The Transformation Continues

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The phrase "fighting with fires" has become commonplace in the fire support community. But the integration of new technology is not only improving how we fight with fires, but making it possible to fight better against fires as well. We now are using our advanced Field Artillery tactical data system (AFATDS) not only to plan and execute fires, but also as an *analysis* tool against the opposing force's (OPFOR's) fires to help the commander shape his battlespace more effectively than ever before.

At the division level, the commander often tasks fire support to shape the fight for the maneuver brigades, neutralize or destroy the enemy's artillery and, finally, neutralize or destroy air defenses and radars, providing suppression of enemy air defenses (SEAD) for deep attacks with Army aviation. Using the latest technology available, the 4th Infantry Division (Mechanized), Fort Hood, Texas, developed dynamic and adaptive tactics, techniques and procedures (TTPs) to accomplish these missions. During our April digitized Division Capstone Exercise (DCX) at the National Training Center (NTC), Fort Irwin California, we executed the TTPs and tracked our progress to a fidelity never before possible.

What follows is a narrative of battles with a live OPFOR combined with the actual screen shots of the fight as depicted on the prototype fire support coordinator's (FSCOORD's) synchronization tool—currently known as the AFATDS Fire Support Client. Throughout the battle, the information provided through our systems greatly improved our situational awareness and execution of fires.

Fire support Client Software. AFATDS offers some powerful new processing and analysis tools that caused us to re-evaluate two fundamental TTPs: radar zones and planned targets.

First, we decided to use the Firefinder radars as we do most of our other technology-based acquisition platforms; we had them report all acquisitions as fast as possible to the fire support element (FSE) and used AFATDS to analyze and "weight" the criticality of the targets based on the commander's guidance. This saved time and avoided the "best-guess" zones built into the radar and AFATDS that are established before the fight begins.

We found that by using *no* radar zones, acquisition reports came from the radar with both a point of origin and point of impact. This enabled AFATDS to display the enemy gun-target line as red vectors on the AFATDS screen. (For a more detailed explanation, see the article "Reactive Targeting: Firefinder and AFATDs in the Digitized Division" by Chief Warrant Officer Two Eric J. Moran and Lieutenant Colonel Dominic D. Swayne in the May-June edition.)

