EVN TOG Meeting

Cagliari Astronomical Observatory, Sardinia, Italy

October 6, 2014

Minutes from the meeting

Participants:

http://evn-tog-sardinia-2014.oa-cagliari.inaf.it/

by phone: Jon Romney (NRAO)

Agenda (with presentations):

http://www.radionet-eu.org/radionet3wiki/doku.php?id=na:eratec:tog:tog-meeting-04:tog-agenda-oct2014

1. Local Arrangements/Opening Remarks
(Michael Lindqvist, chair)

Lindqvist welcomes the participants, opens the meeting. The director of CAO, Andrea Possanti, also welcomes the participants and gives a presentation on the history and current activities of the observatory.

2 Approval and last minute additions to Agenda

No additions, Agenda was approved

3 Acceptance of minutes from last meeting, Wettzell, January 23-24 2014

Minutes were accepted without comments

4 Review of action items from Wettzell meeting

1. Lindqvist to change Bologna rules to change responsibility for ANTAB file generation.
   - Changed to permanent action items. Done.
2. Noto to install and use automatic upload of logs.
   - Done.
3. Quick to send info on new ANTABFS to EVNTech.
   - Done, info has been sent to friends.
4. All stations to measure beam-maps at L- and C-band (provided appropriate software is available at the telescopes) and send them to Keimpema.
   - Few beam maps have been received. Lindqvist urges stations to provide beam maps, needed for multiple phase center observations, better data. Remains.
5. Keimpema: The difference between the theoretical and measured beam correction for the relevant part of the beam has to be investigated.
   - Done.
6. Bach, Quick, de Vicente, Verkouter create test specs/procedures for DBBC (possibly including JIVE5abc).

- Bach has sent the link to the wiki page to EVNTech. Will update procedures, send note to EVNTech when done. Done.
7. Lindqvist will schedule a meeting discussing how to move forward on 2-4 Gbps in the EVN.
   - Done.
8. All to look at document written by Himwich to find out consequences for own telescope. ftp://ivscc.gsfc.nasa.gov/pub/TOW/to...mwich.Sem2.pdf
   - Done.
9. Verkouter: to add info on content of module before conditioning is started.
   - Done.
10. Verkouter: speed of conditioning to be displayed during conditioning and summary at the end (min, max, average) as is done by mk5erase (DiFX).
    - Done.
11. Switching on the module in bank B in a few cases has reset or modified the write pointer in bank B. Quick to send a message about this problem to EVNTech.
    - Done. Verkouter mentions he has not seen this behaviour in past months.
12. Verkouter to also save log file of jive5ab.
    - This has to be done at stations. Quick has script. Remove this action, new ACTION on Verkouter to send out script to stations
13. Upgrade to SDK9.3a first at the correlators then at the stations.
    - CHANGE action, upgrade to SDK9.4
14. All stations (except Wetzell): implement 80 Hz continuous calibration.
    - Stays, new ACTION Lindqvist, mention this issue at CBD.
15. Helldner to send info on 80 Hz unit to EVNTECH & wiki.
    - Done.
16. All stations: report Mark5C bugs to Ruszczyk.
    - Move to permanent action items.
17. Bach to send out a script on how to display the autocorrelation for all modes to EVNTech.
    - Done.

5 Review of permanent action items

Done

6 RadioNet3

Lindqvist notes that three technology workshops have been held so far, among others dealing with RFI calibration and antenna metrology. Proposals for topics are asked for a next meeting, which will probably take place in Firenze.

Paragi mentions the database which holds relevant telescope information, he will contact Stagni to ask him to give login access to the VLBI friends at the telescopes. After this they should be able to fill out the missing information in the database. The required information is what can be observed with their particular telescope, how proposals can be submitted, etc.

- *Synergy RadiotelDB* (Paragi)

7 Reliability/Performance of the EVN

- Reliability/Performance of the EVN (Agudo)
- Pre-session checks, e.g., sampler stats, phase-cal, RFI … (Agudo)
- NME results (Agudo)

- Feedback from last sessions (Agudo)

- Presentation by Agudo: *EVN Performance and Reliability*

- Jb: P-band had crosstalk, this is being looked at
- Mc: working on fixing motor trouble
- Nt: wrong LO setting due to human error
- Mh: did not realize re-calibration was needed after fix
- Jb: no fringes L-band: reason still unknown
- Tr: DBBC sent to Bonn for repairs
- Vicente asks whether opacity information would be useful. Agudo answers it would be somewhat useful, but hat not all stations are capable of providing this.

