

**EVN TOG Meeting**  
**Onsala Space Observatory, Sweden**  
**June 28, 2012**

**Minutes from the meeting**

**Participants:**

<http://www.radionet-eu.org/radionet3wiki/doku.php?id=na:eratec:tog:tog-meeting-01:participants-2012-06-27-28>

by phone: Jon Romney (NRAO), Chester Ruszczyk (Haystack Observatory)

**Agenda (with presentations):**

<http://www.radionet-eu.org/radionet3wiki/doku.php?id=na:eratec:tog:tog-meeting-01:agenda-2012-06-28>

**1. Local Arrangements/Opening Remarks**

(Michael Lindqvist, chair)

Lindqvist welcomes everybody, mentions how wonderful it is to have so many participants (>50, one of the best-attended TOGs yet). As NRAO will call in, some changes have been made to the agenda to accommodate the time difference. Lindqvist gives a short overview of the observatory and its scientific and engineering programmes. He also stresses the growth of proposal pressure on the EVN, which shows the scientific relevance of the instrument.

**2. Approval and last minute additions to Agenda**

Walter Alef suggests calibration at 22 GHz, but Jun Yang says he will cover this in his presentation.

**3. Acceptance of minutes from last meeting, Arecibo, August 30, 2011**

Minutes were accepted without comments

**4. Action items from Arecibo meeting**

1. Small (JIVE) and Walker to incorporate information on frequency agility in SCHED.
  - Bob Campbell says there have been lots of updates to SCHED. He mentions that many stations want different setups, that there are different backends etc. Info from the stations is *\*very\** important, EVN status table should be updated.
  - Ari Mujunen points out that many friends do not know how to find the relevant information.
  - This action can be removed, new **ACTION** on Bob Campbell: let stations know where to find this information

2. Szomoru to investigate if/how the number of ftp-tests could be increased, as a high time priority of the NEXPREs project.
  - Szomoru says that effort is ongoing to implement the complete Mark5 command set in Jive5AB. Once this is done, it will be possible to increase the number of ftp tests without losing scientific observing time. Action remains.
3. Contact details for ToO observations should be put on ToO webpage. This is missing for Arecibo, Wetzell - please forward info to Campbell.
  - Done, remove
4. Lindqvist to schedule a telecon between the EVN and VLBA to clarify interoperability issues when need arises.
  - Done, remove
5. Lindqvist would like a summary/overview from JIVE of what stations get better or worse after calibration.
  - Done, remove
6. Dave Graham to send info about the Mark 5B 1pps issue. (Checking offset between input 1pps and output to confirm it is clean.)
  - Dave has sent email to Lindqvist on this topic. Later during the meeting the setup of the system at Onsala will be shown. Remove action.
7. All stations getting DBBCs need to make plans for implementing continuous calibration.
  - Onsala is in the process of doing this, based on input of Graham, Irbene not yet. This should be discussed offline later. Alef suggests that this email should be distributed to the stations/evntech.
  - **ACTION** Lindqvist and Uwe Bach: distribute this email
8. Romney to provide details of VLBA experience with continuous calibration
  - As far as Lindqvist understands Romney sees no need for a discussion on this point. Lindqvist will ask Romney later during telecon.
9. Software from Eb (dbbcn) to be put on TOG wiki, together with pointers to Hobart DBBC wiki.
  - Done, remove
10. All stations should add their information relevant for 2/4 Gbps operation to [https://deki.mpifrbonn.mpg.de/Working\\_Groups/EVN\\_TOG/Frequency\\_ranges\\_for\\_4\\_Gbps](https://deki.mpifrbonn.mpg.de/Working_Groups/EVN_TOG/Frequency_ranges_for_4_Gbps)
  - Not done, will be discussed at a later point, remove action.

