ASC ENGINEERING FACT SHEET

... An Engineering Success Story

Global Hawk

High Altitude Endurance Unmanned Air Vehicle Reconnaissance System

DESCRIPTION

The Global Hawk air vehicle is capable of fully autonomous operations, including fully automatic taxi, take-off, flight, and recovery. A health and status downlink for mission monitoring provides aircraft system, sensor, and navigational status continuously to the ground operators. Navigation and sensor plans can be dynamically updated in flight from a ground station through any of the redundant data links. The Global Hawk has multiple contingency modes to provide

SUMMARY

PROBLEM:

- To maintain information superiority, theater commanders-in-chief (CINC) require wide-area, long-dwell, responsive, near-real-time, high resolution intelligence, surveillance, and reconnaissance (ISR). A powerful ISR ability enables our forces to collect, process, and disseminate an interrupted flow of information while denying the adversary's ability to do the same.

SOLUTION:

- Unmanned Air Vehicles (UAVs), which utilize modern and emerging technologies, are capable of providing the needed ISR coverage and operational persistence while reducing the exposure of aircrews to combat hazards.
- The Global Hawk System, the Air Force's premiere UAV program, is currently in engineering and manufacturing development (EMD). Managed by Aeronautical Systems Center at Wright-Patterson AFB, Ohio, it is poised to provide the warfighter with the essential intelligence needed to achieve information dominance throughout the battle space well within the 21st century.

safe, predictable operation in the event of lost data links, mission critical equipment, or flight critical equipment. Navigation is accomplished via an embedded Global Positioning System (GPS)/inertial navigation system. Taxi, take-off, and landing accuracy require the use of a differential GPS. The Global Hawk is designed to be self-deploying and can operate from an 8,000-foot runway. Long endurance is a key feature of this vehicle, with flight times in excess of thirty hours.

The Global Hawk ground segment is composed of two elements: the launch and recovery element (LRE) and the mission control element (MCE). These elements provide the capabilities for command and control (C2), air vehicle status, threat data and imagery data downlink, imagery processing, imagery storage and imagery dissemination. The LRE provides C2 for takeoffs and landings while the MCE provides C2 and wideband imagery downlink during flight.

The Global Hawk has the ability to capture images in areas of interest with synthetic aperture radar (SAR), electro-optical (EO), and infrared (IR) sensors. The aircraft carries all three sensors simultaneously and can operate either the EO or IR sensor simultaneously with the SAR.

The Raytheon SAR sensor is capable of imaging with one-meter resolution in the wide area search (WAS) mode and 0.3-meter resolution in the spot mode. It also has a ground moving target indicator (GMTI) mode with a minimum detectable velocity of 4 knots. Maximum imaging range for the SAR is 200 km. SAR data is processed on board the aircraft and is transmitted as uncompressed or compressed images in National Imagery Transmission Format Standard (NITFS) 2.0 format with support data extensions; SAR WAS images are segmented. GMTI data is transmitted as a text product providing location, range, and velocity.

The Raytheon EO/IR sensors are capable of operation in WAS, spot collection, and point target (continuous stare) modes. The IR imaging sensor operates in the 3-5 micron spectrum. EO/IR data is processed aboard the air vehicle and transmitted as 1k by 1k pixel image frames (EO) or 640 by 480 pixel image frames (IR) in NITFS 2.0 format. These EO/IR image frames are formatted into a mosaic in the MCE (140 EO frames/spot image, 98 IR frames/spot image) prior to dissemination.

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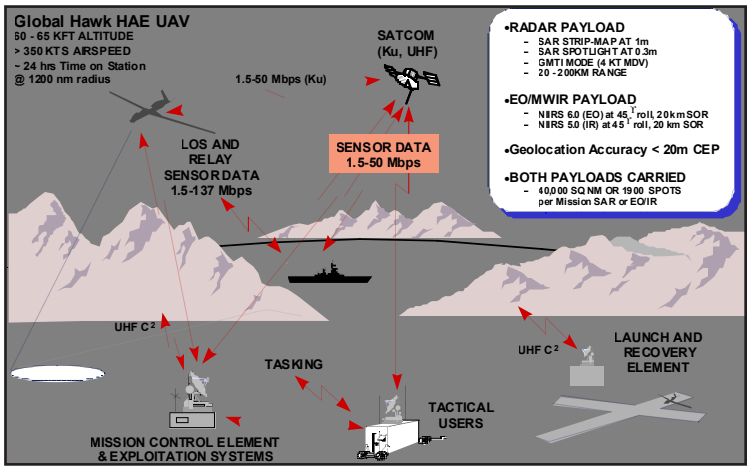

For additional ASC/EN Engineering Directorate literature, contact ASC/ENOX at (937) 255-3979.