PM Aviation Systems — Building the Army's Strategic Interoperability Assets

COL Michelle Yarborough

The Berlin Wall's fall in 1989 symbolized the Cold War's end. As the U.S. Army addressed new types of operational warfare and actively reviewed current strategy and the lessons learned from *Operation Just Cause* in Panama (1989) and *Operations Desert Shield/Storm* in the Persian Gulf (1990/91), analyses prompted then Army Chief of Staff GEN Gordon R. Sullivan to question the Army's strategic direction for the foreseeable future. He challenged the Army to enter the Information Age through a series of small experiments that led to the Army Digitization Master Plan in January 1995.

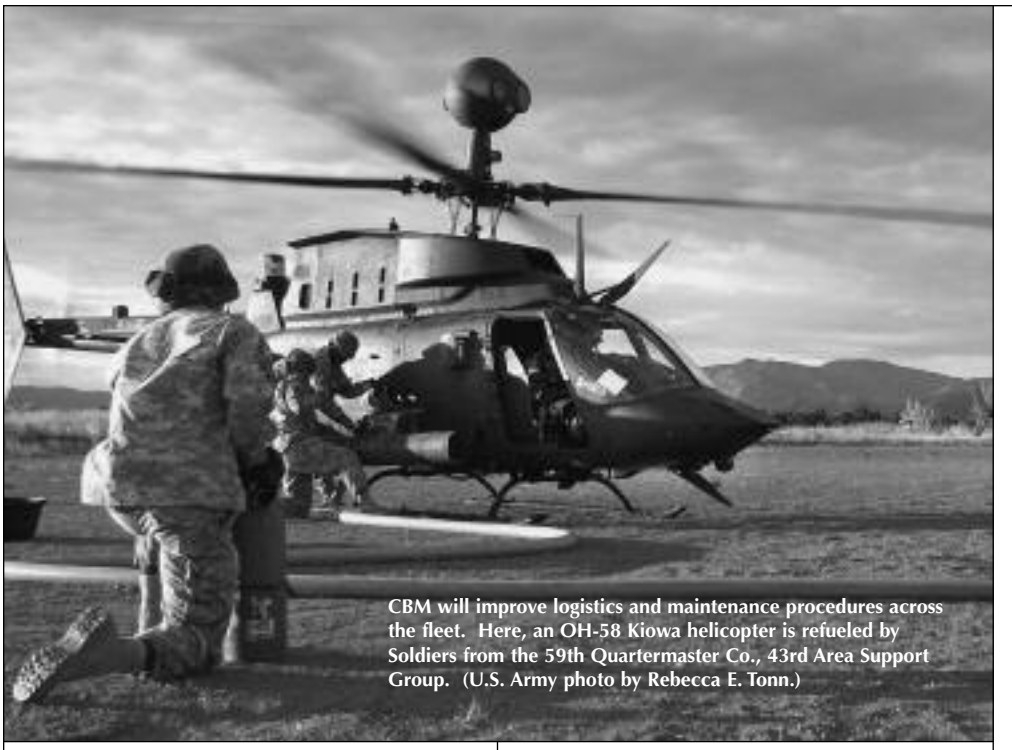
Technological advances and digital enhancements ensure helicopters like the UH-60 Black Hawk depicted here will continue to perform reliably and safely, even in the harsh operational environments found in Iraq and Afghanistan. (U.S. Army photo by SFC Robert C. Brogan.)

Although many of the terms and much of the equipment has changed since Sullivan's early vision, one cornerstone has been the Army aviation community's continuous and consistent contributions toward its success. Building upon 10 years' experience sending tactical fire text messages between scout helicopters and field artillery batteries, Army aviation has participated in nearly every field event with the OH-58D Kiowa and AH-64D Longbow Apache helicopters. Today, with more than a decade of interoperability experience, Army aviation is building upon that success as the Army begins fielding the CH-47F Chinook and UH-60M Black Hawk models with enhanced digital capabilities.

Continuing the forward-looking tradition, Army aviation has partnered with the Future Combat Systems (FCS) Program Manager to outline the path ahead for World Wide Web-like interoperability with both manned and unmanned Future Force elements while remaining compatible with Current Force systems. Leading the aviation community's interoperability efforts is Project Manager Aviation Systems (PM AS).

