Aerostats in Indian operations

Controp Speed-A on an Aerostat .

As an interim measure during 2004-2005, India procured from Israel a number of Aerostats, blimp-like large balloons tethered to the ground with long cables, equipped with Elta Electronic Industries – developed EL/M-2083 phased array radars (simpler versions of the EL/M-2090 'Green Pine' radars) capable of providing three-dimensional low-altitude coverage, some of which are permanently deployed along the border with Pakistan. The tethered EL/M-2083 phased array radar is mounted on a blimp that can hover up to 13,000 feet. Each system is reportedly capable of providing three-dimensional high to low altitude coverage over a radius of 500-km which is roughly equivalent to the coverage that would be provided by thirty ground based radars. Their effectiveness has inspired procurement of more such systems and it is projected that around a dozen may ultimately be acquired. Aerostat radars (like Airborne Early Warning & Control (AEW&C) platforms) can act as major force-multipliers by detecting and tracking cruise missiles and low-flying aircraft much earlier than ground-based radars, and transferring the generated data to a central air defence command & control (C&C) centre to maintain an extended comprehensive sky situation picture.

The aerial targets can be targeted near instantaneously (critical while dealing with low-level threats) by air defence artillery and surface-to-air missile systems. Designed to act as 'eyes in the sky' to increase the situational awareness of the theatre commander, the phased array radars on Aerostats can be operated either in a 360-degree search mode or a sector scan mode while remaining afloat round-the-clock for four to five weeks at a time. Much cheaper and easier to operate than AEW&C platforms, yet providing three-dimensional low-altitude coverage, with matching internal and external pressures, Aerostats can withstand several punctures and stay afloat and can be reeled in, repaired and then deployed once again. Meanwhile to fill vital gaps in coastal security, the Indian Navy is to acquire two Aerostat radars. Aerostats being inherently relocateable, can be moved to any location on the basis of the threat perception, offer flexibility in deployment. It can be deduced that additional requirements will follow (perhaps at least ten times more) for security of vast stretches of the Indian coastline and nearby strategic facilities including offshore platforms. Whether Aerostats can be deployed in mobile ground and naval platforms for additional tactical flexibility remains a debated topic and never been confirmed officially.

As for providing payloads for aerostats, Controp, an Israeli developer of light-weight, high-performance electro-optical (EO) payload systems for aerospace, defence and security applications, has a new range of EO systems weighing from 1 g to 40 g, designed for any mission, from daylight police work and law enforcement to covert, long-range observation from high-altitude unmanned aircraft. Among new products are the T-STAMP stabilised payload, designed for small UAVs and the A-View, tailored for primarily law-enforcement helicopters. Another new product is the SHAPO, a multi-sensor stabilised payload designed for airborne and land-based applications. There is also the DSP-1, comprising a high-performance FLIR and a TV channel. The DSP-1 can be fitted with an inertial measurement unit (IMU) providing accurate target geopositioning based on accurate line-of-sight measurement. Weighing only 2.8 kg, T-STAMP includes a cooled thermal imager with a continuous zoom, a powerful zoom CCD camera and a laser pointer. All three sensors are accommodated into a 178-mm (7") diameter ball weighing only 2.8 kg, and mounted on a gyro-stablised gimbal, providing day and night imaging capability.

Slightly heavier and regarded as an affordable pilot assist system, A-View, weighing 3.2 kg, accommodates a stabilised FLIR or daylight TV, offering helicopter pilots and mission specialists the ability to monitor a wide field of view or focus on an object of interest, maintaining stable image, regardless of zoom factor. The system has already been integrated on board small police helicopters demonstrating remarkable performance.

At 10 kg, the 24-cm diameter SHAPO represents another milestone for Controp's technology optimised for operation on helicopters and aircraft, day and night, as well as under adverse weather conditions.

Responding to an urgent operational requirement, Controp has developed a stabilised payload optimised for lightweight tethered observation systems. The SPEED-A provides three-axis stablisation in pitch, yaw and roll, matching the typical movement of a tethered aerostat. Since tactical aerostats are deployed at relatively low altitudes (500 to 3,000 feet), SPEED-A has already been used in field operations for border security onboard tactical mobile balloon systems.

At 22.5 kg, DSP-1 represents Controp's largest, most widely deployed EO payload. It uses a four-gimbal gyrostablised system, providing high-precision stability in azimuth and elevation, allowing the EO sensors' line of sight (LOS) to be aimed and maintained for long-range observation. The system uses two camera channels: a thermal imaging camera with continuous X 36 zoom lens and a high-resolution colour CCD daylight camera with X 20 zoom lens. The latest version of the DSP-1 has an optional broadcast quality 3 CCD daylight camera and an optional laser designator or laser range finder (LRF), as well as an optional INS on the LOS.

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