

# Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS)

## Executive Summary

- In January 2011, the Army conducted a Verification of Correction of Deficiencies (VCD) test with a redesigned version of the Rifleman Radio. The VCD indicated the redesigned radio corrects most of the prior-design radio's deficiencies and improves reliability.
- In May 2011, the JTRS HMS program received a Milestone C Low-Rate Initial Production (LRIP) decision based upon the improved performance of the Rifleman Radio demonstrated during the VCD. The Defense Acquisition Executive approved the Rifleman Radio LRIP quantity of 6,250 radios and a Manpack LRIP of 100 radios based upon its performance in 8 days (reduced from 45 days) of developmental testing.
- In June 2011, the Army conducted a Manpack LUT as a part of its 2011 Network Integration Evaluation (NIE). The Manpack radio demonstrated problems with reliability, transmission range, and voice quality that restricted the unit's ability to accomplish its mission. These same problems were observed during the curtailed period of developmental testing.
- The JTRS HMS program is schedule-driven and has reduced developmental testing to support an aggressive operational test schedule. Therefore, operational testing has and will likely continue to reveal problems that should have been discovered and fixed during developmental testing. The program continues preparation for its scheduled November 2011 Rifleman Radio IOT&E and its scheduled May 2012 Manpack Multi-Service Operational Test and Evaluation (MOT&E).

## System

- JTRS is a family of software-programmable and hardware configurable digital radios intended to provide increased interoperability, flexibility, and adaptability to support numerous tactical communications requirements.
- The JTRS HMS program provides handheld and two-channel manpack radios supporting Army, Marine Corps, Navy, and Air Force operations. The program develops Small Form Fit (SFF) radio configurations that include the stand-alone Army Rifleman Radio and embedded SFF variants that serve in Army host platforms such as the SFF-B (intended for the Shadow Unmanned Aerial Vehicle) and the SFF-D (intended for the Small Unmanned Ground Vehicle).
- The program strategy has two phases of HMS production. Phase 1 is Rifleman Radios with National Security Agency (NSA) Type 2 encryption of unclassified information. Phase 2 is Manpack Radios with NSA Type 1 encryption of classified information.



## Mission

Commanders from the Army, Marine Corps, Navy, and Air Force use JTRS HMS radios to:

- Communicate and create networks to exchange voice, video, and data using legacy waveforms or the Soldier Radio Waveform (SRW) during all aspects of military operations.
- Integrate JTRS SFF variants into host platforms to provide networked communications capabilities for users engaged in land combat operations to support voice, video, and data across the air, land, and sea battlespace.

## Major Contractor

General Dynamics, C4 Systems – Scottsdale, Arizona

## Activity

### Rifleman Radio

- The JTRS HMS program initiated a complete redesign of the Rifleman Radio hardware and improved its software to address the deficiencies identified during the 2009 LUT. The redesigned Rifleman Radio features improvements in size, weight, battery life, and increased radio frequency power out.
- In January 2011, the Army conducted a Rifleman Radio VCD at the Maneuver Battle Lab, Fort Benning, Georgia. The VCD was used to confirm that deficiencies in the Rifleman Radio's reliability, doctrine, range, battery life, and thermal characteristics had been properly addressed.
- On May 18, 2011, the Defense Acquisition Executive approved the JTRS HMS Milestone C LRIP decision to purchase 6,250 Rifleman Radios.
- The Army continued development of the Rifleman Radio Test and Evaluation Master Plan (TEMP) to support its planned 1QFY12 NIE Rifleman Radio IOT&E.

### Manpack

- The Army conducted two developmental tests of the Manpack radio:
  - Manpack Customer Test, conducted at Fort Benning, Georgia, February 7-11, 2011
  - Formal government developmental test (GDT), conducted at the Electronic Proving Grounds, Fort Huachuca, Arizona, April 15-22, 2011 (originally planned for 45 days)
- At the program's May 18, 2011, Milestone C, the Defense Acquisition Executive approved an LRIP of 100 Manpack radios. The Manpack LRIP is intended to support future developmental and operational tests. A second Manpack LRIP In Progress Review (IPR) is planned for February 2012.
- In July 2011, the Army conducted the Manpack LUT, as part of its NIE at Fort Bliss, Texas, to support the program's post-Milestone C IPR. The Army used the LUT to assess the performance of the Manpack under numerous mission scenarios executed by a cavalry troop.
- The Army is developing a JTRS HMS Manpack Radio Acquisition Strategy Report, Capabilities Production Document (CPD), and TEMP. These documents will be required for future developmental and operational testing.

## Assessment

### Rifleman Radio

- During the 2009 Rifleman Radio LUT, DOT&E assessed the radio as useful during mission preparation, movement, and reconnaissance activities. During combat engagements, however, the radio demonstrated poor performance and the squad had difficulty with employment of the radio.
- During the 2011 Rifleman Radio VCD, the redesigned radio demonstrated improvement:
  - Operational reliability was 277 hours Mean Time Between Essential Function Failure compared to the

radio's revised requirement of 477 hours. This translates to a 92 percent chance of completion of a 24-hour mission compared to a requirement of 95 percent.

- Transmission range met the radio's requirement of 2,000 meters in an urban setting and 1,000 meters in dense vegetation.
- Radio battery life exceeded the radio's revised 8-hour requirement.
- Doctrine for use of the radio demonstrated improvement.
- Radio temperature was reduced.

### Manpack

- The Army reduced the Manpack formal GDT (April 2011) from its originally scheduled 45 days to 8 days to place radios into the NIE JTRS HMS Manpack LUT.
- Both the Manpack Customer Test and formal GDT highlighted deficiencies in performance and poor reliability. The Army determined that the Manpack's Single Channel Ground and Airborne Radio System (SINGARS) waveform was not ready for test and did not test it during the truncated formal GDT.
- During the NIE JTRS HMS Manpack LUT, the radio demonstrated the following:
  - Ability to transmit and receive on two channels
  - Ability to distribute Position Location Information throughout the network
  - Poor reliability
  - Short range of the Soldier Radio Waveform and SINGARS waveforms that significantly constricted the operational area of the cavalry troop
  - Inconsistent voice quality
  - SINGARS waveform did not support unit operations and was immature for operational test
- The NIE JTRS HMS Manpack LUT's reliability data collection was inadequate and not conducted in accordance with the approved test plan.
- The JTRS HMS program is schedule-driven and has reduced developmental testing to support an aggressive operational test schedule. The program continues preparation for its scheduled November 2011 Rifleman Radio IOT&E and its scheduled May 2012 Manpack MOT&E.

## Recommendations

- Status of Previous Recommendations. The JTRS HMS program is addressing all previous recommendations.
- FY11 Recommendations. The JTRS HMS program should:
  1. Ensure that adequate developmental testing is performed prior to future operational tests.
  2. Correct any deficiencies noted at the November 2011 Manpack LUT prior to the scheduled MOT&E.
  3. Complete necessary Rifleman Radio and Manpack radio documentation to support future developmental and operational testing.