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Aerial Common Sensor (ACS)

Outlook

- ACS program was restructured and renamed the Enhanced Medium-Altitude Reconnaissance and Surveillance System (EMARSS)
- Funding under PE#0307207A, Aerial Common Sensor (ACS) was transferred to PE#0605626A, Aerial Common Sensor (SDD) Project AC5 EMARSS (MIP) in FY11
- Boeing was awarded an EMARSS contract in December 2010

Orientation

Description. The purpose of the ACS program was to develop a corps-level airborne intelligence, surveillance, reconnaissance and target acquisition system designed for worldwide deployment.

Sponsor

U.S. Army
Program Executive Officer Intelligence & Electronic Warfare
Project Manager Signals Warfare
Vint Hill Farm Station
Warrenton, VA USA

Status. The ACS program has been restructured and renamed the Enhanced Medium-Altitude Reconnaissance and Surveillance System (EMARSS).

Total Produced. No ACS aircraft were produced.

Application. The goal of ACS was to merge and improve the capabilities of the U.S. Army Guardrail and Airborne Reconnaissance Low (ARL) intelligence systems. The ACS system was expected to incorporate data from multiple intelligence, surveillance, and reconnaissance sources.

Technical Data

Design Features. The ACS suite was envisioned as a series of modular sensors mounted on an airborne platform or multiple airborne platforms. The Army wanted ACS to be capable of operating independently or remotely via satcom or line-of-sight datalinks with a ground processor.

Engineers planned for the ACS to have three subsystems: the Airborne Platform Subsystem (APS), the Airborne Mission Equipment Subsystem (AMES), and the Ground Processing Facility (GPF).

The APS specification called for non-developmental aircraft capable of self-deployment and 10 hours of endurance flights covering up to 2,500 nautical miles at an altitude of approximately 30,000 feet. More than one type of aircraft may be used.

The AMES specification stated that the suite will feature both sensor and communication equipment: signals intelligence (SIGINT), image intelligence (IMINT), and measurements and signature intelligence (MASINT). The SIGINT payload was thought to include the scaled High Band Subsystem (HBSS),

which is associated with the Joint SIGINT Avionics Family (JSAF) program. Different aircraft may be fitted with different capabilities.

The GPF was foreseen to consist of main and forward ground workstations and would feed remote workstations. The system goal was to receive, process, display, and disseminate SIGINT and IMINT from the APS and other service platforms that are Common Imagery Ground/Surface System/Common Data Link compliant. It would provide SIGINT and IMINT reports at different classification levels.

The ACS will not be dependent on the GPF for reporting and dissemination of acquired intelligence. Most communications will be via satcom. The system will be able to pass data to most existing Army intelligence systems and capable of limited onboard data processing.

Program Review

Background. The original objective of the Aerial Common Sensor program was to improve and merge the capabilities of the Army Guardrail and Airborne Reconnaissance Low platforms into a single integrated intelligence, surveillance, and reconnaissance (ISR) system. Engineers planned to use commercial off-the-shelf (COTS) components and an open architecture, which should result in more readily available and less expensive hardware. Proprietary software would maintain distinct capabilities.

The goal of the ACS program was to supply commanders with full-spectrum SIGINT, IMINT, and MASINT capabilities. The system would be able to conduct remote operations, which would reduce the number of soldiers and equipment deployed during operations. ACS' remote capabilities would permit it to transmit signals and information via satellite to the ground processing station.

And Then There Were Two

In April 2000, the Army awarded three separate $4 million contracts to Northrop Grumman, Raytheon, and Lockheed Martin to develop ACS subsystem concepts and provide cost information. In spring 2002, the Army narrowed the competition to Lockheed Martin and Northrop Grumman and delayed the selection of a single contractor until early 2003. Both were awarded Component Advanced Development Phase contracts in April 2002. This phase was scheduled to last 15 months; however, the Request for Proposals (RFP) was delayed to the end of 2003.

Costs Skyrocket

Program officials identified $122 million in funding shortfalls. The ACS program wanted an additional $14 million for FY03 and FY04 to cover anticipated cost increases for the Low Band Subsystem (LBSS). As part of a preplanned product improvement (P3I), an additional $56.4 million was needed for advanced synthetic aperture radar (SAR), moving target indicators (MTI), foliage penetration radar, measurement and signature intelligence sensors, and extended-range electro-optical/infrared (EO/IR) sensors. Officials also wanted an additional $45 million for two aircraft for the engineering and manufacturing development phase.

After several delays and at least $58 million in cost overruns, the BAE Systems LBSS contract was terminated in July 2001. To fill the gap, Lockheed Martin and Northrop Grumman offered their own SIGINT payloads.

