

Everything on Earth seen in smallest detail from above

Just 90 seconds for new satellite to photograph Belarusian territory from border to border



By Vladimir Mikhailov

A Belarusian satellite has been orbiting for over a month, leaving us keen to discover when its valuable data will begin to be received by Earth. As the proverb says: 'only a fairy-tale ends quickly'. In fact, the launch of the satellite is just the beginning; its adjusting is to take at least three months. However, specialists say that, even then, the satellite is unlikely to produce a miracle since the quality of its work will directly depend on the state of the atmosphere, ballistics and its technical parameters.

Sharp angle of view

The Flight Control Centre at the National Academy of Sciences is tracking the satellite's movement day and night, with its route shown on a large CLD monitor. "All this time, we've been adjusting its calculation, orientation and stabilisation systems. The satellite transfers detailed telemetric information on

its state to the Control Centre on Earth," explains Vladimir Yushkevich, the Head of the Flight Control Centre. "We should remember that the satellite only passes over our territory six times in 16 days: 10-11 times a month.

The remaining time, it can only 'see' the country from a very sharp angle. Its flight trajectory and the state of the atmosphere matter a great deal of course; you don't see much if it's cloudy. We can't monitor day and night, so it's not easy to fulfil particular tasks to order — such as detecting heat or water abnormalities, updating maps or controlling land use."

Smile — you're on camera!

In fact, the satellite is a powerful photographic camera, able to shoot panchromatic (2.1m resolution per pixel) and poly-zonal (10.5m resolution per pixel) pictures. Clearly, it can't distinguish the stars on a military uniform but

it can certainly notice an oil spill, the consequences of strong wind in the forest or smoke over peat land.

High quality photos of Belarus are due to arrive from September but the Centre has already received some test photos showing desert, ocean, rivers, roads and other sites.

"The satellite can photograph a 4,500km line (20km across) in 11 minutes, taking 90 seconds to shoot Belarus from border to border. It then takes about two and a half minutes to send this data to Earth, where restoration and initial processing take another 20 minutes. Additionally, 3-4 minutes are spent on transferring data to consumers. Accordingly, final users must wait 30-40 minutes to receive operative information about Belarus. Potential customers include the Emergency Ministry, the Ministry for Natural Resources and Environmental Protection, the Ministry for Agriculture and Food, the State Property Committee, the

Department for Liquidation of the Consequences of the Chernobyl NPP Catastrophe and the Forestry Ministry," explains Oleg Semenov, the Deputy Chief Designer of the Belarusian satellite.

Strong link

The Emergency Ministry pins great hopes on the Belarusian satellite monitoring the land, space and cosmos, with linking these elements a major challenge. "It's wrong to say that Belarus hasn't been receiving data from the cosmos. Several times a day, American TERRA and NOAA meteorological satellites broadcast their data to Earth; we receive it as part of the Open Cosmos international programme. However, their resolution is low: 1km per pixel. An emergency would have to be on a huge scale for such data to become useful so, clearly, it's most suitable for meteorologists," notes Leonid Shkolnikov, the Deputy Head of the Republican Emergency Management and Response Centre at the Emergency

Ministry. "The Belarusian satellite shifts our domestic monitoring to a whole new level as we can now 'see' every detail when peat lands are on fire, as well as floods, forest fires or oil spills.

Knowing the exact time of the satellite passing Belarus, we'll be able to 'order' certain sites and receive data in just 20 minutes, at high resolution. This is the major benefit of the Belarusian satellite."

The Emergency Ministry is now testing unique 'Emergency Monitoring' software which aims to decode pictures from orbit in the shortest possible time, marking all heat and water abnormalities. "Using archives from the National Academy and hydrologists, we're creating a photo database of the country's rivers, lakes and water reservoirs.

