

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



In April 2022, the Army conducted a soldier touch point (STP) of the Leader Radio and Manpack demonstrating improvements in performance. Light infantry platoons equipped with the Leader Radio and Manpack are operationally effective when operating the voice and data network in the dense vegetation where they expect to operate. The Army has not demonstrated operational effectiveness or operational suitability of a company-level system-of-systems network. The system of systems that comprise the tactical network have not demonstrated operational suitability due to incomplete testing of the logistics burden on the unit.

SYSTEM DESCRIPTION

The Handheld, Manpack, and Small Form Fit (HMS) program consists of the Leader and Manpack radios. The Leader Radio is a two-channel, handheld, software-defined radio. The Manpack radio is a two-channel, software-defined radio employed by general purpose radio users capable of operating two simultaneous waveforms. Both the Manpack and Leader Radio provide SECRET and CUI tactical voice and data communications. The Atom network management software configures the networks formed by the waveforms running on the Leader Radio and Manpack.

MISSION

Commanders employ the battalion and below networks to support mission execution through the exchange of information. The tactical networks created by Leader Radio and Manpack provide the transport layer for battalion and below network. These networks should be capable of sending and receiving the voice and data messages necessary to execute command and control and commander's intent.

PROGRAM

The Leader Radio and Manpack are Acquisition Category IC programs under the Product Manager HMS and Program Executive Officer Command Control Communications –

Tactical. DOT&E approved the Test and Evaluation Master Plans for the Leader Radio and the Manpack in 2020. The Army approved the Leader Radio and Manpack for full-rate production in August 2021.

» MAJOR CONTRACTORS

- L3Harris Technologies Inc. – Melbourne, Florida
- Collins Aerospace – Cedar Rapids, Iowa
- Thales Defense and Security Inc. – Clarksburg, Maryland

TEST ADEQUACY

The Army conducted a STP customer test of the HMS Leader Radio and Manpack at Fort Bragg, North Carolina in April 2022. The Army Acquisition Executive required the program to verify corrections of deficiencies discovered during the IOT&E. The STP did not have a DOT&E-approved test plan, but was observed by DOT&E. The HMS STP was adequate to evaluate the operational effectiveness of dismounted infantry platoon missions and the suitability of training and human system interface with the radios. The STP consisted of eight force-on-force missions conducted over eight days with each mission lasting around four hours. The STP was not designed to evaluate operational effectiveness or survivability at the company echelon, as the IOT&E was. The Army did not scope the STP to assess reliability, availability, or

maintainability. In accordance with the Test and Evaluation Master Plans, these will be evaluated by combining data as appropriate from annual production verification testing and STPs.

PERFORMANCE

» EFFECTIVENESS

Infantry platoons equipped with the Leader Radio and Manpack are operationally effective when operating the Tactical Scalable Mobile ad-hoc network (TSM) voice and data network provided by the HMS equipment. When connected, the TSM network provided enhanced situational awareness by providing soldier position location information and clear voice communication. The TSM network demonstrated sufficient connectivity and range in dense vegetation for platoon operations.

The Leader Radio provided TSM at ranges meeting platoon distance requirements and the Manpack TSM range supported the operationally realistic STP missions. The Army has not demonstrated TSM effectiveness at the company-echelon.

Single Channel Ground and Airborne Radio System, Mobile User Objective System, and Integrated Waveform satellite communications worked well. The Atom software was operationally effective for network management planning and loading.

» **SUITABILITY**

The HMS STP demonstrated improvements to Leader Radio and Manpack battery life and soldier integration. Leader Radio demonstrated a battery life that supported the limited mission lengths conducted during the STP. Extrapolation of measurements collected during the STP indicate that the Leader Radio and conformal wearable battery life support extended operations. The Manpack demonstrated improved battery life. Dismounted infantry companies demonstrated the ability to keep the Leader Radios, Manpacks, and conformal wearable batteries charged with their organic equipment, but not in an operational or field environment.

The Leader Radio demonstrated improvements integrating into soldier combat equipment. The Manpack continues to demonstrate high external temperatures and soldiers were dissatisfied with the weight. Changes in carrying

packs were well received by the soldiers. Product Manager HMS is continuing to develop the packs. Signal soldiers observed improvements in Atom software's usability. Training was sufficient for the Leader Radio, Manpack, and Atom software.

The HMS IOT&E did not provide adequate data to evaluate the reliability, availability, and maintainability of the Leader Radio and Manpack. The reliability data collected during the STP will be combined with future events to provide a cumulative evaluation. HMS radios will participate in the Integrated Tactical Network Operational Demonstration in 2QFY23, providing an opportunity for assessment.

» **SURVIVABILITY**

The survivability of the Leader Radio and Manpack in cyber-contested and electromagnetic spectrum operational environments is detailed in the

classified annex of the HMS IOT&E report published in July 2021. The Army has not corrected the cyber deficiencies.

RECOMMENDATIONS

The Army should:

1. Design a tactical network that prioritizes range for voice and position location information.
2. Test tactical power management for light infantry units in an operational environment.
3. Continue to improve integration with the rucksack for the Manpack.
4. Conduct follow-on operational testing to evaluate the remaining operational effectiveness, operational suitability, and survivability deficiencies with a company equipped with the Leader Radio and Manpack.