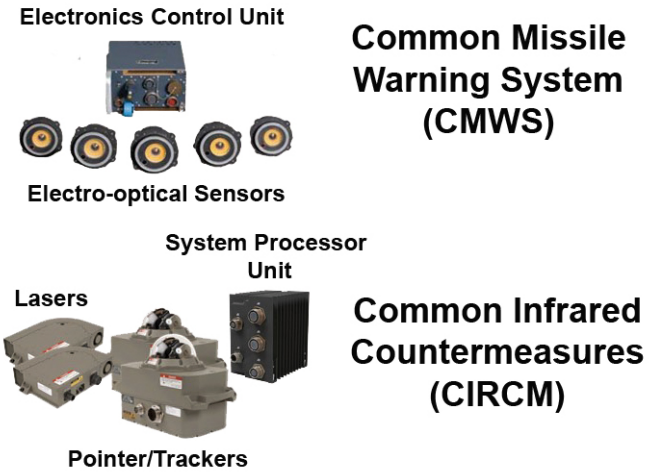
Common Infrared Countermeasures (CIRCM)

Executive Summary
- The Army Test and Evaluation Command (ATEC) conducted an IOT&E of the Common Infrared Countermeasures (CIRCM) system as integrated on the UH-60M Black Hawk at multiple facilities and open-air locations from February through November 2019. Testing supports a decision in March 2021 to proceed to full-rate production and authorize up to 596 units. DOT&E produced a classified report to support that decision.
- Operational testing showed the system is effective against man-portable air-defense systems (MANPADS) and is suitable – though the human-system interface design needs improvement. Cybersecurity testing demonstrated the system has minor vulnerabilities the Army can mitigate.



System
- The CIRCM system is a defensive system for aircraft, which is designed to defend against surface-to-air infrared missile threats.
- The system of systems combines the Army's legacy Common Missile Warning System (CMWS) consisting of ultraviolet missile warning sensors and an electronics control unit or other Missile Warning Systems (MWSs) with the CIRCM system consisting of two lasers, two pointer/trackers, and a system processor unit.
- If the MWS detects a probable threat to the aircraft, it passes the tracking information for that possible threat to the CIRCM processor, which directs the pointer/trackers to slew to and jam the threat with laser energy. Simultaneously, the MWS processor continues to evaluate the possible threat to determine if it is a real threat or a false alarm. If the MWS declares the detection to be an actual threat, it notifies the aircrew through audio alerts and a visual display on the aircraft Multi-Function Display in the cockpit, while also releasing flares as a countermeasure.

Mission
- Commanders employ Army rotorcraft equipped with the CIRCM system to conduct air assaults, air movements, casualty evacuation, attack, armed escort, reconnaissance, and security operations.
- During Army missions, the CIRCM system is intended to provide automatic protection for rotary-wing aircraft against shoulder-fired and vehicle-launched infrared surface-to-air missiles.

Major Contractor
Northrop Grumman, Electronic Systems, Defensive Systems Division – Rolling Meadows, Illinois

Activity
- ATEC conducted IOT&E of the CIRCM system as integrated on the UH-60M Black Hawk from February through November 2019. Testing supports a decision in March 2021 to proceed to full-rate production and authorize up to 596 units. DOT&E produced a classified report to support that decision.
- Testing incorporated hardware-in-the-loop activities from the Integrated Threat Warning Laboratory located at Wright Patterson AFB, Ohio; the Threat Signal Processor-in-the-Loop facility located at Naval Air Weapons Center China Lake, California; and the Guided Weapons Evaluation Facility located at Eglin AFB, Florida.
- Flight testing occurred at multiple locations throughout the United States to subject the system to the following environments: heavy foliage, littoral, mountainous, snowy, and urban and industrial infrared and ultraviolet clutter.
- ATEC primarily accomplished testing in accordance with DOT&E-approved test plans.
- The Army has instituted workarounds and is developing a solution for the occasional CIRCM tracker jitter problem caused by electromagnetic interference introduced by sources on the UH-60M aircraft.

- The coronavirus pandemic caused delays in data analysis and reporting due to personnel having limited access to systems necessary to process classified data and related information.

Assessment

- Operational testing showed the system is effective against MANPADS and vehicle-launched infrared surface-to-air missiles. Testing also showed the system has acceptable reliability, availability, maintainability, and built-in test performance.
- Electromagnetic interference introduced by sources on the UH-60M aircraft caused jitter in CIRCM's tracker, which could reduce jamming power placed on the threat and may cause the CIRCM system to restart.
- The CIRCM control panel has poor control switch placement in the cockpit that makes it difficult for the pilots to access. The Army is in the process of redesigning and relocating the CIRCM control panel for easier pilot access.
- Cybersecurity testing demonstrated the system has minor vulnerabilities that the Army can mitigate.

Recommendation

1. The Army should mitigate the minor cybersecurity vulnerabilities identified during testing.