

Warfighter Information Network – Tactical (WIN-T)

Executive Summary

- In 2011, the Army conducted a Warfighter Information Network – Tactical (WIN-T) Increment 2 developmental test that assessed a network of more than 70 WIN-T Increment 2 communications nodes. In benign developmental test conditions, WIN-T Increment 2 met its performance requirements, but did not meet its Army-defined reliability requirements.
- In May 2012, the Army conducted a WIN-T Increment 2 IOT&E as a part of the Network Integration Evaluation (NIE) 12.2. The Soldier Network Extension (SNE), Tactical Relay-Tower (TR-T), and High-Band Networking Waveform (HNW) were not effective. All other configuration items and the Net-Centric Waveform (NCW) were effective.
- DOT&E provided details of the IOT&E test results in the WIN-T Increment 2 Beyond Low-Rate Initial Production (BLRIP) Report issued on September 25, 2012.
- WIN-T Increment 2 is not suitable due to poor reliability and maintainability and not survivable due to deficiencies noted in the classified annex to the DOT&E BLRIP report.
- In September 2012, the Defense Acquisition Executive (DAE) authorized the Army to procure an additional 538 WIN-T Increment 2 communication nodes. The DAE directed the Army to conduct an FOT&E to demonstrate improvement of the SNE and HNW, and to provide evidence that each WIN-T Increment 2 configuration item is on track to meet reliability and maintainability requirements. The DAE directed the Army to provide an updated growth plan with growth curves to achieve reliability and maintainability requirements for each WIN-T Increment 2 configuration item.
- The program plans to conduct an FOT&E on the system during NIE 13.2 in May 2013.

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.
- The WIN-T program consists of four increments.
 - 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.



Point of Presence



Soldier Network Extension



Tactical Comms Node

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

- 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 Point-of-Presence (PoP) and the SNE and provides a mobile network infrastructure with the Tactical Communications Node (TCN).
- 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).

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- 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 2011, the Army conducted a developmental test that assessed a WIN-T Increment 2 network containing more than 70 communications nodes. The Army conducted the test at Aberdeen Proving Ground, Maryland, and the contractor's facility in Taunton, Massachusetts.
 - In January 2012, the Army conducted cold weather developmental testing at the Cold Weather Natural Environmental Testing, Fort Greeley, Alaska.
 - In February 2012, the Army approved a revised requirement that lowered WIN-T Increment 2's reliability requirement by 30 – 60 percent based upon an updated operational mission summary/mission profile.
 - In May 2012, the Army Test and Evaluation Command (ATEC) conducted the WIN-T Increment 2 IOT&E using the following units employed under operationally realistic mission scenarios.
 - 2nd Brigade, 1st Armored Division, Fort Bliss, Texas, and White Sands Missile Range, New Mexico
 - 101st Airborne Division, Fort Campbell, Kentucky
 - Sustainment Brigade, Fort Riley, Kansas
 - Network Service Center – Training, Fort Gordon, Georgia
 - The WIN-T Increment 2 IOT&E included a fully equipped brigade and division headquarters dispersed over a wide geographic area to assess WIN-T Increment 2's capability to support the unit's at-the-halt and on-the-move mission in desert, forest, and urban terrain. ATEC conducted IOT&E in accordance with a DOT&E-approved Test and Evaluation Master Plan and test plan.
 - On September 2012, the DAE chaired the WIN-T Increment 2 Defense Acquisition Board (DAB) to consider whether to approve the system for full-rate production and published an Acquisition Decision Memorandum (ADM) detailing the results. DOT&E provided a BLRIP report to support the DAB.
- (up to 10 percent) when the configuration item switched between terrestrial HNW and satellite NCW.
- DOT&E assessed the following WIN-T Increment 2 items as effective based upon performance demonstrated during IOT&E:
 - **TCN.** The TCN improved mission performance by sustaining a mission command network, and providing voice and data access to the network while on-the-move.
 - **PoP.** The PoP provided voice and data support for commanders while on-the-move and at-the-halt.
 - **Network Operations and Security Center (NOSC).** The NOSC supported the unit's network management mission at division and brigade, but needed additional Soldiers and tools at battalion and company.
 - **Colorless Core.** The Colorless Core supported multiple security levels and improved bandwidth allocation.
 - **NCW.** Given sufficient satellite bandwidth, the NCW connected TCNs and PoPs to the network and provided sufficient data flow while at-the-halt and on-the-move.
 - **Satellite Tactical Terminal + (STT+).** The STT+ demonstrated simultaneous connections of its satellite waveforms in support of the unit's mission.
 - **Vehicle Wireless Package (VWP).** The VWP was useful at the brigade and division levels, but should be installed in different vehicles at battalion level to better support command post movements.
 - **Joint Gateway Node (JGN).** The JGN allows WIN-T to connect to a variety of external networks.
 - **Modular Communications Node – Basic (MCN-B).** The MCN-B allowed the unit to extend subscriber services from an adjacent TCN.
 - DOT&E assessed the following WIN-T Increment 2 items as not effective based upon performance demonstrated during the IOT&E:
 - **SNE.** The SNE did not support commanders while on-the-move but served as an alternate communications means while at-the-halt.
 - **HNW.** The HNW terrestrial line-of-sight waveform demonstrated poor transmission range in vegetation and routing problems that decreased the WIN-T Increment 2 network's performance.
 - **TR-T.** The single TR-T employed at brigade was not able to keep the HNW network from fragmenting when the unit dispersed.