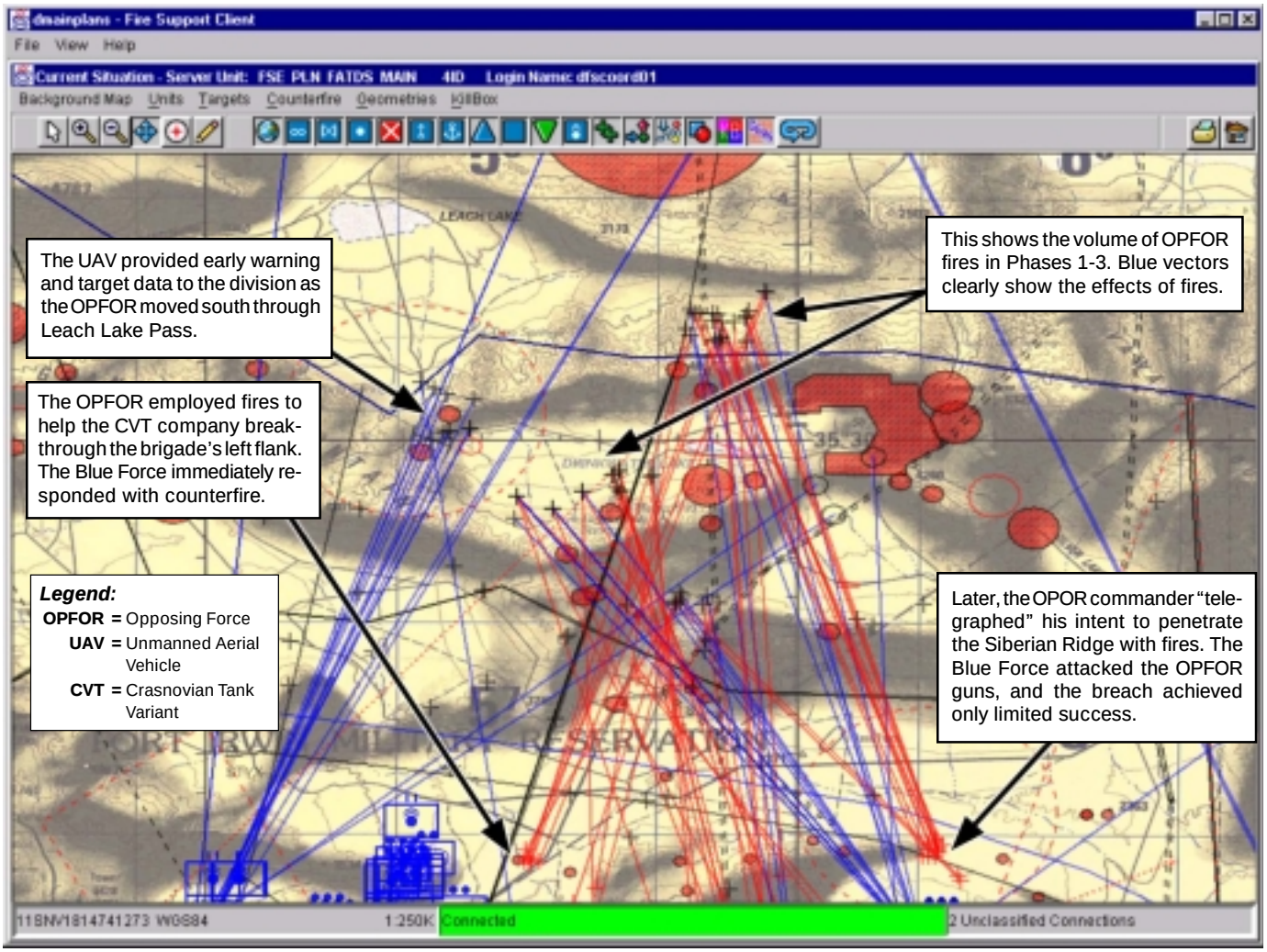
The unintended consequence of showing the red vectors was that suddenly we could visualize the enemy's intent for fires and translate that into real-time intelligence. This capability proved to be one of the key enablers for achieving situational dominance.

With default radar targets loaded into the AFATDS high-payoff target list (HPTL), AFATDS automatically converts each acquisition into a call-for-fire. We consider this interim TTP and anticipate that target areas of interest (TAIs) will replace Firefinder call-for-fire zones (CFFZs). Future changes to AFATDS will factor critical friendly zones (CFZs) into its mission value analysis (the basis of priority of targets), and the Firefinder radar will allow all zones to generate red vectors in AFATDS. The FA Tactical Data Systems (FATDS) Version 7 software for AFATDS and Firefinder radar is scheduled to be fielded in FY03 and will include these capabilities.

The second breakthrough TTP was to harness the power of the TAI in AFATDS. In the traditional sense, a target should have an intent, an observer and something to apply effects to the target (a shooter). In much the same way, AFATDS provides its TAI as a potent tool that makes top-down, bottom-up fire planning flexible and easy to execute, and allows us to associate areas with both *observers* and *shooters*.

The benefits of the TAI are that they can contribute to mission value in AFATDS, and several can be entered and rank ordered. Also, we can associate them with observers and shooters independently. With the radar reporting every acquisition, we used TAIs in AFATDS (rather than CFFZs and CFZs in the radar) to focus fires.

Death by Fires. Using the Fire Support Client, the fire support officer (FSO) or targeting officer in the FSE can quickly and dynamically establish (draw) TAIs over the enemy artillery. By analyzing and targeting the source of the red vectors, the enemy fires' origin, the FSO and counterfire cell can



Courtesy of Raytheon

Figure 1: DCX Fire Support Client Screen Capture. This advanced FA tactical data system (AFATDS) screen capture illustrates the Blue Force's canalization of the OPFOR in Leach Lake Pass and how the Blue Force prevented the OPFOR from flanking it during the Blue Force's hasty defense near Siberian Ridge. (The red vectors are the OPFOR's gun-target lines, and the blue vectors are the Blue Force's gun-target lines.)

take advantage of the TAI's power in AFATDS and truly influence the fight.