PM AS is the architect for Army aviation's Future Force Interoperability Strategy and is working closely with the U.S. Army Aviation Warfighting Center to bring the Aviation Data Exploitation Concept to fielded warfighting capability. Together, these organizations have developed three major initiatives toward achieving interoperability across the fleet:

- Migration to a common, compatible, transport layer enabled by the Airborne, Maritime, Fixed Joint Tactical Radio System.
- Integration of an FCS System-of-Systems (SoS) Common Operating



CBM will improve logistics and maintenance procedures across the fleet. Here, an OH-58 Kiowa helicopter is refueled by Soldiers from the 59th Quartermaster Co., 43rd Area Support Group. (U.S. Army photo by Rebecca E. Tonn.)

Environment to provide shared network-centric interoperability services with ground forces.

- Integration of FCS Battle Command and Army aviation to develop a Web-enabled environment conducive to such futuristic warfighting capabilities as Automated Network Fires.

Bringing the power of interoperability technology and integration to the logistics domain, Army aviation is implementing DOD's directions for condition-based maintenance (CBM) and Military Flight Operations Quality Assurance (MFOQA) programs to improve logistics and maintenance procedures and reduce losses through improved risk management for both manned and unmanned aerial systems. Key components of PM AS' responsibility are the installation of diagnostics and prognostics capabilities — digital source collectors (DSCs) — onboard aircraft to standardize automated transfer of data to the Standard Army Management Information System, Unit Level Logistics System-Aviation Enhanced (ULLS-AE), aircraft component analysis and an integrated aviation training, operations and logistics process to improve mission capability and mitigate risk. Ongoing projects include equipping Combat Aviation Brigades (CABs) deploying to *Operations Enduring* and *Iraqi Freedom (OEF/OIF)* with DSCs to support CBM and MFOQA and conduct an aviation Common Logistics Operating Environment Proof of Enablers demonstration. The goals are simple: increase readiness, reduce cost and maintenance man-hours, and improve safety.

In addition, PM AS manages the acquisition of three, and coordinates the roles of five, other major aviation assets to include participation in a series of large-scale SoS interoperability tests required for Army Software Block implementation at the Aviation Multi-Mission Technical Integration Facility. This capability is further enabled through the aviation community's remotely located Software Integration Labs. Aviation weapons systems undergo a series of risk-reduction test events prior to executing the interoperability evaluation conducted by the Central Technical Support Facility at Fort Hood, TX. The PM AS serves a vital role in ensuring that Program Executive Office (PEO) Aviation assets are successful in completing the Intra-Army Interoperability Certification, a key requirement for all Army systems.

The Army will soon field the CH-47F fleet of helicopters to replace the aging fleet of troop and supply carriers. Here, U.S. Army Soldiers from 3rd Battalion, 187th Infantry Regiment, 101st Airborne Division (Air Assault) conduct a joint raid with their Iraqi counterparts from the 4th Army Division last spring near Samarra, Iraq. (U.S. Army photo by SSG Alfred Johnson.)

Tactical Airspace Integration System (TAIS)

An excellent example of a key interoperability "enabler" managed by PM AS is the AN/TSQ-221 TAIS. Its purpose is to extensively automate and improve situational awareness of the Army Airspace Command and Control and Air Traffic Services (ATS) for warfighting commands and ATS companies. TAIS is an Army Battle Command System (ABCS) SoS component and provides linkage to the Joint airspace management processes within the Theater Air Ground System. TAIS automates airspace deconfliction processes from brigade to theater levels, thereby reducing to minutes a procedure that previously took hours to accomplish. Interface is coordinated through the Theater Battle Management Core System (TBMCS), the key system at the Joint level. TAIS is certified as an extension of the U.S. Air Force's (USAF's) Air Operations Center (AOC) Weapons System baseline and "plugs in" to the Joint or combined AOC network without any additional certifications or approvals, seamlessly interfacing the Army's requests for airspace with TBMCS.

