

*EVN TOG meeting
Arecibo Observatory, Puerto Rico, USA
30 August 2011*

Minutes from the meeting

Attendees:

Franco Mantovani, Walter Alef (chair), Uwe Bach, Alexander Neidhardt, Michael Lindqvist, Arpad Szomeru, Dmitrijs Bezrukovs, Jonathan Quick (minutes), Rongbing Zhao, Chris Salter, Roger Hammargren, Tapasi Ghosh, Luis Quintero, Kevin Douglas.

(EVO: Pablo de Vincente, Bob Campbell, Geert Kuper, Martin Leeuwinga, Jun Yang, Hans Tenkink)

(Phone: Jon Romney, Alan Whitney, Chester Ruszczyk, Ed Himwich)

Local Arrangements and Opening Remarks:

Alef said it was a great pleasure to be meeting at Arecibo despite the problems experienced with Hurricane Irene. The visitor's centre will be open over lunch. Group photo to be on the balcony at the end of lunch break.

1. Approval of / additions to agenda:

Some parts will be very short due to absence of attendees caused by hurricane Irene. No additions.

Presentations and reports are available at

http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togreps11-2/.

The agenda is available at

http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/tog_agenda-2011-2.html.

The meeting webpage can be found under

<http://www.radionet-eu.org/fp7wiki/doku.php?id=na:engineering:ew:5thtog>.

2. Acceptance of minutes from last meeting:

The minutes from the last meeting have been accepted.

3. Review of past action items:

1. Ruszczyk to send email on EVNtech with the explanation of all details how to deal with SDK9. *If Ruszczyk cannot attend the meeting later via telephone, Alef to ask what the support from Haystack for Mark5/6 will be in the future.*

2. Olnon(JIVE) and Walker to incorporate information on frequency agility in SCHED.
Open.

3. All friends to enter RFI-events in the database.
RFI info - to be moved to permanent action items.

4. Szomeru to investigate if/how the number of ftp-tests could be increased, as a high time priority of the NEXPreS.

Not done, perhaps deliverable at end of NEXPreS.

5. Stations to send updated information for the SCHED catalogue.

Updates to catalogues happen, but stations have to be chased. This should be moved to the

permanent action items.

Request from Campbell for contact details on ToO webpage. This is missing for Arecibo, Wetzell - please forward info to Campbell.

6. Alef to schedule a monthly telecon between the EVN and VLBA to clarify interoperability issues. *Ad-hoc telecons did happen but not very regularly. Rephrase action item to have them when need arises.*

7. JIVE to inform Alef about the retired disks for keeping the inventory up to date.

Done.

8. Stations to update the page of the disk inventory. They should contact Alef to gain access.

This should be a permanent AI. Action item for Alef to talk to Jodrell about this.

9. Stations to indicate the disk space on new modules. Email to W.Alef.

This should be made a permanent AI.

10. W.Alef would like a summary/overview of what stations get better or worse after calibration.

AI for JIVE still open.

11. A. Whitney to send information about A. Roger's Updown Convertor to match bandpasses (with regards to issue of mis-matched IFs) to W.Alef.

Info on UDC is now on TOG wiki page.

12. Arrange small telecon next week with Chet and including A. Szomoru, B. Campbell, W. Brisken and W.Alef to get the SDK9 related information.

No developments on SDK9 - item still open, waiting for Haystack to report in the meeting on this issue.

13. To inform directors at next CBD meeting to put aside a few 1000 euros for new modules/new disks, old modules have single disks which fail more easily.

Done. Alef will report at the meeting.

14. On wants their old disk packs for upgrades.

Done, ON has packs.

15. Inquire about fares and connections to Arecibo on these days within 2 weeks

Done.

16. Tapashi to provide an estimate of accommodation cost (25 people on site).

Done.

17. Alef to DRAFT a program for Arecibo. All to give feedback

Done.

18. JIVE to send someone to teach at TOW

Teaching at TOW happened.

4. Reliability/Performance of the EVN.

(Jun Yang remotely)

Yang presented the Reliability and Performance report. The detailed report and related presentations are available on the web at

http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togreps11-2/Performance_JunYang_Arecibo.pdf

etc.