8 Amplitude Calibration

- Quality of calibration (Agudo)
- Timely delivery of ANTAB-files? (Agudo)

- Presentation by Agudo: *EVN Amplitude calibration*

Jb: Gunn explains that calibration at C-band of Lovell is not working at all, because of the poorly known pointing. Hopefully there will be a fix next year, when a bar code has been placed along the track. Cullen is currently working on Tsys, and has found power fluctuations on a 10 minute timescale. Still unknown where these originate, might be the IF.

Porcas notes that the MarkII is the default for C-band, unless specifically requested, so there should normally not be any use of Lovell for C-band.

Discussion on the use of sky dips to improve Tsys determination. Kvazar does not provide Tsys at all. Porcas wonders whether it would be possible to induce Kvazar to provide Tsys through the CBD.

ACTION Lindqvist, Yang, Agudo, Bach, Vicente: investigate how to improve K-band calibration, maybe using sky-dips.

ACTION Lindqvist: talk to Kvasar friends about possibility (and need) to provide Tsys.

9 Digital BBC-systems

- DBBC development and production status (Alef)
- DBBC spare parts (Lindqvist)
- DBBC experience at stations (all)

- Presentation by Alef: *DBBC Production and delivery status*

Lindqvist reminds the VLBI friends of the EVN spare parts list:

https://deki.mpifr-bonn.mpg.de/Working_Groups/EVN_TOG/EVN_spare_parts

In order to move to 2Gbps operations in the EVN, new DBBC firmware which is currently only available as a beta release will be needed.

ACTION Lindqvist, Bach, Yang: test DDC 105E mode, with the aim to use it operationally February 2015.

Alef: everybody should consider Fila10G operations, with ethernet connection to Mark6 or FlexBuff

10 JIVE

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

11 New observing categories

- EVN+LBA (Szomoru)
- Out-of-Session observing (Gunn)
- Joint frequency blocks (Gunn, Lindqvist)
- Triggered/interrupted e-VLBI observations (Kettenis)

- Presentation by Szomoru: *Joint EVN – LBA observing*
- Presentation by Gunn: *OoS Observations*
- Presentation by Kettenis: *Automated triggers*

Gunn mentions that scheduling efficiency is currently at about 50%, and that this is mainly the result of a lack of recording media. Efficiency might be improved somewhat by meshing bands, which is only possible for sets of telescopes that can switch rapidly between specific bands.

Kettenis presents results of automated trigger tests, a long discussion follows on rules and decision making for triggers.

12 Technical development

- Diskshipping-less operation (Yang, Verkouter), tog-sardinia-okt2014-eshipping.pdf
- Towards 2-4 Gbps operation (Szomoru)

- Development of a Low-noise wide-band integrated amplifier for VLBI antennas, RadioNet3/DIVA Task 1 (Alef)
- DBBC3, RadioNet3/DIVA Task 2 (Alef), dbbc3_evn_symposium_2014.pdf

- Presentation by Verkouter: *e-Shipping*
- Presentation by Szomoru: *Towards 2-4 Gbps operations*
- Presentation by Alef: *DBBC3 Development*

The point is made, with respect to the first two topics, that until now only Ef and the KVN have Mark6 units.

13 Field system, status and new features

- Status report, new developments (Himwich)

Presentation by Himwich: *Field System Topics*

14 Haystack

- Haystack status report (Ruszczyk)

- Presentation by Ruszczyk: *Haystack status*

15 Mark5, 6

- Status: Mark 5A/B/B+/C,6, software, firmware, SDK9 (Ruszczyk)

- Presentation by Ruszczyk: *Mark5 software status*

Change of agenda: because of the availability of NRAO via telecon items 16 and 17 are moved forward. The remainder of item 15 will follow afterwards.

16 SCHED developments

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

Campbell gives a talk, makes the following points:

- SCHED versions 11.2 and above (current = 11.3u1) provide VSI-astro consistent bit-stream ordering (in the $TRACKS section, where the track number is the 0-based bit-stream number +2) and also DBBC support (the dodge of having DAR=NONE in the stations.dat catalog is no longer required).

- SCHED can currently handle 2 Gbps schedules -- but for the DBBC/DDC to allow

32MHz subbands & associated 64 Mbps sampling rate, 1 line of code in each of chkdbbc.f and chkdbfq.f need to changed. (for the moment, DAR=NONE in the stations.dat catalog can avoid this).

