

SECURE MOBILE ANTI-JAM RELIABLE TACTICAL TERMINAL

SMART-T

*Providing Reliable, Protected
Satellite Communications to
the Joint Warfighter*



*Supply Chain Council Awards
for Excellence In
Supply Chain Operation & Management*

February 2005



**Supply Chain Council Awards
for Excellence In
Supply Chain Operation and Management**

***Optimizing the Effectiveness and Efficiency of
the SMART-T Supply Chain in Support of
Operation Iraqi Freedom***

February 2005

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Secure Mobile Anti-Jam Reliable Tactical Terminal

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Executive Summary

The Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T) provides range extension to the DoD's current and future tactical communications networks. The **SMART-T** satellite terminal processes data and voice communications at both low and medium data rates. The system provides worldwide anti-jam, low probability of intercept, secure voice and data capabilities for the Joint Warfighter. The terminal provides secure range extension capability for the current and future tactical communications systems. **SMART-T** currently provides the tactical backbone for long-haul communications for Army, Air Force and Marine Corps units deployed as part of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF).

SMART-T was successfully developed, tested, and is being fielded, trained, and provided at the precise time our nation needs this unique capability in defense of freedom. **SMART-T** continues to receive the highest praise and accolades for its contributions to the ongoing Global War on Terror, for innovative approaches to meeting wartime sustainment requirements, and for supporting the Army's transformation to an information-enabled force.



SMART-T's success in OIF can be attributed to an innovative supply chain operation and maintenance system which is effective, efficient, and highly sensitive and responsive to the Joint Warfighter's needs.

This submission spans the supply chain operation and management system's delivery and return process. Elements of the supply chain operation and management system highlighted in this submission include the innovative warranty and the web-based Warranty Reporting and Tracking System, as well as aggressive steps taken to increase terminal reliability and system availability by introducing sweeping improvements to both the supply and manufacturing processes.



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SMART-T Terminal supporting Operation Enduring Freedom

SECTION 1: GENERAL INFORMATION AND PROJECT COMPLEXITY.

1.1 Name of the Submitting Organization.

US Army Communications-Electronics Command (CECOM) and Program Executive Officer for Command, Control and Communications – Tactical (PEO C3T).

1.2 Responding Organizational Unit.

Project Manager Warfighter Information Network – Tactical (PM WIN-T), Product Manager Extremely High Frequency Satellite Systems (PDM ESS), Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T) program.

1.3 Brief Mission Description of the Overall Business Objectives, Product Lines, and Mission of the Organization.

The SMART-T is shown at Figure 1-1. SMART-T provides range extension to the DoD's current and future tactical communications networks. SMART-T processes data and voice communications at both low and medium data rates. SMART-T provides worldwide anti-jam, low probability of intercept, secure voice and data capabilities for the Joint Warfighter. Development is underway to upgrade the systems to operate over the Advanced Extremely High Frequency (AEHF) constellation of satellites, providing significant increases in achievable data rates.

The terminal provides secure range extension and is a cornerstone for the services' future tactical communications systems architectures. SMART-T provides a robust, highly mobile capability for US Forces deployed around the globe winning the Global War on Terror.

SMART-T supports data rates from 4.8 Kilobits per second (Kbps) up to 1024 Kbps, as well as the 1544 Kbps commercial rate. The terminal provides both voice and data transmission capability. It is interoperable with Milstar, Ultra High Frequency Follow-On (UFO), and MIL-STD 1582C compatible payloads. The SMART-T crew size is limited to one dedicated and one Mobile Subscriber Equipment (MSE) operator. The set-up time and tear-down time in a benign environment is less than 30 minutes. Less than 30 minutes are required for unit level Mean Time To Repair (MTTR). SMART-T is configured on a High Mobility Multi-purpose Wheeled Vehicle (HMMWV), and provides for unmanned operation up to a mile after set-up.

SMART-T Joint and Combined interfaces are depicted in Figure 1-2. Currently, the SMART-T is used in conjunction with the Stryker Brigade's Brigade Subscriber Node (BSN) and Network Operations Center – Vehicle (NOC-V).



Figure 1-1 Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)

