German Antarctic Receiving Station O'Higgins

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Abstract

Ten VLBI sessions of 24 hours have been observed successfully during the last three Antarctic campaigns. A H-maser failure stopped the last experiment. The local ties have been controlled. Modifications of the timing system by a TAC have been done. The collocated geodetic systems (GPS, PRARE, etc.) continued to provide data. The upgrade to MkIV is planned for the spring campaign 2001.

1. Observation Campaigns at O'Higgins 1999/2000

During the period from March 1999 to December 2000 three VLBI observation campaigns were organized at the German Antarctic Receiving Station (GARS) O'Higgins by staff members of BKG (Federal Agency for Cartography and Geodesy) in cooperation with the colleagues from DLR (German Aerospace Center - responsible for SAR Data Acquisition).

Figure 1. Schmitt Island with the Chilean base and the annexed German station O'Higgins during the Antarctic spring time – October 1999.

During the three campaigns at O'Higgins altogether ten 24-hour VLBI experiments were carried out. The observations were mainly focused on the special IVS CORE O'Higgins (COHIG) experiments, namely the experiments COHIG 7 to COHIG 13. In addition the O'Higgins telescope was involved in IRIS South 144, 147 and 155 experiments. Due to a H-maser failure the IRISS 155

experiment had to be interrupted after about 14 hours of observation. The external ion pump of the maser vacuum system was broken and the H-maser lost lock.

All the observed experiments could be correlated successfully and the data were used in various analysis for station position determinations and Earth Orientation Parameter evaluations.

At the end of 1999 first experiments were conducted with the JARE station Syowa, which is the second VLBI station in Antarctica.

2. Status of VLBI and Other Geodetic Equipment

There were no major changes in the VLBI equipment of the O'Higgins station since 1999. The main components of the VLBA/MkIII equipment worked stably and with respect to the special Antarctic conditions with sufficient quality.

Only the station timing system had to be modified. Since November 1999 the station sync is realized by a TAC-GPS tracking system. The Cs-atomic frequency standard HP5061 failed. It is planned to replace it by a new cesium frequency standard HP 5071 during the year 2002.

In January 2000 the survey of the antenna reference point was repeated. No changes in the eccentricities between the various systems at O'Higgins station were detected.

Figure 2. The VLBI Antenna at O'Higgins, in front the GPS-Antenna and the PRARE ground unit protected by different radomes (October 1999).

The additional geodetic systems collocated in O'Higgins are working continuously. Sometimes interruptions in the continuous data acquisition occurred – especially during those periods when the station is unmanned.

The permanent GPS tracking system, a TURBO ROGUE, is included in the IGS network. The data and additional information can be found under the ID character OHIG and under the IERS DOMES No. 66008M001.

The PRARE ground unit at O'Higgins can be found under COSPAR No. 7710.

Since February 1999 a new tide gauge system provides continuously data of the variations of the sea surface level around O'Higgins.

3. Outlook

The upgrade of the O'Higgins station to a VLBA/MkIV station including the thin tape equipment and the field system 9.xx is in progress.

All the necessary racks, parts, computers and tools are shipped to the station and will arrive there during the first weeks of the year 2001.

It is planned to install and to test all the new systems at the station during the first campaign 2001 in January/February. The first experiments employing the new equipment are scheduled for the weeks 7 and 8 of the year 2001.

Regarding the installation of TIGO in Conception (Chile), it has to be pointed out that the importance of O'Higgins VLBI station (GARS) as a reference point close by will increase and common observations will improve the results tremendously. Therefore, it is planned to continue the campaigns in the next years, if possible twice a year.