The U.S. Navy Wants ACS

In June 2003, the Navy discussed replacing its fleet of EP-3E electronic intelligence aircraft with the ACS platform. The two services did have a few differences, including the number of workstations required and the ability to operate in a maritime environment.

Lockheed Martin Wins

In 2004, the ACS finalists were the Northrop Grumman team with a Gulfstream G450/RC-20 business jet and the Lockheed Martin team proposing a modified Embraer ERJ 145 jet. The Lockheed Martin team included former rival Raytheon. In August 2004, Lockheed Martin was awarded an $822 million contract for development and production of five ACS aircraft. Low-rate production was expected to begin in 2007, and full-rate production was scheduled to begin in 2009.

However, in the summer of 2004, Congress cut $20 million in FY05 funding. The cut delayed the start of the EO/IR payload, some datalink communications, and hyperspectral imagery. Nevertheless, the ACS program received $129 million.

Stop Work Order, Then Contract Canceled

News stories in June 2005 brought a weight problem to center stage. ACS program management concluded that an Embraer ERJ 145 jet could not be used because the aircraft couldn't handle the weight of the payload, cooling systems, and power units. Lockheed Martin researched using a larger platform. Reducing the payload was not an option because the Army did not

want to eliminate any mission systems or reduce ACS functions. The weight problem also led the Navy to delay its formal entry into the program.

Consequently, the Army issued a stop work order to Lockheed Martin in September 2005. In November 2005, Lockheed Martin presented three options to the Army. Although the options were not made public, reports indicated a platform change, with the Bombardier Global Express being the first choice. Other platforms that may have been discussed include the Gulfstream G550, the Boeing 737, and the Embraer 190. A last option may have been reducing the payload and keeping the ERJ 145 jet.

The Army announced in January 2006 that it had canceled the Lockheed Martin ACS development contract. "The program itself has not been terminated," said Assistant Secretary to the Army Claude Bolton Jr.

Army Restarts with Industry Day

At the Airborne ISR Industry Day in October 2006, industry heard that the DoD recognized the need for manned ISR aircraft. The Army repeated that the ACS program would restart in the 2009 timeframe. Edward T. Bair, program executive officer for Intelligence, Electronic Warfare and Sensors, said that the future ACS system will focus on a capability that operates jointly using modern communication and systems engineering practices. The result will be airborne ISR systems that connect seamlessly to DoD ground stations, satellites, and intelligence systems.

Col. Robert Carpenter, ACS program manager, said there were a number of proposals on the table, including a joint Army-Navy program. However, in early 2007 it was announced that the Army and the Navy had each agreed to develop its own signals intelligence aircraft.

Phased Approach

In March 2007, the Army's Vice Chief of Staff signed off on a Phased Acquisition Plan that envisioned delivering a new capability as early as FY13. The Army approved a new block approach that would build capability over time instead of pursuing a 100 percent solution from the outset, letting the Army take advantage of mature payloads earlier. The Army planned to award a new development contract, worth up to $1.5 billion, in FY09.

The 2008 Army Position Statement "Expanding Persistent Surveillance Capabilities" says that ACS is the Army's next-generation manned, multidiscipline, multisensor airborne RSTA/ISR collection system, capable of fusing data collected by Extended Range/Multi-Purpose and other RSTA/ISR platforms in near real-time. ACS provides the cueing necessary for effective manned-unmanned teaming while supporting sensor-to-shooter and shooter-to-sensor operations. With the first operational aircraft planned for FY15, ACS will be capable of receiving data from non-Army ISR platforms and performing onboard fusion analysis with Distributed Common Ground System-Army (DCGS-A) in direct support of ground tactical commanders.

Northrop Grumman and Other Companies

In January 2008, Northrop Grumman announced that it would lead a team to compete for the ACS program. Northrop Grumman's ACS team includes AAI, an operating unit of Textron Systems; General Dynamics C-4 Systems; and L-3 Communications.

Sources indicate that Boeing is also interested in the ACS program; however, the company has not made any public announcements. Other possible bidders may include Raytheon and Lockheed Martin.

Industry Day 2008

The U.S. government's ACS Industry Day in May 2008 offered a detailed status on the ACS, including information on the risk-managed, incremental capability acquisition strategy and schedule, concept of operations, and requirements as outlined in the Capability Development document. It was reported that Industry Day had 202 attendees from 88 companies and five countries. A Request for Proposals was expected to be released in the fall of 2008, with a contract award slated for 2009. This did not happen.

