AH-64E Systems Integration

Lessons Learned in Support of 3/2 CR CALFEX

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Pictures courtesy of 1LT Ethan Gleue

Bemowo Piskie Training Area, Poland

As the American military has transitioned from counterinsurgency to a decisive action focus, the emphasis on systems integration to build a common operational picture and shared understanding has become more necessary than ever. The proliferation of combat multiplying systems on the battlefield mandates that Soldiers become experts at synchronizing, analyzing, and utilizing complex systems to mass combat power at the decisive point of operations. Attack Aviation has played an absolutely critical role with research, testing, and utilization of these systems to increase operational reach through manned/unmanned teaming (MUM-T) tactics and integration into the Link 16 network.

The setting is Afghanistan 2007. An Attack Weapons Team (AWT), callsign Apache 10, arrives on station supporting an infantry platoon, callsign Spartan 16, in contact while patrolling a Main Supply Route (MSR). The lead aircraft communicates with the platoon leader to build situational awareness. It's nighttime, environment is kinetic, and situational awareness is lacking.

"**Spartan 16, this is Apache 10. We're two AH-64s 10 miles to the east inbound with 4 Hellfires, 38 rockets, 600 rounds of 30 mm and 1 hour of playtime. Understand you're currently taking fire, send your situation update."**

"Apache 10, Spartan 16, we are a convoy with 12 vehicles located at grid VU 1234 5678, currently taking small arms fire from our west. Our lead vehicle was hit by an IED and is now neutralized. We pushed out a squad of dismounts to the qalat structures to find the enemy. Need you to identify and destroy enemy forces."

As the AWT arrives on station, they are working to identify the friendlies and enemy. Gun 1 is currently searching for the enemy location while Gun 2 tries to find the squad pushed out.

"**Spartan 16, Apache 10, what is the front line trace of the squad you pushed out."**

"Apache 10, Spartan 16, they're in the building directly to my west."

"Spartan 16, Apache 10, I've got about 40 buildings to your west. I need you to be more specific. Can you send me a grid to their location or have them mark their location?"

"Apache 10, Spartan 16. Roger, standby and I will have them mark location."

3 minutes goes by as Spartan 16 communicates with his squad leader to mark his current location.

"Apache 10, Spartan 16 friendlies marking with IR strobe."

"Gun1, Gun 2, I have friendly location. Sending you a point now."

"Spartan 16, Apache 10, contact mark. In relation to the squad, where are you taking fire from?"

"Apache 10, Spartan 16, approximately 100 meters to the northwest of their location, marking enemy location with .50 cal."

"Gun 2, Gun 1, got two targets in a courtyard, they have small arms and are maneuvering tactically."

"Spartan 16, Apache 10 tally target. I have PID on two individuals with weapons in the courtyard, requesting clearance of fires and I think it's going to be danger close so I'll need your initials."

"Apache 10, Spartan 16, you're clear, ABB."

"Spartan 16, Apache 10, I'm inbound with Hellfire and 30 mm."

"Gun 2, Gun 1, I have the targets in sight, I'll be inbound from south to north, running Hellfire, engaging at 2000 meters, breaking at 1000. Need you to follow with 30 mm on my splash."

The engagement takes place, targets are destroyed, and the convoy recovers its personnel, vehicles, and equipment. The entire sequence of events takes a little under 10 minutes. But how different would this have been with modern C2 systems such as Nett Warrior, Link 16, and MUM-T?

C/1-227th Attack Reconnaissance Battalion (ARB) participated in a Combined Arms Live Fire Exercise (CALFEX) with 3/2 Calvary Regiment from 13-27MAR18 at Bemowo Piskie Training Area, Poland. Throughout the troop and squadron CALFEX, aircrews worked with ground forces to integrate multiple combat systems like the Nett Warrior system, Link 16 network, Air to Air to Ground (AAG), and Upper Receiver (UR) systems. The result of training these systems in a live fire environment was shared understanding through a common operational picture, decreased fratricide risk, increased operational reach, decentralized reconnaissance/attack operations, and overall increased efficiency.

The Nett Warrior System is an integrated individual Soldier situational awareness and mission command system that provides the end user with graphical depiction of the battlefield, operational graphics, and precise location information (PLI) on a Samsung Galaxy S5 platform. The Nett Warrior System operates through a TrellisWare radio which provides connections to the network similar to a Wifi network with each radio acting as a repeater. This allows for the Nett Warrior network to extend over miles depending on line of sight (LOS) of the radios. Quite simply, Nett Warrior is a near real time, user friendly Joint Capabilities Release (JCR) the size of a smart phone, and distributed on the battlefield from team leader to regimental commander. The real time reporting and accuracy of the Nett Warrior systems greatly surpasses the often latent data and capabilities provided by the JCR on a dynamic battlefield. Used in conjunction with the Move Out/ Jump Off (MOJO) kit, Nett Warrior provides PLI of the ground force to the Link 16 network.

