

SWEPOS[®] - THE SWEDISH NETWORK OF PERMANENT GPS REFERENCE STATION (Status February 2001)

Gunnar HEDLING, Bo JONSSON, Christina LILJE and Mikael LILJE, Sweden

ABSTRACT

Since 1st of July 1998 the Swedish network of permanent GPS reference stations, SWEPOS, is operational in IOC mode, i.e. positioning in real time with meter level accuracy and by post-processing with centimetre level accuracy. Future plans are for monitoring in real-time on the centimetre/decimetre level. Twenty-one of the SWEPOS-stations are mounted on bedrock and have redundant equipment for GNSS-observations, communications, power supply etc. Another ten stations are mostly located on the top of buildings and have less redundant equipment. The main task for these stations is real-time RTK services. All the SWEPOS stations have real time connections to the control centre in Gävle through leased lines (using the TCP/IP protocol).

The purpose of SWEPOS is to:

- provide L1 and L2 data in RINEX format for post-processing
- Provide DGPS and RTK data in RTCM format to real time distributors
- act as high precision control points for Swedish GPS users and act as the basis of the Swedish national reference frame
- provide data for studies of crustal movements (geophysical research)
- monitor the integrity of the GPS system.

To investigate the conditions for a national service for real-time positioning on the centimetre/decimetre level, the National Land Survey, Onsala Space Observatory, the Swedish National Testing and Research Institute and Teracom (the broadcasting company for public radio and television in Sweden) have decided to form a project called NeW-RTK. The National Land Survey in collaboration with the local authorities, universities and governmental agencies also carries out pilot projects for Network-RTK in three areas. These areas are located in the most southern part of Sweden, the Stockholm area and the western part of Sweden. The tasks for these projects are to study the conditions for a service which gives an accuracy on the centimetre level with respect to the modelling of the atmospheric effects, multipath errors, predicted orbit information, reference station separation, and the distribution channels GSM and DARC on the FM-Radio network.

The possibility to establish a Nordic Positioning Service is studied in a Nordic project under the responsibility of the Nordic Geodetic Commission (NKG). An agreement on exchange of data between the Nordic countries for real-time services as well as post-processing services will be signed in a near future.

The SWEPOS-stations Onsala, Visby, Mårtsbo, Vilhelmina and Kiruna are included in the European network of permanent reference stations, EPN. Onsala, Borås and Kiruna are also included in the International GPS Service Network, IGS.

CONTACT

Mikael Lilje
Geodetic Research Division
National Land Survey
SE-801 82 Gävle
SWEDEN
Tel. + 46 2663 3742
Fax + 46 2661 0676
E-mail: mikael.lilje@lm.se

BIOGRAPHICAL NOTE

Mr. **Gunnar Hedling** is a Senior Research Geodesist at the Geodetic Research Division of the National Land Survey of Sweden. He received a M Sc. in applied physics from Lund University in 1986. He has worked with different GPS applications during the last 15 years.

Mr **Bo Jonsson** is graduated with a B. Sc. in mathematics, physics and astronomy from University of Lund in 1969. Courses in Geodesy at the University of Uppsala in 1974. He is working as GPS Program Manager and Deputy Head of the Geodetic Research Division of National Land survey since 1996. Mr Jonsson is secretary in the Presidium of the Nordic Geodetic Commission.

Mrs. **Christina Lilje** graduated as a land surveyor from The Royal Institute of Technology, Stockholm, Sweden in 1993 with main subjects concerning Geodesy, Photogrammetry and GIS. She has worked at the National Land Survey since 1993, except 1998-1999 when she was working with technical support at Ashtech Europe. She is working as a research geodesist at the Geodetic Research Division with GPS and particularly RTK and network RTK.

Mr. **Mikael Lilje** graduated as a land surveyor from The Royal Institute of Technology, Stockholm, Sweden in 1993 with main subjects concerning Geodesy and Photogrammetry and GIS. He has worked at the National Land Survey since 1994. He is working as a research geodesist at the Geodetic Research Division and mainly with the ongoing third precise levelling of Sweden. Mr. Lilje is the secretary for FIG Commission 5.