

Handheld Manpack and Small-Form Fit (HMS) Programs – Leader Radio and Manpack

Light infantry companies equipped with the Leader Radio and Manpack are not operationally effective when operating the voice and data network in dense vegetation, the primary area of operations. The system of systems that comprise the tactical network are not operationally suitable due to the increased logistics burden levied on the unit. The Leader Radio is vulnerable in a cyber-contested environment, while the Manpack is survivable against some cyber threats. Both are vulnerable in an electromagnetic spectrum-contested environment. In August 2021, the Army approved the full-rate production for the Leader Radio and Manpack.



System Description

The Handheld, Manpack, and Small Form Fit (HMS) program consists of the Leader and Manpack radios intended to equip infantry companies with a capability to send and receive voice and data to command and control the unit and execute the commander's intent. The Leader Radio is a two-channel, handheld, software-defined radio providing SECRET and CUI tactical voice and data communications. The Manpack is a two-channel, software-defined radio employed by general purpose radio users to operate two simultaneous waveforms. The Atom network management software configures the networks formed by the waveforms running on the Leader Radio and Manpack.

Program

The Leader Radio and Manpack are Acquisition Category IC programs under the Product Manager HMS and Program Executive Officer (PEO) Command Control Communications – Tactical (C3T). DOT&E approved the Leader Radio Test and Evaluation Master Plan (TEMP) and the Manpack TEMP in 2020. The Army approved the Leader Radio and Manpack for full-rate production in August 2021.

Major Contractors

- L3Harris Technologies – Melbourne, Florida.
- Collins Aerospace – Charlotte, North Carolina.
- Thales Group – Clarksburg, Maryland.

Test Adequacy

The Army conducted an IOT&E and an Adversarial Assessment (AA) of the HMS Leader Radio and Manpack at Fort Bragg, North Carolina to support the full-rate production decision. The IOT&E and AA were not conducted in accordance with the DOT&E-approved test plans. The HMS IOT&E was adequate to evaluate the operational effectiveness of the Leader Radio and Manpack but not reliability, availability, maintainability, training, and the ability of a unit to install the tactical network using Atom. The HMS IOT&E and AA were not adequate to address the cybersecurity of HMS radios against an outsider threat or the ability of the unit to prevent, mitigate, and recover from a cyberattack. The IOT&E and AA consisted of 21 force-on-force missions conducted over three, 72-hour scenarios. Additional details are provided in the HMS IOT&E report published in July 2021.

Performance

Effectiveness

Infantry companies equipped with the Leader Radio and Manpack are not operationally effective when operating the Tactical Scalable Mobile ad-hoc network (TSM) voice and data network provided by the HMS equipment. The TSM network demonstrated limited connectivity and range in dense vegetation, diminishing this operational capability. Platoons and squads may have more connectivity and use of TSM due to shorter range requirements. When connected, the TSM provided enhanced situational awareness by providing soldier position location information and clear voice communication. The radios' legacy communications worked well for company-level communications and reach-back to battalion for most missions.

The Leader Radio provided TSM at short ranges that did not meet distance requirements and had a battery life that did not support mission lengths. The Manpack also had TSM range limitations and short battery life but did provide Mobile User Objective System satellite communications that worked

well. The HMS IOT&E report published in July 2021 details the ability of the unit to conduct their mission command using the HMS products as well as the performance of the individual systems. The Atom software was operationally effective for network management planning.

Suitability

The system of systems that comprise the tactical network are not operationally suitable due to the increased logistics burden levied on the unit. The dismounted infantry companies were not able to keep the Leader Radios, Manpacks, and conformal wearable batteries charged with their organic equipment. The Leader Radio did not integrate well into soldier combat equipment. Cables disconnected in vegetation, leading to battery disconnects and a loss of situational awareness. The Manpack was difficult to carry due to its weight, size, and heat. Signal soldiers scored Atom usability as marginal due to software immaturity, which the Army is working to correct. The HMS IOT&E did not provide adequate data to evaluate the reliability of the Leader Radio and Manpack.

Survivability

The survivability of the Leader Radio and the Manpack in a contested cyber and electromagnetic spectrum operational environments is detailed in the classified annex of the HMS IOT&E report published in July 2021.

Recommendations

The Army should:

1. Design a tactical network that prioritizes range for voice and position location information.
2. Develop a tactical power management plan.
3. Continue to improve integration with combat gear for both the Leader Radio and Manpack.
4. Conduct follow-on operational testing to evaluate the areas where the HMS IOT&E did not provide the data for an adequate evaluation of operational performance.