Highlights were:

- Successful use of DBBC at Ef.
- Successful 2 Gbps fringes in Europe (Ef-On) using the DBBC in PfB mode and also in China using the CDAS.
- Lots of problems with both Jb1 and Jb2, particularly instability.
- New problem with Mark 5B recording at Yebes - also seen occasionally at other stations.

Comment: Mark 5B is very sensitive to the cleanliness of the 5/10MHz and 1pps.

ACTION: Dave Graham to send info about Mark 5B 1pps issues, perhaps after telecon with Haystack ? (Checking offset between input 1pps and output to confirm it is clean.)

- Ef: dropouts were RFI from a radar.

- Still having the problem of data for two different correlators being put on one pack. Due to e-transfers this is less of a problem. But still need to beware of JIVE data being first shipped to Socorro as it can get lost (NRAO may need a reminder that the modules have to be shipped after correlation in Socorro rather than just erased).

5. Amplitude Calibration:

(Jun Yang remotely)

Yang also presented his report on the EVN amplitude calibration. The detailed report and related presentations are available on the web at

http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togreps11-2/Calibration_JunYang_Arecibo.pdf

etc.

Session 1/2011, poor calibration accuracy at Jb, Ur, Zc.

Session 3/2010, poor calibration accuracy at On, Zc.

Various issues at Bd, Sv, Zc, On, Jb2, Kn, Ur were mentioned

K-band: 10 stations are now available, but amplitude calibration is poor.

Lack of opacity free gain curves at Nt, Jb, Ro. (amongst others)

No Tsys available at Jb2, Cm.

Reminder on timely delivery of products:

Feedback, rxg, antab, uvflg should be delivered within 2 weeks and ASAP for eVLBI.

Automatic uploading of log files/gps data welcomed.

Arecibo confesses to be a problem.

Bach spoke on continuous calibration using DBBC (using a ND of about 5-10% Tsys) - 1 second average results are noisy, new software version allows 10s averaging but then messes up the 2-bit quantisation.

ACTION: All stations getting DBBCs need to make plans for implementing continuous calibration.

ACTION: Romney to provide details on VLBA experience.

Responsibility for maintaining the EVN status table has now moved from Polatidis to JIVE staff..

6. DBBC Status

(given by Alef - Tuccari not well)

Presentation available at

http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togreps11-2/DBBC%20status%20TOG%20Arecibo.pdf

DBBCs have mainly been sent to the southern hemisphere (Hb, Ww, Yg, Ke), but have now also been delivered to On, Ir and Tr. The biggest issue is the lack of proper FS support. However Ef has a prototype dbbcn program for controlling the DBBC (copy of mk5cn).

ACTION: Software from Eb (dbbcn) to be put on TOG wiki, together with pointers to the Hobart DBBC wiki.

- The FILA10G ethernet interface is still to come
- There was some discussion on VDIF format.
- The internal timing calibration step is to be automated.
- A control socket interface is now available.
- EVN adoption status presented. Worries are Wb, Jb and perhaps Kvasar stations.
- It should be possible to do 2Gbps soon (with a Mark5B+).
- A new DBBC mailing list has been created at Bonn - see <https://lists.mpifr-bonn.mpg.de/mailman/listinfo/dbbc>

7. 4Gbps/2Gbps:

- The 2Gbps PfB instance of the DBBC is not tunable so there is a problem of LO matching.
- An LO frequency matrix has been set up on TOG wiki.

ACTION: All stations should add their information to https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Frequency_ranges_for_4_Gbps

- Romney spoke about the RDBE/DDC tunability quantum – believes it should be solvable.

ACTION: Romney to ask Briskin to produce a document about tunability and interoperability with VLBA.(RDBE with DBBC)

11. NRAO/Haystack status report.

(Jon Romney, by telephone)

- RDBE/PFB – NRAO have been running piggyback experiments by splitting the IF as it comes into control room, recording with new Mark5C's.
- A lot of tests have been done – but it is not yet considered operational.
- The Mark5C is not reliable ($\pm 70\%$) and there are multiple failure modes.
 - Alan Whitney commented that Haystack is working on the problem.
- VDIF support: Haystack has a prototype output module but it isn't in any of the RDBE personalities as yet.
- However the e-VLA WIDAR correlator has a native phased-array VDIF output.
- 4Gbps upgrade path is on hold - no money is available at present.

