

## Testing hardware and software for the local seismographic network at Neumayer Station, Antarctica - lessons about Antelope software

The local seismic networks at Neumayer Station, Antarctica, have been operated by AWI for more than two decades as part of the geophysical observatory program. In 2009/10 the network was completely upgraded with the installation of a Q330 based data acquisition system and the deployment of new broadband sensors. System monitoring and data evaluation is performed with the Antelope software package. We have special interest in local and regional seismicity and the structure of the deeper Earth.

Seismic monitoring is the main topic of the geophysical observatory program carried out at the Neumayer Station, Antarctica, since 1982. Since 1997 a small local seismic network is in operation in its current design. It comprises a nearby short period station and two remote broadband stations. A short period detection array with 15 vertical seismometers deployed at one of the remote stations improves substantially the network's detection capabilities. Besides contributing to the international monitoring system the main interest focuses on local and regional seismicity and related neotectonics, as well as mapping basic structural features of the Earth's crust and upper mantle. The local "backbone" seismic network will be complemented in future by some other mobile broadband stations.



**Figure 1:** Station setup at remote site VNA3

To meet modern standards in seismology a complete upgrade of the entire network was absolutely necessary. Therefore, in 2009/10 we installed Kinemetrics Q330 digitizers and deployed Guralp CMG-3ESP 120-sec sensors at both remote stations. Station control, system

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performance and data analysis are performed with the Antelope software package.

Because of lacking expertise with Q330 and Antelope we applied to NERIES for a comprehensive introduction at ZAMG, Vienna, and we could visit the ZAMG and the Conrad Observatory from Nov. 11-13, 2009. The topics we learned about were as following:

- Antelope software.
- General introduction into setup, configuration and most important features of Antelope.
- Concept and functionality of orbstat, orb2orb, orbmonrt, orbdetect, orbassoc, crontabs, dbpick, dbloc.
- Useful basics to set up a daily routine.
- Database structure and main database requests (dbjoin, dbsort, dbselect, dbbuild).
- Basics to construct daily bulletins for NEIC etc.
- Tools to backup seismic data and the related database.
- How to program additional own scripts for special purposes.
- Batch processing of old or additional data.
- Q330 digitizer.
- Introduction into the "Willard" program for direct Q330 access and configuration.
- Status information, remote digitizer and sensor control.

The lectures and especially the exercises at ZAMG were very comprehensive and extremely helpful. The acquired knowledge and skills enabled us to bring the new system into full operation without major problems within a couple of days.

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