

The hovering OH-58D Kiowa Warrior helicopter of D Troop, 1st Squadron, 7th Cavalry (1-7 Cav) of the 1st Cavalry Division, Fort Hood, Texas, began to rise slowly. Only the mast-mounted sight was showing over the tops of the trees when the crew lased the enemy armored formation moving through the field to the north. As the aircraft vanished below the tree line, a call-for-fire (CFF) was transmitted to the squadron fire support element (FSE). In less than a minute, the crew heard the thunder of the division's multiple-launch rocket system (MLRS) battalion's rockets engaging the enemy formation.

This scenario was played out during a recent 1st Cav task force external evaluation (EXEVAL). The division cavalry squadron was the opposing force (OPFOR) during the EXEVAL, which used fire markers instead of actual rockets on 1-7 Cav's "targets."

A few weeks before this exercise, 1-7 Cav's FSE had demonstrated to the division artillery (Div Arty), division and squadron commanders its ability to interface digitally with the advanced FA tactical data system (AFATDS). The aircraft initiated the system status (SYSTAT) message from the OH-58D's improved data modem (IDM) computer

to the squadron FSE and, through the auto-relay process of data distribution in AFATDS, to the division fire control element (FCE). The aircraft then flew through an established air corridor, updating its location with a SYSTAT every 1,000 meters, which allowed the division and Div Arty commanders to continuously monitor its location.

After arriving in its hide position, the aircraft spotted a target in the engagement area (EA). Using the mast-mounted sight, it lased the target, generating a fire mission transmitted to the squadron FSE that was forwarded to the division FCE for target servicing. The entire process was digital and took less than a minute.

This article discusses the AFATDS-Kiowa Warrior communications protocols and tactics, techniques and procedures (TTP) for the digital interface to accomplish fast, lethal missions.

**AFATDS-IDM Communications.** AFATDS is the primary method of transmitting CFFs to agencies outside the squadron. The squadron's three ground troop fire support teams (FISTs) transmit fire missions to the squadron FSE using handheld terminal units (HTUs) on the digital fire support net.

The artillery also taps the squadron's 16 OH-58Ds to engage targets with artillery fires. The Kiowa Warrior has a laser, global positioning system (GPS) and thermal night vision. Additionally, the on-board IDM allows the aircraft to communicate digitally with other aircraft or ground units.

The IDM is similar to the FA's forward entry device (FED) or HTUs, and when "talking" digitally to AFATDS, it has the same net characteristics. Fire supporters talk to the aircraft IDMs on the same net used by FISTs.

The communications configuration of AFATDS and IDM is not difficult. The communications protocol is for the airborne target handover system (ATHS) on the helicopter that uses the single-channel ground and airborne radio system (SINCGARS) advanced system improvement program (ASIP). The ASIP settings are "frequency hopping" and "cipher text" in the tactical fire direction ("TACFIRE") mode. This allows AFATDS and IDM to send targeting data digitally. 1-7 Cav currently uses IDM Version 2.0 and airborne SINCGARS software Version 6.0. All of the 1st Cavalry Division Artillery uses AFATDS Version A98U.0.15.

**Tactics, Techniques and Procedures.** The pilots and the FSE worked out the

# AFATDS-Kiowa Warrior A Deadly Digital Interface

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exact procedures to make the two devices talk through trial and error. In a tactical environment, the digital link is established during a communications exercise (COMEX) before executing a mission. Voice contact is made on the squadron fire support net, and the crew begins sending SYSTATs when it leaves the forward area rearm/refuel point (FARP). The icon of the aircraft is automatically updated in AFATDS. (The aircraft are built into the AFATDS' database according to tail number, which is how the IDM subscriber data is organized.)

When in the FARP, the icons for the aircraft are pulled out-of-zone on the screen. When the SYSTAT is sent, it has the location of the aircraft and updates the AFATDS icon. The aircraft then can send the FSE SYSTATs as it moves through the zone.

When a pilot lases a target, several things occur. The onboard GPS tells the inertial navigation system where the aircraft is, and the laser tells the system how far the target is from the aircraft. The aircraft's improved master control processing unit (IMCPU) then plots the target's heading and angle, based off the mast-mounted sight measurements, and an eight-digit grid is automatically placed in the target buffer. The IDM supports fire mission processing (formatted messages, as with the HTU) and can have multiple active and preplanned missions in its buffer.