12. Mark 5:

(including Haystack report by Whitney and Ruszczyk, by telephone)

- Switches between disk recording and e-VLBI mode is still handled by changing software.
- SDK 9/9.1 works with Mark5A/B, but there is an issue with Mark5B+
 - Ruszczyk will try upgrade Haystack correlator soon, then the Westford station and only then will he release it to end-users, hopefully within 4 months.
 - JIVE will also try SDK9/9.1 on a few systems.
 - Bonn is already using 9.0(9.1?) for playback through OS to the software correlator.
- The current pack size limit is 8TB and component disk size limit 1TB (or bigger with 8.3 patch,

but overall pack size limit remains the same.)

- On is not happy with the recent firmware upgrade, to follow up with Verkouter.
- Stations should allocate 7,000 € per year to replace older disks.

ACTION: Alef will raise issue of Kvasar stations buying a suitable amount of diskpacks.

<Lunch-break & group picture>

8. Technical operations and R&D at JIVE:

(Arpad Szomoru)

Presentation available at

http://www.mpifr-bonn.mpg.de/div/vlbicor/tog_chair/togreps11-2/arpad_tog11-2.pdf

- Mainly use Mark5A+ for playback, no real native Mark5B playback yet, but coming soon.
- New PCInt and many new Mark5Cs have been added - currently used for software correlator.

e-VLBI status:

- Full 1024Mbps is now used operationally at most stations.
- Recent improvements: Sh 256Mbps, Ar 512Mbps, KVN 512Mbps, and some ASKAP testing
- SXFC: 16 cluster nodes, 2 quad CPUs per node. Now capable of supporting e-VLBI at 512Mbps.

Uniboard production run completed:

- Digital receiver
- VLBI correl
- Beam-former
- all-dipole Lofar correlator.

NEXPreS: 4 activities

1. Cloud correlation buffering - automatic network-dependent correlation, remote control/monitor.
2. High bandwidth on demand - integrate with e-VLBI, prepare EVN to use this technology.
3. Computing in a shared infrastructure - distributed correlation.
4. High bandwidth, high capacity network storage - Growth in bandwidth, no of telescopes, network capacity also growing to 100Gbps.

9. Sched developments

(Bob Campbell and others)

- New VEX2 document in preparation.
- Question of support for DBBC/Mark5C
- Some convergence on how to handle Mark5B

10 Field system

(Ed Himwich via phone)

- Hopes to be able to work on FS once CONT11 campaign is complete.
- First priority will be a maintenance release addressing outstanding issues, also including the remote interface software from Wetzell.
- Support for DBBC/RDBE is highest priority for the release thereafter.

ACTION: Romney to put Himwich in contact with NRAO programmers.

- Known outstanding issues:
 - fmout-gps jumps at Kvasar stations.

- problems with DBBCs at some Auscope stations.

13. Date and Place of next meeting:

(Walter Alef)

- Presentation on Radionet 3 support for TOG meetings
 - every second TOG meeting would be combined with a Technical Workshop meeting.
 - support level is slightly less than before
 - Alef offered to act as coordinator
- Discussion on date and place of next meeting was deferred to item 14 – see below.

15. A.O.B:

- Issue of support for aspiring stations?

ACTION: All aspiring stations must attend TOW/TOG mini-workshops first, before we would support them in terms of visits to stations.

ACTION: Next TOG mini-workshop should include a "How to check out a VLBI station."

- Whose disks should be used for Radioastron?

ACTION: TOG agrees that normal EVN disk pool should not be used - forward to CBD about additional disks required.

- Spare parts purchase?

ACTION: Directors agreed each institute to invest ~3000 € in spare parts. Stations to define required items on TOG wiki, purchase (coordinated through Alef) and keep on-site as a hot spare which can be sent to other stations as needed.

- Impact of Chinese Space program on EVN schedules?

No information available at meeting

- Noto status?

To be repaired by the end of 2012 (Franco Mantovani).

14. New TOG chair:

- Michael Lindqvist will be the new TOG chairman from January 2012.
- Suggestion from the in-coming chairman for the place of the next meeting is Onsala, time frame would be in May 2012.

Alef ended the meeting by expressing the TOG's thanks to the local organisers.