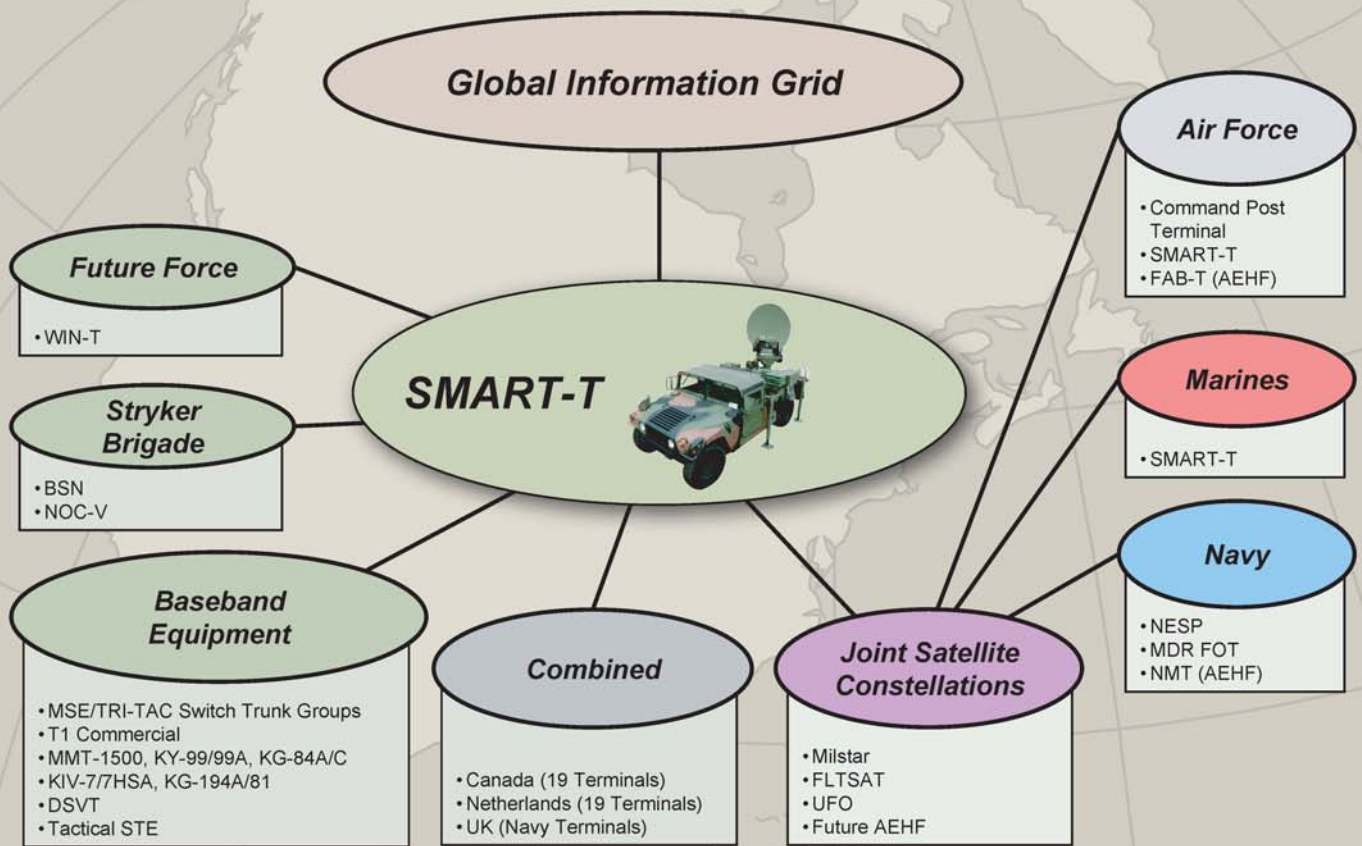


Figure 1-2 SMART-T Joint and Combined Interfaces

SMART-T was successfully developed, tested, and is being fielded, trained, and provided at the precise time our nation needs this unique capability in defense of freedom. SMART-T continues to receive the highest praise and accolades for its contributions to the ongoing Global War on Terror, for innovative approaches to meeting wartime sustainment requirements, and for supporting the Army's transformation to an information-enabled force. All of these successes can be attributed to an innovative supply chain operation and maintenance system

which is effective, efficient, and highly sensitive and responsive to the Joint Warfighter's needs.

"The 124th Signal Battalion was able to install, operate and continues to maintain the largest division communications network in the history of the Army consisting of eleven (11) Large Node Centers, forty-five (45) Small Extension Node (SENs), 4 NCSEs and 14 SMART-Ts dispersed over a 90,000 square kilometer area of operations in Iraq. Again, it would be impossible to do this mission without the SMART-Ts."

SMART-T continues to provide a critically important Joint capability that is receiving excellent reviews from America's deployed Warfighters. SMART-T was the key enabler allowing the 4th Infantry Division to establish the largest communications network in the history of the Army with 14 SMART-Ts dispersed over a 90,000 square kilometer

operational area in Iraq. The First Marine Expeditionary Force describes SMART-T as the "most highly valued communication system in the war." These tactical Milstar satellite terminals offer commanders on the ground the ability to reliably establish secure, anti-jam satellite communications links in less than 10 minutes. SMART-T supports a keystone of the Army's Transformation Plan. SMART-T has been identified as an important component of the Army's network enterprise, LandWarNet, since it enables Joint, network-centric, interoperable,

knowledge-based warfare. As a joint system, SMART-T supports the Department of Defense (DoD) requirement for increased interoperability for all C4ISR programs and is crucial to support the Army's Transformation to the Future Force. SMART-T's unique capabilities effectively tie together the mobile, modular, globally-dispersed networks of the Joint Future Force. As a Battle Command enabling system, SMART-T supports the key and essential operational capabilities required to conduct global Joint missions. The WIN-T architecture includes SMART-T to enhance command and control connectivity, extend the operational reach of deployed forces, and provide direct and immediate access to the Milstar and AEHF constellations of satellites. The SMART-T system upgrade will provide each Army Division with significantly more aggregate bandwidth (86 Mbps). The Army's Chief of Staff has selected SMART-T as a key satellite communications system for the modular conversion of the 3rd Infantry Division, 10th Mountain Division, 101st Airborne Division (Air Assault), and the 4th Infantry Division. As a result, SMART-T will provide protected, assured communications as a force multiplier for the Units of Employment X (UEX) and Units of Action (UA).

"SMART-T was the most highly valued communication system in the war. At the apex of the war, there were a total of 14 SMART-Ts, operating 24 hours a day, and 7 days a week. All this while maintaining a 97% readiness throughout the war. The Marine Corps is highly satisfied with the reliability of this system"

Not only is SMART-T the right product for the current operational environment in Iraq, but it will continue to grow in capability and become a key communications system for the Future Force. The SMART-T was designed for optimal reliability, and the supply chain operation and management system implemented to support the Joint Warfighter in OIF has established SMART-T as a critical communications component of both the current and future force.

1.4 Award Category of the Submission (Operations, Academic, Technology).

Supply Chain Operational Excellence Award.

1.5 Brief Description of the Supply Chain and the Processes the Submission Spans.

The PM has formulated and implemented an innovative supply chain operation and management system that has proven highly effective, efficient, and responsive to Joint Warfighter needs.

This submission spans the supply chain operation and management system's delivery and return process. Elements of the supply chain operation and management system highlighted in this submission include the innovative warranty and the web-based Warranty Reporting and Tracking System, as well as actions taken to increase terminal reliability and system availability by introducing changes to both supply and manufacturing processes in response to challenges unique to OIF.

The SMART-T Maintenance Concept is reflected in Figure 1-3. A brief discussion of each of the key elements of the SMART-T supply chain operation and management system follows.

Warranty. The SMART-T program includes an innovative five year, failure free warranty, which provides for a more responsive, effective and efficient maintenance and supply capability than would be available through more traditional supply channels. The warranty is directly linked to system availability, as it guarantees the Operational Availability (Ao) of the terminal. The warranty is intended to optimize the efficiency and effectiveness of the supply chain, while minimizing cost and the administrative burden on the Joint Warfighter.

Per the terms of the warranty, the operator turns in unserviceable Authorized Stockage List (ASL) to the Direct Support (DS) Maintainers, and receives in exchange a serviceable ASL asset.

The DS Maintainer is the focal point for shipping, receiving and storing of warranty items. The DS Maintainer submits a request for service via a user-friendly web-based automated System, called the SMART-T Warranty Reporting and Tracking System. The required Department of Army (DA) Form 2407 is generated and used for identifying/tracking the location and status of the failed asset. The DS Maintainer packages and ships unserviceable assets to the contractor depot in Largo, Florida. The contractor ships the ASL replacement to the DS Maintainer upon receipt of the warranty claim. If the contractor does not have an ASL asset available and the item is critical, repair or replacement is expedited via an Emergency Request. The SMART-T supply chain operation is depicted in Figure 1-4.



