

The Bonn Astro/Geo Mark IIIA Correlator

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The Bonn Astro/Geo Correlator is located at the Max-Planck-Institute for Radio Astronomy, Auf dem Hügel 69, D-53121 Bonn, Germany. The Bonn Astro/Geo Correlator is a joint activity of the Max-Planck-Institute for Radio Astronomy, Bonn, of the Bundesamt für Kartographie und Geodäsie, Frankfurt a.M., and of the Geodetic Institute of the University of Bonn sharing the responsibilities for acquisition, maintenance and operation.

Currently, geodetic correlations are scheduled for 40% of the operation time and 60% are used for astronomical experiments. The routine correlation tasks, mainly starting computer programs and changing tapes, are performed by up to four under-graduate students providing on average about 50 hours of operational geodetic correlations per week. Arno Müssens and Mauro Sorgente set up the necessary computer files, do fringe search and supervise the students. They are also responsible for additional more sophisticated correlation tasks which require more knowledge and experience.



Figure 1. Bonn Correlator: Tape Drive Section

The following projects have been correlated at the Bonn correlator during the last year:

- **International Radio Interferometric Surveying - South (IRIS-S)**
Twelve Sessions per year with the stations Wettzell, HartRAO, Fortaleza, Fairbanks and Westford
- **Continuous Observations of the Rotation of the Earth - O'Higgins (CORE-OHIG)**
with stations HartRAO, O'Higgins, Fortaleza, Hobart, Kokee and DSS45 plus one session also including the Japanese Antarctic station Syowa
- **Measurement of Vertical Crustal Motion in Europe by VLBI (EURO)**
(EU Project FMRX-CT960071)

Six sessions per year with the stations NyÅlesund, Onsala, Wettzell, Simeiz, Madrid (DSS65), Yebes, Medicina, Matera and Noto. Effelsberg and TIGO-WTZL participated occasionally.

- **Phase delay and polarization test**
with a subset of European stations (appended to 2 EURO sessions)

- **Wettzell local ties (WTIES)**

Two sessions between Wettzell 20-m telescope and TIGO-WTZL which are about 59 m apart

The Bonn Astro/Geo Mark III Correlator is a shared correlator consisting of two blocks of correlator modules for $6 \cdot 14$ tracks and $12 \cdot 14$ tracks permitting simultaneous correlation in mode C of 3 and 12 baselines, respectively. However, only 10 baselines are correlated routinely in one pass of the 12-crate correlator due to organizational and data flow limitations. The three-baseline correlator is only used for fringe search and sessions which need only a limited number of correlator crates. The data flow and hardware are controlled by HP1000F and HP1000-A900 computers. Eight Metrum/Honeywell playback drives may be switched between correlator units for efficient use of resources. The correlator output is temporarily stored on HP1000F system disks for subsequent transfer to a HP9000-7xx HP-UX computer for fringe fitting, archiving, and export.



Figure 2. Bonn Correlator: Correlator Modules

After their release and degaussing the Mark IIIA tapes are sent back to the observatories for further recordings. At present two types of tapes are in use, regular tapes and extra thin tapes with double recording capacity. In order to keep the wear of the recording magnetic heads low, only one type of tape should be used at a station throughout. However, there is a shortage of thin tapes causing a large discrepancy between tapes requested by the observatories and those being sent to the Bonn correlator. The lack of thin tapes requires additional transportation of tapes from the US correlators to observatories to compensate for the regional imbalance of thin tape supplies. Additional thin tape purchases by BKG are urgently envisaged.

Within the next year the current Mark IIIA correlator will be replaced by a Mark IV correlator for nine stations. The existing playback tape drives have already been upgraded with Mark IV/VLBA style control electronics (32 tracks) and thin tape capability. The infrastructure for the new correlator is being completed and the delivery of the correlator modules is expected soon.