The TAI increases the mission value of acquisitions, much like a CFFZ increases message priority in legacy systems. The FSO or targeting officer can selectively prioritize each TAI, so the FSCOORD can focus the counterfire fight. This is a much more rapid and dynamic process than creating and adjusting CFFZs. The process also allows us to "see" the enemy's fires in the current version of software.

A second effective use of the TAI was to attach them to friendly firing units. If there was a need to focus a particular unit's fires in one area, the FSCOORD could create a TAI associated with only one fire unit. In this way, only calls-for-fire originating in that TAI would go to the associated unit.

The AFATDS screen captures show the friendly units' "gun-target" lines as blue vectors from missions that were executed, as documented in AFATDS. Although passing vectors from AFATDS to AFATDS has some communications and update challenges, the process gave us reliable vectors on the battalion-level unit firing the mission.

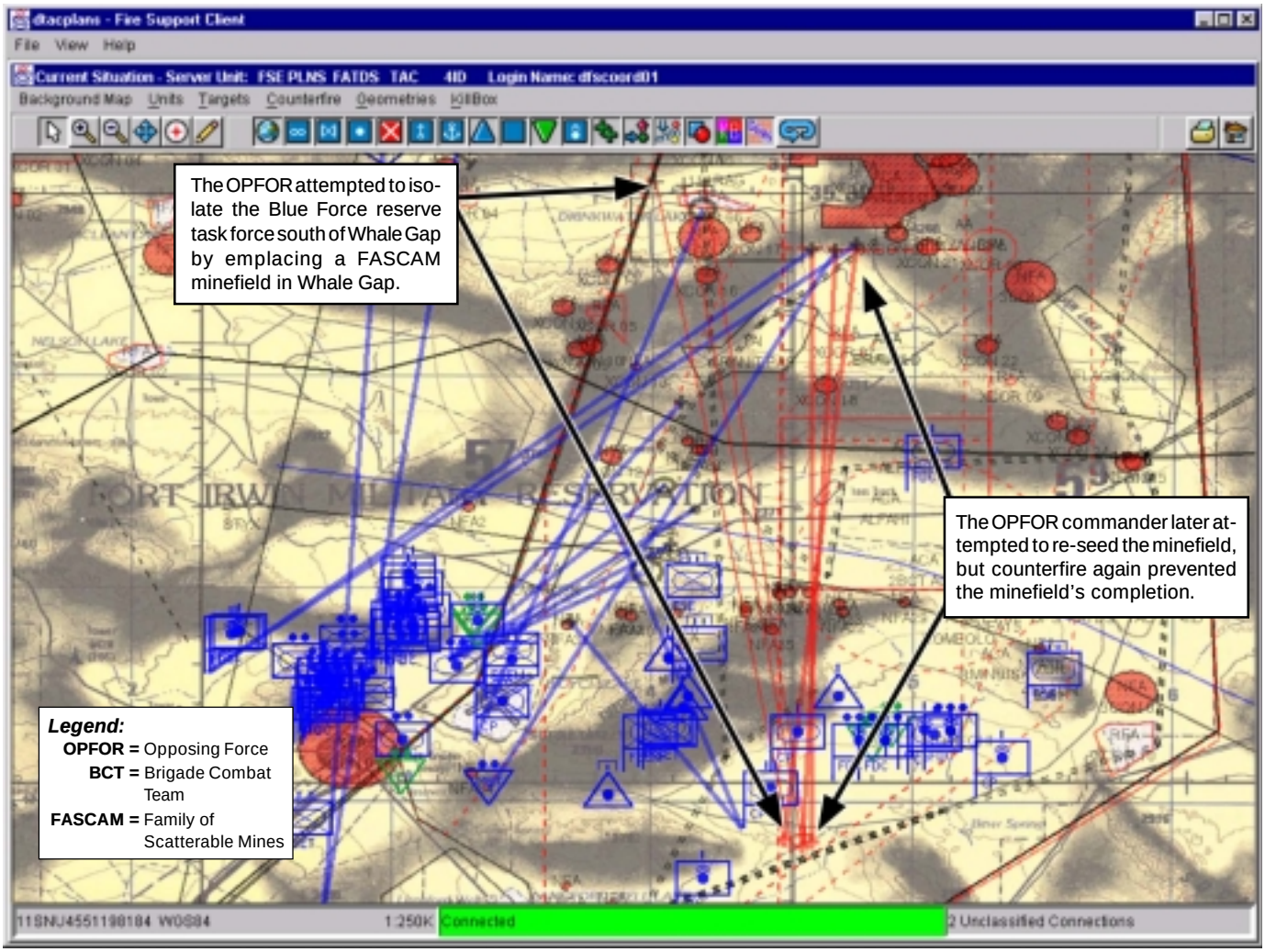
Additionally, AFATDS TAIs are much more flexible than radar zones as they can overlap with or be inside of another TAI. This gives the FSCOORD a number of automated decision-making tools with a large number of fine-tuning options.

