

Ny-Ålesund 20-Meter Antenna

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Abstract

For the year 2008, the 20-meter VLBI antenna at the Geodetic Observatory, Ny-Ålesund, has participated in VLBI experiments, observing 68 of 78 scheduled 24-hour experiments and 36 of 45 scheduled Intensives. Reasons for the lost experiments were the personnel situation and some problems with the dewar/coldhead during spring. Several experiments also had to be run with a warm receiver due to the latter problem. During fall there was a problem with the X-Band cable and the local oscillator that had to be changed. In 2008, Ny-Ålesund was a three-person station until July when Inge Sanden's contract ended and then continued as a two-person station until the CONT08, when Inge Sanden and Svein Rekkedal helped out for some time. After CONT08, until mid-September, the station was only manned by one person followed by a brief period of no observations due to a lack of operators. Ole Bjørn Årdal's contract ended in the end of August, and he agreed on a new one-year contract starting in the end of September. Helge Digre's contract also ended this year. With no renewal, he finished his contract period on 31 October after having worked 11 years for the NMA. In October two new operators were employed and started their training: Carl Petter Nielsen and Geir Mathiassen, both on part-time contracts. Their work schedule is basically three months of work followed by one month off. This caused the station to become a two-person station during December, except for Christmas when only one person manned the station. From July on, except for August, the maintenance and repair were done at a minimum level, given the personnel situation. No responses were made to any alarms, and no errors were corrected during unmanned operation. Ny-Ålesund is a Mark 5A station.

1. General Information

The Geodetic Observatory of the NMA is situated at 78.9 N and 11.87 W in Ny-Ålesund, in Kings Bay, at the west side of the island of Spitsbergen. This is the biggest island in the Svalbard archipelago. In 2008, Ny-Ålesund was scheduled for 78 24-hour VLBI experiments, including R1, R4, EURO, RD, T2, and RDV sessions, and 49 Intensives within the INT3 program. Ny-Ålesund also participated in the CONT08 campaign. Four experiments were cancelled by the correlator. Fifteen experiments had to be cancelled because of station problems. Four whole and two half experiments were cancelled because the station was unmanned during the last part of September and half a day during Christmas. Part of the lost observation time was caused by understaffing, and part was due to unpredictable problems. Additional downtime was often caused by bad weather conditions before, during, or after repair, making it impossible to work outdoors.

In addition to the 20-meter VLBI antenna, the Geodetic Observatory has two GPS antennas in the IGS system and a Super Conducting Gravimeter in the Global Geodynamics Project (GGP) installed at the site. There is also a CHAMP GPS and a SATREF (dGPS) installation at the station. At the French research station in Ny-Ålesund, there is a DORIS station. In October 2004 a GISTM (GPS Ionospheric Scintillation and TEC Monitor) receiver was installed at the Statens Kartverk structure in the frame of ISACCO, an Italian research project on ionospheric scintillation observations, led by Giordiana De Franceschi of the Italian Institute of Volcanology and Geophysics (INGV).

2. Component Description

The antenna is intended for geodetic use and is designed for receiving in S-band and X-band. Ny-Ålesund is a Mark 5A only station. The station configuration file can be found on the IVS Web site: <ftp://ivscc.gsfc.nasa.gov/pub/config/ns/nyales.config>. Ny-Ålesund is located so far north that the sun is below the horizon from the 23rd of December until the 22nd of February and has midnight sun from 20 April to 27 August. During the polar night there may be daytime aurora. The location of the antenna enables signal reception over the North Pole. In 1998, Ny-Ålesund was the only antenna that could receive signals from the Mars Global Surveyor for 24 hours.

3. Staff

Table 1. Staff related to VLBI operations at Ny-Ålesund.

Hønefoss:	Section manager:	Line Langkaas
	Station responsible at Hønefoss:	Svein Rekkedal
Ny-Ålesund:	Station commander:	Helge Digre / Ole Bjørn Årdal
	Engineer	Inge Sanden until 2008.07.31
	Engineer	Ole Bjørn Årdal
	Engineer	Carl Petter Nielsen since 2008.10.01
	Engineer	Geir Mathiassen since 2008.10.06

Inge Sanden's contract ended 2008.07.31, and he did not renew the contract. Inge Sanden and Svein Rekkedal helped us out for a period during CONT08. Ole Bjørn Årdal's contract ended 2008.08.31, and he agreed on a new one-year contract starting 2008.09.30. Helge Digre's contract ended 2008.10.31, and he did not sign the new contract that he was offered. He terminated his contract period. He worked 11 years for the NMA. Ole Bjørn Årdal has since then acted as station commander. In October two new operators were employed and started their training. Carl Petter Nielsen and Geir Mathiassen both have a 3-year part-time contract. They will work three months followed by one month of leave. Svein Rekkedal was granted leave of absence from 2008.12.31 until 2010.12.31.

4. Current Status and Activities

Ny-Ålesund participated in the scheduled VLBI experiments, periodically as a tag-along station. Two new FS computers were bought this year and will hopefully be operational by early 2009. During 2008 e-VLBI was used for transferring R1 and INT3 measurements from Ny-Ålesund to the Bonn correlator.

The Super Conducting Gravimeter (SCG) placed on the same foundation as IGS-GPS NYA1 has been running without problems. The yearly service on the system was performed by Dr. Yoshiaki Tamura and Ove Omang in the end of September. National Astronomical Observatory of Japan, Mizusawa VERA Observatory, which owns the SCG, lent this equipment to NMA starting



Figure 1. Ny-Ålesund antenna.

2007.04.01, to continue the scientific measurement series.

A consultant checked the safety aspect of work in the antenna. New safe climbing equipment was bought, and new safety precautions were made. The outer roof of the observatory was renovated due to moisture.

5. Future Plans

Ny-Ålesund will continue to participate in the 78 regular and 45 Intensive experiments for which the antenna is scheduled, and it intends to move from tag-along status to fully operational as soon as the observatory is fully manned. The vacant station commander position has been announced and will hopefully be filled by early 2009. We also hope that the new Field System computers will be up and running soon. The SCG has to be refilled with liquid helium each year, and the lift has to be re-certified every year. The insulation in the roof of the Observatory has absorbed a lot of moisture, so the ceiling has to be renovated. This will hopefully happen either during the summer of 2009 or 2010. Because of the moisture in the ceiling, the indoor working environment will be checked by a consultant in early 2009.