RADIONET3

REPORT FROM TOG-MEETING
WP6 - ERATEC
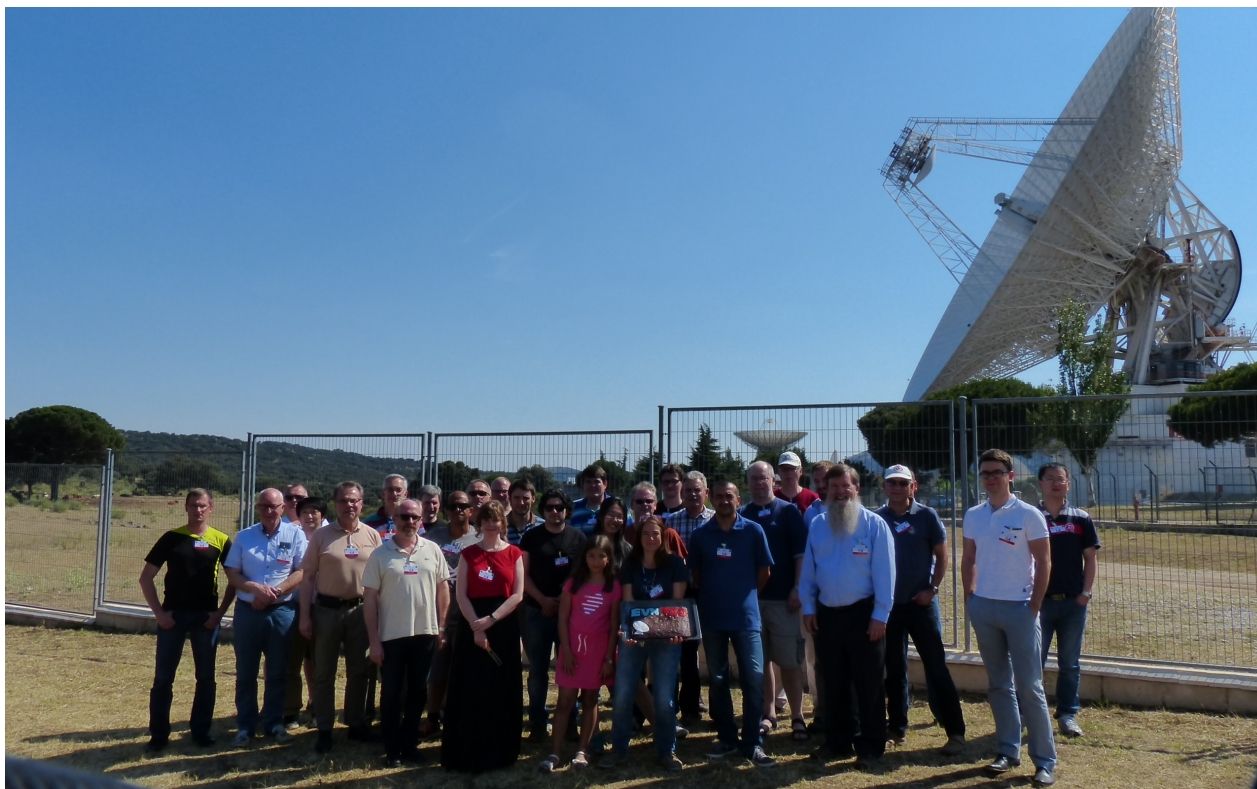
SUBJECT	**Report from TOG-meeting**
DATE	**26 June 2015**
PLACE	**Robledo, Spain**
PARTICIPANTS	**32**

Minutes from the meeting

Meeting photo taken at the TOG meeting in Robledo, Spain

Agenda:
http://www.radionet-eu.org/radionet3wiki/doku.php?id=na:eratec:tog:tog-meeting-05:tog-agenda-june2015

1. Local Arrangements/Opening Remarks
Garcia-Miro welcomes participants, explains the local arrangements, Vicente welcomes participants at his first TOG as chair.

Presentation by Vicente:
http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:tog_chair_robledo_2015.pdf

2. Approval and last minute additions to Agenda
No additions, agenda was approved

3. Acceptance of minutes from last meeting, Cagliari, October 5 – 6, 2014
Minutes were accepted without comments

4. Review of action items from Cagliari meeting

1. *All stations to measure beam-maps at L- and C-band (provided appropriate software is available at the telescopes) and send them to Keimpema.*
Keimpema has received a number of beam maps. Vicente has made a table on TOG wiki. Action remains.