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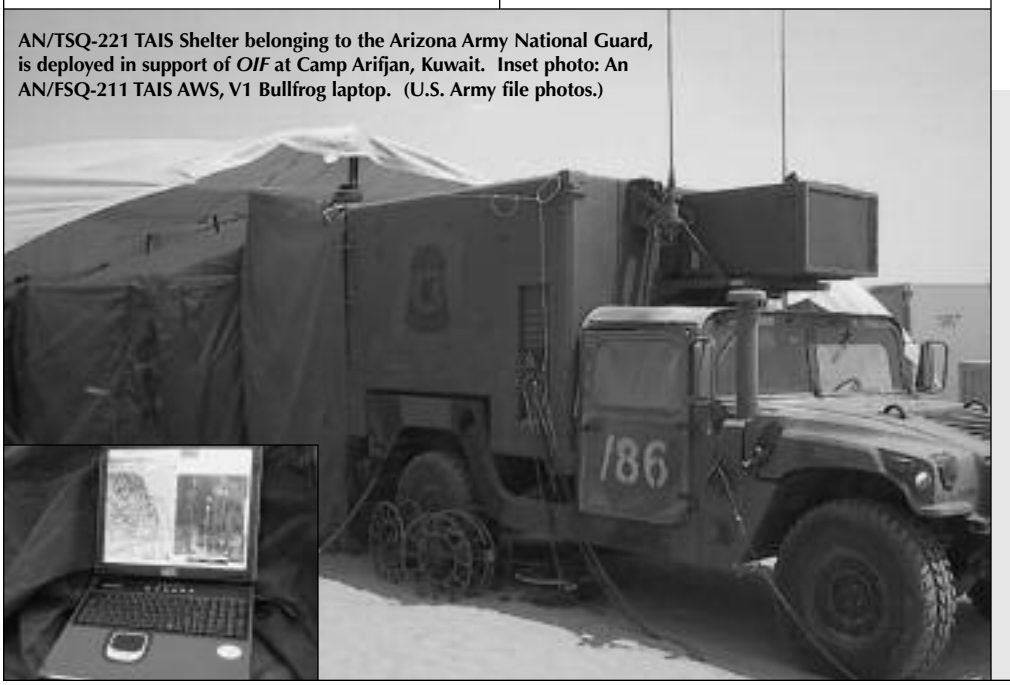
The AN/TSQ-221 consists of the TAIS shelter, mobile communications, generator and various antennas. The AN/FSQ-211 TAIS Airspace Workstation (AWS) provides the same functionality as the workstations in the TAIS shelter, but without the large footprint, for deployment at locations such as Battlefield Coordination Detachments, static headquarters and training centers.

TAIS is fully interoperable with other ABCSs and battle command enablers via U.S. Message Text Format (USMTF)/Variable Message Format messaging and through publish and subscribe functionality with the battle command server. TAIS uses USMTF messaging as the primary means of interoperability for airspace control means requests, airspace control orders, air tasking orders, free text messaging and battlefield geometries. TAIS has the ability to forward and receive Multi-Tactical Data Information Link (TADIL) Air Tracks in Links 11A, 11B and 16 to support near-real-time airspace deconfliction. It can also receive, process and display Blue Force Tracker-Aviation (BFT-A) and High Frequency Tracker air tracks and, through a cursor on target interface, TAIS can forward Army BFT-A tracks to the Joint Data Network as a TADIL-J message.

TAIS has two critical interfaces that improve clearance of fires and integration of Army aviation mission planning. These are the Advanced Field Artillery Tactical Data System Missile Flight Path interface and the Aviation Mission Planning System interface, respectively. Finally, TAIS incorporates a Web-based interface that provides any command, regardless of echelon, with the capability to request airspace clearance, via the network through a Web browser. This cross-platform capability provides a net-centric and service-oriented approach to airspace management.

PM AS is heavily involved in changing the face of aviation interoperability and, through partnerships with other aviation platforms, including FCS, ULLS-AE and Army airspace command and control systems, will continue to push ahead the Army's goal of achieving maximum battlefield interoperability.



AN/TSQ-221 TAIS Shelter belonging to the Arizona Army National Guard, is deployed in support of *OIF* at Camp Arifjan, Kuwait. Inset photo: An AN/FSQ-211 TAIS AWS, V1 Bullfrog laptop. (U.S. Army file photos.)

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