<End of meeting & telescope tour>

Action Items

1. Olon(JIVE) and Walker to incorporate information on frequency agility in SCHED.
2. Szomoru to investigate if/how the number of ftp-tests could be increased, as a high time priority of the NEXPreS project.
3. Contact details for ToO observations should be put on ToO webpage. This is missing for Arecibo, Wetzell - please forward info to Campbell.
4. Alef to schedule a telecon between the EVN and VLBA to clarify interoperability issues when need arises.
5. Alef would like a summary/overview from JIVE of what stations get better or worse after calibration.
6. Dave Graham to send info about the Mark 5B 1pps issue. (Checking offset between input 1pps and output to confirm it is clean.)
7. All stations getting DBBCs need to make plans for implementing continuous calibration.
8. Romney to provide details of VLBA experience with continuous calibration.
9. Software from Eb (dbbcn) to be put on TOG wiki, together with pointers to Hobart DBBC wiki.
10. All stations should add their information relevant for 2/4 Gbps operation to https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/Frequency_ranges_for_4_Gbps
11. Romney to ask Brisken to produce a document about tunability and inter-operability with VLBA. (RDBE with DBBC).
12. Alef will raise issue of Kvasar stations buying a suitable amount of diskpacks at CBD.
13. Romney to put Himwich in contact with NRAO programmers (for RDBE control in FS).
14. All aspiring stations must attend TOW/TOG mini-workshops first, before we would support them in terms of visits to stations.
15. Next TOG mini-workshop should include a "How to check out a VLBI station."
16. The TOG agrees that normal EVN disk pool should not be used for Radioastron observing - forward to CBD about additional disks required.
17. Directors agreed each institute to invest ~3000 € in spare parts. Stations to define required items on TOG wiki, purchase (coordinated through Alef) and keep on-site as a hot spare which can be sent to other stations as needed.

Summary of "Permanent" Actions/TOG recommendations

IN ADVANCE OF SESSION:

Stations should ensure SCHED catalogue information is up-to-date.

Stations should update the page of the disk inventory. (Contact Alef to gain access.) They should also indicate the disk space on new modules by e-mail to Alef.

SESSION PREPARATION:

Gunn to send email before each session when the final versions of all schedules are ready for download.

All should check that Mk5 modules are placed squarely on a flat surface when received; otherwise connectors are easily damaged when bent 8packs get inserted in Mark 5 units

All stations should condition disk packs if time permits, especially those which are to be used for 1Gbps recording. If a disk pack is found to be not suitable for 1Gbps recording, the label can be changed to 512 Mbps.

All stations which do both astronomy and geodesy should clearly distinguish between astronomical and geodetic 8packs and ensure there is no "leakage" into the wrong pool, as mixing pools can create problems for scheduling.

Disk packs should be shipped with one European and one US address on covers so they can be easily returned in case a shipment is lost in transit.

DURING SESSIONS:

All stations should look at data regularly with chchk program, use it to locate significant RFI, report the results to Polatidis and CRAF representatives and enter them into the database, and use it to check phasecal throughout the session. The chchk program can be run in gaps, or for example on ftp data files.

All stations should monitor Tcal throughout sessions. This can be done by running ANTABFS and plotting the results.

All stations should forward FS error log files to Himwich in the event of a crash, including details of what the FS was doing when the crash occurred.

All stations should try to run the FS diagnostic tests and investigate the results.

All stations should ship disk packs as soon as they are full, at least once per week, following the Bologna rules.

POST SESSION FEEDBACK:

All stations should look at pipeline results available from the EVN data archive pages at JIVE, in particular amplitude corrections found by selfcal on strong, compact calibrators. JIVE support scientists should include a comment on the quality of amplitude calibration results, especially to indicate cases where a problem may have occurred and the amplitude correction factors are unreliable.

NME calibration files should be made available as early as possible. All stations should look at NME reports sent by JIVE. NMEs should be pipelined as early as possible and email sent to EVNtech when the results are available, to ensure feedback is provided well in advance of the next session.

Stations must aim to produce ANTAB and RXG files within 2 weeks after the end of a session. For eVLBI, RXG files from the previous session can often be used. ANTAB files for eVLBI experiments should be produced as soon as possible as rapid analysis is often a high priority for these experiments. JIVE should inform Alef of any problems, so that Directors can be asked to prioritise calibration if insufficient time is available at stations