2. *Upgrade to SDK9.4 first at the correlators then at the stations.*
Awaiting official release. Remains.

3. *All stations (except Wettzell): implement 80 Hz continuous calibration.*
Some progress, will be discussed during meeting. Remains.

4. *Verkouter to send out script of Quick to save logfiles to all stations.*
Done.

5. *Lindqvist to mention 80Hz issue at CBD, impress them with urgency and need.*
Done.

6. *Lindqvist, Yang, Agudo, Bach, Vicente to investigate how to improve K-band calibration, maybe using sky-dips.*
Yang: consensus is that it can be done. Done. New **ACTION** all stations: contact Vicente for explanation on method.

7. *Lindqvist to talk to Kvasar friends about possibility (and need) to provide Tsys.*
Lindqvist, Campbell, Gunn will have mini TOG in advance of PC meeting next week in Petersburg, will discuss this issue with Kvazar friends. Remains.

8. *Lindqvist, Bach, Yang to test DDC 105E mode, with the aim to use it operationally February 2015.*
Done.

9. *Verkouter to send another email to stations regarding the buffer (-b) mode of Jive5ab, which can be safely used now, and which enables automated fringe tests.*
Done.

10. *Szomoru to send out document to all stations dealing with the upgrade of Mark5 to Wheezy OS and SDK9.4.*
Awaiting roll-out of official version. Remains

5. Review of permanent action items

During review the following came up:
at sched_initi or exper_initi these FS commands should be available:

- dbbc=version (**ACTION** Himwich)
- fila10g=version (**ACTION** Himwich)
- jive5ab=version (**ACTION** Verkouter)
- FS command asking jive5ab for version (**ACTION** Himwich)

6. RadioNet3

Lindqvist mentions that next Technical Forum Workshop will be in Firenze in October 2015. Two days on receivers, one day on software.

7. Reliability/Performance of the EVN

- Reliability/Performance of the EVN (Duev)
- Pre-session checks, e.g., sampler stats, phase-cal, RFI, versions of schedules ... (Duev)
- NME results (Duev)
- Feedback from last sessions
- Presentation by Duev: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:duev_reliability_tog_robledo.pdf
    - o Rb: new backend, no Tsys. Looking into continuous calibration
    - o Alef suggests it might be worthwhile to talk about problems that could have been avoided, unlike things like the weather. Campbell mentions the feedback page for every station. Maybe we should go from experiment to station-based problem reporting. Quick thinks the feedback loop between TOGs is too long. This discussion resulted in a new **ACTION** on JIVE: set up a wiki page, summarizing problems per station. Stations must give response before each TOG.
    - o Gunn mentions problems with schedules, would like to change the use of .latest to make it impossible to get wrong schedule, possibly upload to server at JIVE. Problem that schedule version is a comment, which makes it hard to know if one is using the right version. **ACTION** on Campbell, Quick, Gunn, Himwich, Vicente, re-think way of distributing schedules.

8. Amplitude Calibration

- Quality of calibration (Duev)
- Timely delivery of ANTAB-files? (Duev)
- Presentation by Duev: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:duev_amplitude_tog_robledo.pdf

- o Vicente asks when calibration info becomes available. Duev answers this could be done on the fly. Campbell mentions this information is available per experiment. **ACTION** Campbell: have Duev adapt the script that he uses to generate tables, for rapid feedback. **ACTION** Vicente, send script he wrote for similar purpose to Duev.
  - o Gunn explains that there is no way of knowing what receiver will be used before telescope is available, as there are nine at Jb and they are not numbered. **ACTION** Vicente, attempt to raise priority of VLBI at Jb at the CBD.

- Continuous cal: availability at stations, switch between cont and non-cont cal, antab processing (Vicente, all)
- Presentation by Vicente (see agenda item 1)
  - o Vicente explains method at Yebes. Campbell remarks that Antabfs or log files not needed if the 80Hz results are believable. RXG file however still needed. Garcia-Miro asks whether other correlator (than SFXC) can handle cont cal. Alef answers that DIFX is capable, but it has not been exercised yet.
  - o Mh, Tr, Mc, Rb are in progress implementing the needed hardware
  - o Himwich: DRUDG could write a procedure to choose between cont. cal and not. Another method could be to set this up at receiver change, no need to change DRUDG. Vicente will give this a try.
  - o Alef asks whether stations should not produce Tsys curves anymore, consensus is that it is quite useful and stations should continue to do so.