- Campbell is in favor of the original plan for getting DBBC-consistent station patching info into the freq.dat catalog. Inidividual PIs are therefore still provided with "setini" plug-ins for their key-file(s) prior to each session.

- Feedback to the stations about their pointing-sector control information currently in the sched stations.dat catalog is still due (re: discussion from Wettzell TOG meeting).

From NRAO, via telecon, Martin Pokorny tells us that a person has been identified to take over from Walker when he retires. NRAO however will not support developments for non-NRAO capabilities without some sort of agreement.

Lindqvist notes that the only thing that can be done from the side of the TOG is to bring this issue to the board. JIVE does not have the resources to take over this task.

17 NRAO

- NRAO status report (Romney)

- Presentation by Romney: *NRAO status report*

Lindqvist updates Romney on the plans to test the 32MHz DDC mode in the EVN.

15 Mark5, 6 (continued)

- jive5ab (Verkouter)
- Mark5/FS status at EVN stations (Szomoru)
- Mark 5 problems encountered during last session (all)
- Disk inventory and purchase status – 7000 € per station/year (Lindqvist, all)
- Disk throughput at JIVE, balancing with NRAO, Astro/Geo pool (Campbell)
- Mark 5 logistics (repairs, shipping rules, VLBA shipping requirements, boxes, labels, etc.) (all)

- Presentation by Verkouter: *jive5ab current status*
- Presentation by Szomoru: *Mark5 status at EVN stations*

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

Ruszczyk mentions that SDK8.2 cannot be upgraded tot 9.4 in one go, needs intermediate step via version 9.

ACTION Szomoru: send out document to all stations dealing with the upgrade of Mark5 to Wheezy OS and SDK9.4.

Request was made to Szomoru to have the test stations removed from the status table.

Discussion on 7000 € per station/year: not clear all stations actually purchase this many disks. Should there be a push for more money? More FlexBuffs? Gunn reiterates that scheduling efficiency would go up with more media.

Campbell reports that recent sessions remain disk-limited. The return of global observations, mostly correlating in JIVE, has put new pressure on the pack pool (NRAO stations rejoin at Gbps; globals correlating at JIVE require pre-positioning of packs to NRAO to maintain trans-Atlantic pack-flux balance). According to the TOG wiki, the current EVN-available pack reservoir was 1838 TB; with the 2-session recycling rule, each session would therefore "have" 969 TB. In the Oct/Nov session, the original block schedule correlating all globals at JIVE would have called for ~1500 TB. Moving 2 globals to Socorro lowered that to ~1200 TB. Dropping some observations further lowered it to ~900 TB.

Alef raises a question about whether small disk packs should be retired. Campbell notes that they are not being shipped anymore, anyway PATA disks cannot be sent to Socorro.

18 Activities at EVN stations

• The new radome for the OSO 20 m telescope (Hammargren)

Hammargren shows a very nice presentation of the refurbishing of the radome, the presentation however is too big to upload.

Jung reports Wagner is currently working at KVN

19 Activities at potential new EVN stations

No reports

20 Upcoming meetings

• EVN Symposium and Users' Meeting, Cagliari, Italy, 7-10 October 2014
• 3rd International VLBI Technology Workshop, JIVE, The Netherlands, 10-13 November, 2014
• Eighth IVS Technical Operations Workshop, Haystack Observatory, Westford, USA, 4-7 May, 2015
• TWS, 2015

21 Date and place of the next TOG meeting

Robledo Spain, June 26 2015

22 AOB

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.
2. Upgrade to SDK9.4 first at the correlators then at the stations.
3. All stations (except Wettzell): implement 80 Hz continuous calibration.
4. Verkouter to send out script of Quick to save logfiles to all stations.
5. Lindqvist to mention 80Hz issue at CBD, impress them with urgency and need.
6. Lindqvist, Yang, Agudo, Bach, Vicente to investigate how to improve K-band calibration, maybe using sky-dips.
7. Lindqvist to talk to Kvasar friends about possibility (and need) to provide Tsys.
8. Lindqvist, Bach, Yang to test DDC 105E mode, with the aim to use it operationally February 2015.
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.
10. Szomoru to send out document to all stations dealing with the upgrade of Mark5 to Wheezy OS and SDK9.4.