



# Report from the event supported by RadioNet

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**TITLE** *TOG & GTG MEETINGS*

**DATE:** *26 JUNE 2019*

**LOCATION:** *JODRELL BANK, MANCHESTER, UK*

**MEETING WEBPAGE:** [https://radiowiki.mpifr-bonn.mpg.de/doku.php?id=na:sustainability:tog:2019\\_06](https://radiowiki.mpifr-bonn.mpg.de/doku.php?id=na:sustainability:tog:2019_06)

**HOST INSTITUTE:** *JODRELL BANK OBSERVATORY (UNIVERSITY OF MANCHESTER)*

**RADIONET  
BENEFICIARY / NO:** *UAH / 12*

# Report:

## 1 SCIENTIFIC SUMMARY

### LINKS

The following public pages contain information about the meeting:

1. [https://radiowiki.mpifr-bonn.mpg.de/doku.php?id=na:sustainability:tog:2019\\_06](https://radiowiki.mpifr-bonn.mpg.de/doku.php?id=na:sustainability:tog:2019_06)
2. <https://events.mpifr-bonn.mpg.de/indico/event/112/>

### OBJECTIVES OF THE MEETING

The TOG (Technical and Operations Group of the EVN) meeting takes place every 9 months in a different observatory of the EVN to allow a direct exchange of technical expertise and experience between the station personnel. Every 18 months the TOG meeting is held together with a meeting of the GMVA technical group (GTG). The meetings are attended by VLBI friends and technical staff of the stations and the correlators as well as by selected external experts. The meeting reported about here took place in Jodrell Bank, belonging to the University of Manchester and lasted one day. This meeting was locally organized by Jodrell Bank Observatory, University of Manchester, which hosted the meeting at the new SKA building in Jodrell Bank.

The general objective of the TOG meeting is to identify operational issues of the EVN and GMVA infrastructures and discuss strategies to mitigate those in the future. Permanent agenda items deal with improving the quality of calibration, maintenance of the data acquisition and recording equipment as well as of the used software components. In addition strategies of improving the scientific capabilities of the infrastructures are being discussed. The main results of the Jodrell Bank meeting will be discussed in the following section.

The presentations and subsequent discussions can be found in the minutes of the meeting.

### MAIN RESULTS OF THE JODRELL BANK MEETING

Several issues were reviewed of which the 2 Gbps problem was the most critical one. In the previous TOG meeting a road map to solve the problem was set. In between both meetings the EVN has recovered its capability to record at 2 Gbps using DDC mode version 107, which has been extensively tested within the network. Furthermore the new version allows to record at higher speeds: 4 and 8 Gbps.

Other issues were related to the continuous calibration a long sought goal which is finally been achieved, synchronization issues related to the GPS rollover and its impact on the VLBI backends and potential solutions, eVLBI progress incorporating more stations, DBBC3 software developments, Field System developments, status of the 32 Gbps project, media requirements for higher recording rates, code sharing via git hub. The most important conclusions of all discussions among the members are collected at the minutes and presentations from participants can be found at the wiki web page.

The list of action items together with the people they have been assigned to can be found within the minutes of the meeting, which can be looked up at this link:

[https://radiowiki.mpifr-bonn.mpg.de/lib/exe/fetch.php?media=na:sustainability:tog:2018\\_10:tog\\_2018\\_2\\_minutes.pdf](https://radiowiki.mpifr-bonn.mpg.de/lib/exe/fetch.php?media=na:sustainability:tog:2018_10:tog_2018_2_minutes.pdf)

## AGENDA OF THE EVENT

### JUNE 26<sup>th</sup> 2019

1. Local Arrangements/Opening Remarks (Bach, Gunn, García Miró)
2. Welcome by Phil Diamond and Simon Garrington
3. Approval & last minute additions to Agenda (all)
4. Acceptance of minutes from last meeting (all; Minutes from Granada meeting)
5. Review of Action Items from last meeting (all; see Action Items from last meeting )
6. Review of Permanent Action Items (all; see Permanent Action Items)
7. Reliability/Performance of the EVN
  - Reliability/Performance of the EVN. (Benito)
  - NME results (Benito)
  - Feedback from last sessions. (Benito)
  - Amplitude calibration. (Benito)
8. Amplitude Calibration
  - Review of continuous cal at the stations (Bach)
9. VLBI backends
  - DBBC2 and Fila10G news (Bach)
  - DBBC2 firmware: V107 (Bach & all)
  - Other VLBI backends: MDBE, OCTAD news
10. Recorders: Mark 5, Mark6, Flexbuf
  - Recorder news/problems (all)
  - Flexbuff status and 2 Gbps (all)
  - RadioAstron disks at Bonn (Rottmann)
  - Disk inventory and purchase status (Bach, all)
  - Future media requirements, Flexbuff upgrades (Bach)
11. Stations
  - Any news? (All)
  - JBO updates (Cullen).
  - Activities at Mc, Nt, and Sr (Orlati, Surcis, Migoni).
12. eVLBI
  - Current status, new stations, 2 Gbps, ...
  - Correlator capabilities.
13. JIVE
  - Technical Operations and R&D at JIVE, (Szomoru)
14. Technical Developments
  - Report on higher incremental recording rates up to 32 Gbps (Szomoru).
  - 32 Gbps the correlators view (Kettenis)
  - VOEvent demo (Kettenis)
  - pySCHED (Eldering)
  - DBBC3. Current status. Backwards compatibility and available firmware (Bach)
  - 2 Gbps at L-band (Bach)