11. Romney to ask Brisken to produce a document about tunability and inter-operability with VLBA. (RDBE with DBBC).
  - Will be discussed during presentation of Romney. Remove action.
12. Lindqvist will raise issue of Kvasar stations buying a suitable amount of diskpacks at CBD.
  - Gennadii Ilin informs that a total of 80TB disk space will be purchased. Remove action.
13. Romney to put Himwich in contact with NRAO programmers (for RDBE control in FS).
  - Himwich is not sure, but not relevant anymore. Remove action.
14. All aspiring stations must attend TOW/TOG mini-workshops first, before we would support them in terms of visits to stations.
  - Lindqvist once again stresses importance of attendance to TOW/TOG. Himwich adds that at the next TOW there will be a DBBC (and other digital backends). Remove action.
15. Next TOG mini-workshop should include a “How to check out a VLBI station.”
  - This has not happened, instead there will be a workshop on DBBC. The TOW should provide enough info. Lindqvist mentions that the TOW will not be during any observing sessions, so there should be no excuses not to attend. Himwich mentions the need for teachers.
  - Remove this action, new **ACTION** Lindqvist: make sure TOW covers all topics related to checking out VLBI stations.
16. The TOG agrees that normal EVN disk pool should not be used for Radioastron observing - forward to CBD about additional disks required.
  - Bach says that recording rates are low anyway, for which old packs can be used, and that they do not need to be sent. Remove action.
17. Directors agreed each institute to invest ~3 keuro 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.
  - Lindqvist points out that DBBC spare parts (discussed during workshop on previous day) would cost about 30-40 keuro. **ACTION** Lindqvist: get estimate of extra money needed. **ACTION** everybody: check out list on wiki.

## 5. Reliability/Performance of the EVN

- Pre-session checks, e.g., sampler stats, phase-cal, RFI ... (Yang)
- Extending “near-realtime” fringe checks, status (Yang)
- NME results (Yang)
- Feedback from last sessions (Yang)

- Presentation by Jun Yang: *Reliability/Performance of the EVN*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:performance\\_junyang\\_onsala.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:performance_junyang_onsala.pdf)

- During N12K2 there were no fringes to Mh. Mujunen stresses that rapid feedback is very important, in this case a (wrong) explanation was found instead of understanding the problem.
- 22 GHz phasecal problematic. On injects into IF, Ef directly? **ACTION** Bach: if directly, send out info on evntech. If not, no action
- Scan\_check ending with "e" -- issue. Leeuwinga explain that if scan does not stop at an integral second this is reported (through the "e"), but the data are fine. Verkouter stresses that there can be many reasons for error messages on Mark5B, but the data can still be fine.

- Timeliness of disk shipments

- Leeuwinga notes that some stations follow Bologna rules, some send everything at end. Lindqvist would like to know what is preferred. Campbell does not have a strong preference.

## 6. Amplitude Calibration

- Presentation by Jun Yang: *Quality of calibration*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:calibration\\_onsala2012.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:calibration_onsala2012.pdf)

DBBC 16MHz: limited bandwidth. **ACTION** Tuccari: investigate if 16 MHz band shape can be improved

K-band:

- Robledo will measure opacity gain curve in July
- Noto is experiencing some problems with K-receiver
- Jodrell Bank: no diode in K-band receivers, no priority
- Kvazar: will be done soon (after fixing receiver)

- Timely delivery of ANTAB-files

Onsala has sent script to Kvazar for sending GPS info to vlbeer. **ACTION** Lindqvist: put script on wiki

- Presentation by Aard Keimpema: *Beam-shapes for calibrating off-axis detections*

<http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:tog-aard.pdf>

Point sources are needed for determining actual beam shapes. Only L and C bands are relevant.

**ACTION** stations: determine beam shapes, list elevation at which it was done, send results to Keimpema.

- New Antabfs script (part of Yangs presentation)

Jb will maybe have RDBE. Yang needs to know if all stations will use 80 Hz radiometry, or whether they will use RDBEs, before starting to write a script.

Bach has a script, which uses the FS logfile

**ACTION** Yang, Bach, Lindqvist, Himwich and Graham: discuss new script, present conclusions at next TOG

## 7. Digital BBC systems

- Presentations by Tuccari and Bach: *Short development and production status*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:dbbc\\_status\\_june\\_2012.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:dbbc_status_june_2012.pdf)

and *Continuous calibration with the DBBC*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:dbbc-continuous\\_cal.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:dbbc-continuous_cal.pdf)

Garcia-Miro mentions the DBC that is being built at Robledo. Discussion follows about VLBI technology meeting in autumn at Haystack that will have a 3-day workshop during which different backends will be compared. Possibly Robledo could join as well.