Unit Level	DS Support	Depot
MOS 31F Operator/ORG maintenance	MOS 31F Intermediate support	Contractor via 5 year failure free warranty
MOS 52D (Generator) Support maintenance	MOS 52D (Generator) Support maintenance	CONUS 2 Days OCONUS 5 Days Remote Location 14 Days
		
Replace LRUs	Replace LRUs	Repair/Replace LRUs

Figure 1-3 SMART-T Maintenance Concept

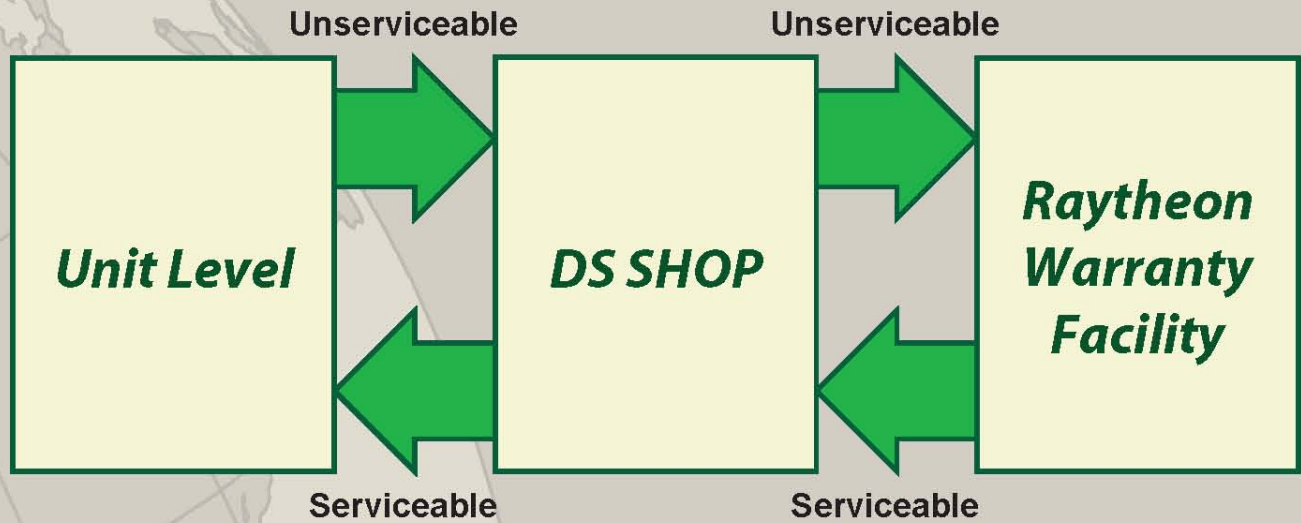
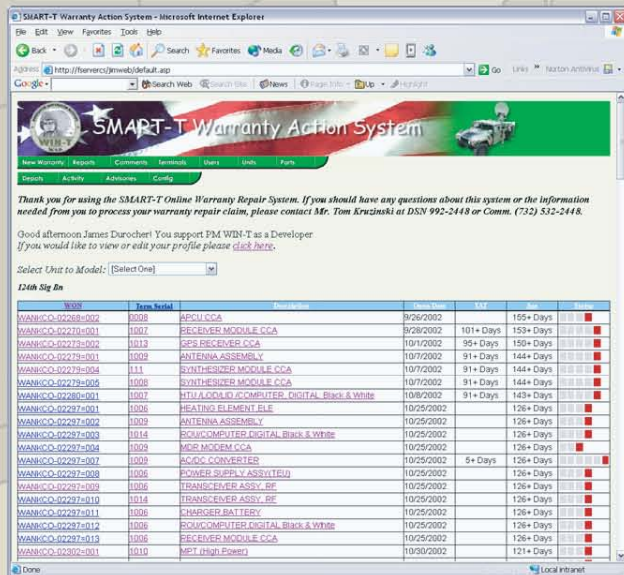


Figure 1-4 SMART-T Supply Chain Operation

Warranty Reporting and Tracking System. The SMART-T Warranty Reporting and Tracking System is web-enabled, high technology tool that improves overall SMART-T system availability by enhancing the efficiency and the effectiveness of the warranty and expediting warranty repair transactions. It greatly reduces administrative burden on the Joint Warfighter, and reduces administrative costs associated with warranty administration. The SMART-T Warranty Reporting and Tracking System also enables the PM to monitor contractor performance in managing warranty performance.



The Warranty Reporting and Tracking System provides a forum to facilitate communications between the Joint Warfighter, the PM, and the contractor Depot responsible for repair/replacement and return of the ASL. Once the warranty action is created, all participants work together in a coordinated approach to process it through the warranty system, where the status can be checked at any time by the organizations involved in the transaction.

The Warranty Reporting and Tracking System was designed to maximize efficiency by presenting warranty status information on the unserviceable ASL, as well as information regarding previous transactions. The interface is customized to the authority of the user, and his organization. Only that data needed by the user is presented. For example, a user representing an

operational unit cannot see or affect warranty actions from other operational units. However, if the current user supports a unit that has subordinates who use the warranty system, then that user can see, but not make changes, to warranty actions submitted by those subordinate units.

Therefore, the Warranty Reporting and Tracking System ensures operational data security as well as maximizing user efficiency since only those records of concern are displayed.

To create a new warranty action, the user makes that selection from the main interface and only has to input a small subset of information. Most of the information is available in Windows Drop Down list boxes that are tailored to that individual user. Other data elements are automatically populated. This approach reduces the administrative burden on the Joint Warfighter, and also ensures the integrity and consistency of the data.

Once the warranty action is created, representatives of both the Unit and the Depot can change the status to indicate the action's progression through the warranty process. The PM can monitor the progress of any given transaction. The Warranty Reporting and Tracking System automatically generates email messages on a nightly basis to alert organizations with overdue actions.

The Warranty Reporting and Tracking System analyzes data and produces reports that assist the PM in evaluating the efficiency of warranty transactions, assessing the availability of the SMART-T and the reliability of its components, assessing contractor performance, and evaluating warranty effectiveness.

Increasing Terminal Reliability and System Availability. The PM used the Failure Reporting, Analysis and Corrective Action (FRACA) process to increase system availability and terminal reliability. FRACA is an automated system which uses inputs from the Joint Warfighter, the PM, the contractor and the test community to identify potential component enhancements that can significantly improve system reliability. The PM employed the use of FRACA in formulating a plan of action to overcome early reliability and system availability issues experienced by the Joint Warfighters in OIF. The FRACA process was critical in the PM's development of an action plan that included:

- Remanufacture of Critical Circuit Card Assemblies (CCAs) and Selection of a New Vendor. Raytheon improved CCA producibility and reliability by implementing improved manufacturing processes. First-pass production yields for critical CCAs have improved by nearly 50% on average with the new vendor..
- Retrofit of the Terminal Electronics Unit (TEU). The redesign prevents water intrusion by reducing the number of seams in the TEU/Power Distribution Unit (PDU). The TEU door was modified to enhance usability and improve structural integrity.
- Environmental Stress Screening (ESS). Implemented ESS as part of terminal acceptance testing process. ESS stresses the TEU through both vibration and thermal profiling.