The software compares average water levels with critical (e.g. floods or drought) so unusual data is automatically flagged," explains Mr. Shkolnikov. "Fires are fixed on photos taken in infra-red; resolution of 10.5 metres per pixel is

an advantage as, after decoding,

you can see fire

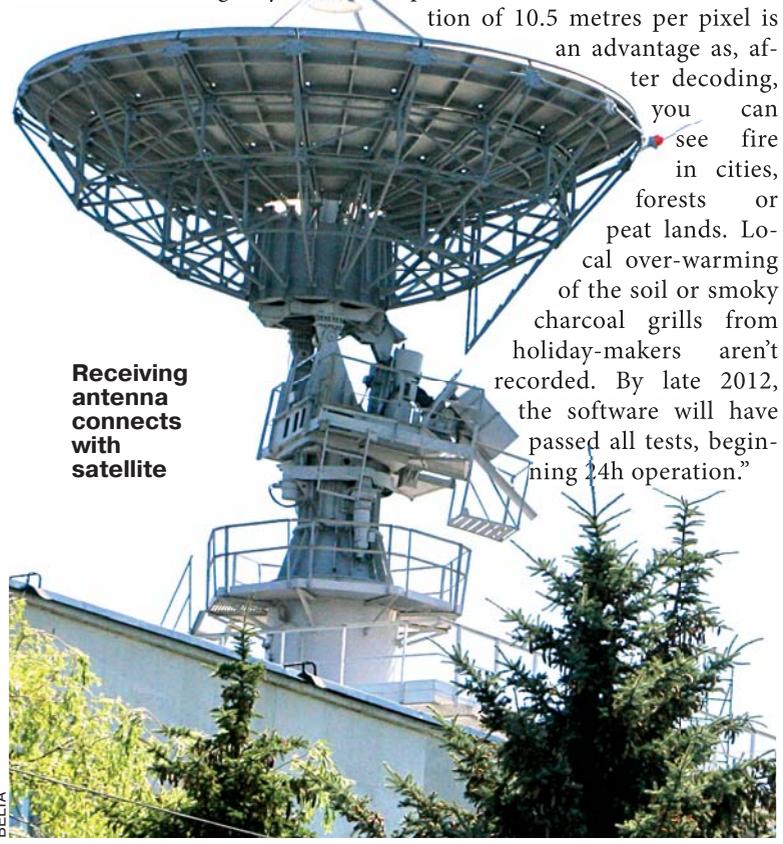
in cities, forests or

peat lands. Local over-warming

of the soil or smoky charcoal grills from

holiday-makers aren't recorded. By late 2012,

the software will have passed all tests, beginning 24h operation."



Receiving antenna connects with satellite

Tasks have been already determined

Belarusian-Vietnamese Innovation and Education Centre set up at Belarusian State University

The Centre is to focus on the development of educational, scientific and cultural relations between the BSU, other Belarusian institutions of higher education, and Vietnamese enterprises and scientific and educational organisations. It aims to promote the exchange of scientific and innovative achievements between our two countries while strengthening bilateral sci-tech co-

operation. Departments, institutes, centres, enterprises and other subdivisions of the BSU are taking part in its work, as are Vietnamese scientific and educational organisations.

Another major task of the Centre is to develop collaboration and maintain contacts with BSU alumni living in Vietnam. Moreover, it is to organise joint conferences and scientific research while attracting scientific employees, teachers, post-graduates and students to the BSU to implement joint scientific and research projects.

Food expenditure as reflection of people's level of income

By Alexander Kobaltov

The International Labour Organisation (ILO) has reported that many countries see people spending their lion's share of earnings on food: up to 70 percent

In Belarus, even after last year's economic collapse, the picture looks quite favourable, with just 45.6 percent of income spent on food. Of course, this indicates standards of living. A nation's

'disposable income' is a clear factor in citizens' degree of contentment.

In addition, the average family in Belarus spends 34.9 percent of its income on non-food items; services account for 16.8 percent, although urban and rural residents do spend rather differently.

Looking at total consumer spending on food, sausages and smoked meats account for the major share (13.3 percent), followed

by bread (7.2 percent); vegetables and gourds are next in line (7.1 percent) followed by fruits and berries (6.6 percent), poultry (6.3 percent), and sugar and sweets (5.5 percent). Belarusians spend approximately 4.9 percent of their total income on pork based foods; 4.6 percent is spent on fish and fish products while 4 percent goes on tea, coffee and cocoa. Belarusians spend 4 percent on milk and 3.5 percent on pastries, cakes and biscuits.