# Warfighter Information Network – Tactical (WIN-T)

Executive Summary

- In September 2013, the Defense Acquisition Executive (DAE) conducted a Warfighter Information Network – Tactical (WIN-T) Increment 2 Full-Rate Production (FRP) Defense Acquisition Board (DAB) based upon the May 2013 WIN-T Increment 2 FOT&E. DOT&E presented an FOT&E report that assessed:
  - Most WIN-T Increment 2 configuration items were operationally effective. The Soldier Network Extension (SNE), Tactical Radio – Tower (TR-T), and High Band Networking Waveform (HNW) were not operationally effective.
  - Most WIN-T Increment 2 configuration items were operationally suitable. The SNE and Point of Presence (PoP) were not operationally suitable.
  - WIN-T Increment 2 demonstrated improvement in survivability, but requires further improvement in cybersecurity.
- As a result of the September 2013 DAB, the DAE published an Acquisition Decision Memorandum (ADM) that:
  - Authorized the acceptance of the 2012 low-rate initial production (LRIP) and procurement of another LRIP without SNEs.
  - Directed the Army to reduce SNE and PoP complexity, improve PoP reliability, fix survivability, correct deficiencies discovered during the FOT&E, and demonstrate these improvements in a second FOT&E.
- During FY14, the Army conducted two WIN-T Increment 2 developmental tests, which demonstrated improvements in SNE and PoP operations, but did not provide confidence that the SNE and PoP would meet reliability requirements during the planned second FOT&E. The Army has again reduced its approved reliability requirements for selected WIN-T components, including the SNE, to levels now likely to be consistent with demonstrated performance.
- The Army conducted a second WIN-T Increment 2 FOT&E (FOT&E2) during Network Integration Evaluation (NIE) 15.1 from October to November 2014.
- The program updated the WIN-T Increment 2 Test and Evaluation Master Plan (TEMP) to support the second FOT&E and completed a WIN-T Increment 2 TEMP annex that outlines the remaining WIN-T Increment 3 test activities.

System

- The Army designed the WIN-T as a three-tiered communications architecture (space, terrestrial, and airborne) to serve as the Army's high-speed and high-capacity tactical communications network.
- The Army intends WIN-T to provide reliable, secure, and seamless communications for units operating at theater level and below.
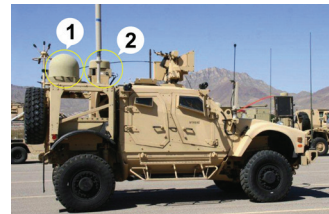
M-ATV Point of Presence

M-ATV Soldier Network Extension

Stryker Point of Presence

1 - Net-Centric Waveform Antenna
2 - High-Band Networking Waveform Antenna

M-ATV - Mine Resistant Ambush Protected (MRAP) All-Terrain Vehicle (M-ATV)

Tactical Comms Node

- The WIN-T program consists of four increments. In May 2014, the DAE approved the Army's request to stop development of the Increment 3 aerial tier of networked airborne communications relays and limit Increment 3 to network management and satellite waveform improvements. The Army intends to increase procurement of WIN-T Increment 2 configuration items to satisfy capability set requirements previously planned for Increment 3. Increment 4 is currently not funded.
  - Increment 1: "Networking At-the-Halt" enables the exchange of voice, video, data, and imagery throughout the tactical battlefield using a Ku- and Ka-satellite-based network. The Army has fielded WIN-T Increment 1 to its operational forces.
  - Increment 2: "Initial Networking On-the-Move" provides command and control on-the-move down to the company level for maneuver brigades and implements an improved network security architecture. WIN-T Increment 2 supports on-the-move communications for commanders with the addition of the PoP and the SNE and provides a mobile network infrastructure with the Tactical Communications Node.
  - Increment 3: "Full Networking On-the-Move" provides full mobility command and control for all Army field commanders, from theater to company level. Network reliability and robustness are enhanced with the addition of the air tier transport layer, which consists of networked airborne communications relays.

   - Increment 4: "Protected Satellite Communications On-the-Move" includes access to the next generation of protected communications satellites while retaining all previous on-the-move capabilities.

Mission

Commanders at theater level and below will use WIN-T to:

- Integrate satellite-based communications capabilities into an everything-over-Internet Protocol network to provide connectivity, while stationary, across an extended, non-linear battlefield and at remote locations (Increment 1)

- Provide division and below maneuver commanders with mobile communications capabilities to support initial command and control on-the-move (Increment 2)
- Provide all maneuver commanders with mobile communications capabilities to support full command and control on-the-move, including the airborne relay and protected satellite communications (Increments 3 and 4)

