

## FROM TELEMETRY TO END-PRODUCTS



*Olga Gershenzon*  
*SCANEX Vice-President*

SCANEX Research and Development Center (SCANEX R&D Center) has been operating on the Russian space information market for 18 year already. The Center has manufactured and put into operation over 200 ground receiving stations, dozens of departmental, educational, regional and commercial centers of space monitoring and data processing. Ground receiving stations of SCANEX have been operating in 14 countries in Europe, Asia, Africa and Antarctica with the stations supply geography constantly expanding. Nowadays, there are over 60 employees in the company with the average age of 35, mostly young graduates of the Moscow State University and technical colleges.

SCANEX Center developed interesting solutions for all key RS data receiving and processing technologies: stations, centers and networks of space monitoring, space imaging archives of Russia and CIS, software tools of data primary and thematic processing.

SCANEX's data reception stations are small in size, universal, affordable, upgradeable and reliable. Regional receiving stations provide services for a limited area, therefore installation of large aperture antenna systems for a guaranteed data reception at low elevation angles is not required. Smaller antenna system size enables to considerably reduce the cost of station for the operator.

Universality of ground stations allows the user to acquire telemetry from a variety of Earth observation satellites. In 1990s SCANEX Center under agreement with Russian Federal Space Agency started data acquisition from the series of Russian Resurs-O1 satellites (№ 3 and 4). For the first time in the history of Russia a network of 14 "ScanAir" ground stations in X-band frequency with local image archives was created instead of 3 existing in the Soviet times. Networks of regional receiving centers comply with the principles of democratic and easy access to RS data with due account for Russian specifics.



**2006 SPOT-2 and SPOT-4 satellites coverage using three ground stations**

Due to a decline in domestic RS satellite constellation in 1990s the company had to re-target at foreign satellites and to develop universal receiving stations, capable of acquiring data from several RS Operators. Our first partners were the Indian Antrix – IRS satellites Operator (2002) and the Canadian MDA – the RADARSAT-1 satellite Operator (2004). Later on SCANEX signed license agreements with other

leading companies – ImageSat Int., SPOT Image, ESA, USGS and Eurimage. This fact ensured a sound supply of space geodata to the Russian market.

To date, the most accomplished project is the universal “UniScan” ground station, providing for the data reception from 14 different satellites: USA (Terra, Aqua, LANDSAT-5), India (IRS-1C/D, IRS-P5/P6), France (SPOT-2/4), Israel (EROS-A/B), Canada (RADARSAT-1), Europe (ENVISAT-1) and Russia (Monitor-E). Under agreement with Federal Space Agency, SCANEX plans to upgrade its UniScan stations with the equipment, developed at Federal State Unitary Enterprise of Precision Instruments for the reception of Resurs-DK satellite’s telemetry. For the past several years 26 UniScan stations were manufactured and delivered in Russia and abroad. The ground complex with a 2.4 m antenna ensures the multi-band data reception from EROS-B satellite at 0.7 m resolution and at the rate of 350 Mbps (up to 170 Mbps per one channel).

Data, received in real-time, is digested and processed for further image analysis in 0.5-1 hour after imaging, which testifies to high process efficiency.



***Installations of UniScan universal stations, manufactured at SCANEX R&D Center***

SCANEX’s developments are widely used within the regional networks of Ministry of Natural Resources, Emercom, and Federal Service for Hydrometeorology and Environmental Monitoring, as well as in national remote sensing systems of Kazakhstan, Belarus, Iran, Azerbaijan and Vietnam. In 2006, the first SCANEX’s commercial net of three receiving stations (in Moscow, Irkutsk and Magadan) was put into operation in Russia, providing for the data reception from the satellites of world leading operators over Russian territory in real-time. Space images, acquired at the network stations, are used under the programs of forest monitoring, ice reconnaissance in North Sea Route and Far East, for subsoil use control on Sakhalin island and construction activities monitoring of Amur highway (Chita-Khabarovsk).

For the moment SCANEX has collected a rich archive of updated images, covering the entire area of Russia and CIS countries. Starting in 2002, basic Russian economic areas were covered with multi-temporal images at 30-5.8 m resolution. An on-line image catalog is up and running for quick ordering and quality assessment (<http://catalog.scanex.ru>). Starting from 2006 highly detailed imagery data of Russian and CIS towns have been collected using the Israeli EROS-A/B satellites. In 2007, the archive started to be replenished by the stereo pairs of the Indian IRS-P5 Cartosat-1 satellite (2.5 m resolution) – the most wanted products nowadays in its class in terms of price-to-quality ratio.

The principle of raw telemetry reception to the ground stations with further data processing in Russia provides for quite low prices of end-products for internal market. Data reception of a remote sensing program by our stations makes it unprofitable to purchase the images of this program from abroad.

In support of educational programs in sphere of geo-informatics, SCANEX Center allocates funds to augment the catalog of available images under the “Transparent World” non-profit partnership ([www.transparentworld.ru](http://www.transparentworld.ru)).

Universal ground receiving stations manufactured at SCANEX are supplied complete with the proprietary software, enabling to resolve the tasks of data reception, processing, archiving and cataloging, followed by the creation of thematic products with further importing into most popular GIS and software formats. ScanMagic, ScanEx Image Processor and ScanEx NeRIS are the favorite software applications among the specialists in geo-informatics. Over 200 software licensed copies have been installed in Russia and worldwide. Applications description and demo versions are available at the company’s site ([www.scanex.ru](http://www.scanex.ru)).

SCANEX’s training center hosts training courses on the basics of remote sensing and software applications usage. Over 20 educational centers on remote sensing and geo-informatics at leading universities and colleges have been established in Russia and CIS countries based on the “ScanEx” station: Moscow State University, Bauman State Technical University, Moscow State University of Geodesy and Cartography; universities in Astrakhan, Barnaul, Belgorod, Nizhny Novgorod, Samara, in Kazakhstan and Spain.

The biennial International Conference “Earth from Space – the Most Effective Solutions” is held in Moscow to give publicity to the most effective applied solutions in the area of space geo-information. The next conference is to take place on December 4-6, 2007 in Moscow. We look forward to seeing you at your conference!

**SCANEX Research and Development Center**  
5/22, building 1 Rossolimo str., Moscow, Russia, 119021  
Phone: +7(495)246-2593  
E-mail: [olga@scanex.ru](mailto:olga@scanex.ru), [www.scanex.ru](http://www.scanex.ru)