European Permanent Network in Ukraine.

Kucher O. (Science and Research Institute of Geodesy and Mapping, Kiev, Ukraine)
Stopkhay Y. (Ukrainian State Aerogeodetic Enterprise, Kiev, Ukraine)

Last time GPS became the base technology in different fields - from navigation to precise monitoring of dynamic of the Earth's crust. The most popular method of accurate determinations in geodesy is a differential positioning to decrease different errors (e.g. orbital errors, atmospheric errors etc.). Observations on sites with well-known coordinates are needed to provide this technology in highest level. Such sites are the permanent stations.

The modern status of Ukrainian Permanent Network is shown in fig.1. There are five permanent stations in Ukraine now:

GLSV	Golosiiv	North of Ukraine
UZHL	Uzhgorod	West of Ukraine
EVPA	Evpatoria	South of Ukraine, Crimea
CRAO	Simeiz	South of Ukraine, Southern Crimea
POLV	Poltava	Central Ukraine

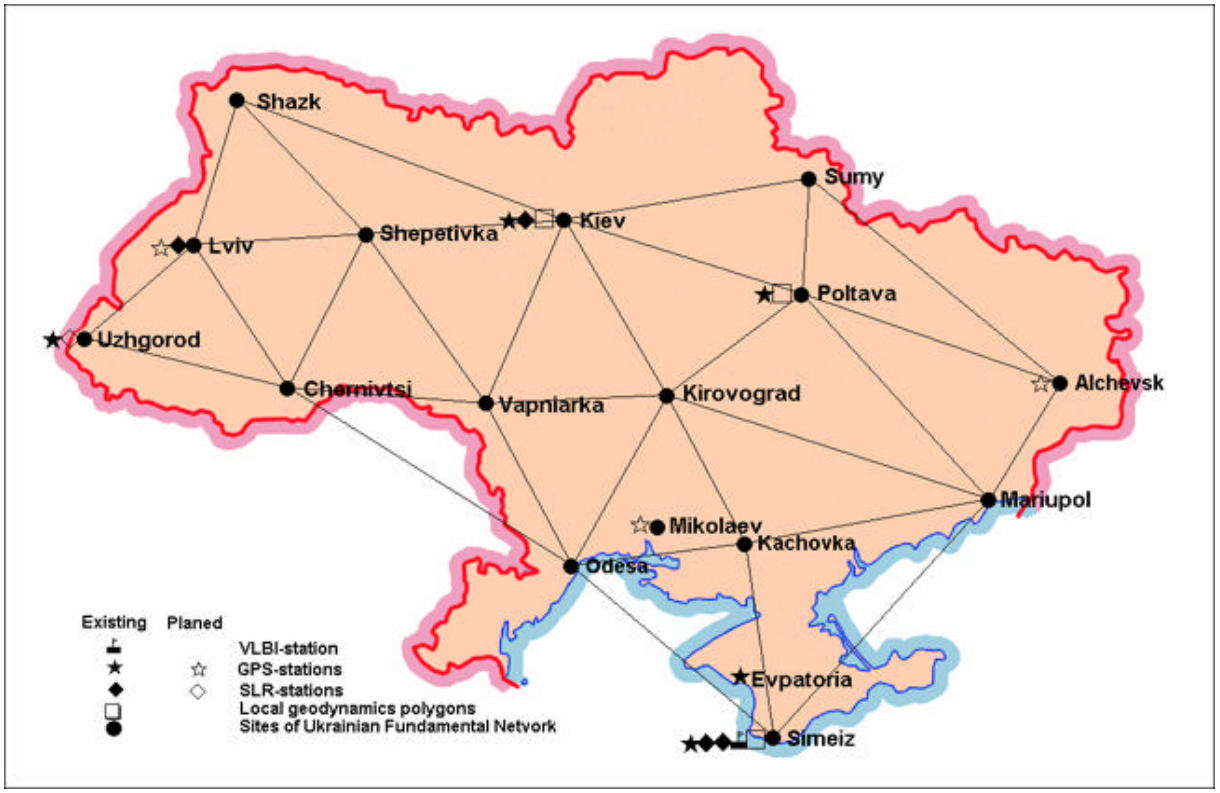

Fig 1. Permanent stations of high precision network of Ukraine.

Three of them (GLSV, UZHL, EVPA) are mounted and managed by the Main Astronomical Observatory (MAO) of National Academy of Sciences of Ukraine. Sites GLSV and UZHD are IGS-stations and EPN-stations. The site EVPA will be included in these networks after setting up Internet connection. These stations are equipped with Trimble 4000SSI GPS receivers and TRM29659.00 (Choke Ring) antennas. The receiver on station GLSV has RTCM Output option, so one can be used as a base DGPS-station. Operation of receivers is fully automated by O. Khoda (MAO) using advantage of OS Linux, R-utilities of Trimble and TEQC software (Estey, 1998).

Permanent station CRAO is installed by the Massachusetts Institute of Technology (MIT) as permanent station of Mediterranean GPS Network. Site is equipped with GPS-receiver ROGUE SNR-8000 and antenna AOAD/M_T. Observations on this station are

available on ftp-sites at UNAVCO - archive.unavco.ucar.edu/pub/ps_out/<year>/<DOY> and at MAO - ftp.mao.kiev.ua/pab/gps/archive/<year>/CRAO.

On the April 27, 2001 at Poltava Gravimetric Observatory a new station (POLV) was installed by Science and Research Institute of Geodesy and Mapping. Station is equipped with Trimble 4700 CORS system and TRM29659.00 (Choke Ring) antenna. Trimble Reference Station (TRS) software is used to operate the receiver.

According to the requirements of IGS (IGS, 1997) and EUREF (Gurtner, 1997) observations on sites are organized with following parameters: session start at 00:00 UTC daily; session end at 23:59 UTC daily; measurement rate: 30 sec beginning from 0 sec; elevation mask: +5°.

Next step of Science and Research Institute of Geodesy and Mapping will be installing of permanent stations in Lviv (West Ukraine), Alchevsk (Eastern Ukraine) and Mykolaiv (Southern Ukraine). Mykolaiv will be available for international community but Lviv and Alchevsk unfortunately will be unavailable some period. Generally speaking, Science and Research Institute of Geodesy and Mapping has planed to mount six stations on the territory of Ukraine. This year the first half of the project will be performed.

Moreover reobservations of 15 sites of Fundamental GPS network (they were observed during EUREF-95 Ukraine campaign) were performed last year in autumn by Ukrainian State Aerogeodetic Enterprise. Next observation campaign on this network is scheduled on the beginning of June 2001. Next step will be processing of whole database to obtain precise coordinates and velocities of sites and to design new reference frame for Ukraine for internal use. Science and Research Institute of Geodesy and Mapping will perform it using the software like Bernese GPS Software or GAMIT. It is planed to perform permanent processing of the data from the Ukrainian Permanent Network. It will be performed by MAO or by Science and Research Institute of Geodesy and Mapping or in collaboration.

References:

Estey L. (1998): TEQC Summary. Proc. IGS Network System Workshop, Annapolis, Maryland, USA, November 2-5, pp. 343-345.

Gartner W. (1997): Guidelines for a Permanent EUREF GPS Network, http://www.oma.be/KSB-ORB/EUREF/permgps.html.

IGS (1997): Guidelines for IGS Stations and Operational Centers, Version 1.2 (reformatted for IGS Report, August 31, 1998) (prepared by IGS Infrastructure Committee and Central Bureau). IGS 1997 Technical Reports, pp. 278-285.