New Incremental Approach – 2008

The Army decided to handle the ACS mission with a much more risk-averse, incremental (four-phase) approach. The first phase, Increment 1, would focus on integrating computers and communications networks with a suite of technologically mature sensor payloads. After Increment 1 was fielded, the Army planned to incorporate new sensor payloads once they were technologically mature. According to the *Journal of Electronic Defense* (October 2008), Increment 1 would field COMINT and GMTI/SAR sensors, and Increment 2 would incorporate an ELINT sensor. Increment 3 would add EO/IR sensors, a hyperspectral sensor, and other advanced capabilities. The final platform, Increment 4, was expected to become available after 2020.

Aerial Common Sensor (ACS)

Funding

FUNDING, U.S. ARMY

	FY10 AMT	FY11 AMT	FY12 AMT	FY13 AMT	FY14 AMT	FY15 AMT	FY16 AMT	To Complete
RDT&E (Army)								
PE#0307207A – ACS (MIP)	115.43	0						
PE#0605626A – ACS (SDD)								
AC5: EMARSS (MIP)		211.5	31.465	3.35	30.234	28.807	28.699	Continuing

All $ are in millions.

Notes: A total cost is not shown because the program is expected to continue past FY16.

The DoD has refined the ACS program as the Enhanced Medium-Altitude Reconnaissance and Surveillance System (EMARSS).

Funding under PE#0307207A transferred to PE#0605626A – ACS (SDD) – EMARSS (MIP).

Funding in FY09 and earlier in PE#0207344A; funding in FY10 in PE#0307207A; funding in FY11 and beyond in PE#0605626A.

Source: FY12 U.S. Army RDT&E Descriptive Summaries, Army Appropriation, Budget Activity 7, Volume II, Feb. 2011

Contracts/Orders & Options

Contractor	Award ($ millions)	Date/Description
Lockheed Martin	6.0	Apr 2002 – A $6 million increment of a $35 million cost-plus-award-fee contract for the ACS Component Advanced Development phase. Work was completed by Sep 2004. The Communications Electronics Command Acquisition Center, Fort Monmouth, NJ, was the contracting agency. (DAAB07-02-C-P405)
Northrop Grumman	6.0	Apr 2002 – A $6 million increment of a $35 million cost-plus-award-fee contract for the ACS Component Advanced Development phase. Work was completed by Sep 2004. The contracting agency was the Communications Electronics Command Acquisition Center, Fort Monmouth, NJ. (DAAB07-02-C-P406)
Lockheed Martin	79.0	Aug 2004 – A $79 million increment of an $821.5 million cost-plus-award-fee contract for the Aerial Common Sensor program. Work was completed by Feb 28, 2010. The U.S. Army Communications-Electronics Command, Fort Monmouth, NJ, was the contracting agency. (W15P7T-04-C-J409)
CACI International	24.5	Sep 2009 – CACI will support airborne ISR for the Army Product Manager, ACS. The airborne ISR ground station support system is housed in specially modified aircraft. The system gathers and processes intelligence data that is transferred to ground locations for further analysis.

Timetable

Month	Year	Major Development
Apr	2000	Concept exploration phase contracts awarded
July	2001	U.S. Army decides to postpone decision to choose a single contractor for the ACS program
Apr	2002	Lockheed Martin and Northrop Grumman chosen for Component Advanced Development phase
Aug	2004	Lockheed Martin chosen for the ACS development program

Month	Year	Major Development
Sep	2005	U.S. Army issues stop work order to Lockheed Martin for the ACS program
Jan	2006	U.S. Army cancels Lockheed Martin's ACS development program
Oct	2006	U.S. Army holds Industry Day to brief contractors on ACS program
Jan	2007	U.S. Army and Navy agree to have separate signals intelligence programs
Mar	2007	U.S. Army signs off on phased acquisition, block approach ACS program
Dec	2010	EMARSS contract awarded to Boeing

Worldwide Distribution/Inventories

No systems have been produced. This is a **U.S.** program; exports will be restricted during the program's initial stages.

Forecast Rationale

ACS Restructured – EMARSS

U.S. Army FY12 budget documentation states that the ACS program has been restructured and renamed the Enhanced Medium-Altitude Reconnaissance and Surveillance System (EMARSS).

Funding under PE#0307207A, Aerial Common Sensor (ACS) was transferred to PE#0605626A, Aerial Common Sensor (SDD) Project AC5 EMARSS (MIP) in FY11.

In December 2010, Boeing received a two-year engineering and manufacturing development contract for the EMARSS from the U.S. Army.

This report will be archived in April 2012.

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