Reducing Cycle Times. The critical and urgent nature of the OIF demanded the SMART-T supply chain operation and management system undergo modification to significantly reduce long cycle times associated with numerous supply actions. Early recognition of unprecedented geographic dispersion, extreme environmental stress, severe ground threat, and other operational factors drove the PMO to develop an effective approach to quickly respond to wartime swells in sustainment demand. The PM directed a surge in production to increase unit, depot, and theater stock to buffer erratic asset flow and significant spikes in demand. The PM established forward spares stockage points, employed the use of Regional Support Centers, and established alternative supply chains to accommodate unique requirements of the US Marine Corps. The PM contracted for parts shipment and tracking between these locations, and established a unique support chain for the Marine Corps in western locations in the theater of operations. The PM sent additional parts as buffer stock with units

deploying to OIF. The PM is working closely with CE-LCMC to build the optimum level of government depot stocks to satisfy projected future demands. The PM also established a forward repair capability in theater to reduce the unnecessary flow of repairable stock back to the US-based depot.

1.6 Names of the Supply Chain Partner Organizations (External) Involved in the Project.

External Functional Organization	# of People	Functional Category
Raytheon Company	6	Production Contractor Contractor Depot Warranty
Defense Contract Management Agency (DCMA)	3	Oversight Trouble Shooting of Issues

1.7 Names of the Functional Organizations (Internal) Involved in the Project.

External Functional Organization	# of People	Functional Category
PEO C3T	5	Readiness Engineering, Information Management, Resource Allocation
Office of the PM, WIN-T	5	Project Management
Office of the PdM, ESS	3	Product Manager ESS Project Leader, SMART-T Assistant Project Leader, SMART-T
PM WIN-T Readiness Management Division	9	Logistics Planning and Analysis Training Materiel Fielding Post Fielding Assessment & Support
PM WIN-T Technical Management Division	6	Systems Engineering Electronic Engineering Production Engineering Communications Engineering Test & Evaluation Help Desk
PM WIN-T Business Management Division	5	Program Evaluation & Analysis Cost Estimating & Anlysis Budget Planning & Execution

*Includes PM resident CECOM matrix support elements and resident support contractors

1.8 Provide a POC for Each Supply Chain Partner.

Raytheon Company: Mr.Edward Littlejohn, SMART-T Program Manager, Raytheon Company NCS/ICS Raytheon SMART-T Team, 1001 Boston Post Road, Marlborough, MA 01752, Comm: (508) 490-1962, EMAIL: Edward_Littlejohn@raytheon.com

DCMA: Defense Contract Management Association, ATTN: (Mr. Thomas Mcghee), 7887 Bryan Dairy Road, Largo FL 33777, Comm: (727) 768-8120, EMAIL: Thomas.McGehee@dcma.mil



Theater Distribution Center (TDC) Arifjan

SECTION 2: IMPLEMENTATION.

2.1 Explain Why the Supply Chain Initiative Was Undertaken and How It Was Selected.

Providing an effective, efficient and responsive supply chain operation and management system to satisfy the wartime demand is an absolute requirement for SMART-T, which is an important Battle Command enabling system. The SMART-T terminal density continues to grow and is at its highest level since Operation Iraqi Freedom (OIF) began. Currently, 61 SMART-T's are deployed meeting Joint strategic, operational and tactical mission requirements. The challenges experienced during OIF demonstrated the importance of delivering an extremely reliable terminal.

SMART-T was designed to satisfy a Joint Warfighter requirement for high reliability. The PM developed a supply chain operation and management system to optimize system availability by streamlining the maintenance and supply process. The PM implemented an innovative warranty that guaranteed system reliability. The PM used this warranty to streamline warranty transactions for contractor-provided depot support. The PM also developed and implemented a high-technology Warranty Reporting and Tracking System, which enabled the user, the contractor depot and the PM to monitor the status of all warranty transactions. This enabled the PM to evaluate component reliability, system availability, the effectiveness of the warranty and the contractor performance under the terms of the warranty. The original supply chain operation is depicted in Figure 2-1.

OIF presented unique and unanticipated challenges, reducing the availability of limited warranty stock. The requirement for such a significant population of terminals in theater (equivalent of 5 Divisions) was unanticipated, and the Operational Tempo (OPTEMPO) requirement exceeded the high-end estimates in the contract. Preventive Maintenance Checks and Services (PMCS) were abbreviated due to the on-the-air requirements. The extreme environmental stress (heat, sand and dust) adversely impacted system performance

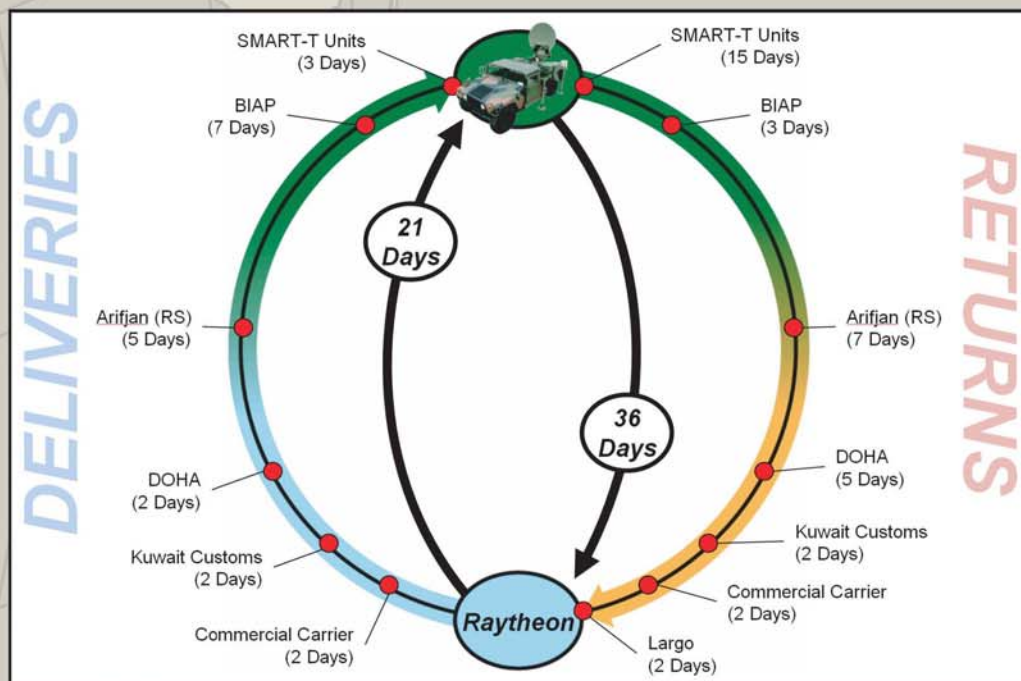


Figure 2-1 Beginning of the War:OIF Supply Chain

The PM also struggled with the added demand of the National Guard Cascading/Modularity on parts replenishment, and fielding to support future OIF rotations. As a result, parts flow proved unacceptably slow.