Major Contractor

General Dynamics, C4 Systems – Taunton, Massachusetts

Activity

- In response to a September 2012 DAB, the Army conducted the WIN-T Increment 2 FOT&E in May 2013 as part of NIE 13.2. The test employed the 2nd Brigade, 1st Armored Division under operationally realistic conditions at Fort Bliss, Texas, and White Sands Missile Range, New Mexico.
- In September 2013, DOT&E published a WIN-T Increment 2 FOT&E report to support a September 2013 FRP DAB. This report assessed:
  - Most WIN-T Increment 2 configuration items were operationally effective. The SNE, TR-T, and HNW were not operationally effective.
  - Most WIN-T Increment 2 configuration items were operationally suitable. The SNE and PoP were not operationally suitable.
  - WIN-T Increment 2 demonstrated improvement in survivability, but requires further improvement in cybersecurity.
- In September 2013, the DAE conducted a WIN-T Increment 2 FRP DAB. The resulting ADM:
  - Authorized the acceptance of the 2012 LRIP and the procurement of another LRIP without SNEs.
  - Directed additional developmental testing followed by FOT&E2 to confirm correction of deficiencies noted during FOT&E and to demonstrate—
    - The PoP meets threshold reliability requirements.
    - Significant reductions in the complexity of start-up, troubleshooting, and shutdown procedures for the SNE and PoP.
    - Significant reductions in the complexity of the SNE Combat Network Radio (CNR) Gateway operations.
- In May 2014, the DAE approved the Army's proposed restructure of the WIN-T Increment 3 program to defer the air tier, the Joint Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (JC4ISR) radio, and cease all efforts associated with development of unique hardware items. The program will complete development of the Net Centric Waveform 10.X software upgrade, and network operations software, and transition these capabilities to WIN-T Increments 1 and 2. The program will demonstrate the HNW version 3.0 waveform

(supports the JC4ISR radio) and then store the waveform in the DOD Waveform Repository.
- The Army redesigned the user interface for the SNE, PoP, and CNR Gateway to reduce complexity and exhibited these improvements at a demonstration event at Aberdeen Proving Ground, Maryland.
- During 2-3QFY14, the Army conducted two developmental tests at Aberdeen Proving Ground, Maryland, and Fort Bliss, Texas. These events were designed to verify the corrective actions to address SNE and PoP usability and reliability prior to FOT&E2. The second developmental test employed Soldiers operating SNE and PoP variants of Mine Resistant Ambush Protected and Stryker vehicles under a rigorous test scenario.
- Per ADM direction, the program updated the WIN-T Increment 2 TEMP to support FOT&E2 and completed a WIN-T Increment 2 TEMP annex that outlines the remaining WIN-T Increment 3 test activities.
- On October 9, 2014, the Army approved a revised WIN-T Increment 2 reliability requirement, Mean Time Between Essential Function Failure (MTBEFF), which reduced the reliability requirements for the majority of WIN-T Increment 2 configuration items. The Army modified the requirement by adjusting WIN-T system utilization rates within a 72-hour mission duration based upon previous operational testing. This adjustment resulted in the following changes to MTBEFF requirements:
  - SNE decreased from 250 to 184 hours.
  - PoP decreased from 182 to 144 hours.
  - Vehicle Wireless Package increased from 45 to 97 hours.
  - Tactical Communications Node decreased from 314 to 303 hours.
  - Network Operations and Security Center decreased from 218 to 216 hours.
  - TR-T decreased from 146 to 142 hours.
- Since the original 2008 WIN-T Increment 2 Capability Production Document MTBEFF requirement of 900 hours for all systems except SNE and TR-T (300 hours), the Army has reduced its reliability requirements three times in advance of operational testing based upon the following modifications.

- Prior to the May 2012 IOT&E, reduced mission duration from 96 to 72 hours.
  - Prior to the May 2013 FOT&E, reduced probability of mission completion from 90 to 80 percent.
  - Prior to the October 2014 FOT&E2, adjusted system utilization rates.
- From October to November 2014, the Army conducted the WIN-T Increment 2 FOT&E2 during NIE 15.1 at Fort Bliss, Texas, and White Sands Missile Range, New Mexico. FOT&E2 included operational testing to assess the integration of SNE and PoP equipment into Stryker combat vehicles.

Assessment

- The Army's demonstration of an improved user interface for the SNE, PoP, and CNR gateway presented an intuitive, easy-to-use method for operations and troubleshooting.
- During the two developmental test events, WIN-T Increment 2 demonstrated:
  - Improved SNE and PoP usability, which Soldiers viewed as easier to operate.
  - Reduced SNE and PoP startup and shutdown time.
  - Simplified SNE and PoP troubleshooting.
  - Improved the CNR Gateway interface, which simplifies operations and troubleshooting.
  - Although improved since FOT&E, reliability results do not provide confidence of the SNE and PoP meeting reliability requirements during FOT&E2.
- The program validated fixes for all identified failure modes during the FOT&E and the first developmental test, and intended to demonstrate these fixes during FOT&E2. The assessment is ongoing.

- The Army continues to test WIN-T Increment 2 in a brigade configuration and has not conducted an operational test on a complete division. With each release of software, WIN-T Increment 2 has experienced new failure modes during operational test.
- WIN-T Increment 2 continues to demonstrate cybersecurity vulnerabilities. This is a complex challenge for the Army since WIN-T is dependent upon the cyber defense capabilities of all systems connected to the network, for example, Distributed Common Ground System – Army and Joint Warning and Reporting Network.

Recommendations

- Status of Previous Recommendations. The program addressed one of three previous recommendations. They still need to improve the range of HNW and demonstrate recommended improvements during the WIN-T Increment 2 FOT&E2, conducted during NIE 15.1. The assessment is ongoing.
- FY14 Recommendations. The Army should:
  1. Assess the results of the WIN-T Increment 2 FOT&E2 and conduct an operational test to demonstrate correction of deficiencies noted during test.
  2. Conduct an operational test to assess the Net Centric Waveform and network operations capabilities provided by WIN-T Increment 3.
  3. Conduct an operational test to assess the future integration of WIN-T Increment 2 into combat vehicles.
  4. Improve HNW and TR-T to gain better transmission range from the radio and increase the number of TR-Ts available to support units in dispersed operations.