ARAT

THE ARMY REPROGRAMING ANALYSIS TEAM:

A Quarter Century of Enabling Aircrew Survivability

By Mr. Jason M. Juliano

Survival in the operational environment depends on the ability of an aircrew's aviation survivability equipment (ASE) to quickly and accurately detect, classify, and respond to threats. However, with the potential of new threat systems, sudden changes in operating modes of known systems, or variations to threat tactics, techniques, or procedures in an actual or impending combat environment, who can an aviator turn to for the latest ASE mission solution to counter enemy air defense systems?

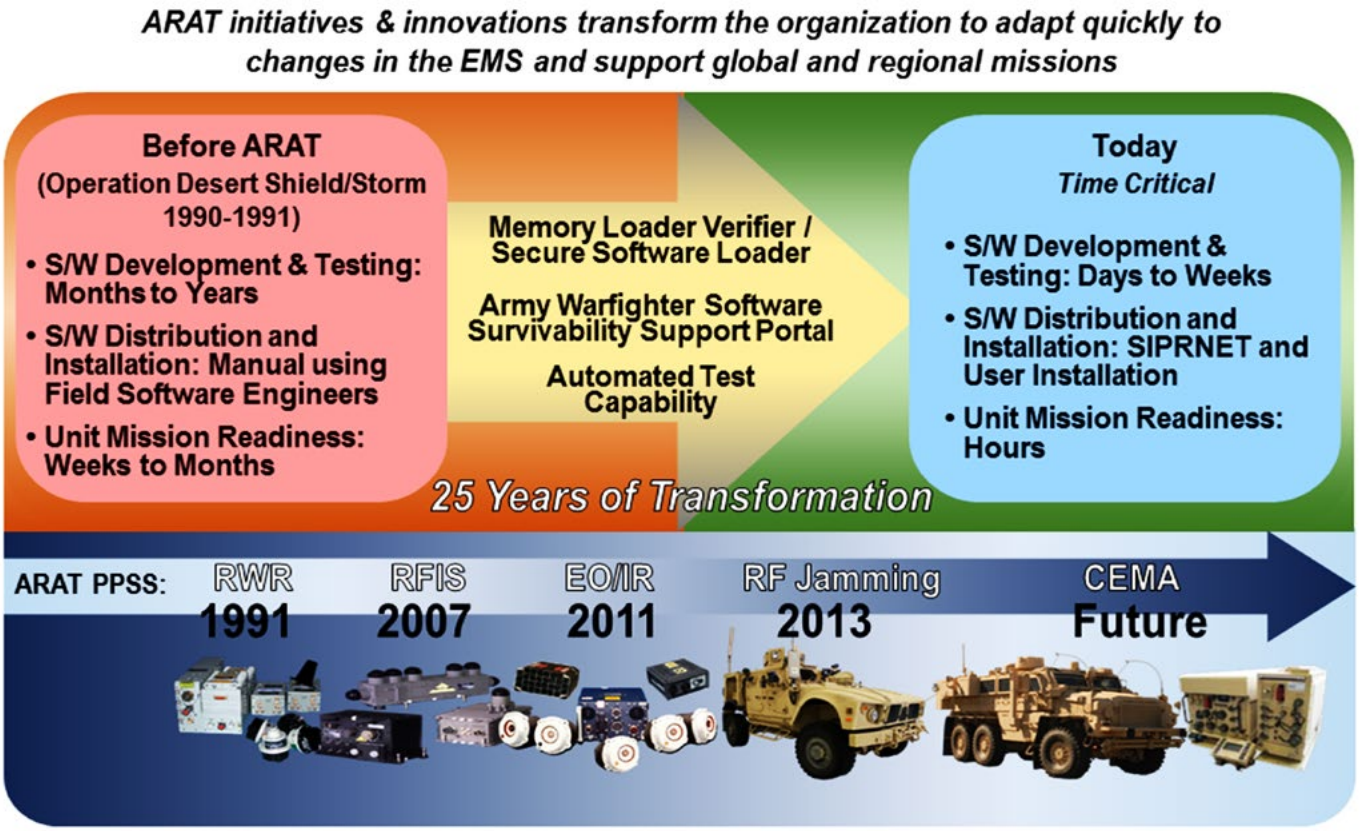
The answer to this challenging question rests with the Communication-Electronic Command's Software Engineering Center (SEC) Army Reprogramming Analysis Team (ARAT). Since 1991, the SEC ARAT has been providing unwavering support to aviators and, more recently, the ground electronic warfare (EW) community. Under the direction of Army Regulation 525-15, *Software Reprogramming For Cyber Electromagnetic Activities*, the SEC ARAT executes its mission as a Headquarters, Department of the Army mandated rapid software reprogramming (RSR) infrastructure that develops, delivers, and sustains ASE mission support products (MSP) (e.g., mission data sets with their mission software, user notes, and kneeboard cards). Formed in response to a Cold War gap in the Army's ability to respond effectively to threat changes, as well as important lessons learned during Operations Desert Shield and Desert Storm, the SEC ARAT faces, on a daily basis, the challenge of protecting globally responsive, regionally focused commanders and aviators who rely on ASE for mission success and protection.

