000 MHz bandwidths in 8 IFs will be available soon.
- The development of the DBBC3 will start soon. It will use sampling of 4 GHz wide bands and Core3 FPGA modules with output of 32 Gbps via 40 Gbps Ethernet.
- The DBBC is produced by HAT-Lab from which it can be ordered in various setups. The production started much slower than expected due to problems with the board manufacturer located in Bavaria. A second batch of DBBCs was produced in the expected time span.

3. planned test of backends: US and/or EVN

Outcome

- The possibility of common tests of the new backends between then EVN and the US was discussed. At the moment only tests with the PFB firmware can be done. Alef will inform LaPorta to contact Romney about joined tests. A pure EVN test is already being organized, but it will require DDC firmware. Several tests of the VLBA backends have been done already.

4. calibration methods for digital backends – compatibility

Outcome

- Alef inquired about TSYS measurements with the RDBE. Romney reported that it is not implemented in the RDBE now, but it is planned to do 80 Hz radiometry with the RDBE. Efforts to extract the measurements with DiFX are well underway. While the old backends remain available they will be used for radiometry.
- Phase-calibration extraction is also planned for the RDBE. The DBBC will not extract phase-cal signals. DiFX can also extract phase-cal signals. This is the default at the MPI.

5. timing of the backend upgrades

Outcome

- If additional funding fails it may be necessary to switch the remaining VLBA antennas to the new backends. Alef commented that this might cause problems with compatibility in global observations. Especially global spectral line observations might be affected.

6. items of mutual interest for the TOG meeting at JIVE

Outcome

- No special points were brought up for discussion the TOG meeting. (US participants have a problem to participate in the TOG meeting due to conflicting commitments with a US meeting.)

7. AOB

C. Walker:

- Walker reported a number of improvements to the SCHED program, support for the new hardware and removal of tape related code. SCHED improvements also include automatic scheduling of "DELZN" segments (short bursts of geodetic style observing to get atmospheric solutions for phase-referencing) and enhancement of the DWELL parameter to allow scans to start without waiting for the slowest stations.
- New 4.1 – 7.9 GHz receiver are being built. It will have 2 IFs, 2 pols., 2 GHz BW. Installation is targeted for the end of 2011.

Follow-up	Who's responsible?	When?
NRAO/Haystack presentation for the TOG meeting to be presented by Alef	Romney/Walker/Whitney	25.1.2011
Establish contact between LaPorta and Romney for	Alef	5.1.2011

Follow-up	Who's responsible?	When?
combined EVN-US backend tests.		

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