

Joint Tactical Radio System (JTRS) Ground Mobile Radio (GMR)

Executive Summary

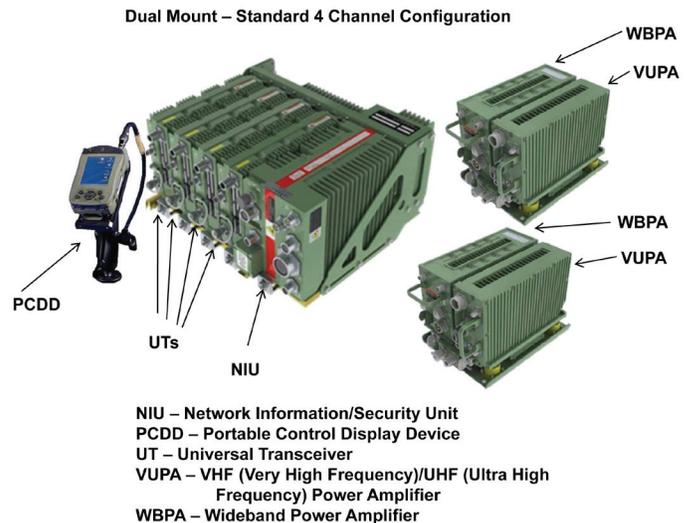
- The Joint Tactical Radio System (JTRS) Ground Mobile Radio (GMR) System Integration Test (SIT) was delayed from May 17 to June 29, 2010, due to problems with late hardware deliveries and immature software.
- The program completed the JTRS GMR SIT, which was modified into a customer test and a government-assessed developmental test, from June 29 to September 14, 2010. Due to JTRS GMR performance deficiencies revealed during the SIT, the Army delayed the planned December 2010 JTRS GMR Limited User Test (LUT) until June 2011 to allow time for reliability and performance improvements.
- The Early Infantry Brigade Combat Team (E-IBCT) Increment 1 LUT in September 2010 assessed the JTRS GMR as a component of the Network Integration Kit (NIK).
- The E-IBCT LUT 10 demonstrated the JTRS GMR's capability (as a component of the NIK) to transfer images from E-IBCT sensors to other NIKs within the brigade NIK/GMR network. The E-IBCT LUT 10 highlighted GMR deficiencies including poor support for secure voice networks, limited transmission range, difficulty connecting to sensor fields and concerns with reliability.

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.
- JTRS GMR components include portable control display devices, universal transceivers, network/information security interface units, and power amplifiers, which combine to create radio sets for installation in Army and Marine Corps ground vehicles.

Activity

- The JTRS GMR has an approved Milestone B Test and Evaluation Master Plan with requirements based upon JTRS Operational Requirements Document 3.2.1. The Army is in the process of staffing an updated JTRS GMR Capabilities Production Document.
- The Army delayed the start of the GMR SIT developmental test from May 17 to June 29, 2010, due to problems with late hardware deliveries and immature software. The SIT used Engineering Development Model (EDM) GMRs hosting a selection of terrestrial and satellite JTRS waveforms, including



Mission

Commanders from the Army and the Marine Corps intend to use JTRS GMR to:

- Communicate and create networks to exchange voice, video, and data during all aspects of military operations.
- Interface with other JTRS product line radios and legacy radio systems in joint and coalition operations.

Major Contractor

The Boeing Company, Integrated Defense Systems – Huntington Beach, California

the Wideband Networking Waveform (WNW) v4.0. The SIT was split into two parts:

- SIT Part 1, June 29 - August 19, 2010, was a customer test using 35 GMR nodes to conduct continued test-fix-test activities of the WNW and to provide an instrumented network for the Director, Defense Research and Engineering to collect data to assess GMR's technology readiness levels.
- SIT Part 2, September 1 - 14, 2010, was executed as a government developmental test of JTRS GMR and its

Increment 1 waveforms conducted by Army Test and Evaluation Command (ATEC).

- The JTRS GMR program participated in the Vice Chief of Staff of the Army (VCSA) Brigade Combat Team Integration Network exercise in July 2010. This event demonstrated exchange of information among the JTRS GMR, the Warfighter Information Network – Tactical, and the JTRS Handheld, Manpack, and Small Form Fit radios.
- ATEC assessed 15 JTRS GMRs, each serving as a component of a NIK, during the E-IBCT Increment 1 LUT 10 in September 2010. The JTRS GMR within the NIK employs the following waveforms:
 - Frequency hopping, secure Single Channel Ground and Airborne Radio System (SINCGARS)
 - Soldier Radio Waveform (SRW) v1.0c
 - WNW v4.0

Assessment

- The FY10 JTRS GMR schedule delays were due to late hardware deliveries and a technically immature operating environment and waveform software.
- In 2009, the JTRS GMR supported the 30-Node Wideband Networking Waveform (WNW) Field Test and the E-IBCT LUT 09 (as a component of the NIK) with pre-EDM GMRs and an earlier version of the WNW. These GMRs operating with the WNW had difficulty establishing a stable network, poor throughput, unsatisfactory message completion rates, and poor operational reliability.
- The September 2010 JTRS GMR SIT initial results indicate that the JTRS GMR and WNW performed better within portions of the network (subnets), but when tested across 29 GMR WNW nodes, the radio continued to demonstrate deficiencies noted in 2009, including:
 - Difficulty establishing the network
 - Low data throughput as data is transmitted throughout the network
 - Low message completion rates that decrease as communications traffic travels across the larger network

- Low message completion rates that decrease as GMR nodes physically moved within the test range
- The September 2010 E-IBCT LUT 10 demonstrated the NIK (with JTRS GMR as a component) as capable of transmitting BSOs and images from E-IBCT sensors to others NIKs within the brigade NIK/GMR network. The JTRS GMR's performance (as a component of the NIK) highlighted the following deficiencies:
 - Undependable SINCGARS frequency-hopping secure waveform (used for voice command and control)
 - Limited transmission range of 7-10 kilometers which required the use of two NIK/GMR relay nodes
 - Difficulty connecting to E-IBCT sensors using the SRW
 - GMR and waveform difficulties which contributed to the poor reliability of the NIK
- Due to deficiencies in JTRS GMR performance revealed during the SIT, the Army delayed the planned December 2010 LUT (in support of the program's Milestone C) until June 2011 to allow time for reliability and performance improvements.
- The JTRS GMR program faces potential restructure under Nunn McCurdy that may impact the program's schedule and supporting test events.

Recommendations

- Status of Previous Recommendations. The program addressed two of the four FY09 recommendations. The previous recommendations regarding the correction of deficiencies noted in the 30-Node WNW Field Test and the E-IBCT LUT 09, as well as the synchronization of activities to create an integrated approach between JTRS GMR, JTRS Network Enterprise Domain, and the E-IBCT programs remain valid.
- FY10 Recommendation.
 1. The JTRS GMR program should execute an independent government developmental test to verify correction of all reliability and performance deficiencies revealed during previous testing.