The critical and urgent nature of OIF demanded that the SMART-T supply chain operation and management system undergo modification to improve system availability and reliability, and reduce cycle times. Early recognition of unprecedented geographic dispersion, extreme environmental stress, severe ground threat, and other operational factors drove the PMO to develop an effective approach to quickly respond to wartime swells in sustainment demand. Changes were introduced to the supply chain operation, which greatly improved terminal availability and reliability, and significantly reduced cycle times. The PM directed a surge in production to increase unit, depot, and theater stock to buffer erratic flow and high demand. The revised supply chain operation system is depicted at Figure 2-2.

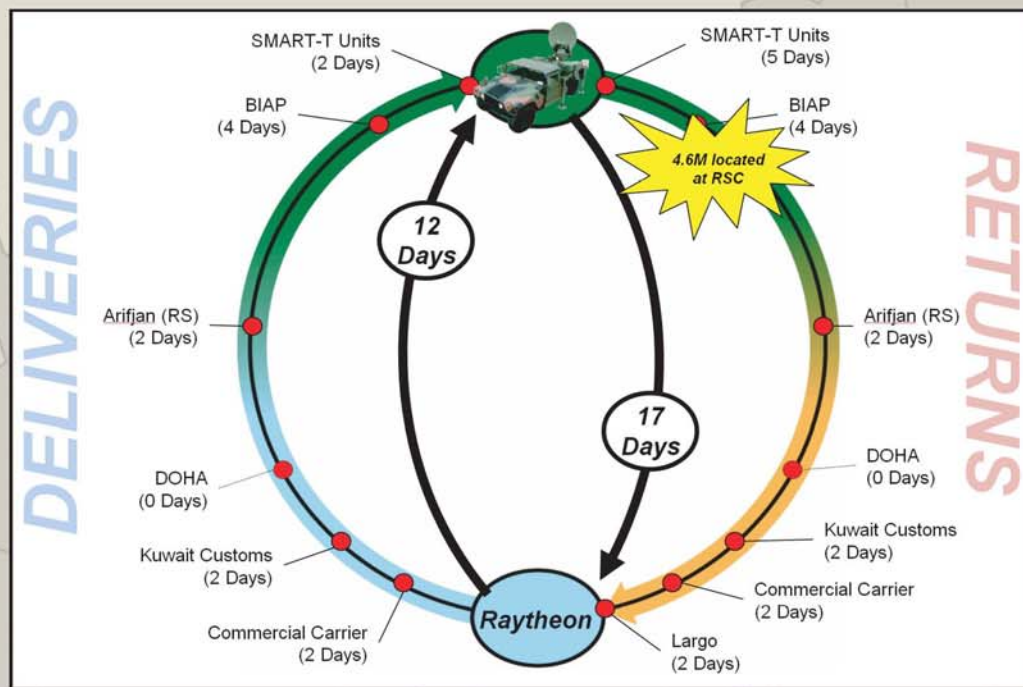


Figure 2-2 Current Status: OIF Supply Chain

The PM also worked with Raytheon to implement new manufacturing and verification processes for 13 critical Circuit Card Assemblies (CCA's) in the Terminal Electronics Unit (TEU), substantially improving production yield, increasing production capacity, and integrating a production test capability at the new vendor's facility. The CCA's are a terminal cost-driver, as the TEU represents half the cost of a terminal. The CCA's also drive system reliability and availability. By implementing new manufacturing and verification processes, the PM optimized terminal reliability and system availability for the Joint Warfighter in OIF.

2.2 Indicate the Duration of the Project. Note if the Project Was a Pilot That is Being Rolled Out. Note if the Project is Ongoing or Still in Development.

SMART-T is an ongoing project. SMART-T is not a pilot project.

The SMART-T program was initiated following a Milestone B Decision Review in 1992. Competitive development contracts were awarded to Raytheon Company and Rockwell International. The two contractors developed competing designs, and the PM awarded a Fixed Priced Low Rate Initial Production (LRIP) contract with Full Rate Production (FRP) options to Raytheon in 1996. The first FRP option was awarded to Raytheon in 1998, following an FRP In Process Review (IPR). Full Material Release was granted on 28 October 2003. The FRP assets are now being fielded, with a total of 47 currently in Iraq supporting OIF.

194 Terminals Fielded:

124 - Army

29 - Air Force

25 - Marines

12 - Other Users

4 - JCSE

Not only is SMART-T the right product for the current operational environment in Iraq, but it will continue to grow in capability and become a key communications system for the Future Force. The SMART-T was designed for optimal reliability, and the supply chain operation and management system implemented to support the Joint Warfighter in OIF has established SMART-T as a critical communications component of both the current and future force.

2.3 Describe in Detail the Process Used to Complete the Initiative.

In order to maximize efficiency and optimize the availability of the SMART-Ts used in OIF, the PM sought to improve Unit, Depot and Theater Support. The PM established forward spares stockage points, employed the use of Regional Support Centers, and Field Service Representatives, and established alternative supply chains to accommodate unique requirements of the US Marine Corps. The PM contracted for parts shipment and tracking between these locations, and established a unique support chain for the Marine Corps in western locations. The PM sent additional parts as plus-up with units deploying to OIF.

FY05 is the last planned EHF parts buy opportunity for the Users to purchase spare parts. The PM is working closely within CECOM to build adequate government depot stock for future demands. The PM has also submitted requirements to facilitate establishment of a forward repair capability in theater.

The PM sought to optimize reliability and system availability. The PM began retrofitting terminals prior to deployment, building in substantial reliability enhancements, and bringing terminals back to FMC prior to deployment with thorough check-out.

The PM worked with the contractor to implement new manufacturing and verification processes for CCAs, substantially improving production yield, increasing production capacity, and integrating a production test capability at the vendor's facility. The PM employed the use of the CCA Best Value Source Selection Model, and generated comprehensive solicitation and technical data packages. The PM solicited quotes from 7 potential suppliers. In conducting the evaluation, the PM employed the use of a variety of R6s tools. The PM documented lessons learned for transitioning to and starting up a new supplier. A winner take all approach was used. All candidates had extensive CCA experience, and the source selection team considered candidates with both military and/or commercial experience to facilitate a best value selection. The PM then progressively down-selected to a single, best-value recommendation.

