

NYAL Ny-Ålesund 20 Metre Antenna

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Abstract

For the year 2003, the 20-meter VLBI antenna at the Geodetic Observatory, Ny-Ålesund has participated in VLBI experiments at the scheduled level, except for the period 12th of June to 19th of June, when the Observatory was closed to avoid possible SARS contamination. Maintenance and repair have been done. There have been temporary changes in staff. Ny-Ålesund's status as an EU Large Scale Facility site has not been renewed by EU.

1. General Information

The Geodetic Observatory of the Norwegian Mapping Authority at 78.9 N and 11.87 W is located in Ny-Ålesund, in Kings Bay at the west side of the island Spitsbergen, the biggest island in the Svalbard archipelago. In 2003, Ny-Ålesund was scheduled for 69 VLBI experiments within R4, R1, EURO, VLBA/RDV, RD, T2 and ICRF. In addition to the 20-meter VLBI antenna, the observatory has two GPS antennas in the IGS system and a Super Conducting Gravimeter is installed on the site. On the site, there is also a CHAMP GPS and a PRARE installation. The LaCoste-Romberg has been removed from Ny-Ålesund. The place Ny-Ålesund was an EU Large Scale Facility from 1997 to 2002. EU did not renew the LSF status for 2003. Ny-Ålesund Geodetic Observatory was closed down from 12th of June to 19th of June. The director of Kings Bay had invited Chinese visitors from Beijing, who arrived in Ny-Ålesund before the 10 days incubation period for SARS was through. There has been a change of director in Kings Bay this summer, so it is very unlikely that something like this happens again under the new director.

2. Component Description

The antenna is intended for geodetic use, and is designed for receiving in S- and X- band. The equipment was all Mark 4 until late in the autumn, when it was upgraded with a Mark 5A unit. Station configuration file:<ftp://ivsc.gsfc.nasa.gov/pub/config/ns/nyales.config>. Ny-Ålesund is located so far north that it has daytime aurora in winter, and this location of the antenna makes it possible to receive 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

The head of the division needed Vidar Eggimann at the main office in Hønefoss for the rotation period from July until November. As replacement, Kari Buset and Tom Pettersen worked about one month each on the Observatory during this 4-month rotation period. David Holland went on sick leave at the end of his first period and is still on sick leave. To be able to do the scheduled experiments in the rotation period starting the 1st of November, Leif Morten Tangen stayed a bit longer in November, and Svein Rekkedal came up for a week in mid-December.



Figure 1. Ny-Ålesund 20 meter antenna

Table 1. Staff related to the operation of the VLBI in Ny-Ålesund.

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|-------------|--------------------------------|-------------------------------------|-----------|
| Hønefoss: | Section manager: | Rune I. Hanssen | |
| | Station responsible, Hønefoss: | Svein Rekkedal | |
| | | | |
| Ny-Ålesund: | Station commander: | Leif Morten Tangen / Helge Digre | |
| | Engineers: | Vidar Eggimann / David Holland | |
| | Engineer: | Sune Elshaug | |
| | | | |
| | Rotation group: | Kari Buset | (07.2003) |
| | | Tom Pettersen | (09.2003) |

4. Current Status and Activities

Ny-Ålesund has participated in VLBI experiments at the scheduled level, except for the period 12th of June to 19th of June, when the Observatory was closed to avoid possible SARS contamination. Because of this, Ny-Ålesund did not participate in 4 experiments, while the 5th was moved until later in the year. There have been some problems with inert gases, causing the cold head failure. The transport time for the replacement cold head has caused that experiments have been run with warm receiver. Ny-Ålesund's status as an EU Large Scale Facility site has not been

renewed by EU, so there have been no LSF funded scientists visiting the site in 2003. The temporary installed (1996) LaCoste-Romberg gravimeter has been removed from the bunker where it was mounted, and has been returned to the main office in Hnefoss. The Super Conducting Gravimeter placed on the same fundament as IGS-GPS NYA1, has been running without any problems. This year, PRARE has been more and more unstable and work consuming. From this spring, weekly re-booting has been necessary to keep it running. At the end of the year, it would not run at all any more. The back up from Germany has been very limited since this summer. The “cherry-picker” has got new hydraulic hoses all over, so hopefully, it can be re-certified next year. Its hydraulic pump is electrically driven. In winter, it is much quicker to use than the diesel driven alternative.

Ny-Ålesund has bought and installed Mark 5A. After successfully running one experiment recording on tape and using Mark 5 in “piggyback-mode”, Ny-Ålesund is running Mark 5A on all experiments except the ones correlated at Socorro. The Mark 5 system has been fully tested and is proved able to record with the highest possible data rate.

The 5-year contract for lease of ground and community services with Kings Bay AS has been renewed. The Ministry of Environment funds the Norwegian Mapping Authority (NMA). For 2004, there will be cutbacks again. As a part of the process of reducing costs, one of the suggestions from NMA was to temporarily close down the Geodetic Observatory for an undecided period of time, something NMA meant should be easy to do because all employees are on time limited contracts. The Ministry of Environment did not accept any close down, so as far as known today, the Geodetic Observatory in Ny-Ålesund will be running in 2004.

5. Future Plans

Ny-Ålesund will continue to participate in the experiments the antenna is scheduled for, and will try to make it possible to increase the number of yearly experiments. The SCG has to be refilled with liquid Helium each year, and the lift has to be re-certified every year. Hopefully it will be possible to have the “cherry-picker” re-certified. The Maser is up for the bi-annual service check in 2004. Also, it is 2 years since the inner and outer reference systems were checked, so this should also be done again in 2004.

Ny-Ålesund reduced the number of experiments from 2002 to 2003. The main reason for this was all the problems and the consequences of the problems in 2002. From the middle of November to the end of January, Ny-Ålesund has the Polar Night and is without any daylight. In 2002, January was one of the months that year with most experiments. With trouble during the Polar Night, everybody became really aware of the fact that the Observatory is located at almost 79°N. What was learned the hard way then was that breakdowns in winter ought to be avoided, as it is difficult to do repair work outdoors during the Polar Night.

This resulted in the following conclusions: Continue the work on improving the maintenance and repair procedures, aiming for achieving only planned downtime. Try to get or build “Module-based” replacement “bottle-neck” sections to reduce downtime. On the location there ought to be spare modules containing known critical parts, so the whole module could be taken out for repair, while the spare is mounted. Then the module with the defective part should be repaired, serviced and tuned indoors in the workshop while the antenna is up and ready again after a short stop because the spare module is installed. Critical spare parts should be located in Ny-Ålesund to avoid downtime and extra repair time caused by transportation time.