As we explored AFATDS' potential, we examined how AFATDS could link with other battlefield operating systems (BOS). We then linked the power of AFATDS and the Fire Support Client to our existing technology, in this case the joint surveillance and target attack radar system (JSTARS) and unmanned and aerial vehicles (UAVs). These systems helped improve our *Decide*, *Detect*, *Deliver* and *Assess* targeting methodology.

Canalizing the OPFOR at Leach Lake Pass. JSTARS proved to be an effective tool for both analysis and targeting. Using JSTARS and the division's UAV, we tracked the OPFOR's movement into Leach Lake Pass at the NTC. (See Figure 1.)

In anticipation, we built four target groups along the two severely restricted passes and timed the fires to attack the columns when they were still tightly grouped. The first column entered the northern pass with 27 vehicles. After firing the group, they were observed exiting the pass with 12. The next column chose the southern route but suffered a similar fate.

Hitting moving targets always has been difficult. But in this situation, we used a natural obstacle, Leach Lake Pass, to canalize the enemy's forces. This allowed us



Courtesy of Raytheon

Figure 2: Fire Support Client Screen Capture. The OPFOR fired into Whale Gap, an area in which there were no Blue Forces. By deduction, the Blue Force determined the fires were most likely laying FASCAM with the intent of isolating the Blue Force reserve task force south of Whale Gap from the rest of the Blue Force. The Blue Force fired counterfire to stop the OPFOR from firing the minefield and then had the brigade engineers breach the obstacle.

to execute on-call groups of targets as JSTARS and the UAV tracked the opposing forces moving through the pass.

Securing the Hasty Defense. In a subsequent fight with Blue Forces in a hasty defense, the G2 assessed that the OPFOR would press both flanks of the brigade, but his main effort would be center at the crest of the Siberian Ridge. We used JSTARS to monitor battlefield movement, much like a television camera provides slow-motion replay.

On the AFATDS' display of the Fire Support Client, we watched as the OPFOR "telegraphed" his intent to press our left flank with a high volume of fires. Rapid, effective counterfire prevented Blue Force attrition, and a quick "heads up" to the maneuver commander confirmed the enemy's intended point of penetration.

JSTARS moving target indicators again confirmed the G2's read as tracked vehicles moved in coordination with their Phase 3 fires. Next came a high volume of fires at the crest of the Siberian Ridge. The OPFOR commander followed his Phase 3 fires with a well-coordinated movement of tracked vehicles—valuable, real-time information provided by the stalking JSTARS platform and displayed in AFATDS as red vectors.

The raw information provided by multiple sensors and automated systems combined with staff analysis gave the high-ground advantage to the assistant division commander for maneuver [ADC (M)]–in effect enabled him to achieve situational dominance. Situational dominance and the ability to synchronize dominant maneuver at the decisive point are powerful combat multipliers.

Spoiling the OPFOR Defense. JSTARS was also an effective stand-alone analysis tool when other systems were not available. Before our deliberate attack, the G2 assessed that the OPFOR was taking advantage of limited visibility to build a battalion-level defense. The brigade combat team (BCT) was rebuilding combat power and preparing to continue the offense the next day. The brigade's UAV had been employed to its maximum time limits during the previous fight and was not available to target the enemy as they prepared their defense.

The FA intelligence officer (FAIO) noted that JSTARS was tracking multiple vehicles moving into the areas where the G2 predicted the OPFOR would be digging in his defensive positions. JSTARS tracked three to 14 vehicles into discrete areas near the templated defensive positions. The vehicles then stopped and began making short back-and-forth movements, the

same type of movements you would expect from bulldozers digging in a trench line.