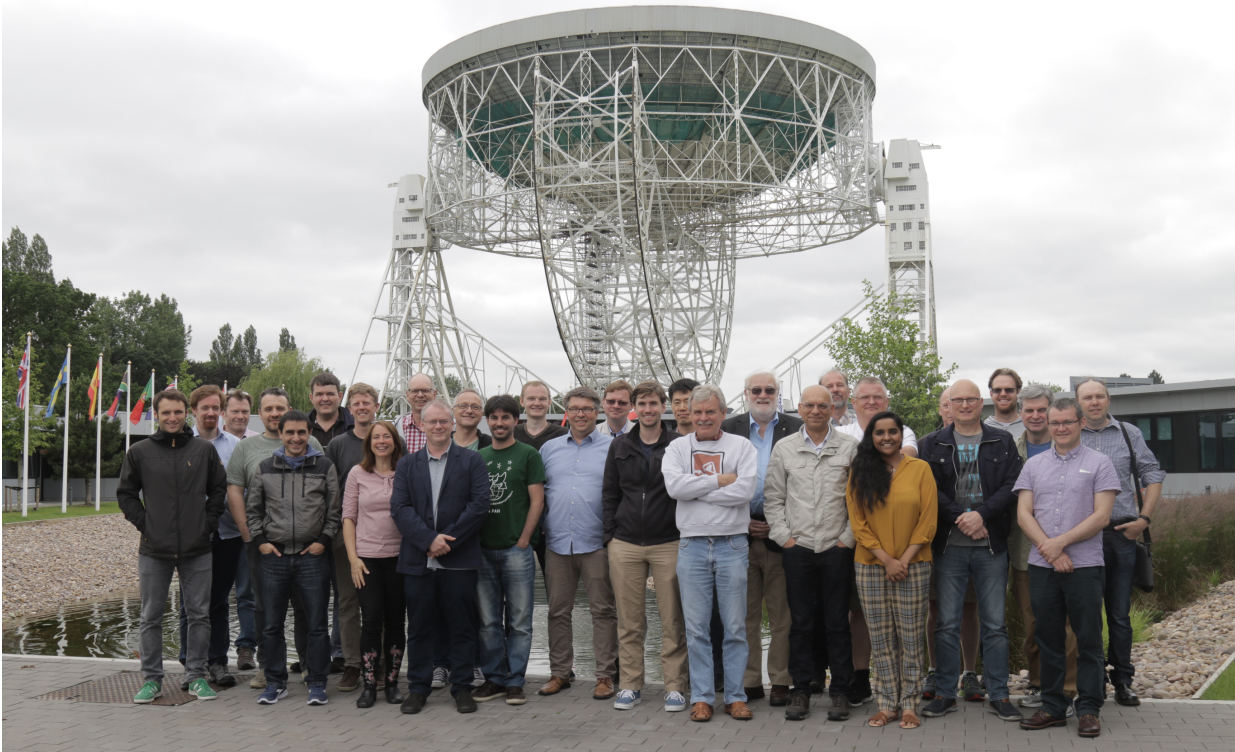
- Available IF bandwidth at all bands, receiver developments (Bach)
  - Auxiliary scripts & central repository? (Bach)
15. Field System, status and new features
- Status report, new developments (Horsely/Himwich)
16. VLBA
- VLBA status report (Brisken)
  - Globals and recording compatibility. Recorded Mark6 operations.
17. Jumping JIVE
- WP5. New stations.
18. Long term future
- DBBC3 tests & future implementation at the FS
  - Review of potential developments in the next 2-3 years
19. Date and place of the next TOG meeting
- To be decided
20. Date and place of the next TOG meeting
- To be decided
21. AOB

**TOG presentations:**

- U. Bach: TOG Chair slides
- B. Marcote: EVN stations - Reliability and Performance
- Cullen/Varenius: eMerlin and JBO updates
- G. Surcis: Developments at Italian VLBI antennas
- A. Szomoru: Technical Operations and R&D at JIVE
- H. Rottmann: GMVA 4 Gbps fringe test
- M. Kettenis: 32 Gbps - A correlators view
- B. Eldering: pySCHED
- G. Tuccari: DBBC2/3 deployment status
- Himwich/Horsely: Field System development

## 2 PARTICIPANTS

There were 26 attendants, from 11 different countries of Europe, Asia, America and Africa. Only one woman attended the meeting. The conference picture was taken in front of the SKA headquarters in Jodrell Bank where the meeting took place.



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### 3 RADIO NET FINANCIAL CONTRIBUTION

One external expert funded by RadioNet attended: the current co-maintainer of the VLBI-Field-System, the control program used to drive the antennas and manage the VLBI backends and recorders at almost all of the EVN and GMVA stations.

In total 8 attendants received economic support from RadioNet for the attendance.

The University of Manchester, a RadioNet Institute, paid for the lunch and coffee breaks that took place at the location of the meeting and will claim these expenses later to RadioNet Management.

### PUBLICATIONS

All talks, presentations, station and correlator reports and minutes of the meeting are public available at the RadioNet web site: [https://radiowiki.mpifr-bonn.mpg.de/doku.php?id=na:sustainability:tog:2019\\_06](https://radiowiki.mpifr-bonn.mpg.de/doku.php?id=na:sustainability:tog:2019_06)

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