Headquartered at Aberdeen Proving Ground, Maryland, with elements at six other locations across the United States, to include the U.S. Army Aviation Center of Excellence at Fort Rucker, Alabama, the SEC ARAT identifies and analyzes threats to aircrews. The SEC ARAT also develops and tests MSP to counter the threats, disseminates the MSP to aviators through secure means, and provides a reach-back means to assist aviation mission survivability officers (AMSO) and EW officers with their ASE concerns. Working collaboratively with the acquisition, intelligence, doctrine, and training communities, the SEC ARAT responds to U.S. Army Training and Doctrine Command (TRADOC) directed requirements that address priority threats to aircraft operating in TRADOC defined regions across the globe.

The SEC ARAT's normal mode of operation is to update MSP on a routine basis per TRADOC direction. However, if a TRADOC Capabilities Manager identifies a requirement in response to a sudden change in a region that has potential immediate and negative impacts on an ASE system's ability to detect, identify, and respond to a threat, the SEC ARAT will redirect its energy to its RSR mode of operation. This means that the SEC ARAT will shift resources and go into 24/7 operations to develop and deliver updated MSP to the aviator. The length of time to conduct an RSR depends on the complexity of the change(s) affecting a system, but the SEC ARAT significantly reduces its existing timelines to address the urgent requirement.

Essential to both ASE "routine" software reprogramming and RSR is direct Soldier involvement. During Operations Desert Storm and Desert Shield, aircrews had to wait for field service engineers to arrive

The SEC ARAT's Mission is to Support Soldiers Everywhere and at All Times



SEC ARAT's Transformation to Meet Commander's and Soldier's Needs

at their units to manually install updated mission software into their ASE. Today, through a continual focus on transformation and innovation, the ARAT has placed mission software installation in the hands of the AMSO and ASE maintainers. As shown in the graphic above, the SEC ARAT has significantly reduced ASE software development and distribution timelines, leading to faster mission readiness.

Tools available to aviators for mission software installation and mission readiness include:

- ARAT Warfighter Survivability Software Support Portal, a SIPRNet-based website through which the ARAT posts MSP that end users can download at the time and location of their choice

- ARAT Survivability Software Loader (ARATSSL) which consists of software and a USB cable that aviators use to install mission software via their unit's Aviation Mission Planning System computer

- Memory Loader/Verifier cable kit used in conjunction with the ARATSSL that allows aviators to install mission software into their ASE on the flight line

This triad of ARAT-developed applications and tools provides Army aviators with the ability to download and begin installing mission software on their systems, potentially within minutes of being notified of its availability.

While the SEC ARAT looks back on its two and a half decades of success, it is not losing sight of the future. As the Army transitions new ASE into its inventory, the SEC ARAT continues to evolve to ensure that the most current MSP and tools are available to the Army Aviator.

For more information on the SEC ARAT, ask your unit's AMSO or visit the SEC ARAT website at: https://www.arat.army.mil.

Jason M. Juliano is the ARAT Program Office at Aberdeen Proving Ground, MD. He assumed the position of Program Officer in November 2014.

Acronym Reference

AMSO - aviation mission survivability officer	**RF** - radio frequency
ARAT - Army Reprogramming Analysis Team	**RFIS** - Radar Frequency Interferometer System
ARATSSL - ARAT Survivability Software Loader	**RSR** - rapid software reprogramming
ASE - aviation survivabilty equipment	**RWR** - radar warning receiver
CEMA - cyber electromagnetic activities	**SEC** - Software Engineering Center
EO/IR - electro optical/ infrared	**SIPRNET** - Secret Internet Protocol Network
EW - electronic warfare	**S/W** - software
MSP - mission support products	**TRADOC** - Training and Doctrine Command
PPSS - post production software support	**USB** - universal serial bus