

Coastal Battlefield Reconnaissance and Analysis (COBRA) System

Executive Summary

- The Navy conducted the Coastal Battlefield Reconnaissance and Analysis (COBRA) Block I IOT&E to evaluate the system's capability to detect and classify mine lines, mine fields, and obstacles on the beach zone in daylight.
- COBRA Block I provides an operational capability for beach reconnaissance.

System

- The COBRA system is a mission payload on the MQ-8B Fire Scout unmanned air system (UAS), which can be embarked on a Littoral Combat Ship (LCS) or other air-capable ships. The COBRA system is a component of the mine countermeasures (MCM) mission package (MP) when employed from LCS.
- The COBRA program is using evolutionary acquisition and incremental development to meet overall mine and obstacle reconnaissance requirements.
 - Block I capability is intended to provide tactical reconnaissance for detection and location of unburied mine lines, mine fields, and obstacles on the beach in daylight. The MQ-8B Fire Scout currently serves as the Block I sensor platform. The Navy declared Block I system Initial Operational Capability (IOC) in July 2017.
 - Block II is intended to enhance the COBRA system sensor to provide daytime and nighttime detection and location of unburied mine lines, mine fields, and obstacles in the beach and surf zones. The Navy expects Block II to reach IOC in FY22.
 - As currently envisioned, Block III will add the capability to detect buried mines in the beach and surf zones. The Block III IOC date has not yet been established.
- The COBRA Block I system consists of the COBRA Airborne Payload Subsystem (CAPS) and Post Mission Analysis (PMA) subsystem.
 - CAPS consists of a multi-spectral camera, installed on an MQ-8B Fire Scout as a modular payload. The system saves collected multi-spectral imagery of the target area to a Data Storage Unit (DSU) for post-mission analysis.
 - Upon aircraft recovery, the DSU is removed from CAPS and connected to the PMA subsystem. When the PMA operator has completed analysis of the data, the processed imagery is forwarded to the Mine Warfare (MIW) Environmental Decision Aids Library (MEDAL) for message formatting and further dissemination to the Mine Countermeasures Commander and other operational commanders via tactical data networks.
- The COBRA system is dependent on the UAS and shipboard systems to perform its mission.



- Shipboard operators use the Tactical Common Data Link (TCDL) to communicate with CAPS from the MQ-8B Mission Control System (MCS) while the MQ-8B Fire Scout is in flight.
- On LCS, MEDAL resides in the mission package application software (MPAS). The PMA subsystem and MPAS, in turn, reside on the mission package computing environment, which provides operator control, computing, networking, and storage infrastructure.
- The COBRA system provides the sensing capability for Joint Direct Attack Munition (JDAM) Assault Breaching System (JABS), a component of the Assault Breaching System, which can be used to neutralize mines and obstacles on the beach prior to an amphibious assault. The COBRA system precision location capability supports JABS targeting or identification of clear lanes to bypass mines and obstacles.
- The COBRA system provides beach reconnaissance capability for the LCS Coastal Mine Reconnaissance Mission Module in the LCS MCM MP.

Mission

- The Joint Force Commander will use LCS units equipped with the COBRA Block I system as part of the MCM MP to conduct unmanned aerial tactical reconnaissance of potential landing sites for an amphibious assault.
- The Joint Force Commander will use LCS units equipped with the COBRA Block II system as part of the MCM MP to conduct daytime and nighttime unmanned aerial tactical reconnaissance of both beach and surf zones for potential landing sites for an amphibious assault.

Major Contractor

Areté Associates – Tucson, Arizona

FY18 NAVY PROGRAMS

Activity

- DOT&E approved the COBRA Block I Cybersecurity IOT&E Plan and Change 1 to the COBRA Block I IOT&E Plan in March 2018.
- The Navy completed COBRA Block I IOT&E Test Periods Two through Five in FY18. The testing was conducted in accordance with DOT&E-approved test plans.
 - During Test Period Two, fleet sailors operated the system in the Southern California Operational Area from LCS 4 in March 2018. The MQ-8B Fire Scout with the COBRA payload completed four missions to assess its shipboard performance at sea. After each flight, trained fleet operators completed post-mission analysis of COBRA data.
 - During Test Period Three, fleet sailors conducted a Maintenance Demonstration (M-DEMO) on LCS 4 in March 2018. The M-DEMO included five maintenance vignettes each on the CAPS and PMA subsystem using simulated system faults.
 - The Navy Operational Test and Evaluation Force (OPTEVFOR) completed cybersecurity testing during Test Periods Four (Cooperative Vulnerability and Penetration Assessment) and Five (Adversarial Assessment) pier-side on LCS 4 in early March 2018 and April 2018, respectively.
- Test Period Two (March 2018) provided additional data to assess the effectiveness of the system to detect, classify, and localize mine lines, mine fields, and obstacles in a beach zone that transitioned from plain sand to areas with beach vegetation on sand.
- The system exceeds the Navy threshold requirements for maximum false alarm rate.
- COBRA Block I exceeded all suitability threshold requirements based on results from Test Periods One through Three.
 - Test Period Two provided data that were adequate to assess the shipboard suitability.
 - The M-DEMO during Test Period Three was adequate to assess COBRA Block I maintainability using simulated system faults, but fleet sailors lacked spare parts to complete some identified parts replacement actions.
 - The COBRA Block I system performed reliably with four minor operational mission failures during IOT&E.
 - MQ-8B Fire Scout test platforms were not operational for several days during the COBRA IOT&E. MQ-8B troubleshooting and repairs required significant maintenance and technical support. The Navy acquired the MQ-8B Fire Scout variant in response to an Urgent Operational Need and did not fully assess its operational performance or suitability in IOT&E.
- COBRA Block I is cyber survivable based on testing in Test Periods Four and Five.

Assessment

- COBRA Block I provides an operational capability for beach reconnaissance. The system did not meet the Navy Block I Capability Production Document threshold requirements for one class of targets but provides an organic, remotely operated, beach reconnaissance capability to support amphibious assault operations.
 - Test Period One of the COBRA Block I IOT&E, completed in June 2017, provided the data to evaluate the search rate, percentage of targets (mine fields, mine lines, and obstacles) detected and classified, and the target location error and false alarm rate for the targets.

Recommendations

The Navy should:

1. Fund and integrate the COBRA Block I system on a more robust and reliable platform (i.e., MQ-8C).
2. Implement COBRA Block I software upgrades for image processing to reduce the false alarm rate.
3. Fund and develop the COBRA Block II system to provide nighttime and surf zone reconnaissance capability.