Because the vehicles tended to stay in pretty tight areas (300-meter radius), we decided to target them and, at least, reduce the enemy's ability to dig in. This made it easier for the Blue Forces to assault through the obstacles and defeat the strongpoints.

Although using JSTARS as a primary acquisition platform for targeting is not common, in this scenario we already knew the area was clear of civilians and neutral forces and the OPFOR was preparing a defense. Also, no other viable acquisition platforms were available. Over the course of the evening, this TTP proved exceptionally effective.

Reading the OPFOR's Intent for Fires. Another effect of our analysis benefited our interaction with our engineers and maneuver elements. The OPFOR artillery initiated a high volume of fires into Whale Gap. (See Figure 2 on Page 23.) Assuming the OPFOR was employing observed fires, these volleys initially didn't make sense as our situational awareness provided by Force XXI battle command brigade and below ($FBCB^2$) showed no Blue Forces nearby.

The brigade commander back-briefed the ADC (M) over the video teleconference (VTC) display screen so everyone in the division tactical operations center (DTAC) knew the brigade's plan. The plan assumed the OPFOR had achieved some success in infiltrating reconnaissance and probably had a fair assessment of the disposition of Blue Forces. The Blue Force reserve task force was positioned south of Whale Gap, terrain that was a likely location for an obstacle—such as a family of scatterable mines (FASCAM) minefield fired by the OPFOR FA.

The FSE in the DTAC quickly consulted the division engineers who concurred with the plan. Counterfire prevented the OPFOR from firing multiple volleys, and within minutes, BCT engineers were dispatched to the site and quickly breached the immature minefield before any Blue Forces were damaged significantly.

A short time later, the OPFOR attempted to re-seed the minefield. Again, we analyzed his fires vectors and dispatched BCT engineers to the site. Simultaneously, the NTC fire markers arrived to mark the minefield as reseeded, which the engineers then breached without additional Blue Force losses. In other words, we "read" the enemy's intent and sent engineers to counter his intent as the fire markers arrived to mark the simulated minefield.

The same methodology could be used for dealing with artillery-delivered chemical strikes.

Locating the OPFOR Observers. One final tool we developed proved useful in focusing counterreconnaissance efforts in the rear. Again, based on the knowledge that the OPFOR usually employs observed fires, we used our engineer's digital topographic support system (DSST) to help locate enemy observers. Because our AFATDS TTP allowed us to track impacts of enemy fires in our rear area, we were able to analyze several of these targets. It appeared likely that one observer was responsible for many of the fires in our rear area.

We gave the impact grids to the division engineer support element and asked the element to do a common line-of-site analysis from the points of impact to see if there were limited areas from which one observer could see all three targets. Using the DSST, the engineers not only determined that one observer probably was responsible for the three targets, but also provided eight-digit grids to the three likely observer locations. This enabled the brigade to focus its division reconnaissance team (DRT) sweeps more effectively.

Conclusion. As the DCX clearly demonstrated, digital systems give the commander greater flexibility in employing joint and combined arms teams deeper and over a significantly larger battlespace. Our digital systems allow us to get "inside" the enemy's decision cycle. The Blue Force was able to defeat substantial enemy forces well before we made contact with enemy ground maneuver.

Although the 4th Infantry Division's new digitized tools have increased our warfighting capabilities significantly, such technology in not a panacea. During the DCX in the same NTC scenario, the low-tech OPFOR still achieved some successes. One example follows.

Having halted the OPFOR attack, the brigade prepared to attack into the enemy's prepared defensive positions to the north in Echo Valley. The BCT launched a company-sized demonstration designed to make the enemy react and divert his attention away from our scout insertion.

Even without high-technology tools, the OPFOR hit these moving targets and halted the demonstration well before the company could make contact with the OPFOR defense. The OPFOR's well-trained observers, 80 percent illumination and primitive optics allowed him to engage moving vehicles and destroy several. Regardless of our superior technology, we must never underestimate an enemy.

As a digitized force, we must capitalize on the strengths of the fire support BOS: our ability to focus effects, expedite sensor-to-shooter links, allow the commander to visualize blue and red fires, and contribute to situational dominance. Our strengths enable the commander to fight more effectively with and against fires.

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