The pilot then transmits the data to AFATDS. In case of laser failure, the pilot also can manually input the target location, and the mission is processed as if a FED or HTU had sent the information. On the AFATDS screen, the aircraft icon moves as the aircraft updates its location.

When the Kiowa Warrior sends a target to AFATDS, it is displayed in bold on the AFATDS screen as an active target, and the AFATDS fire mission processing screen appears. If the target is sent as an artillery target intelligence (ATI) message, it is displayed normally without the fire mission screen. Depending on how AFATDS guidance is set up, the mission will be sent to either a firing unit or FSE. Messages-to-observer (MTOs) also can be sent to the IDM.

CFFs are cleared in the squadron tactical operations center (TOC) with the aid of AFATDS and then sent to the firing unit. If the squadron is under division control and no direct support (DS) FA assets are available, the mis-

sions go through the division tactical command post (TAC) FSE and then to the Div Arty FCE. If the squadron is under division control with a DS unit, missions are cleared and sent to the FA battalion fire direction center (FDC).

Sometimes the squadron is under the operational control of (OPCON to) one of the 1st Cav's maneuver brigades. In this case, the missions are transmitted to the brigade FSE, not the battalion FDC.

Great care must be taken when the squadron is OPCON to a brigade combat team (BCT) because of the differences in AFATDS' attack criteria. In the squadron, air defense artillery (ADA) is at the top of the list for target engagement. When OPCON, squadron missions are sent to AFATDS in the BCT's FSE and must compete with the missions generated by task forces organic to that brigade. Usually, ADA is not ranked as high as maneuver targets in the BCT's FSE, causing squadron missions against ADA to be delayed. This, in effect, controls the squadron's maneuver tempo. The aircraft must detour, wait until FA fires are available or wait until squadron mortars come into range.

The fix is simple: the fire support annex must reflect the changes needed to the AFATDS fire support guidance at the brigade FSE. If the squadron is given priority of fires (POF) and AFATDS is set up to process missions according to POF instead of target type, missions will not be slowed. This doesn't disrupt the brigade as ADA targets require a much smaller volume of fire than any other target type.

AFATDS also helps manage the squadron's airspace. By enabling the vector function in AFATDS map overlays, the gun/target line is displayed as a thick blue line on the AFATDS digital map, automatically alerting the aircraft and artillery to any conflicts. Because the squadron routinely operates forward of the division, it uses AFATDS to provide situational awareness across the division.

For example, if the attack aviation battalion is conducting operations across the forward-line-of-own-troops, Kiowa Warriors and AFATDS receive the attack battalion's graphics and can de-conflict the airspace. The air corridors come through the data distribution process and are highlighted as graphics on the screen, confirming the attack battalion's coordinates. This updates the TOC map graphics in a timely fashion. The function also works in the

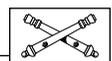
reverse: data about aircraft and FIST locations is distributed out to other units.

Finally, the AFATDS-Kiowa Warrior interface is particularly useful when operating in restrictive terrain, such as in Korea. In this tactical situation, the Kiowas work with ground cavalry scouts to find the enemy who may be concealed in defiles overlooking narrow maneuver approaches. Digital CFFs are quick and responsive and enhance flexibility of the entire maneuver force.

Using the AFATDS-Kiowa interface allows artillery to coordinate, clear and process fire missions throughout the 1st Cavalry Division area of operations. 1-7 Cav relies on quick, decisive maneuver to carry out its mission. As the aircraft screen forward, the artillery is always poised to provide suppression of enemy air defenses (SEAD) against any ADA threat.

To reinforce this digital link, the Div Arty commander has instituted monthly training on a rotating basis for the BCT FSEs and battalion FDC sections with the 1-7 Cav. In addition, the 4th Brigade's 1-227 Attack Battalion has replicated this digital link with its AH-64D Longbow Aircraft. 1-7 Cav will execute this digital link during National Training Center Rotation 01-04 at Fort Irwin, California, in January 2001.

The bottom line is the equipment and software already exist—units only need to train on these devices as one integrated digital system. Then they will be assured of an AFATDS-Kiowa Warrior interface for fast deadly fires.



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