Reliability was further improved by conducting a system reset and Depot Level Repair upon the unit's return to home station. The PM also initiated a comprehensive FRACA process, as a means to manage and improve reliability.

2.4 Identify Significant Challenges Encountered, and the Process for Resolution and the Solution. Identify Best Practices Employed or Developed.

OIF presented unique and unanticipated challenges, reducing the availability of limited warranty stock. The requirement for such a significant population of terminals in theater (equivalent of 5 Divisions) was unanticipated, and the OPTEMPO requirement exceeded the high-end estimates in the contract. PMCS was limited due to the on-the-air requirements. The extreme environmental stress (heat, sand and dust) adversely impacted system performance. The PM also struggled with the added demand of the National Guard Cascading/Modularity on parts replenishment, and fielding to support future OIF rotations. As a result, parts flow proved unacceptably slow. The original supply chain operation is depicted in Figure 2-1.

The critical and urgent nature of the OIF demanded the SMART-T supply chain operation and management system undergo modification to improve system availability and reliability, and reduce cycle times. Early recognition of unprecedented geographic dispersion, extreme environmental stress, severe ground threat, and other operational factors drove the PMO to develop an effective approach to quickly respond to wartime swells in sustainment demand. Changes were introduced to the supply chain operation, which greatly improved terminal availability and reliability, and significantly reduced cycle times. The PM effected a surge production to increase unit, depot, and theater stock to buffer erratic flow and high demand. New manufacturing processes were implemented to improve 13 critical Circuit Card Assemblies.

2.5 Indicate the Metrics Used to Measure Progress and Success.

The SMART-T was designed to be a highly reliability terminal, with high system availability. The best metric for assessing the effectiveness of the supply chain operation and management system employed is the reliability and availability of terminals being employed today in support of OIF. The Joint Warfighters in OIF are reporting that SMART-T provides exceptional reliability and has surpassed their expectations. These Joint Warfighters report perfect or near perfect system reliability around the globe. The exceptional reliability of the SMART-T is directly related to the supply chain operation and management system described in this submission.

The following is breakout of the reliability reported. These reports were collected from June 2003 through January 2004 for all terminals deployed to South West Asia (SWA).

Army Operational Readiness (OR) Rate: Averaged: 94%	
37 Terminals	III, V Corps and SBCT-1
Marine Corps OR Rate: Averaged: 97%	
14 Terminals	April-June for II MEF April-September for I MEF
Air Force OR Rate: 100%	
2 Terminals	1 Month Deployment

On 21 October 2003 the Deputy Commanding General, IMEF testified before the House Armed Services Committee Subcommittee on Terrorism, Unconventional Threats and Capabilities regarding IMEF C4I during OIF. He stated:

“The SMART-T, a HMMWV-mounted mobile satellite terminal, designed and fielded to provide a satellite communications capability to the regimental level exceeded all expectations. With this expeditious satellite terminal, regimental commanders were able to stop, set-up and establish secure tactical phone connectivity with the Division Commander, often within 10-15 minutes.”

2.6 Document and Quantify Cost and Performance Benefits, Including the Projects Return on Investment and Changes in the Value of one or More of the SCOR Level 1 Metrics (Not All Metrics Must be Captured or Reported).

Benefits associated with the SMART-T Supply Chain operation and management system are best quantified in terms of performance.

An increase in terminal reliability is directly tied to the PM's use of FRACA methodologies to identify the high potential for failure items, and the items for which failure most adversely impacted overall system availability. This resulted in a design to modify the process by which critical CCAs are manufactured, verified, and tested. For some of the CCAs, including the Synthesizer, MDR Baseband and LDR Modem CCAs, reliability virtually doubled by implementing the new manufacturing processes. Other increases were slightly less dramatic, but still significant. See Figure 2-3, which quantifies the impact of the revised manufacturing processes.

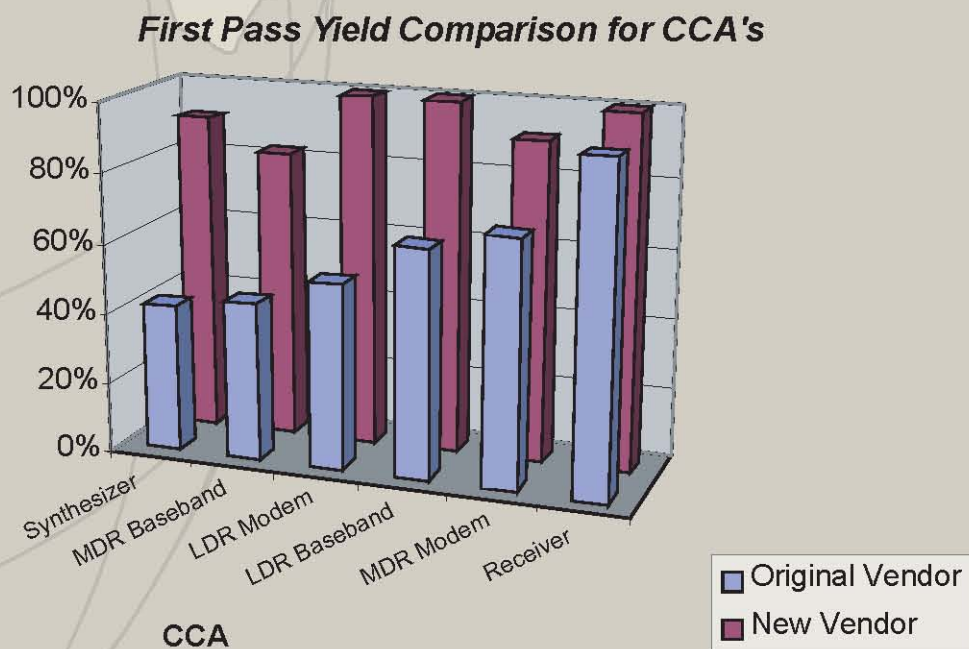


Figure 2-3 Circuit Card Assembly Comparison

Likewise, the changes made to the supply chain operation system had a dramatic impact on the turn around time for parts required in OIF. During development and LRIP, the PM formulated a supply chain management model to be used for system support. However, the PM faced many difficult and unanticipated challenges when a large number of terminals were deployed to OIF. Surge requirements and extreme environmental considerations rendered the existing supply chain operation and management system ineffective. In short, the process was simply too slow to respond to critical real-world user requirements. Changes were implemented, which included reallocation of parts and support and changes in transportation methods. This enabled the PM to significantly reduce cycle time associated with parts flow in OIF. See Figure 2-4 for a summary turn-around times.