\*\*\*\*Lunch\*\*\*\*

Walter Alef is given a soccer shirt (captain of the Swedish national team, Zlatan Ibrahimović) signed by the attendants, to thank him for his long inspiring leadership as fearless captain of the TOG.

- DBBC experiences:

- Hartebeesthoek: Quick says it is surprisingly easy to set up, and that it is advisable to be on the mailing list, as it contains lots of important information. Lindqvist mentions the (not up to date) DBBC wiki page at Hobart. The 15m at Hh will be outfitted with DBBC next week.
- Onsala: Lindqvist says that IF level is the main concern, but system seems more or less ok now
- Irbene: DBBC working fine now. Progress was slow because of lack of experience and lack of second backend for comparison. Performance used to vary, but since 2 core boards were replaced it has been working fine. Tuccari has given input on configuration day before.
- Pico Veleta: not used for science recording yet. Advice to assemble on site, as shaking during transport can cause damage.

- Presentation by Tuccari: *Setting up the DBBC for 2 Gbps*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:dbbc\\_2\\_and\\_4\\_gbps.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:dbbc_2_and_4_gbps.pdf)

- Feedback from JIVE (Campbell): data quality much better

- Presentation by Nosov: *R1002M*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:nosov\\_evn\\_tog\\_meeting.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:nosov_evn_tog_meeting.pdf)

Should be included in DBC comparison workshop in Haystack. Invitation needed. **ACTION**

- Presentation by Zhao: *China Digital Acquire System (CDAS)*

<http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:cdas-evn-tog20120627.pdf>

## 8. JIVE

- Presentation by Szomoru: *Technical Operations and R&D at JIVE*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:arpad\\_tog12.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:arpad_tog12.pdf)

## 9. 2-4 Gbps observations EVN, EVN+VLBA

These topics were sufficiently covered during previous presentations and discussions. However, EVN+VLBA compatibility will have to be discussed during the next US-EVN teleconference.

## 10. Haystack

- Presentation by Smythe: *Haystack status report*

<http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:haystack.pdf>

## 11. Mark5

- Presentation by Smythe: *Status: Mark 5A/B/B+/C, software, firmware, SDK9*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:mark5ab\\_v3.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:mark5ab_v3.pdf)

Some confusion/slight panic about "critical" bug in latest Sdk9 related to incorrect output of scan\_check. Chet Ruszczyk is contacted and asked to join the telecon. Critical seems not to be critical after all, workable work-around exists (scan\_set before scan\_check should solve

problem). Version 9.2 nearly ready, but needs testing, Chet is looking for Westford time to do so. 9.2 should be capable of handling 3 TB disks.

- Short presentation by Lindqvist on disk inventory and purchase status. Lindqvist stresses that EVN science right now is limited by the size of the disk pool, and that the directors have agreed to spend 7 keuro/year/station on the purchase of disks. Everybody should make sure this money gets spent. **ACTION** all stations, purchase disks and/or disk packs.

- Presentation by Leeuwina: *Disk repair statistics*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:diskrepair\\_statistics.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:diskrepair_statistics.pdf)

Conclusion is that no clear evidence exists that large packs break more frequently than small ones. Smythe suggests investigating reliability of specific brands of disks through the disk drive serial number.

- Disk throughput: Campbell mentions that last session was very tight, but situation has improved.

## 12. NRAO

Presentation by Romney (via telecon): *NRAO status report*

[http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:120628\\_tog.pdf](http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:120628_tog.pdf)

Campbell asks about global compatibility. Romney answers that this should be topic of separate telecon.

Alef inquires whether the new VLBA synthesizer equals the Haystack down converter. Romney answers it is not a down converter, but generates LOs, and that it is not clear other institutes could use it easily.

## 13. Sched developments

Campbell mentions a number of points

- continually trying to find out what stations want to see in vex files
- often have to lie to Sched a bit
- new Kvazar backend support incorporated, not yet released
- request to everyone to follow Effelsberg DBBC rules
- DDC-related issues ok now, still learning about PFB
- IF channel naming problem has been solved
- .skd files are still copied from .vex; should let Drudge only use .vex

Romney mentions a problem that occurs when trying to use a subband requiring 3 digits or more (128MHz for example). It seems Sched then inserts a double asterisk in the \$FREQ section. This should have been fixed in the beta version.