9. Digital BBC-systems

- DBBC development and production status (Alef)
- Presentation by Alef: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:tog15_dbbc2.pdf
- DBBC OS security issues: Windows XP & Windows 7 (Hammargren)
  - o Hammargren: security of DBBC is iffy, probably best to keep isolated from outside world in local network until Tuccari fixes it. Embedded windows might be an option. Alef suggests Linux. No conclusion, but advice to stations to beware.
- DBBC spare parts (Vicente)
- Presentation by Vicente (see agenda item 1)
  - o Vicente mentions pool of spare parts in Bonn. If stations need parts, they should get in touch with Vicente or Wuenderlich. Stations have to pay for the transport of the parts, buy replacement parts and have them delivered in Bonn where they return to the pool.
- DBBC experience at stations (all)
  No comments

10. JIVE
Presentation by Szomoru: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:arpad_tog15.pdf

11. New observing categories
EVN+LBA (Szomoru)
Nothing to report

Out-of-Session observing (Gunn)
Gunn menstions that most RadioAstron observations are impossible for the EVN due to a number of constraints. An out-of-session triggered e-VLBI observations was asked by a PI, but this cannot be done

Joint frequency blocks (Gunn, Lindqvist)
Nothing to report

Triggered/interrupted e-VLBI observations (Szomoru)
Nothing to report

Can a triggered e-VLBI proposal overrun the chosen observing frequncy for a given e- VLBI session? (Lindqvist)
Gunn poses the general question how much time is needed for a change of frequency at the stations. A discussion follows on the implications of having some telescopes missing (who cannot change frequency or not fast enough). Final consensus is that the PC will impose a 24 hour limit on proposals that need a different frequency, without any guarantes.

12. Technical development

- Diskshipping-less operation (Yang, Eldering)
- Presentation by Eldering: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:tog2015-eldering.pdf
- Mark6 as a FlexBuff (Alef)
- Presentation by Alef: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:tog15_mark6.pdf
    o Mujunen makes the point that if disks are not to be sent, might as well use standard disks, diskpack enclosures are very expensive
- Transition to Flexbuff & Mark6. Mixed operations VSI/VDIF. (all)
- Towards 2-4 Gbps operation. Common frequencies (Vicente).
- Presentation by Vicente (see agenda item 1)

- o 2Gbps: Jb, Wb, Tr still only have 2 core boards, not enough, directors are aware. Campbell: 4Gbps will also pose problem with LO of VLBA. Alef: maybe move to 512 MHz in one chunk, let correlator sort it out. DSC mode in DBBC3, could be used in future. R2DBE has the same output. **ACTION** all: fill out the table on TOG wiki with available equipment.
- o Campbell notes that 4 core boards are also important for 1Gbps operations, as it then becomes possible to use the newest firmware and 16 MHz subbands, which have much better bandpass shapes.

- • DBBC3, RadioNet3/DIVA Task 2 (Alef)
- • Presentation by Alef: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:tog15_dbbc3.pdf
- • SFXC capabilities (Keimpema)
- • beam shape determination (Keimpema)
- • Presentation by Keimpema: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:beam_maps_robledo2015.pdf

13. Haystack
Presentation by Ruszczyk: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:haystackstatus_june26_15.pdf

14. Mark5,6

- • Status: 5A/B/B+/C,6, software, firmware, SDK9 (Ruszczyk)
  Presentation by Ruszczyk: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:mark5_june26_15.pdf
  - o Szomoru asks if SDK 9.4 for Wheezy can be released as soon as possible, without waiting for next Linux (Jessy or Jessica). Ruszczyk replies this will be done within roughtly two weeks
- • jive5ab (Verkouter)
- • Presentation by Verkouter: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:tog-robledo-jun2015-remote.ppt
- • Mark 5 problems encountered during last session, (all)
- • Disk inventory and purchase status (Vicente, all)
- • Presentation by Vicente (see agenda item 1)

- o Request to stations to update wiki when disk are bought. Plots show enormous amount of disk space at Ef, Alef confirms this is not only EVN pool. Discussion on number of disks needed for normal sessions, 2 Gbps in near future, when sending packs or using FlexBuff. Szomoru argues the numbers are different when using FlexBuff, as only correlator needs enough space to hold more than one session, as soon as each experiment is recorded at station it will be transferred, data can be erased at station thus greatly reducing need for storage at station. **ACTION** Campbell to come up with realistic numbers for disk space needed.