Assessment

- During the 2011 developmental test, the Army's developmental test efforts assessed that WIN-T Increment 2 met its performance requirements under benign conditions. WIN-T Increment 2 did not meet its reliability requirements and did not demonstrate planned reliability growth.
- During the Army's January 2012 cold weather testing, WIN-T Increment 2 met its cold weather requirements. During testing, the PoP demonstrated reduced bandwidth throughput

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- DOT&E assessed the WIN-T Increment 2 as not suitable due to poor reliability and poor maintainability:
 - The VWP and MCN-B met their reliability requirements. The TCN, PoP, SNE, TR-T, and NOSC did not meet their reliability requirements. The WIN-T Increment 2 on-the-move platforms (TCN, PoP, and SNE) reliability estimates demonstrated during IOT&E are less than one third of the Army requirement.
 - The VWP and JGN met their maintainability requirements, while the remaining configuration items did not meet the Mean Time to Repair requirement. The IOT&E hosted twice the number of Field Service Representatives to perform maintenance (relative to the Army's support plan). Even with increased Field Service Representatives present at IOT&E, repair times for half of the configuration items took two to four times longer than the Army's requirement.
- As a result of IOT&E, DOT&E assessed WIN-T Increment 2 as not survivable due to significant Information Assurance vulnerabilities that would degrade a unit's ability to succeed in combat. These vulnerabilities are discussed in a classified annex to the DOT&E BLRIP report.
- On September 26, 2012, the DAE signed an ADM that:
 - Authorized the Army to procure an additional 538 WIN-T Increment 2 communication nodes as a second Low-Rate Initial Production.
 - Directed the Army to conduct an FOT&E to demonstrate operational effectiveness and suitability of the SNE and HNW.
 - Provide evidence that each configuration item is on track per approved growth curves to meet reliability and maintainability requirements.
- The Army plans to conduct an FOT&E during NIE 13.2 in May 2013 to demonstrate that WIN-T Increment 2 has addressed the operational effectiveness and suitability deficiencies noted in the DOT&E BLRIP report as directed by the September ADM.

Recommendations

- Status of Previous Recommendations. The program successfully addressed one of the three FY10 recommendations. The program still needs to correct deficiencies identified during the WIN-T Increment 2 LUT, complete requirements documents for Increment 3, update the Increment 2 TEMP, and develop an Increment 3 TEMP.
- FY12 Recommendations. The Army should:
 1. Create a reliability growth plan to improve the poor WIN-T Increment 2 reliability highlighted during IOT&E. Reliability improvements should be demonstrated during a future operational test event.
 2. Identify the root causes of the SNE deficiencies, correct the poor performance, and demonstrate its effectiveness in a future operational test event.
 3. Improve HNW and NCW to address deficiencies noted during the IOT&E. Waveform improvements should be demonstrated during a future operational test event.
 4. Complete a post full-rate production TEMP and ensure funding is available to conduct a future operational test to demonstrate improvements in WIN-T Increment 2.

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