## 14. Field System

- Presentation by Himwich: *Status report, new developments: Mark 5C, RDBE, DBBC, VDIF*

[http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:fs\\_tog\\_jun\\_2012.pdf](http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:fs_tog_jun_2012.pdf)

## 15. Technical priorities for the EVN

- Presentation Lindqvist: *Result of the JIVE user-questionnaire*

[http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:survey\\_report.pdf](http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:survey_report.pdf)

Lindqvist stresses that the highest ranking request of the users is for more and shorter baselines in the EVN (e.g., eMerlin, Sardinia Radio Telescope, Irbene, China, Korea, Ghana).

Quick gives some information on Ghana effort

- Ghana dish has been handed over by Vodaphone to government
- South Africa actively involved, trying to make 5 and 6.7 GHz work
- should give a dramatic improvement of UV coverage

Lindqvist urges everybody to take a look at the user questionnaire (part of JIVE review document)

Alef once again asks all stations to buy disks, 7 keuro per year should make it possible to sustain 2 Gbps recording.

## 17. Activities at potential new EVN stations

Presentation by Bezrukovs: *Irbene*

[http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:vl.bezrukovs\\_talk\\_evn\\_tog.pdf](http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:vl.bezrukovs_talk_evn_tog.pdf)

Alef ask about the precision of dish. Answer is 1-5 mm, the hope is that 22 GHz will be possible after (ongoing) improvements.

Lindqvist asks Irbene to send representatives to next TOW.

- Presentation by Jung: *KVN*

[http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:20120628-evn\\_tog-jung.pdf](http://www.radionet-eu.org/radionet3/wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-01:20120628-evn_tog-jung.pdf)

Alef asks about X-band. Jung says it will be implemented at some time, no fixed date yet.

Lindqvist suggests the KVN director should be invited to attend the CBD as observer.

## 18. RadioNet3

Lindqvist explains there is money for support, but less than under RadioNet FP7. TOG hosts will have to pay more out of their own budget than previously.

## 19. Date and place of the next meeting

As already decided, this will be in Bonn, March-April 2013. There will be a hands-on DBBC workshop in connection with the TOG. The TOG is part of the Radionet3 Network Activity ERA-Tec, and at some point combined meetings are called for (engineers/users/operators). The first meeting will possibly be held in Bonn.

### Action Items:

1. **Campbell** to let friends know where to find relevant SCHED catalogue information. Note that there is a permanent action item, “stations should ensure SCHED catalogue information is up-to-date.”
2. **Szomoru** to investigate if/how the number of ftp-tests could be increased, as a high time priority of the NEXPREs project.
3. **Lindqvist/Bach** to circulate input from Graham concerning implementing of continuous calibration with the DBBC.
4. **Lindqvist** to make sure that the next TOW covers all topics related to checking out a VLBI station.
5. **Lindqvist**: investigate if extra money is needed for DBBC spare parts.
6. **All**: check out the spare part list on the wiki and make sure that each institute contributes. [https://deki.mpifr-bonn.mpg.de/Working\\_Groups/EVN\\_TOG/EVN\\_spare\\_parts](https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/EVN_spare_parts)
7. **Bach**: Send out information on the Effelsberg 22 GHz phasecal system.
8. **Tuccari**: investigate if the DBBC 16 MHz band shape can be improved.
9. **Lindqvist**: put script that transfer GPS-data to vlbeer on the wiki.
10. **All L- and C-band stations**: determine beam shapes at L- and C-band, if possible at different elevations. Send results, as well as the elevation intervals used, to Keimpema.
11. **Yang, Bach, Lindqvist, Himwich and Graham**: discuss new ANTAB script, present conclusions at next TOG.
12. **Lindqvist/Szomoru**: get Haystack Observatory to send official invitation to Nosov so he can participate in the DBC comparison workshop.
13. **All**: Make sure that your station spends 7 keur/year on the purchase of disks.