- Disk throughput at JIVE, balancing with NRAO, Astro/Geo pool, Radioastron pool (Campbell)
- Mark 5 logistics (repairs, shipping rules, VLBA shipping requirements, boxes, labels, etc.) (all)

15. NRAO

- NRAO status report (Romney)
- Presentation by Romney: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:150626_tog_back.pdf
  - o Alef asks whether whole band output could be implemented, no PFB, no DDC, like R2DBE. Romney is not sure but doubts it.

Clarification from J. Romney:

There is a "direct capture" path in both of the FPGA personalities we currently use in the RDBE. It does something similar to what Walter is asking for, but is limited by the capacity of the RDBE's Xilinx V5 chip. It was intended to support both bandpass plots (seldom done any more) and total-power measurements (implemented but not used currently). But it does not appear to be suitable for the operational use that Walter presumably has in mind. It cannot sample continuously, has no scheduled trigger for its sample blocks, and no formatted output.

16. Field system, status and new features

- Status report, new developments (Himwich)
- Cable wrap and pointing sector (Himwich)
- Presentation by Himwich: http://www.radionet-eu.org/radionet3wiki/lib/exe/fetch.php?media=na:eratec:tog:tog-meeting-05:fs_tog_jun_2015.pdf
  - o Alef asks whether 32 bit FS can be built on 64 bit systems. Himwich: probably not. Feiler asks if automatic detection of DBBC version will be made possible. Himwich answers this may happen.

17. SCHED developments

- Digital BBC-systems, Mark 5C, Mark 6, 2-4 Gbps operation etc. (Campbell)
- SCHED (all)

Long discussion by Campbell, summary will be provide before next TOG. ACTION Quick, Cambell, Vicente discuss SCHED, contact Amy Mioduszewski and Cormac Reynolds about Pointing sector and DBBC version handling.

18. Activities at EVN stations
No discussion

19. Activities at potential new EVN stations
No discussion

20. TOG Information Resources (Vicente, Alef, all)
No discussion

21. Upcoming meetings (Vicente)
TWS, Firenze, October 2015

21. Date and place of the next TOG meeting
Yebes, Spain, February 2016. The following one possibly St Petersburg, October 2016

22. AOB
None

Updated list of action items:

1. All stations to measure beam-maps at L- and C-band (provided appropriate software is available at the telescopes) and send them to Keimpema. Update the table with the current status at the TOG wiki.
2. Upgrade to SDK9.4 first at the correlators then at the stations.
3. All stations (except Wettzell): implement 80 Hz continuous calibration. Update the table with the current status at the TOG wiki.
4. Lindqvist to talk to Kvasar friends about possibility (and need) to provide Tsys.
5. Szomoru to send out document to all stations dealing with the upgrade of Mark5 to Wheezy OS and SDK9.4.
6. All stations: contact Vicente for explanation on method how to improve K-band calibration using sky-dips
7. Himwich: implement dbbc=version query in FS
8. Himwich: implement fila10g=version query in FS
9. Verkouter: implement jive5ab=version query
10. Himwich: implement query in FS to ask for jive5ab version
11. JIVE: set up a wiki page, summarizing problems per station. Stations must give response before each TOG.
12. Campbell, Quick, Gunn, Himwich, Vicente, re-think way of distributing schedules, to prevent wrong schedules from being observed.
13. Campbell: have Duev adapt the script that he uses to generate calibration tables, for rapid feedback.
14. Vicente, send script he wrote for similar purpose as described in action 9. to Duev.
15. Vicente, attempt to raise priority of VLBI at Jb at the CBD.
16. All: fill out the table on TOG wiki with frequency information. Important for the future 4 Gbps.
17. Campbell to come up with realistic numbers for disk space needed, both for disk-shipping and FlexBuff stations.
18. Quick, Cambell, Vicente discuss SCHED, contact Amy Mioduszewski and Cormac Reynolds about Pointing sector and DBBC version handling.

Information of the EC financial contribution

The EU project RadioNet3 has sponsored the TOG Meeting on June 26, 2015 in Robledo, Spain. The local organisation costs were supported in the level of ~2000 EUR, additionally the travel expenses of 6 participants were supported in the total range of ~4100 EUR:

- Roman Feiler, Nicolaus Copernicus University, Poland
- Roger Hammargren, Onsala Space Observatory, Sweden
- Ed Himwich, NASA/NVI, USA
- Antonis Polatidis, ASTRON, The Netherlands
- Jonathan Quick, Hartebeesthoek Radio Astronomy Observatory, South Africa
- Jun Yang, Onsala Space Observatory, Sweden