

Network Coordinator Report

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Abstract

A brief report on network performance is presented. Most of network operations went well. Some positive developments are identified. There were a few significant problems, mostly with antennas and receivers. New antennas in Australia and New Zealand started observing. New antennas are under development in the USA. There are prospects for Korea, India, and Saudi Arabia to start contributing to IVS. Other activities of the Network Coordinator are summarized.

1. Network Performance

The overall network performance was for the most part good. As occurred last year, this year's report does not include the usual detailed assessment of overall network performance (but we hope to include it again next year). However, the usual average single station loss of 10-20% probably occurred again this year.

One of the positive developments this year is the increased use of e-transfer with data from Ny-Ålesund, Fortaleza, AuScope, and Warkworth now being largely e-transferred. This speeds data transfer and reduces shipping costs. Another positive development is that Mark 5B recorders were installed at several stations. This improves correlator efficiency. A third development is that digital back-ends are starting to be used at more stations for operations. The DBBC developed by the EVN is being used at Hobart, Katherine, Yarragadee, and Warkworth (which is another positive development—the latter three stations just started observing this year). The Haystack/NRAO-developed RDBE is nearing readiness for observations and is expected to start being used in 2012.

Overall, while the network operated well for the most part, there are a few notable issues (in alphabetical order), while some situations improved from the previous year:

- Badary, Svetloe, and Zelenchukskaya had intermittent antenna problems that caused occasional data losses.
- Fortaleza started observing again after being off the air for more than a year. Its SEFDs are now a little higher than before. This may be related to increases in local RFI.
- Hobart, Katherine, and Yarragadee have timing issues with the DBBC back-ends. These cause occasional clock breaks and data gaps when they occur. The manufacturer is investigating this issue.
- Kokee Park's damaged gearbox was repaired and was re-installed. This improved the antenna's pointing and its SEFDs but did not return them to their normal levels. There are still problems with both azimuth gearboxes that will need to be repaired.
- Matera repaired its X-band cryogenic system.
- The receiver at Medicina warmed up in November 2011. It is not clear when it will be repaired.
- Noto is repairing its bearing and is expected to return to operations in the spring of 2012.
- Ny-Ålesund has had higher than normal SEFDs since about May 2010. The cause of this was found and repaired.

- Ny-Ålesund's receiver communications has failed. A back-up system is being used to control the noise diode for system temperature measurements until the receiver can be repaired. Otherwise this is not currently impacting operations.
- TIGO has shown higher than normal SEFDs for several years. There has been no success in resolving this issue.

2. New Stations

There are prospects for new stations on several fronts. These include (in approximate order of how soon they will start regular observations):

- At Wettzell in Germany, construction of the new Twin Telescope Wettzell (TTW) for VLBI2010 is underway.
- At GSFC in the USA, a new 12-m antenna has been erected and is undergoing testing. While this antenna is primarily for use in the development of the VLBI2010 systems, it is expected that it will eventually join the network for regular observing.
- At Arecibo in Puerto Rico a new 12-m antenna has been erected and is expected to be used for geodetic observing.
- In Spain/Portugal, the RAEGE (Atlantic Network of Geodynamical and Space Stations) project aims to establish a network of four fundamental geodetic stations including radio telescopes that will fulfill the VLBI2010 specifications: Yebes (1), Canary Islands (1), and Azores (2).
- In Norway, the Norwegian Mapping Authority (NMA) has received initial funding for a project to establish a fundamental station at Ny-Ålesund, which will include a twin telescope of the Wettzell type.
- Onsala has applied for funds for a twin telescope system.
- In Russia, an effort is underway to get 12-m VLBI2010 antennas at some of the QUASAR network sites.
- Korea is planning to build one antenna primarily for geodesy (Korea VLBI system for Geodesy, KVG) at Sejong. There is also interest in geodetic use of the Korean VLBI Network (KVN), which will consist of three stations intended primarily for astronomy.
- There is interest in India in building a network of four telescopes that would be useful for geodesy.
- Saudi Arabia is investigating having a combined geodetic observatory, which would presumably include a VLBI antenna.
- Colombia is investigating having a combined geodetic observatory, which would presumably include a VLBI antenna.

Many of these antennas may become available for use in the next few years. Efforts are being made to ensure that these antennas will be compatible with VLBI2010.

3. Network Coordination Activities

Network coordination involved dealing with various network and data issues. These included:

- Reviewing all experiment “ops” messages, correlator reports, and analysis reports for problems and working with stations to resolve them
- Responding to requests from stations for assistance
- Identifying network station issues and working with the Coordinating Center and stations to get them resolved. This year these included:
 - Dealing with Mark 5 recording problems
 - Adjusting procedures for correct monitoring of Mark 5 timing
 - Implementing strong passwords for Mark 5 systems
 - Identifying incorrect resistors on Mark 5 motherboards
 - Preparing Mark 5 modules for use and correcting VSN problems
 - Checking Mark 5 modules for correct alignment
 - Maintaining FS PC kernel
- Planning for possible USA government shutdowns and providing alternate servers for operational data and messages
- Collecting information for RFI protection of sites
- Participating in development of the new VEX2 schedule file standard
- Helping to coordinate Mark 5B transitions at Kokee, Ny-Ålesund, TIGO, Matera, and HartRAO
- Developing a database of Mark 5 recorder version information to help identify station capabilities and which stations need upgrades to be compliant
- Assisting with Warkworth antenna calibration
- Preparations and support for CONT11, including:
 - Preparing plans for handling cable wrap issues at schedule change and break times. These can be avoided in the future if schedules are built continuously across day changes and if the tag-along observations during station breaks are built into the original schedule instead of being added afterwards.
 - Identifying stations unable to support SATA modules and developing work-arounds so all scheduled data can be recorded on available modules.
 - Preparing station test procedures and reviewing results from stations.
 - Assisting with problems during experiments.
- Updating RDV experiment VEX files to allow proper operation with the VLBA correlator, updating the notes file to reflect equipment set-up at different stations, and encouraging timely shipping of data.
- Installing software to support a MET3 instrument at Westford.

4. Future Activities

Network coordination activities are expected to continue next year. The activities will largely be a continuation of the previous year's activities:

- Reviewing all experiment “ops” messages, correlator reports, and analysis reports for problems and working with stations to resolve them
- Responding to requests from stations for assistance
- Identifying network station issues and working with the Coordinating Center and the stations to get them resolved.
- Updating Network Station configuration files.
- Other activities as needed.