The Link 16 network provides near real time tactical data transmission and reception among fixed wing, rotary wing, and ground assets. For the AH-64E V4 specifically, Link 16 allows for up to eight aircraft to exchange location, weapons engagement, information distribution, messaging, and voice communications. The MOJO kit, which hosts a Small Tactical Terminal (STT) and Situational Awareness Data Link (SADL), essentially takes otherwise incompatible data and spans the network bridge to allow for Nett Warrior data to be viewed on the Link 16 network.

Link 16 is a highly effective combat multiplier utilized on a decisive action battlefield . It significantly decreases radio traffic in a highly dynamic environment, rapidly orients aircrews to sister ship location and sensor point of interest (SPOI), and allows for near real time messaging/ voice communications and weapons engagement information. Throughout the CALFEX, 1ACB aircrews accessed the Link 16 network and received PLI on the ground force operating the Nett Warrior system. Nett Warrior provides Attack Aviation with accurate front line trace information, callsign, altitude, and bearing on the aircraft Tactical Situation Display (TSD) page. At any given point in time, aircrews had a real time COP with ground force locations, sister ship location, SPOI, and weapons engagement tracks. This information, readily accessible at one location, greatly decreases decision making timeline and increases effectiveness for Air Mission Commanders.

The greatest limitation of the Nett Warrior system is its security classification; the Nett Warrior system is unclassified while the Link 16 network is classified. The MOJO takes the unclassified data from Nett Warrior and uploads it to the Link 16 network but it cannot declassify the Link 16 data down to the Nett Warrior systems. This means the aircraft are able to see the ground forces, but the Ground Force Commander (GFC) is unable to receive the same information from aviation assets. Currently, there is no bridge capable of taking the Link 16 user data to the Nett Warrior network.

The addition of the Handheld Link 16 Radios on the battlefield at the Joint Terminal Attack Controller (JTAC) or Joint Fires Observer (JFO) level would allow the GFC to readily receive all pertinent Link 16 information from Attack Aviation on a secure network. The 82nd Airborne Division currently uses Handheld Link 16 Radios at the JTAC level, allowing combat controllers to fully integrate on the Link 16 network. This asset, used in conjunction with Nett Warrior system, would allow the aircrew to maintain near real time situational awareness on the ground force through Nett Warrior system; it would also provide the GFC with access to precise participant location and identification (PPLI) for a wide range of fixed and rotary wing assets.

AH-64E AAG/UR system allows for simultaneous transmission and reception of video feed between aircraft and the One System Remote Video Terminal (OSRVT). The AH-64E AAG/UR generally operates on Ku band frequencies to transmit and/or receive sensor video. Used in conjunction with the UR, this system allows the AH-64E to receive video feed from Unmanned Aerial Vehicles (UAVs) and transmit that same video to the GFC via OSRVT. These systems greatly increase combat power through MUM-T tactics. C/1-227th ARB received and transmitted video feed between aircraft, received Shadow V2 feed, and pushed AH-64E video feed to the OSRVT in the Regimental Command Post. In addition to building situational awareness, aircrews conducted remote Hellfire missions and decentralized reconnaissance using Shadow feed. In an Integrated Air Defense system environment, this allows Apaches to maximize standoff and survivability.

This capability presents challenges with spectrum management and training shortfalls. Spectrum managers must authorize the use of numerous Ku band frequencies to allow the full capability to be explored. During the CALFEX, the GFC was able to receive Shadow feed on the Nett Warrior devices via the OSRVT connected to a TrellisWare radio. With the authorization of additional Ku band frequencies, this means that any Soldier with the Nett Warrior system could receive the Shadow and AH-64E feed. Aircrews must train with these systems to build proficiency and efficiency.

The complexities and technological advances of combat on a decisive action battlefield requires Soldiers be trained to quickly incorporate data from multiple sources, rapidly analyze, and make dynamic decisions. Looking back to the original scenario, how much quicker could Attack Aviation service the targets when, 10 miles out, they already had the precise friendly and enemy locations via Nett Warrior and Shadow video feed? The answer is 45 seconds.

"Spartan 16, this is Apache 10. We're two AH-64s 10 miles to the east inbound with 4 Hellfires, 38 rockets, 600 rounds of 30 mm and 1 hour of playtime. I have your front line trace and visual on the enemy via Shadow feed. Request clearance of fires as soon as I'm in range."

"Apache 10, Spartan 16, roger you're cleared."

"Gun 2, Gun 1, south to north, Hellfire followed by 30 mm when we get closer. Engaging at 7000 meters. Once we hit 1700 meters, we'll engage with 30 mm."

In the Army, you can't go a day without someone telling you that the enemy has a vote, but what if he only has 45 seconds instead of 10 minutes to cast that vote? On a deliberate operation where combined arms synchronization of fires and massing combat power at the decisive point hinges on situational awareness across all warfighting functions, systems like Nett Warrior, Link 16, and MUM-T are critical. During the CALFEX, aircraft already knew the precise location of friendly forces, viewed UAS video of targets, and engaged with maximal standoff when the GFC wanted to mass fires. In order to provide lethal and adaptive support to the ground force, the Army Aviation community must continue to build combat readiness and integrate capabilities like Nett Warrior, Link 16, and AAG/UR on the battlefield.