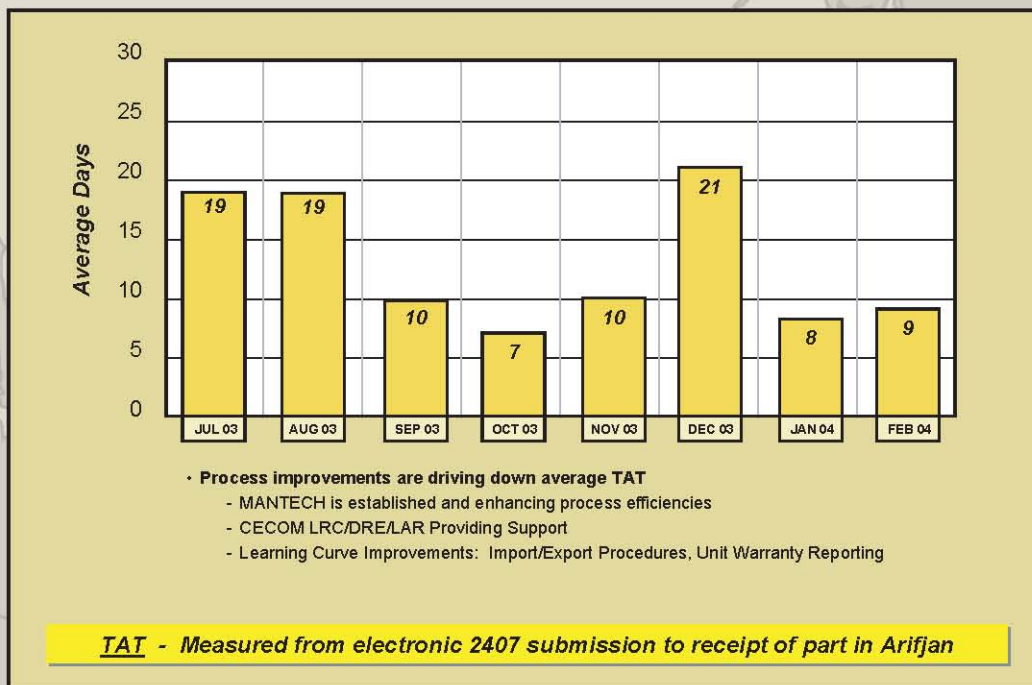


Figure 2-4 Average Turn Around Time for SWA

2.7 Outline How the Success of This Effort Supports the Organizational Objectives Described in Section 1, Item 3.

The SMART-T was designed for optimal reliability, and the supply chain operation and management system implemented to support the Joint Warfighter in OIF has established SMART-T as a critical communications component of both the current and future force. The Joint Warfighter employing SMART-T in support of OIF have experienced near perfect system reliability around the globe. The exceptional reliability of the SMART-T is directly related to the supply chain operation and management system described in this submission.

SMART-T supports a keystone of the Army's Transformation Plan. SMART-T has been identified as an important component of the Army's network enterprise, LandWarNet, since it enables Joint, network-centric

interoperable, knowledge-based warfare. As a joint system, SMART-T supports the DoD requirement for increased interoperability for all C4ISR programs and is crucial to support the Army's Transformation to the Future Force. SMART-T's unique capabilities effectively tie together the mobile, modular, globally-dispersed networks of the Joint Future Force. As a Battle Command enabling system, SMART-T supports the key and essential operational capabilities required to conduct global Joint missions. The WIN-T architecture includes SMART-T to enhance command and control connectivity, extend the operational reach of deployed forces, and provide direct and immediate access to the Milstar and AEHF constellations of satellites. The SMART-T system upgrade will provide each Army Division with significantly more aggregate bandwidth (86 Mbps). The Army's Chief of Staff has selected SMART-T as a key satellite communications system for the modular conversion of the 3rd Infantry Division, 10th Mountain Division, 101st Airborne Division (Air Assault), and the 4th Infantry Division. As a result, SMART-T will provide protected, assured communications as Force. The SMART-T was designed for optimal reliability, and the supply chain operation and management system implemented to support the Joint Warfighter in OIF has established SMART-T as a critical communications component of both the current a force multiplier for the UEx and UA.

Not only is SMART-T the right product for the current operational environment in Iraq, but it will continue to grow in capability and become a key communications system for the Future and future force.



Two SMART-T Terminals outside an Operations Center



A Soldier using a SMART-T Terminal In Iraq

SECTION 3: KNOWLEDGE TRANSFER**3.1 Describe Efforts to share Lessons Learned From This Effort With Other Internal Organizations.**

The SMART-T failure-free warranty was the first of its kind in PEO C3T. In the recent past, when warranties were mandatory for all systems, the CE-LCMC warranty office adopted the SMART-T five-year failure-free warranty as a “model” for all other CE-LCMC managed systems. The SMART-T warranty was used as a “case study” for the Warranty Training Initiative offered by the CE-LCMC Warranty Office, and became a model for the development of warranties for many other CE-LCMC managed programs. The SMART-T warranty was also featured as a case study in a training class sponsored by the CE-LCMC Logistics Readiness Center (LRC), on Acquisition Reform and Streamlining.

Lessons learned from SMART-T are currently being leveraged in formulating supply chain operation and management systems for other PEO C3T systems, including Phoenix, SECOMP-I, JTRS Cluster 1 and JTRS Cluster 5, and the WIN-T program. The PdM has also proactively sought to share lessons learned with other PMs within PEO C3T.

PdM ESS has been a featured speaker for the many professional organizations that operate at Fort Monmouth. He has aggressively sought opportunities to candidly discuss the program, the supply chain and lessons learned from experiences in OIF with industry. The SMART-T was featured at the Army Acquisition Corp’s Senior Leader Conference and the PM discussed lessons learned with the Army’s senior leadership and his Acquisition Corps peers.

3.2 Explain How This Initiative Can be Transferred to Other Organizations and Specify the Likely Candidates for Transference.

COL Angel Colon, PM WIN-T, is responsible for planning and executing many of the most critical and complex communications programs within PEO C3T and Department of the Army. Programs for which he is responsible include the following Major Defense Acquisition Programs (MDAPS): SMART-T, SCAMP, JTRS Cluster 1, JTRS Cluster 5, and the WIN-T program. He is also responsible for a series of programs that are smaller, but no less critical to the success of the Warfighter. These include Phoenix, SECOMP-I, and the Commercial Tactical Satellite Program.

Having so many critical communications programs under the direction of a single Project Manager results in tremendous synergy, and a unique opportunity to communicate ideas and lessons learned, as well as accomplishing the transference of successful ideas.

Key elements of the SMART-T supply chain operation and maintenance system can, and will be transferred to other satellite communications programs within PM WIN-T, PEO C3T, and throughout the US Army.

