

Tetraedr unveils EO sensors for SAM systems

Tetraedr displayed two new electro-optical (EO) devices intended to maintain the combat capabilities of surface-to-air missile (SAM) systems in the presence of heavy jamming at the MILEX-2007 exhibition held in Minsk, Belarus, on 22–25 May, writes **Miroslav Gyürösi**.

One was a totally rebuilt version of the 9Sh33 Karat daylight TV camera used by the S-125 Pechora (SA-3 'Goa'); the other was a passive thermal imager.

Both devices were shown in prototype form fitted to the UNV-2T guidance radar from the S-125-2T Pechora-2T modernised 'Goa' and on the 9A33BM3-1T combat vehicle from the 9K33M-1T Osa-1T (SA-8 'Gecko') self-propelled SAM system.

Company representatives confirmed that if the system enters serial production, the rebuilt camera and the thermal imager would both be contained in a single casing.

The rebuilt 9Sh33 Karat TV camera retained little more than the lenses from the original unit. Tetraedr designers have teamed these with a new 0.5 in charge-coupled device (CCD) 752x582 pixel sensor with a minimum output resolution of 560 TV lines. The output video signal is CCIR 1 V / 75 Ω .

Designed to operate at light levels of 100–100,000 lx, the camera offers wide (43.5° x 32.5°) and narrow (2° 25' x 1° 49') fields of view. Given minimum visibility of 20 km the camera can detect a MiG-21 sized fighter at 21 km or more and track at 17 km or more.

The clear skies and good visibility experienced during MILEX-2007 allowed a radar crew to track a medium-sized airliner at a range of 110 km. This was achieved when the aircraft's position in the sky was only 1°–2° away from that of the sun. This represents a dramatic improvement over the capability of the original camera, which cannot be used within 16° of the sun.

The modernised camera is 306 mm x 336 mm x 1,077 mm (width x height x length)

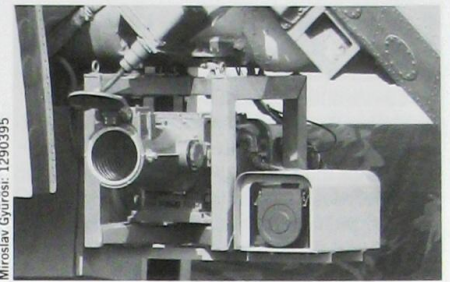


> This Pechora-2T radar is fitted with Tetraedr's new electro-optical sensors.

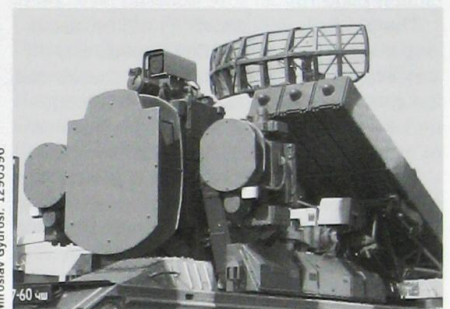
and weighs 45 kg. Powered by a 220 V / 400 Hz / 0.2 A AC or 27 V / 10 A DC supply, it can operate at temperatures of -30 °C up to +55 °C, and has a declared MTBF of 10,000 hours.

The passive thermal imager is based on a SOFRADIR thermal imaging tube and is intended to allow SAM systems to operate at any hour of the day or night and at all levels of terrain illumination. It uses an HgCdTe 320x256 pixel sensor with a minimum resolution of 560 TV lines. Like the day camera it produced a CCIR 1 V / 75 Ω video signal.

The detector element for each pixel is 30 μ m in size. It is cooled to 77° K by a



> The 9Sh33 Karat TV camera (left) has been extensively redesigned, while the thermal imager (right) is an all-new addition.



> The Osa-1T vehicle's day TV camera and thermal imager are mounted above the existing radar.

Stirling-cycle microcooler and can detect a 0.15° temperature difference in a 25 °C scene. Working temperature range is from -40 °C up to +60 °C. Starting from a temperature of 25 °C, it is ready for operation within six minutes of being switched on.

The f: 2.0 lens has a 60 mm focal length giving a (9.1° x 6.9°) wide field of view, and a 240 mm focal length giving a narrow (2.3° x 1.7°) field of view. In optimal conditions, a fighter-sized target can be detected at a range of 35 km. The thermal imager is 144.6 mm x 172 mm x 439.5 mm and weighs 11 kg. Powered by a 22–25 V DC supply, it consumes 26 W when operating at 20 °C. ●

First S-400 Triumf unit undertakes practice firings

Russia's first battalion equipped with the S-400 Triumf (SA-21 'Growler') surface-to-air missile system was reported to be conducting final training exercises at an unidentified Russian proving ground in May.

Announcing his intention to visit the unit during its working up, Colonel General Alexander Zelin, Commander-in-Chief of the Russian Air Force, said the unit was having some minor problems. But he added

that he was confident in the battalion's ability to cope with these setbacks. The unit was at full strength by March and personnel had completed retraining. Work on its operational site at the city of Elektrostal was more than 80 per cent finished.

According to Col Gen Yury Solovyov, Commander of the Air Defence Forces Special Command (formerly the Moscow Military District Air Defence Command),

the S-400 can engage air-breathing targets, including stealth aircraft and cruise missiles, and can intercept ballistic missiles with a re-entry speed of up to 4.8 km/sec and a range of up to 3,500 km.

The Russian Air Defence Forces have more than 30 regiments equipped with the S-300 missile system. These will be converted to the S-400 at a rate of one or two regiments per year. ●