

Future Research and Development Satellite Systems

FUTURE RUSSIAN RESEARCH AND DEVELOPMENT SATELLITES

Summary and purpose of the WP

Three new Russian R & D satellites MONITOR-E, SICH-1M and RESURS-DK are planned to be launched in 2004 to meet requirements of up to date technologies.

Various imagers and sounders for remote sensing of the Earth surface, oceans and atmosphere will be placed on these satellites.

The satellites will be used in ecology, disaster monitoring, hydrology, meteorology, mapping and other applied areas.

Action proposed: no action required.

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Three new Russian R & D satellites MONITOR-E, SICH-1M and RESURS-DK are planned to be launched in 2004 to meet requirements of up to data technologies.

The satellite MONITOR-E №1 is destined for environmental and land monitoring in regional scale. The satellite will operate in the sun-synchronous circular orbit at an altitude about 540 km.

The payload of this satellite includes two instruments: 1) the panchromatic imager and 2) the multispectral imager for distributed access. The first imager will provide Earth observations in the spectral band 0.51-0.85 μ m with the spatial resolution 8 m. The swath width is 94 km within the observing zone 730 km. The second instrument will provide multichannel Earth images in the spectral bands 0.54-0.59, 0.63-0.69 and 0.79-0.9 μ m with the spatial resolution 20 m for the main ground receiving centers and 40 m for a lot of small distributed user receiving stations. The swath width is 160 km, the observing zone is 890 km.

The satellite SICH-1M will follow the previous well-known OKEAN-01 series of oceanographic satellites. These satellites have belonged to joint Russian-Ukrainian project. SICH-1M is projected by Russian and Ukrainian specialists jointly, too. SICH-1M №1 will be launched in the circular orbit at an altitude 650 km and inclination 82.5°.

The satellite will be used to obtain oceanographic, land-observing and hydrometeorological data to supply more applications than OKEAN-01 series have provided. The payload of the satellite SICH-1M №1 includes the real aperture side-looking radar station RLSBO, the microwave scanning radiometer RM-08, the multispectral optical scanning device for the visible range MSU-EU, the combined microwave and optical imager/sounder MTVZA-OK and the small additional unit "Variant" for heliogeophysics space environment monitoring. The characteristics are in the next table.

Instrument	Application	Spectral band/working wave length	Spatial resolution, m	Swath width, km	Swath shift, km
RLSBO Side-looking radar	Sea ice mapping, snow coverage, Earth surface monitoring	3.2 cm	Along track 2500, Across track 1300	450	230 to the left
RM-08 MW radiometer	Sea ice mapping	0.8 cm	25000 x 25000	550	230 to the left
MSU-EU Optical scanning device	Earth surface monitoring	3 channels: 0.5-0.59, 0.61-0.69, 0.79-0.92 μm	24 x 34	48 within 750	—
MTVZA-OK Combined MW and optical imager/sounder	Atmospheric temperature and humidity profiling, monitoring of ice and snow, sea surface wind speed, precipitation, ocean color	22 MW channels: 6.9, 10.6, 18.7, 23.8, 31.5, 36.7, 42, 48, 52.3-57.0, 91, 183.3 GHz 5 channels in VIS/IR: 0.37-0.45, 0.45-0.51, 0.58-0.68, 0.68-0.78, 3.55-3.93 μm	19-260 km for MW, 1100 for VIS/IR	2000	conical scanning
“Variant” unit	Heliogeophysics space environment monitoring	—	—	—	—

The satellite RESURS-DK №1 is developed by Rosaviakosmos to obtain panchromatic and multispectral images of the Earth surface at high resolution for the benefit of different branches of Russian economy and for commercial dissemination. The satellite RESURS-DK №1 will operate in the near-circular orbit at an altitude 350 km and inclination 70.4°.

The satellite will have the high resolution optoelectronic imager to operate in the two following modes: 1) panchromatic mode with the spatial resolution 1 m in spectral band 0.58-0.8 μm , 2) multispectral mode with the spatial resolution 2-3 m in three spectral bands 0.5-0.6, 0.6-0.7 and 0.7-.8 μm . The imager swath width is 28.3 km within the observing zone about 450 km.