The Warranty Reporting and Tracking System was designed to permit a high degree of end-user customization. Applicable configuration items that influence the operation of the warranty system are available to edit to users which sufficient privilege (e.g., System Operators). Data permitted to edit include all of the messages presented to the users during operation of the tool and parameters that influence the warranty model itself such as the number of days that form the grace period between warranty status actions. Additionally, the configuration parameters use to calculate Depot warranty part turn around time are also available to modify.

In addition to placing an unprecedented level of control into the end-user's hands, this functionality allows the model to be deployed to meet the needs of other CE-LCMC development programs.

The Warranty Reporting and Tracking System was created with a database architecture that supports multiple concurrent customer developed programs while maximizing the sharing of information. For example, the information pertaining to an operational unit such as the unit's contact information (e.g., mailing address, phone numbers) is stored such that it can be shared amongst any number of Warranty Reporting and Tracking Systems. Since the location of an operational unit does not change, this information can be shared amongst various development programs thereby reducing the information needed to start a new Warranty Reporting and Tracking System while providing a centralized repository of this information.

The Warranty Reporting and Tracking System has the functionality to improve the Government's management of a contractor warranty program while offering metrics that permit accurate evaluation of performance. Additionally, by providing a streamlined approach to the warranty process and offering drop down pre-populated list of data for the user to select, the efficiency of the process and end-user satisfaction is increased.

The PM believes the sharing of lessons learned, and the transference of effective initiatives to be critical to the success of the PMO and the systems for which it is responsible.

The screenshot shows a web browser window titled "http://farswcc/mweb/tdtconfg.asp - Microsoft Internet Explorer". The page header features a banner for "SMART-T Warranty Action System" with a logo on the left and a vehicle on the right. Below the banner, a message reads: "Please complete the following information and select 'Save' when done. It is important to note that changing these parameters could have adverse effects on the operation of this system! Please do not make changes unless you have been trained and understand their impacts." The form contains several fields and options:

- Application Title: SMART-T Warranty Action System
- Application Name: SMART-T
- Database: SMARTT_LOG.MDB
- KC User Profile URL: Mps://www.kc.us.army.mil/peoc3community.mf/kuzsmaria/
- WEB Launch URL: Mps://www.kc.us.army.mil/peoc3/
- System Down for Maintenance: Yes No (10 users currently online)
- Logo File: SMARTTBanner_image
- Cookie Name: SMARTWarranty
- Main Introduction Message: Thank you for using the SMART-T Online Warranty Repair System. If you should have any questions about this system or the information needed from you to process your warranty repair claim, please contact Mr. Tom Kuzinski at DDM 292-2443 or Com. (732) 522-2449.
- Unauthorized Explanation: Your name, as presented by the Knowledge Center (KC), could not be found within the system as an authorized user. Therefore, it is not possible to grant you access to the information supported by this system. It is recommended that you contact the SMART-T Help Desk at 855.663.8434 for assistance in resolving this inconsistency.
- Report Header Marking: For Official Use Only
- SMTP Source eMail Address: thomas.kuzinski@3comail.normouth.army.mil
- Send Mail to all Unit POCs: Yes No
- Send Mail on Cancel: Yes No
- Activate eMail: Yes No
- Number of Days before Warning: 3
- Emergency WON Grace Number: 1

The browser status bar at the bottom shows "Done" and "Local intranet".



SMART-T Terminal supporting Operation Enduring Freedom



SMART-T Terminal Under Camouflage Netting

SECTION 4: SUMMARY

The **SMART-T** continues to satisfy the Joint Warfighter's critical and urgent requirement for protected Low Data Rate and Medium Data Rate communications in support of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF).

The **SMART-T** continues to receive accolades for its contributions to the ongoing Global War on Terror, for implementing innovative approaches to meeting wartime sustainment requirements, and for supporting the Army's transformation to an information-enabled force.

The success of the **SMART-T** in support of OIF and OEF can be attributed to an innovative supply chain operation and maintenance system which is effective, efficient, and highly sensitive and responsive to the Joint Warfighter's needs.

SECTION 5: ACRONYMS

AEHF	Advanced EHF	MCC	Modularity Coordination Cell
Ao	Operational Availability	MDAP	Major Defense Acquisition Program
AOR	Area of Responsibility	MDR	Medium Data Rate
ASL	Authorized Stockage List	MEF	Marine Expeditionary Force
BSN	Brigade Subscriber Node	MOS	Military Occupational Specialty
C3T	Command, Control Communications – Tactical	MSE	Mobile Subscriber Equipment
CCA	Circuit Card Assembly	MTTR	Mean Time To Repair
CECOM	US Army Communications-Electronics Command	NOC-V	Network Operations Center – Vehicle
CE-LCMC	Communications-Electronics Command Lifecycle Management Command	OCONUS	Outside Continental United States
CONUS	Continental United States	OIF	Operation Iraqi Freedom
DA	Department of Army	OR	Operational Readiness
DCMA	Defense Contract Management Agency	OPTEMPO	Operational Tempo
DoD	Department of Defense	PdM	Product Manager
DS	Direct Support	PDU	Power Distribution Unit
EHF	Extremely High Frequency	PEO	Program Executive Officer
ESS	Extremely High Frequency Satellite Systems	PM	Project Manager
ESS	Environmental Stress Screening	PMCS	Preventive Maintenance Checks and Services
FLTSAT	Fleet Satellite	PMO	Project Management Office
FMC	Facility Management Center	REO	Readiness Engineering Office
FMR	Full Materiel Release	RMD	Readiness Management Division
FSR	Field Support Representatives	RSC	Regional Support Center
FRACA	Failure Reporting, Analysis, and Corrective Action	SEN	Small Extension Node
FRP	Full Rate Production	SMART-T	Secure Mobile Anti-Jam Reliable Tactical Terminal
HMMWV	High Mobility Multipurpose Wheeled Vehicle	SWA	South West Asia
ID/IQ	Indefinite Delivery/Indefinite Quantity	TEU	Terminal Electronics Unit
Kbps	Kilo bits per second	TMD	Technical Management Division
LDR	Low Data Rate	UA	Units of Action
LRC	Logistics Readiness Center	UEx	Units of Employment X
LRIP	Low Rate Initial Production	UFO	Ultra High Frequency Follow-On
LRU	Line Replaceable Unit	USAF	US Air Force
		USMC	US Marine Corps
		WIN-T	Warfighter Information Network – Tactical



SMART-T Secure Mobile Anti-Jam Reliable Tactical Terminal





SMART-T

Secure Mobile Anti-Jam Reliable Tactical Terminal

Program Executive Office Command, Control, Communication Tactical
Project Manager Warfighter Information Network - Tactical
Product Manager EHF Satellite Systems